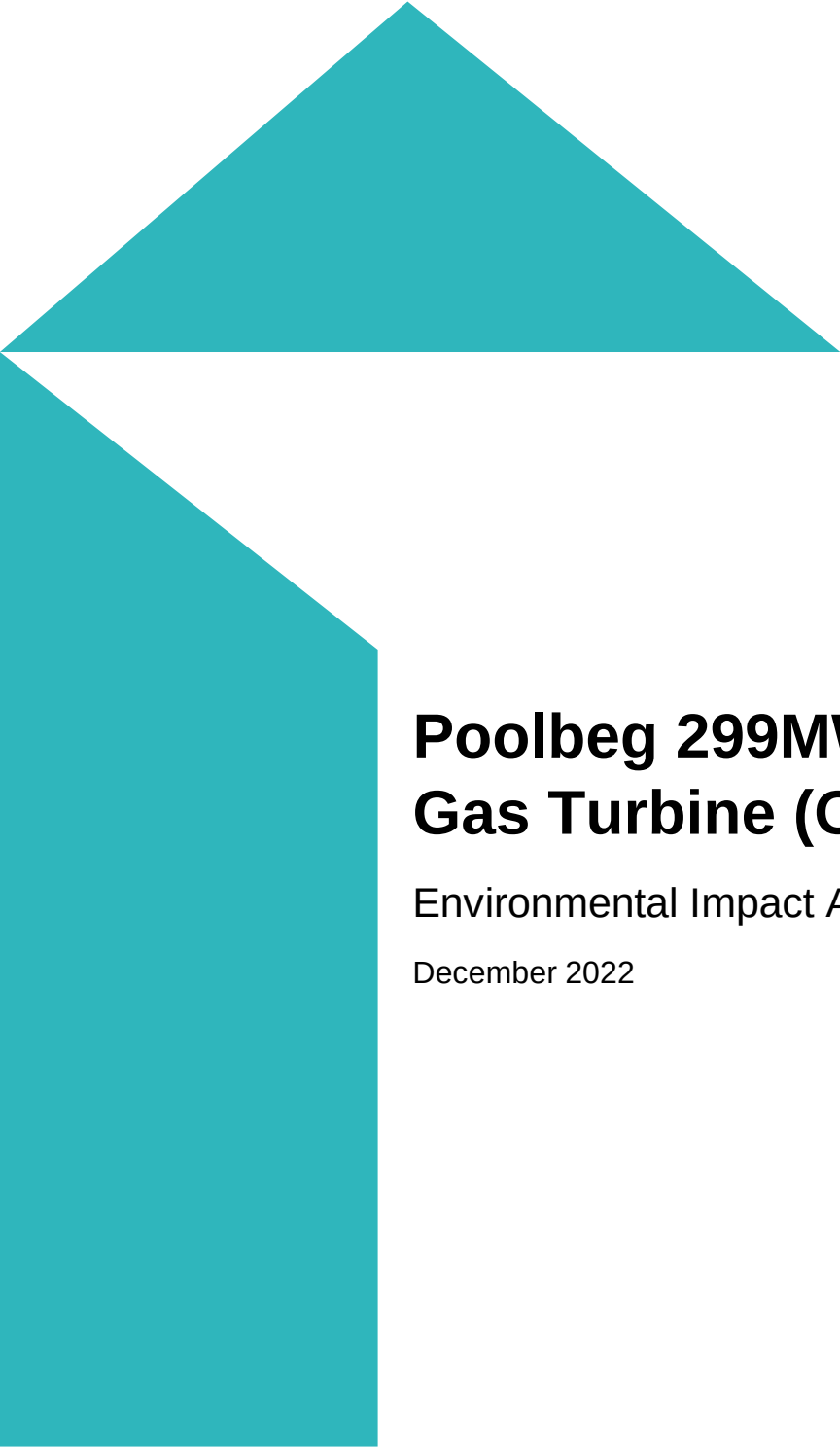




Poolbeg 299MW Open Cycle Gas Turbine (OCGT)

Environmental Impact Assessment Report

December 2022

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Poolbeg 299MW Open Cycle Gas Turbine (OCGT)

Environmental Impact Assessment Report

December 2022

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Abbreviations

Abbreviation	Full Term
AA	Appropriate Assessment
AADT	Annual Average Daily Traffic
AAP	Areas of Archaeological Potential
ABP	An Bord Pleanála
ACA	Architectural Conservation Area
ACM	Asbestos Containing Materials
AD	Anno Domini
AEP	Annual Exceedance Probability
AGI	Above Ground installation
AIS	Automatic Identification System
AOD	Above Ordnance Datum
AQS	Air Quality Standards
BAT	Best Available Technology
BSS	Biological Sampling Survey
BC	Before Christ
BC	Baseline Concentrations
BCT	Bat Conservation Trust
BESS	Battery Energy Storage System
BS	British Standard
BSA	Biologically Sensitive Area
C&D	Construction and Demolition
C&I	Control & Instrumentation
CAP	Climate Action Plan
CARO	Climate Action Regional Offices
CBAM	Carbon Border Adjustment Mechanism
CBD	Convention on Biological Diversity
CCGT	Combined Cycle Gas Turbine
CD	Chart Datum
CDP	City Development Plan
D&CEMP	Demolition and Construction Environmental Management Plan
CEMS	Continuous Emissions Monitoring System
CER	Commission of Energy Regulations
CFA	Contiguous Flight Auger
CH	Cultural Heritage
CH ₄	Methane
CIEEM	Chartered Institute for Ecology and Environmental Management
CIfA	Chartered Institute of Archaeologists
CIRIA	Construction Industry Research and Information Association
CLC	CORINE Land cover
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalents

COMAH	Control of Major Accident Hazards
COSHH	Control of Substances Hazardous to Health
CRU	Commission for Regulation of Utilities
CSO	Central Statistics Office
D&EW	Demolition and Enabling Works Contractor
DAFM	Department of Agriculture, Food and the Marine
DAHG	Department of Arts, Heritage and the Gaeltacht
dB	Decibel
DCC	Dublin City Council
DCCAE	Department of Communications, Climate Action & Environment
DCF	Data Collection Framework
DCIHR	Dublin City Industrial Heritage Record
DECC	Department of Environment, Climate and Communications
DEFRA	Department of Environment, Food and Rural Affairs
DMP	Decommissioning Management Plan
DMRB	Design Manual for Roads and Bridges
DoD	Department of Defence
DoHLGH	Department of Housing, Local Government and Heritage, formerly Department of Housing, Planning and Local Government (DHPLG)
DPC	Dublin Port Company
EC	European Commission
ED	Electoral Division
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EIS	Environmental Impact Statement
EMF	Electromagnetic Field
EMP	Environmental Management Plan
EnCoW	Environmental Clerk of Works
END	Environmental Noise Directive
EPA	Environmental Protection Agency
EPC	Engineering, Procurement, and Construction
EPUK	Environmental Protection UK
EQS	Environmental Quality Standards
ESAS	European Sea Birds at Seas
ESB	Electricity Supply Board
ESBN	ESB Networks
ETS	Emission Trading Scheme
EU	European Union
EV	Electric Vehicle
FRA	Flood Risk Assessment
FU	Functional Units
G.L.	Ground Level
GDA	Greater Dublin Area
GDSDS	Greater Dublin Strategic Drainage Study
GHG	Greenhouse Gas

GLVIA	Guidelines for Landscape and Visual Impact Assessment
GNI	Gas Networks Ireland
GPS	Global Positioning System
GSI	Geological Survey Ireland
GT	Gas Turbine
GW	Gigawatt
GWDTE	Groundwater Dependent Ecosystems
HAS	Health and Safety Authority
HDD	Horizontal Directional Drilling
HDV	Heavy Duty Vehicles
HGV	Heavy Goods Vehicles
HVL	High Value Landscape
IAA	Irish Aviation Authority
IAIA	International Association for Impact Assessment
IAQM	Institute of Air Quality Management
IE	Industrial Emissions
IED	Industrial Emissions Directive
IEEZ	Irish Exclusive Economic Zone
IEMA	Institute of Environmental Management and Assessment
IEN	Irish Environmental Network
IFI	Inland Fisheries Ireland
IHBC	Institute of Historical Building Conservation
IMO	International Maritime Organisation
INNS	Invasive Non-Native Species
IPH	Institute of Public Health
IPPC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature
IW	Irish Water
IWDG	Irish Whale and Dolphin Group
I-WeBS	Irish Wetland Bird Survey
IWT	Irish Wildlife Trust
JNCC	Joint Nature Conservation Committee
KER	Key Ecological Receptors
km	Kilometre
kph	Kilometre per hour
kV	Kilovolt
$L_{A90,T}$	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
LAQM.TG	Local Air Quality Management – Technical Guidance
LCA	Landscape Character Area
LDV	Light Duty Vehicles
LEV	Light Electric Vehicles
Lg	Locally Important Aquifer– Sand and gravel
LGV	Light Goods Vehicles

LI	Locally Important Aquifer– Bedrock which is Moderately Productive only in Local Zones
LIA	Landscape Impact Assessment
LiDAR	Light Detection and Ranging
Lk	Locally Important Aquifer – Karstified to a limited degree or area
Lm	Bedrock which is Generally Moderately Productive
LV	Low Voltage
LVIA	Landscape & Visual Impact Assessment
m	metre
m/s	Metres per Second
MEWP	Mobile Elevated Work Platform
mg/l	Milligram per Litre
mm/s	Millimetres per second
Mt	Metric ton
Mt CO ₂ eq	Million Tonnes of Carbon Dioxide Equivalent
MV	Medium Voltage
MW	Mega Watts
MWe	Megawatts Electric
NBDC	National Biodiversity Data Centre
NDC	Nationally Determined Contributions
NECP	National Energy and Climate Plan
NHA	Natural Heritage Area
NIAH	National Inventory of Architectural Heritage
NIS	Natura Impact Statement
NLCD	National Land Cover Database
nm	Nautical Mile
NMPF	National Marine Planning Framework
NO ₂	Nitrogen Dioxide
NORA	National Oil Reserve Agency
NOx	Nitrous Oxide
NPF	National Planning Framework
NPS	National Policy Objective
NPWS	National Parks and Wildlife Service
NRA	National Roads Authority
NSL	Noise Sensitive Locations
NTS	Non-Technical Summary
O&M	Operation & Maintenance
O ₃	Ozone
OCGT	Open Cycle Gas Turbine
OGV	Ordinary Goods Vehicle
OHL	Overhead Line
OLM	Ozone Limiting Method
OPW	The Office of Public Works
ORE	Offshore Renewable Energy
OSI	Ordnance Survey Ireland
PDA	Planning and Development Act 2000

PDR	Planning and Development Regulations 2001
PEC	Predicted Environmental Concentrations
PFC	Perfluorocarbons
PIC	Personal Injury Collisions
PM	Particulate Matter
PM ₁₀	Particulate Matter (10)
pNHAs	proposed Natural Heritage Areas
ppv	Peak Particle Velocity
PS	Protected Structure
QI	Qualifying Interest
RAMS	Risk Assessment Method Statement
RBMP	River Basin Management Plan
RBSP	River Basin Specific Pollutants
RED II	Renewable Energy Directive 2018/2001
RICS	Royal Institution of Chartered Surveyors
Rkd	Regionally Important Aquifer–Karstified (diffuse)
RMP	Record of Monuments and Places
RNLI	Royal National Lifeboat Institute
Ro-Ro	Roll On-Roll Off
RPO	Regional Policy Objectives
RPS	Record of Protected Structures
RSES	Regional Spatial and Economic Strategy
CRWMP	Construction Resource and Waste Management Plan
SAC	Special Area of Conservation
SAPS	Small Area Population Statistics
SCADA	Supervisory Control and Data Acquisition
SCI	Special Conservation Interest
SCI	Sites of Community Importance
SDZ	Strategic Development Zone
SEAI	Sustainable Energy Authority of Ireland
SF ₆	Sulphur hexafluoride
SID	Strategic Infrastructure Development
SMR	Sites and Monuments Records
SO ₂	Sulphur Dioxide
SO _x	Sulphur Oxides
SPA	Special Protection Area
S-P-R	Source-Pathway-Receptor
SuDS	Sustainable Drainage System
TII	Transport Infrastructure Ireland
D&CTMP	Demolition and Construction Traffic Management Plan
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

UK	United Kingdom
UN	United Nations
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
UV	Ultraviolet
VP	Vantage point
vph	vehicles per hour
VRP	Viewshed Reference Points
WFD	Water Framework Directive
WWTP	Wastewater Treatment Plant
ZoI	Zone of Influence
ZTV	Zone of Theoretical Visibility
µg/m ³	Microgram per cubic meter

1 Introduction

1.1 Project Overview

This Environmental Impact Assessment Report (EIAR) has been prepared in accordance with EIA Directive 2014/52/EU (the EIA Directive) on the assessment of the effect of certain public and private projects on the environment to support an application in accordance with section 34 of the Planning and Development Act 2000, as amended.

ESB is proposing to develop a 299 MWe nominal capacity F-Class Open Cycle Gas Turbine (OCGT) Generating Plant Development at the existing Poolbeg Generating station complex at Poolbeg in Dublin. The key components of the electrical system will be designed for a maximum export load of 297MW net output (299MW gross power generation) and will not be rated to exceed this amount.

The 299 MW OCGT generating unit proposed at Poolbeg will be developed as a commercial project for which a capacity contract will be sought under the capacity auction process operated by the Commission for Regulation of Utilities (CRU).

The capacity auction process is the principal method to secure the new electricity generation capacity needed to replace the capacity of oil and coal fired stations expected to close and to support the growth of renewable electricity and to ensure security of electricity supply.

The OCGT at Poolbeg will be available to operate 24-hours per day, seven days per week. The expected operational period for the plant will however be non-continuous. The purpose of the proposed OCGT is to provide additional generating capacity during periods of high demand or when the weather conditions mean renewable sources cannot meet demand. The proposed OCGT is designed to come on stream quickly as demand on the grid changes. It is expected the plant will operate during peak demand periods on the electricity grid.

Natural gas supplied by the Gas Networks Ireland (GNI) national grid will be the primary fuel for the OCGT at Poolbeg. There is currently a GNI dedicated Above Ground Installation (AGI) and this will be provided by the existing gas compound on site. The Gas Networks Ireland Above Ground Installation is located within the Poolbeg Generating station complex. Further details on the connection to the gas network are set out in Chapter 3. There will be a requirement for AGI connection and modifications works and/or additional equipment to be installed within the existing AGI footprint to meet the gas capacity for the proposed OCGT. GNI will be responsible for the installation, operation, and maintenance of equipment within the AGI gas compound.

The OCGT at Poolbeg will connect to the existing 220kV Substation within the ESB Poolbeg Generating Station complex via a 220kV underground cable. Whilst three grid connection options are assessed as part of this EIAR, planning permission is only being sought for the most likely connection configuration. The actual configuration of the grid connection is pending final clarification from EirGrid. Further details are set out in Chapter 3 of this EIAR.

While gas and electrical grid connection works are integral to the operation of the proposed development they will be subject to separate consent process and as such they do not form part of this planning submission. Notwithstanding, for the purposes of consideration of the whole (OCGT) proposed development, they are considered in this EIAR where relevant.

The proposed development will also consist of a backup fuel of gas oil (i.e. distillate oil). In accordance with the Commission of Energy Regulations (CER) requirements backup fuel for three days' (72 hours) will be stored on site. The secondary fuel will be stored within the existing bunded fuel oil tank farm which is owned by ESB but leased to and operated by the

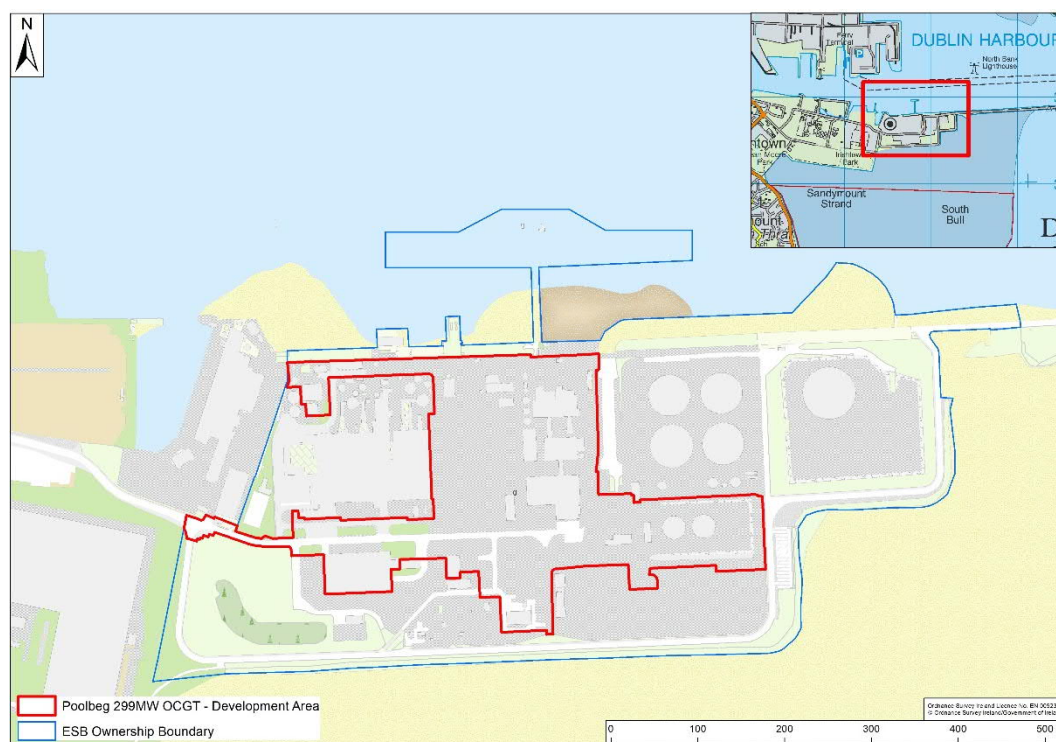
National Oil Reserve Agency (NORA). The fuel oil tank farm bund was designed for three equally sized oil tanks. Currently there are 2no oil tanks with a capacity of 16,000m³ and a water storage tank within the oil bund. As part of this application, planning permission is being sought for 2no fire water tanks to replace the existing water storage tank and the addition of a third fuel storage tank with a capacity of 8000m³. Further details on the proposed fuel storage are discussed in Chapter 3 of this report.

The area of the OCGT at Poolbeg for which permission is sought, and in respect of which this EIAR has been prepared is presented in Figure 1.1. The turbine, generator, equipment skids are typically enclosed within an enclosed steel framed building. The air intake structure is shown at high level. The exhaust stack is also shown. Note that the final arrangement and layout of the buildings and equipment varies between suppliers and is subject to competitive tendering and procurement processes.

Figure 1.1 presents an aerial image of the proposed development site. The application site area is approximately 8.5ha. The proposed development site is wholly owned by ESB. Figure 1.2 presents an image of a typical OCGT development.

The Poolbeg Generating station complex operates, and will continue to operate, under the existing Industrial Emissions (IE) licence (Registration Number: P0577-04), regulated by the Environmental Protection Agency (EPA). Further details on the proposed development are provided in Chapter 3.

Figure 1.1: Proposed Development Site (299MW OCGT)



Source: ESB (OSI Licence No. EN0092320)

Figure 1.2: Image of a Typical OCGT Development



Source: ESB

Figure 1.3: Aerial Image of the Proposed Development Site



Source: ESB

1.2 About the ESB

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 Licencing, Permitting and EIA Requirements

1.3.1 Industrial Emissions Licencing

The proposed Poolbeg OCGT will require an IE Licence from the EPA as the proposed development is a class of activity listed in the First Schedule of the EPA Act 1992, as amended, i.e;

'Combustion of fuels in installations with a total rated thermal input of 50 MW or more'.

The Poolbeg Generating Station complex operates, and will continue to operate, under the existing Industrial Emissions licence (Registration Number: P0577-04), regulated by the EPA.

Should the application for planning consent be successful, an application to the EPA for a licence review of this existing licence will be progressed to incorporate the Poolbeg OCGT within the IE licensed boundary of Poolbeg Generating station complex.

1.3.2 Greenhouse Gas Permits

Poolbeg Generating Station complex operates in accordance with the European Union's Emission Trading Scheme (ETS) and associated Greenhouse Gas Permit (IE-GHG160-10425-2) as administered by the EPA. Should the application for planning consent be successful, a review of this permit or a new permit application will be required to incorporate Poolbeg OCGT.

1.3.3 CRU 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.

1.3.4 Screening for EIA

An EIAR is required to accompany a planning application for development of a class set out in Schedule 5 of the Planning and Development Regulations 2001, as amended (PDR) which equals or exceeds, as the case may be, a limit, quantity or threshold set out for that class of development.

In determining the requirement for EIA, the PDR differentiates between the projects that always require EIA and those for which an EIA may be required. These projects are listed in Schedule 5 Part 1 and Part 2 of the PDR.

The most applicable class of development is set out in Schedule 5, Part 1 Projects, these are projects which are considered as having significant effects on the environment and require a mandatory EIA. Further discussion on the screening of the EIA is addressed in Section 4.3.

Schedule 5, Part 2 Projects, are in general those not included in Part 1 which may be considered to have a lesser environmental impact. This is done by the "screening procedure", which determines the effects of projects based on thresholds/criteria or a case by case examination. If a project exceeds the thresholds as indicated a mandatory EIAR is required.

Schedule 5 Part 1(2)(a) requires a mandatory EIA for the following project type:

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

The OCGT at Poolbeg will have a nominal capacity of 299MWe and will have a net electrical efficiency of approximately 39% equating to approximately 756.5MWth input. The total thermal rating of 756.5 MW with a net thermal rating of 297 MW of electricity generated. As such, the heat output (i.e. heat emitted from the stack) will be greater than the 300 MW threshold identified in Paragraph 2(a) and an EIA is therefore required.

1.3.5 Appropriate Assessment

Mott MacDonald has prepared a screening for Appropriate Assessment (AA) report 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.

1.4 Consultation and Engagement

Consultation and engagement took place over the duration of the proposed development with statutory, non-statutory stakeholders, including a pre-planning consultation with An Bord Pleanála and a pre-application meeting with Dublin City Council. 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 disseminated to the project team.

1.4.1 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 1.2 below summarises the key points from the process and responses received from the various bodies and identifies where such points have been addressed in the EIAR. ESB also contacted neighbouring businesses via email in 13/09/2022 to inform them of the proposed development. A summary of this engagement is set out in Table 1.3.

Table 1.1: Stakeholder Consultees

No.	Stakeholder
1	An Taisce
2	The Arts Council
3	Bird Watch Ireland
4	Commission for Regulation of Utilities
5	Department of Environment, Climate and Communications
6	Department of Rural and Community Development
7	Development Applications Unit, Department of Housing, Local Government and Heritage
8	Eastern and Midlands Regional Assembly
9	EirGrid
10	Environmental Protection Agency
11	Fáilte Ireland
12	Gas Networks Ireland
13	Health and Safety Authority
14	Health Service Executive - Dublin Mid Leinster
15	Heritage Council
16	Inland Fisheries Ireland, Dublin
17	Irish Aviation Authority
18	Irish Water
19	Irish Whale & Dolphin Group
20	Transport Infrastructure Ireland

Table 1.2: Summary of Stakeholder Engagement

Stakeholder	Summary of Engagement Undertaken	Summary of outcomes addressed
Gas Networks Ireland	GNI issued a drawing showing GNI infrastructure (including a GNI Above Ground Installation) in the vicinity of the proposed development along with the GNI 'Code of Practice for Working in the Vicinity of the Transmission Network' 2021. The Code of Practice should be complied with for works taking place in vicinity of the gas infrastructure. No excavation should take place within Gas Networks Ireland Wayleaves unless consent has been granted by GNI.	Details of GNI assets were disseminated to the project design team and further consultation will be carried out with GNI to discuss the GNI connection requirements at the next stage of the project development.
Inland Fisheries Ireland	IFI comments are summarised below. The best practice guidance should be followed during the development of the project. The development is within the River Liffey catchment, a key salmonid fisheries region, with potential impacts on aquatic ecology. The estuaries are an important habitat for fish species including migratory species which are likely to utilise the estuarine habitat in the vicinity of the project at some time during their life cycle. An integrated approach to achieve aquatic ecological protection should be adopted during construction and operation to avoid impacts on aquatic ecology due to release of sediments and pollutants into surrounding water habitats. Mitigation should be primarily focused on avoidance, followed by reduction and remedy. Measures like on-site attenuation ponds, petrol interceptors, silt/grit traps, SUDS, silt fencing and hydrobrake controls should be put in place to avoid surface water discharges. Contaminant levels should be monitored during construction and operation and necessary measures should be taken if contamination arises.	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 (pollution). All details of the proposed development are provided and considered. A Demolition and Construction Environmental Management Plan (D&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 9 Biodiversity and Chapter 10 Surface water Resources and Flooding within this EIAR and the D&CEMP. The Poolbeg Generating Station complex operates, and will continue to operate, under the existing Industrial Emissions licence (Registration Number: P0577-04), regulated by the EPA. Should the application for planning consent be successful, an application to the EPA for a licence review of this existing licence will be progressed to incorporate the Poolbeg OCGT within the IE licensed boundary of Poolbeg Generating station complex
Transport Infrastructure Ireland	TII's comments are summarised below. 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 proposed development is not subject to Traffic and Transport Assessment and a Road Safety Audit is not required. The potential construction and operational impacts on the road network have been considered within Chapter 14 Roads and Traffic. Regard will be had to TII publications, where appropriate, including the Environmental Assessment and Construction Guidelines. A D&CEMP has been prepared and accompanies this planning application all reasonable measures will be taken to avoid / mitigate likely significant impacts, including identification of haul routes.
Health Safety Authority	HSA note that the Authority reserve detailed observations that they may have on the project until requested for technical comments by Dublin City Council Planning (DCCP) department. Details regarding the anticipated presence of any dangerous substances and inventories should be included in information forwarded to DCCP	The Poolbeg OCGT is located within the consultation distance of the National Oil Reserves Agency Ltd. (NORA) fuel storage establishment I which is notified to the Health and Safety Authority (HSA) as an Upper Tier Seveso site and is subject to the provisions of the Chemical Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S.I 209 of 2015).

Stakeholder	Summary of Engagement Undertaken	Summary of outcomes addressed
		The proposed development has been subject to a Land Use Planning Assessment in accordance with the 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.

Table 1.3: Summary of Stakeholder Engagement undertaken by ESB

Stakeholder	Summary of Engagement Undertaken	Summary of Outcomes Addressed
Dublin Port Company (DPC)	Meeting held with DPC on Sept 30th 2022. Outline of the project given including planning submission schedule, potential construction schedule and plant operating regime	DPC indicate the timeline for the ESB projects were in advance of their 3FM project. ESB also requested if DPC lands could be considered for potential construction laydown at the planning stage, to which DPC agreed
National Oil Reserve Agency (NORA)	ESB have met NORA on a number of occasions over the course of Aug/Sept 2022. Outline of project has been discussed including site layouts, planning submission timeline, operating regime and potential for utilising shared infrastructure.	ESB and NORA are working together to optimise layouts and current infrastructure located at both sites, particularly for back-up fuel storage requirements.
Covanta Waste to Energy	ESB have reached out to Covanta to give them an overview and introduction to the project and will send them a stakeholder letter describing the project ahead of an arranged meeting	Meeting arranged for 8th Nov.
Health and Safety Authority (HSA)	ESB facilitated a site visit for the HSA on 26th October 2022 and it was clarified that the subject planning application would include a new oil tank in the NORA bund and new two water tanks (in place of the existing water tank). Once operational, the new oil fuel tank and 2no. water tanks will be under the control of NORA	Following the site visit the HSA agreed in principal that the proposed Poolbeg OCGT will not be considered as part of the NORA COMAH site. As such the COMAH Land Use Planning Risk Assessment should be undertaken to reflect the OCGT development being located adjacent to an Upper Tier site. NORA will also be required to undertake their own COMAH Risk Assessment for the new tank arrangement and issue to the HSA

1.5 Structure of this EIAR

This EIAR has been prepared in accordance with EIA Directive 2014/52/EU (the EIA Directive) on the assessment of the effect of certain public and private projects on the environment and having regard to the Environmental Protection Agency's "Guidelines on the information to be contained in Environmental Impact Assessment Reports" (2022). The structure of this EIAR is as set out in Table 1.4.

Table 1.4: Structure of this EIAR

Chapter No.	Chapter Title
1	Introduction
2	Need for the Project Development & Alternatives Considered
3	Description of the Proposed Development
4	EIA Report Methodology
5	Population and Human Health
6	Air Quality
7	Climate
8	Noise and Vibration
9	Biodiversity
10	Surface Water Resources and Flood Risk
11	Land, Soils and Hydrogeology
12	Architecture, Archaeology and Cultural Heritage
13	Landscape and Visual
14	Roads and Traffic
15	Material Assets and Waste
16	Major Accidents and/or Disasters
17	Interaction Effects
18	Summary of Mitigation and Monitoring Measures
19	References

In addition, a Non-Technical Summary (NTS) has been prepared and accompany the planning consent application.

Details of the competencies of the respective EIAR contributors is provided in Appendix A *EIAR Competencies*. Preliminary design of the proposed development and the details provided in Chapter 3 *Description of the Development* and the planning drawings have been provided by the ESB.

1.6 Other Supporting Documentation

To further inform the application for approval the following accompany the planning application:

- Demolition and Construction Environmental Management Plan;
- Appropriate Assessment Screening Report and Natura Impact Statement;
- Planning Report;
- ESB Construction Methodology Report; and
- Landuse Planning & COMAH Risk Assessment.

2 Need for the Proposed Development & Alternatives Considered

2.1 Introduction

This chapter of the EIAR sets out the need for the proposed development.

EIA legislation requires that 'reasonable alternatives' for projects are considered. Within the European Commission's Preparation of EIAR guidance documents for the implementation of EIA Directive (Directive 2001/92/EU as amended by 2004/52/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 2001/92/EU as amended by 2004/52/EU).

This chapter describes the alternatives that were considered for the Proposed Development under each of the headings below and the reasons for the selection of the preferred options.

- "Do Nothing Alternative";
- Alternative Locations;
- Alternative Technologies; and
- Alternative Layouts.

2.2 Need for the Development

The first EU Renewable Energy Directive (2001/77/EC) on the 'Promotion of electricity produced from renewable energy sources in the internal electricity market' was adopted in 2001. This was replaced with the Renewables Directive (2009/28/EC) which has the following two key targets:

- A reduction of 20% in greenhouse gases by 2020 (below 1990 levels); and
- 20% of the total EU energy (electricity, heat and fuel) consumption to come from renewable sources by 2020.

In 2014, the EC's 'A policy framework for climate and energy in the period from 2020 to 2030', established a framework for future EU energy and climate policies and promoted a common understanding of how to develop those policies after 2020. The Commission proposed that the EU 2030 target for the share of renewable energy consumed in its Member States should be at least 27%.

The 2015 Paris Agreement, as well as technological developments, led to the recast Renewable Energy Directive 2018/2001 (known as RED II). RED II established a binding target of at least 32% of renewable energy for the EU by 2030.

On 29th September 2021, the CRU published a programme of work to increase generation capacity to provide additional stability and resilience to the Irish energy system over the next four or five years. This programme of work was in response to EirGrid's identification of a potential capacity shortfall, if no action is taken, for the following winter periods of 2021/22 to 2025/26, which was set out in EirGrid's updated All Island Generation Capacity Statement 2021. Several key actions were set out in the programme inter alia:

The delivery, through the all -island capacity auctions of over 2,000MW of enduring flexible gas-fired generation capacity by 2030, to provide for growing demand, replace retiring generators, and support additional penetration of renewables in order to meet our 2030 policy goals. And the development of a policy statement to underpin this capacity.

On 29th June 2022, the CRU published an update on the progress of the programme of work. The T-4 26/27 auction will seek to deliver additional capacity in advance of Winter 23/24 and potentially incentivise the early delivery of existing projects in development.

In May 2022, the EC published its REPowerEU Plan (COM/2022/230) that sets its objectives as “ending the EU’s dependence on Russian fossil fuels”, “tackling the climate crisis” and “securing the long-term sustainability, cost effectiveness, and energy supply to the EU”. The key goals in the REPowerEU Plan include:

- Diversifying energy imports;
- Accelerating a transition from fossil fuels to clean energy;
- Saving energy through higher efficiency;
- Smart investment; and
- Reinforcing preparedness.

The Commission remarked that considerable challenges are ahead with such ambitions. One of which is associated with permitting and planning issues. The Commission places emphasis on streamlining permitting processes and recognises the need to “*tackle slow and complex permitting for major renewable projects*”.

The purpose of the proposed OCGT at Poolbeg is to provide additional generating capacity during periods of high demand or when weather conditions mean that renewable energy sources cannot meet demand. This type of power plant is designed to support renewables by operating when electricity demand is higher than average and will facilitate increased renewable energy technologies, such as solar, and wind energy by providing energy to the national electricity grid during periods when the energy available from the renewable technologies is insufficient.

2.3 Do Nothing Scenario

In the event of the Do Nothing scenario the proposed site would remain an undeveloped open area brown field site.

The Poolbeg Generating station complex would continue to operate under the existing licence (EPA registration no. P0577-04). There would be no additional emissions, and no requirement for the licence review process for this activity.

In the absence of the proposed development or similar energy generation there would be:

- Less integration of renewable technologies onto the Irish Grid which is one of the key strategic European and national objectives for the transition to a low carbon economy; and
- The decarbonisation of the power generation portfolio would slow across Ireland, and potentially result in extending the operation of fossil fuel power plants scheduled for closure.

ESB have identified this site as being strategic for electricity generation due to its proximity to grid and gas networks as well as being close to the electricity load centre of Dublin city. If this proposed development does not go ahead ESB would most likely look to consider options for the landholding in that context.

2.4 Alternative Locations

ESB carried out an analysis of potential sites in the Greater Dublin area. The initial search criteria was broadly based on the availability of suitable lands with connectivity to the National Electricity Network and National Gas Network.

- **Connections to the National Electricity Network:** The purpose of this criteria was to facilitate the connection of generation to the grid in an economical manner by co-locating electricity infrastructure at locations where there is a higher potential to locally distribute the electricity generated (i.e. no local electrical constraints). This criteria also has the benefit of reducing the potential environmental impacts and costs of running long lengths of high voltage cable where this can be avoided through co-location. As such the Poolbeg Peninsula was identified due to their close proximity to the national electricity transmission grid substations.
- **Connections to the Gas Network:** Generation of electricity from gas requires the availability of high pressure gas, therefore a connection directly into the gas network is a key requirement. Similar to the National Electricity Networks, this criteria has the benefit of reducing the potential environmental impacts and costs of running long lengths of high pressure gas pipes. Sites in close proximity to the gas grid were identified. were identified that are in close proximity to the gas grid.

The Poolbeg Peninsula was also identified as having adequate gas supply which is capable of supplying all the various power generation facilities with some network upgrades required to meet the capacity demand and has readily available diesel supplies which are required by legislation to provide backup fuel should the gas supply be compromised at any time. The Poolbeg Peninsula was also identified as having adequate grid connections already in place to allow the proposed OCGT development to connect to the existing grid

ESB is a key landowner on the Poolbeg Peninsula. The ESB lands comprise two discrete land parcels – the Ringsend Land Block and the Poolbeg Land Block (Figure 2.1). ESB has a long-established history in the area and is fully committed to generate electricity and provide associated support services at this location in the future. The ESB land parcels within the Poolbeg Peninsula were evaluated for suitability for locating a OCGT generating unit, details of both sites are provided below.

Figure 2.1: ESB Owned Lands at Poolbeg



A Land Management and Development Strategy (2020) has been prepared for ESB lands within the Poolbeg Peninsula to maintain and develop the ESB assets at Poolbeg and Ringsend while having regard to the changing nature of ESB's own business and the on-going requirement to

manage interactions between existing and proposed new developments in the area. The Strategy has been subject of discussion with Dublin City Council and has been used to proactively inform the Planning Authority of the types of development currently envisaged on these lands.

Poolbeg Land Block: Poolbeg is an established industrial site, c. 31.5 Ha in area, characterised by the presence of a regionally significant electricity generation facility, and significant grid infrastructure. Poolbeg benefits from five 220 kV circuits and two 220/110 kV transformers. Poolbeg also has an interbud reactor which helps to facilitate the splitting of the Dublin 220 kV network into North and South transmission network. The site is located in close proximity to an existing Gas Networks Ireland (GNI) Above Ground Installation (AGI) which is supplied from the high pressure gas transmission system. This means that the plant can connection into the existing AGI with minimal modification to the current infrastructure. The site also benefits from being able to use some existing infrastructure from the existing site, i.e. back-up fuel oil storage.

The Poolbeg Land Block is characterised by the presence of a regionally significant electricity generation facility, and significant grid infrastructure, accommodating the following uses (refer to Figure 2-2):

- Site A – site accommodating former administration and storage buildings, all of modern construction, and associated area of hand standing / car parking;
- Site B – Poolbeg Power Station (decommissioned) and the Poolbeg chimneys;
- Site C – Poolbeg CCGT Generation Station and Shellybanks 220Kv substation;
- Site D – NORA facility – accommodating oil storage for the national reserve;
- Site E – Proposed Flexgen/BESS Development currently under construction
- Site F – Gas Networks Ireland (GNI) Infrastructure; and
- Site G – Poolbeg 220 kV substation and associated ESNB infrastructure.

Areas within the existing Poolbeg Land Block were evaluated for suitability for locating a OCGT generating unit. Site B is the only parcel of land within the Poolbeg Land Block which is not currently in use for a specified purpose. Site contains the decommissioned Poolbeg Power Station and the Poolbeg chimneys. Though the station is no longer in use this site it still accommodates a range of activities associated with the continued function of the Poolbeg lands as a site for electricity generation.

The area immediately west of the existing CCGT is suitable to facilitate the proposed OCGT. The infrastructure required for the OCGT (Electricity Substation, Gas Supply and Secondary Fuel Storage) is located in adjacent sites (Site G, Site F and Site D respectively). The existing infrastructure can be utilised to ensure minimal impact on the wider site.

Figure 2.2: The Poolbeg Land Block



Ringsend Land Block: Ringsend is an established industrial site, c.12.6 Ha in area, characterised by the presence of a regionally significant electricity generation facility, and significant grid infrastructure.

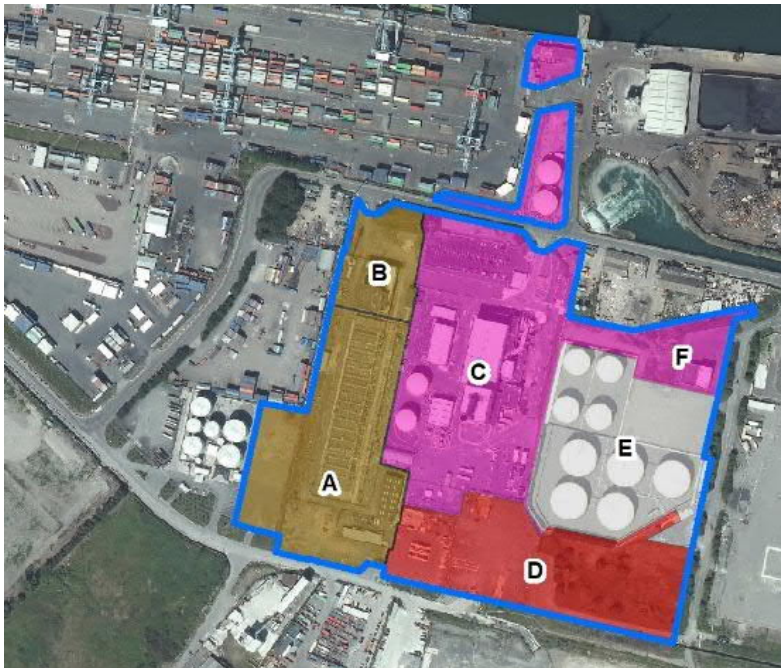
The site is located in close proximity to the Irishtown 220kV substation, an existing Gas Networks Ireland (GNI) Above Ground Installation (AGI) which is supplied from the high pressure gas transmission system. This means that the plant can connection into the existing AGI with minimal modification to the current infrastructure. The site also benefits from being able to use some existing infrastructure from the existing site, i.e. back-up fuel oil storage.

This land accommodates a range of existing uses, including:

- Site A – Ringsend 110 kV substation and the nearby 38kV substation– both owned by ESB Networks and part of the Electricity transmission and distribution network,
- Site B – The former ESB Training Centre and associated area of hand-standing / car parking,
- Site C – Dublin Bay Power Station,
- Site D – Southwall BESS / Dublin Bay Flexgen (under construction)
- Site E – NORA facility – accommodating oil storage for the national reserve,
- Site F – Irishtown 220kV Substation.

Areas within the existing Ringsend Land Block were also evaluated for suitability for locating a OCGT generating unit. As illustrated in Figure 2.3, the site is quite limited in its land availability. Site E and F are the only parcels of land within the Ringsend Land Block which has the potential for development.

Figure 2.3: The Ringsend Land Block



Both ESB sites at Poolbeg and Ringsend benefit from being located in close proximity to National Electricity Grid Infrastructure and Gas Networks Ireland Infrastructure. Both sites also benefit from being able to utilise existing infrastructure for back-up fuel, oil storage etc. Poolbeg was selected as the preferred location due to the availability of land adjacent at Site B, although a similar OCGT development is currently being developed at Ringsend as part of a future planning application.

2.5 Alternative Technologies

2.5.1 Technology types

EirGrid Group is the licensed electricity Transmission System Operator and Market Operator across the island of Ireland. Under its "Delivering a Secure, Sustainable Electricity System", known as the DS3 Programme, it aims to provide safe, secure and sustainable delivery of electricity generation in line with the EU Directive renewable energy targets. In parallel to DS3, under ESB's Brighter Future Strategy, the "Dimensions to a Solution" report was published and states that the future of the Irish electricity system will be provided by a combination of gas generation, carbon capture systems and biomass. Several alternative gas technologies were considered for the proposed development.

2.5.1.1 Combustion Technologies

Combustion technologies available to provide the performance requirement of a rapid response peaking plant include reciprocating (gas) engines or gas turbines. The CRU in Ireland require all generating units with a generating capacity greater than 10MWs to have a back-up fuel source which is typically a fuel gas oil (distillate oil).

Reciprocating Engines: Reciprocating engines are a mature technology with high reliability. Reciprocating gas engines are typically spark ignition engines (Otto cycle) or compression ignition, utilising a spark plug or high compression to ignite a pre-mixed air fuel mixture introduced into the cylinder. As the burning mixture of fuel and air expands, a piston is pushed transferring energy released from combustion to an engine crankshaft/ flywheel which is

coupled to an electrical generator to generate electricity. The net electrical power outputs of reciprocating engines are limited, with larger dual fuel (natural gas and gas oil) engines providing <20 MW, consequently, for the proposed peaking power plant developments several engines would be required at each site.

Gas Turbine Engines: Gas turbine engines are available in three different types, heavy frame, industry and aero-derivative and each can be configured to operate in open or combined cycle plants. Gas turbines consist of a compressor, a combustion chamber and an expansion turbine. After combustion, the gas expands through the turbine and produces electrical power for the generator and compressors with excess electrical power available for export. Aero-derivative gas turbines are the ideal solution in applications where a small footprint and lightweight equipment is required. Unlike the reciprocating engine, a single dual fuel (natural gas and gas oil) gas turbine is sufficient to provide the >75 MWe (electrical output) requirement for each peaking plant.

Due to the need particular characteristics of these plants, which includes the need for fast start-ups and a dual-fuel capability to satisfy regulations; aero-derivative gas turbine types are identified as being best suited to this application. In addition, the annual operating hours on a peaking plant are envisaged to be low, gas turbines also offer a more economical solution from a maintenance perspective as maintenance regimes are based on operational hour where-as in contrast gas engine maintenance at present is based on time interval leading to higher maintenance costs.

2.5.1.2 Peaking Plant Types

Various conventional thermal technologies were reviewed for the proposed development, namely, Combined Cycle Gas Turbine (CCGT) and Open Cycle Gas Turbine (OCGT). It is essential that the selected technology is able to perform to its intended function by providing fast, flexible and efficient responses to changes in electricity demand during morning and evening peak demand periods.

CCGT power plants use the waste heat from the primary gas turbine to generate steam that drives a steam turbine. The typical thermal efficiency of CCGT's operating in Ireland is 55%. As the level of renewable electricity generation increases on the electricity grid this will pose challenges to the performance of CCGT's as greater operational flexibility will be required in responses to fluctuations in electricity generation. This will result in technical performance changes and corresponding operational cost increases. Conventional CCGT designs have operational start up times of approx. 30 minutes to 90 minutes depending on whether a cold or warm start up is initiated. The utilisation of CCGT for the proposed development would not provide the necessary peaking response times.

Open Cycle Gas Turbine (OCGT) technology which provides quicker duty standby start up times than CCGT's, typically approximately 5-20 minutes depending on the type of OCGT. The proposed developments will use F-Class Open Cycle Gas Turbine (OCGT) Generating Plant Development are ideally suited for flexible power generation due to their exceptionally fast start up time of 5 minutes. OCGT peaking plants are specifically designed to react quickly to changes in demand and can provide fast start up ramp up rates, with high cycling capability avoiding thermal fatigue and providing a commercially viable peaking plant able to fulfil its design capability to provide morning and evening peak electricity demand.

2.5.2 Alternative Technology Environmental Impacts

Each of the technology options was considered initially in terms of its key environmental impacts under the following main operational parameters. These parameters were selected on the basis that any significant risk issue identified could present a significant design, consenting or operational constraint.

2.5.2.1 Atmospheric Emissions

Natural gas is a clean fuel with negligible sulphur and particulate matter content. The fuel can be piped directly to the site negating the requirement for transportation of a primary fuel source by road. The emission limit values for nitrogen oxides (NO_x), carbon dioxide (CO₂), sulphur dioxide (SO₂) for any new gas peaking power plant are prescribed with the Industrial Emission Directive 2010/75/EU.

For the purpose of the alternative assessment all considered technologies fall under the same category "Gas turbines (including Combined Cycle Gas Turbines), using natural gas as fuel" and assessed under the same thermal output. The proposed development will be regulated by the Environmental Protection Agency under an IE Licence. All options will also be required to operate on low sulphur diesel oil as a backup fuel in the event of interruption to the natural gas supply.

2.5.2.2 Noise Emissions

Due to the existing industrial and port activities within the Poolbeg Peninsula all technologies will have a limited impact on background noise levels or sensitive receptors. The baseline environment is categorised as a Non-Quiet Area as per EPA Guidance Note for Noise, Licence Applications, Surveys and Assessments in Relation to Scheduled Activities NG4 (2016). All noise limit levels for the proposed development will be agreed and regulated under Industrial Emissions Licences to ensure that no nuisance occurs at the closest sensitive receptors due to the operation of the proposed development.

2.5.2.3 Spatial Requirements

The size and scale of an OCGT Plant is significantly smaller than traditional plants around Dublin City, such as that found at Poolbeg CCGT and Dublin Bay Power, which is significantly larger. The OCGT was selected due to the limited land availability at Poolbeg. The OCGT units under consideration are tightly packaged and of standard modular design. This ensures they occupy the minimum space envelope possible and allow straightforward construction and maintenance.

2.5.3 Preferred Technology parameters and metrics considered

The OCGT technology was selected for its fast start-up times. One of the key selection criteria was the ability to start from cold and be a full generating capacity within 5 minutes therefore capable of meeting the service requirements. With these fast start up times the OCGT can remain off load for long durations while renewable generation is sufficient to meet the grid's demands. However once required by the grid operator they will reliably be able to deliver significant generation onto the system to ensure demands are met and thereby preventing power shortages.

2.6 Alternative Layouts

The development (Site B) is located between the Decommissioned Poolbeg Generating Station and the Poolbeg CCGT Generating Station. The available land for development is approximately 2.2ha. Consideration of alternative layouts was not possible due to the constraints associated with the land availability.

3 Description of the Proposed Development

3.1 Context

ESB is proposing to develop a 299MWe nominal capacity F-Class Open Cycle Gas Turbine (OCGT) and Generator unit at Poolbeg, Co. Dublin. OCGT is considered the most appropriate technology for the proposed development at Poolbeg as it can respond quickly to changes in electricity demand by mobilising and achieving full output within a short period of time. OCGT also provides a very high-power density, minimising its required footprint and visual impact. It produces the lowest NO_x emissions of the equivalent power generating technologies available and exceeds the electrical efficiency requirements established for the sector under Commission Decision 2017/1442. The gas turbine technology will also have the technical capability to operate with future blends of green hydrogen of up to typically 20% by volume, as advised by major OEMs. These gas turbine OEMs also have ongoing research and development activities of their equipment to facilitate the combustion of higher percentages of green hydrogen

The characteristics of OCGT make the technology particularly suitable to support the future increase in the use of electricity across transport and heating to reduce CO₂ emissions in these sectors. The proportion of electricity generated from renewable sources is planned to increase to up to 80% by 2030. Increasing future reliance on electricity to meet energy needs across transport, domestic and commercial sectors will increase the need for continued security of electricity supply. The challenges for increased use in electricity use from renewable sources such as wind and solar is that these sources are variable in nature and introduce intermittency to the electricity generation system. More wind, solar, storage and interconnection added to the generation mix will mean that conventional generation such as OCGT's will also be required.

The OCGT technology consists of a gas turbine enclosure and generator enclosure being installed within a building. The gas turbine is connected to the generator on site as part of the assembly work scope. The supply of all associated auxiliary plant and equipment will be included in the Gas Turbine-Generator package. Table 3.1 below provides dimensions for the proposed plant and equipment.

The process of the Open Cycle Gas Turbine (OCGT) stations will be the combustion of natural gas in a gas turbine that drives a generator to produce electricity. The gas turbine utilises the Brayton thermodynamic cycle, using air as the working fluid. Air at atmospheric pressure enters the gas turbine compressor and is compressed before fuel gas is then added to the combustor. The resulting flue gases are expanded across the turbine to drive the generator. The flue gases then exhaust directly (open cycle) to atmosphere via an exhaust stack. The electricity generated will be fed to the transformer where the voltage is stepped up for transmission into the national grid.

The proposed development will consist of the following;

1. Demolition of the existing Babcock Store building; 1No Hydrogen Tank; the temporary Control Building; 1No. Water Tank within the NORA Bunded Area; and
2. Construction/ installation of an OCGT generating unit and associated plant and equipment, comprising the following main components:
 - An exhaust stack approx. 40m in height (approx. 8.0m diameter and 40m H)
 - Gas Turbine Air Intake (approx. 24m L x 18m W x 26m H)
 - Generator Enclosure (approx. 24m L x 18m W x 14.5m H)

- Gas turbine enclosure including Gas Turbine auxiliaries and loading/ rotor turning area (approx. 53m L x 15m W x 26m H)
- Exhaust Diffuser (approx. 14.5m L x 10.4m W x 10.5m H)
- Gas Turbine Power Control and Electrical Control & Instrumentation (C&I) Module (approx. 24m L x 18m W x 10m H)
- 9No. Fin Fan Coolers (approx. 27m L x 19m W x 8m H)
- Main Transformer (approx. 12.2m L x 7.5m W x 9.3m H), including
 - 7.50m x 18.0m bund; and
 - 3No 12m high Blast Walls
- Auxiliary Transformer compound (approx. 4.9m L x 4.7m W x 6.9m H)
 - 6.80m x 7.5m bund; and
 - 2No 12m high Blast Walls
- Demineralised Water Treatment Plant (approx. 20m L x 10m W x 5.4m H)
- Demineralised Water Tank (approx. 22.3m diameter and 14.6m H);
- Raw/Fire Water Tank (approx. 15.2m diameter and 14.6m H);
- 8,000m³ Distillate Fuel (Secondary Oil Tank (approx. 27.2m diameter and 17.6m H)
 - Including 8No 1.75m high Baffle Walls surrounding the tank
- Fuel Oil Forwarding Pump (approx. 8.9m L x 7.8m W x 2.2m H);
- Fire Fighting Pumphouse (approx. 12m L x 7m W x 5.4m H);
- 1No. <1 MW thermal output emergency diesel generator ~250KWe (approx. 10m L x 4m W x 5m H);
- Generator Circuit Breaker (approx. 8.8m L x 5.1m W x 4m H);
- 2No. Water (replacement) Firewater Tanks for NORA (approx. 13m diameter and 14.6m H)
- 3-Bay 220kV Indoor Switchgear Building (approx. 30m L x 18m W x 18m H) and 3No bolted connections (approx. 12.5m L x 15m W x 15m H)
- Gas Conditioning Compound (approx. 42.2m L x 21.9m W x 3.6m H) which includes a
 - Gas Compressor and Auxiliaries Building (approx. 24m L x 7.5m W x 5m H)
 - Gas Compressor Reducing Building (approx. 8m L x 6m W x 6m H); and
 - Gas Compressor Cooler (approx. 7m L x 4m W x 5m H)
- Hydrogen Storage Compound (approx. 6m L x 3.5m W x 3m H)
- Continuous Emissions Monitoring System (CEMS) (approx. 3.5m L x 2.5m W x 5m H)
- CCGT Stores Building (approx. 15m L x 14m W x 10m H)
- Workshop, Stores and Administration Building (approx. 23m L x 22m W x 15m H)
- 3. Connection to the existing gas Above Ground Installation (AGI);
- 4. Connection to the National Grid via the existing 220kV Poolbeg Substation; and
- 5. All associated works to facilitate the development (e.g. temporary construction compound, perimeter fencing, blast and baffle walls, above-ground pipe racks, underground cables, a new lighting arrangement, lightning and telecommunication masts, parking and surface water drainage network including a new stormwater outfall. All works will take place within the grounds of the ESB Poolbeg Generating station complex.

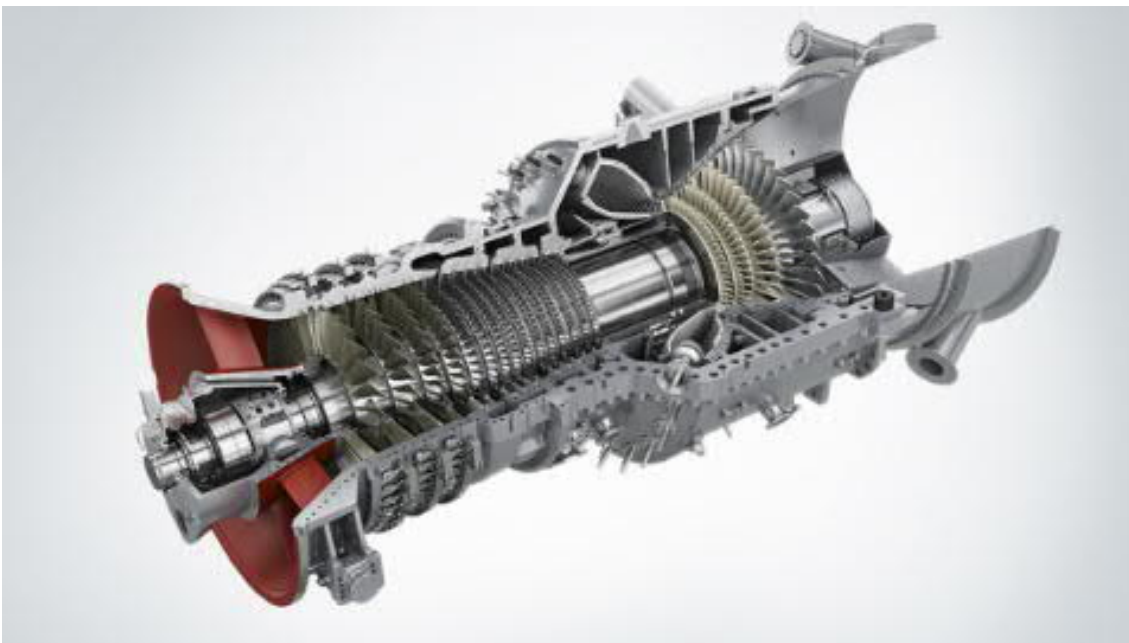
An indicative external view of an OCGT development is shown in Figure 3.1. The turbine, generator, equipment skids are typically enclosed within an enclosed steel framed building. The air intake structure is shown at high level. The exhaust stack is also shown. Note that the final arrangement and layout of the buildings and equipment varies between suppliers and is subject to competitive tendering and procurement processes.

Figure 3.1: Indicative External View of an Open Cycle Gas Turbine (OCGT) Development



Source: ESB

Figure 3.2: Indicative View of the Gas Turbine's Core Engine



Source: ESB

3.2 Site Location

The proposed development site is on the southern banks of the River Liffey, part of the Poolbeg Peninsula. The proposed development site is located on a site owned by ESB within the existing Poolbeg Generating station complex, on the Poolbeg Peninsula within the Dublin City Council (DCC) administrative area (Grid Reference: O20940 33500). The existing ESB Poolbeg

Generating station complex occupies a significant portion of the eastern section of the Ringsend peninsula covering an area of approximately 36ha.

Pigeon House road approaches the proposed development from the west and provides the main access into the ESB Generating station complex.

The wider area is a heavily industrialised city port with a mixture of power generation, wastewater treatment and other commercial enterprises associated with the docks. The peninsula supports a number of large industrial/municipal installations including Dublin Bay Power, Hammond Lane Metal Company Limited, ESB Poolbeg Generating station complex, Dublin Waste to Energy and Ringsend Wastewater Treatment Works.

The site comprises a generally flat area of made ground. The existing ground profile of the development site ranges from approximately 3.8mOD Malin Head in the north of the site to approximately 2.37mOD around the existing NORA tanks in the south east corner (Topographical levels provided by ESB).

An overview of the proposed OCGT development area is shown in Figure 3.3. As shown the ESB complex comprises the following:

- Operating combined cycle gas turbine (CCGT) station;
- National Oil Reserve Agency (NORA) Poolbeg Oil Storage Terminal to the eastern extent of the site (this area has been leased to NORA);
- The Gas Networks Ireland (GNI) Above Ground Installation and ESB Networks Substation to the south
- The western part of the site is occupied by buildings associated with the original power station which have been decommissioned.
- The brick and concrete stacks (Poolbeg Towers), associated with the decommissioned gas fired units, are located in the northern portion of the existing complex.
- Multiple existing office facilities, many of which are no longer occupied.
- A combination of hardstand and grassed areas.

The northern aspect of the existing ESB Generating station complex fronts the “South Wall” of Dublin Bay and the Liffey Estuary. The Irishtown Nature Park is located to the south of the station complex and a popular coastal walking route is located between Sandymount via the Irishtown Nature Park to the Great South Wall. Poolbeg Beach and Shellybanks Beach are located south of the station in Dublin Bay. There are no residential properties in close proximity to the proposed development. The nearest existing residential properties are located to the west of the site near Ringsend Park (approximately 1.4km) and across Dublin Bay in Sandymount (approximately 1.7km).

Figure 3.3: Aerial View of ESB Poolbeg Generating Station looking Northwest showing the Designation of the OCGT Development Works Areas



Source: ESB

3.3 Proposed 299MW OCGT at Poolbeg

The key elements for which planning permission is sought are:

- OCGT generating unit and associated plant and equipment;
- CEMS Skid ;
- Ancillary extension to the existing gas Above Ground Installation (AGI);
- Gas Compressor Reducing Building and compound ;
- Demineralised Water Treatment Plant;
- Demineralise Water Tank;
- Raw/Fire Water Tanks ;
- Secondary fuel storage tank and 2no. Water Tanks;
- Workshop / Stores & Administration Building; and
- Electricity Connection to the National Grid.

The proposed development will also include the installation of palisade perimeter fencing, a new lighting arrangement and surface water drainage network. All works will take place within the grounds of the ESB Poolbeg Generating station complex.

A layout for the proposed OCGT including the grid connections for electricity and gas are shown on Drawing P000442-01-CE21-112-001.

3.3.1 Open Cycle Gas Turbine (OCGT) Unit

One OCGT unit is proposed comprising a single gas turbine and a single alternating current (AC) generator. The generator and gas turbine will be housed in separate acoustic enclosures with ventilation ducts. The turbine will have an emissions exhaust stack (40 metres) which will be fitted with a continuous emissions monitoring system (CEMS) to monitor flue gas composition. The stack will incorporate emissions monitoring sampling points in accordance with EPA Guidance Note on Site Safety Requirements for Air Emissions Monitoring (AG1). Periodical sampling of exhaust gases will be undertaken following commissioning at a frequency to be agreed with the EPA.

The turbine will have an associated control module which will house the turbine controls and an electrical module which will supply power to the turbine and its associated auxiliary systems. The turbine will have a transformer to step up the voltage to 220 kV for export to the existing on-site electrical substation. When operational, the turbine will use air-cooling radiators to dissipate waste heat from the lubrication oil and other essential systems.

The gas turbine will be designed to produce the specific energy output that is proposed (up to 299MW gross output) and will be limited to this maximum output via a hard-wired control system.

The OCGT plant will be available to operate 24-hours per day, seven days per week. However, the expected operational period for the plant will be non-continuous. It is expected the plant will operate during peak demand periods on the electricity grid. Conservative operational hours are assumed to occur between 6am and 8am in the morning and between 4pm and 7pm in the evening with a greater number of daily operational hours in colder months (maximum of 5 hours per day) and a lower number of hours during warmer months (minimum of 1 hour per day).

The gas turbine and associated auxiliaries will utilise BAT (Best Available Technology) combustion technology to ensure that exhaust emissions to atmosphere are following the relevant IE licence requirements.

There will be a localised control module for the GT Power, Electrical, and Instrumentation available on site that will be connected by fibre cable to the local station control room as an independent module on the Poolbeg Generating Station and it will be also connected to a remotely operated control room. It is possible for such gas turbine technology to be remotely operated. The unit will contain a protection system and control system for operating the units along with a switchgear enclosure.

The proposed gas turbine generators, and the majority of other plant equipment, is modularised and will, for the most part, be delivered to site pre-assembled. Table 3-1 below provides dimensions for the proposed plant and equipment associated with this development.

Table 3.1: Proposed Plant and Equipment

Proposed Plant and Equipment	No. of Units	Height (m)	Width (m)	Length (m)	Diameter (m)
An exhaust stack	1	40	N/A	N/A	8.0
Gas Turbine Air Intake	1	26	18	24	N/A
Generator Enclosure	1	14.5	18	24	N/A
Gas Turbine Enclosure incl. GT Auxiliaries & Loading / Rotor Turning Area	1	26	15	53	N/A
Exhaust Diffuser and CO Catalyst	1	10.5	10.4	14.5	N/A
Gas Turbine (GT) Power Control & Electrical / Control & Instrumentation (C&I) Module	1	10	18	24	N/A

Proposed Plant and Equipment	No. of Units	Height (m)	Width (m)	Length (m)	Diameter (m)
Fin Fan Coolers	9	8	19	27	N/A
Main Transformer	1	9.3	7.5	17.5	N/A
Auxiliary Transformer	1	6.9	4.0	4.7	N/A
Demineralised Water Treatment Plant	1	5.4	10	20	N/A
Demineralised Water Tank	1	14.6	N/A	N/A	22.3
Raw / Fire water Tank	1	14.7	N/A	N/A	15.2
Distillate Fuel Oil (secondary) Tank	1	14.4	N/A	N/A	27.2
Fuel Oil Forwarding Pump	1	2.2	7.8	8.9	N/A
Firefighting Pumphouse	1	5.4	7	12	N/A
Emergency Diesel Generator	1	5	4	10	N/A
Generator Circuit Breaker	1	4	5.1	8.8	N/A
Replacement Firewater Tanks for NORA	2	14.6	N/A	N/A	13.0
3 Bay 220kV Indoor Switchgear Building	1	18	18	30	N/A
Bolted Connections to switchgear building	3	15	15	12.5	N/A
Gas Conditioning Compound	1	3.6	21.9	42.2	N/A
Gas Compressor and Auxiliaries Building	1	5	7.5	24	N/A
Gas Compressor Reducing Building	1	6	6	8	N/A
Gas Compressor Cooler	1	5	4	7	N/A
Hydrogen Storage Compound	1	3	3.5	6	N/A
Continuous Emissions Monitoring System (CEMS)	1	5	2.5	3.5	N/A
Poolbeg CCGT Storage Building	1	10	14	15	N/A
Workshop / Stores & Administration Building	1	15	22	23	N/A

3.4 Fuel Supply

3.4.1 Natural Gas

Natural gas, supplied from the Gas Networks Ireland National Grid, will be the primary fuel for the plant. There is currently a Gas Networks Ireland (GNI) dedicated Above Ground Installation (AGI) gas compound within the Poolbeg Generating station complex. The AGI is where the incoming gas supply pressure will be reduced prior to its use in the gas turbine. The gas supply will run below ground from the Poolbeg AGI to the existing Poolbeg station gas compressor building. A high-level pipe rack will run from the existing gas compressor building to the proposed OCGT with gas compression being undertaken in the proposed new gas compression building. (See Drawing P000442-01-CE21-510-001-000).

Wastewater will be generated by the fuel gas scrubber which will be stored in the fuel gas condensate tank located within the Gas Compressor and Auxiliaries building. Water in this tank will contain hydrocarbons and will be disposed offsite by road tanker in accordance with the Waste Management Act 1996, and associated regulations.

There will be a requirement for AGI extension and modifications works and/or additional equipment to be installed within the existing AGI footprint to meet the gas capacity for the proposed OCGT. GNI will be responsible for the installation, operation, and maintenance of equipment within the AGI gas compound. All operations within the AGI will comply with standard GNI operational procedures and risk assessments and will be carried out by approved

GNI contractors. These works will not form part of this planning application submission, but their construction will be assessed cumulatively as part of this EIAR.

3.4.2 Secondary Fuel Storage

The proposed development will be required under the Grid Code to maintain a secondary fuel supply of low sulphur gas oil (i.e. distillate oil) to be stored in tanks within a bunded area on site. The purpose of this secondary fuel is to ensure that power can still be supplied to the electricity network in the event of an interruption to supply from the gas network.

The secondary fuel will only be used in the highly unlikely event that both the gas connection is unavailable and the other generation on the transmission grid cannot meet demand. The secondary fuel will be received via road tanker at an unloading station adjacent to the bunded area and transferred to the tanks via a set of unloading pumps. A fuel forwarding pump set will forward the secondary fuel from the storage area to the plant when required. A sunken fuel pipe run with covers will carry the fuel forwarding and return lines under the internal access road to the OCGT.

The secondary fuel will be stored within the existing bunded Poolbeg fuel oil tank farm which is owned by ESB but leased to the National Oil Reserve Agency (NORA). The fuel oil tank farm bund was designed for three equally sized oil tanks. Currently there are 2no oil tanks with a capacity of 16000m³ and a water storage tank within the oil bund. The existing water storage tank will be dismantled and planning permission is being sought of the construction of a third fuel storage tank with a capacity of 8000m³ located on the existing bund. Two smaller replacement fire water tanks with a total capacity of 3800m³ will also be constructed. The combined storage of the fuel tanks will provide the required gas oil to operate the proposed OCGT on full load for 72 hours with spare capacity.

3.5 Grid Connection

The OCGT will connect to the existing 220kV Substation within the ESB Poolbeg complex via a 220kV underground cable. Pending final clarification from EirGrid as to the actual configuration of the grid connection it is necessary for the proposed development to consider three connection options as detailed below:

- **Option 1:** Power generated from the proposed OCGT will be exported through a new 3 Bay Indoor Switchgear Building using the existing Poolbeg CCGT (ST16) connection to EirGrid's 220kV Shellybank substation. This hybrid option will require power export to new 3 bay indoor switchgear building (from ST16 and the proposed OCGT) to the EirGrid Shellybank substation. The switchgear building will facilitate the shared hybrid connection.
- **Option 2:** Power export through a new 3 Bay Indoor Switchgear Building using the Poolbeg Flexgen Project currently under construction to EirGrid's 220kV Poolbeg AIS substation. This hybrid option will require power export to new 3 bay indoor switchgear building (from Poolbeg Flexgen Project and the proposed OCGT) to the EirGrid 220 kV Poolbeg AIS substation. The switchgear building will facilitate the shared hybrid connection.
- **Option 3:** Power export through a dedicated existing bay (previously connected to the T2003 transformer in the decommissioned Thermal Powerplant Station) in the Poolbeg AIS Substation controlled by EirGrid.

For completeness all three connections options will be assessed as part of the EIAR. Planning permission is being sought for Option 1 which is the most likely connection configuration.

3.6 Water Demand

Water supplies are required as follows:

- Potable water – for welfare facilities;
- Demineralised Water – for injection into the gas turbine for control of nitrogen oxide emissions; and
- Raw/fire water – for emergency responses.

The service connections for these utilities are shown on Drawing P000442-01-CE21-113-001-000.

3.6.1 Water Supply

Water will be supplied to site via the existing Irish Water connection which runs along the station road within the Poolbeg Generation station complex. The water supply will come from a designated metered connection. The water connection will be used to supply the firefighting system, demineralised water treatment plant and staff welfare facilities.

Water will also be stored in proposed common firewater process water storage tank that has approximately 2649m³ in volume.

3.6.2 Demineralised Water Treatment Plant

Demineralised water will only be required for water injection into the gas turbine to reduce nitrogen oxide (NOx) emissions when running on secondary fuel (gas oil). The demineralised water will be produced in an on-site water treatment plant using industry-standard technology. The proposed Demineralised Water Treatment plant will remove any contaminants, chlorine, salt and minerals from water before use. The demineralised water will be stored in the proposed demineralised water tank.

When operating on gas oil, it is expected that the turbine will require 83,330 litres per hour of demineralised water. It is anticipated that equipment requiring the process water will be operational for 2 hours per month for gas oil operation testing purposes. Assuming 70% retention from the water treatment plant, the plant is estimated to use approximately 119,050 litres of raw water per hour of operation. This would amount to a monthly demand of approximately 240,000 litres of raw water.

The bunded chemical tanks specific to water treatment will be contained within the Demineralised water treatment plant building at the OCGT in Poolbeg. The demineralisation process will result in residual wastewater. To produce 83,330 litres of demineralised water the plant will generate approximately 36,000 litres of wastewater per hour of operation. This wastewater will be managed by undergoing suitable treatment (details in Section 3.9.7) before it is discharged to the proposed new surface water discharge point (Easting – 711553, Northing – 758931) into the existing cooling water outfall channel that discharges to the Liffey Estuary Lower Waterbody (IE_EA_090_0300). This new surface water discharge point will be regulated under the IE Licence.

3.6.2.1 Firefighting Systems

Firefighting on site will predominately be carried out by manual fire suppression using the fire water hydrant network on site. The existing fire water network on the site may be used for the protection of the equipment that will be installed as required by the local fire authority. Fire safety evacuation drills & training to be provided as appropriate. NFPA guidance will be followed as appropriate.

As mentioned above, a combined fire water and process water storage tank of approximately 2649m³ will be installed on site for a demand flow rate of 1,900L/min. Fire water discharges will be collected in the surface drainage system and will be discharged from the site after passing through the drainage interceptors.

In the event of a fire at one of the transformers, the affected transformer bund can provide firewater retention. If the volume of the bund is insufficient, the water for firefighting purposes shall be provided via the sealed compound drainage network to the impermeable subsurface remote containment tank. Contaminated firewater collected on the site, shall be characterised (including analysis) to determine the options for proper disposal. Consultation with Irish Water will be required to assist with this further.

3.6.2.2 Potable Water

There is currently no water connection with the proposed development site boundary. A water supply will be required for the proposed welfare facilities within the workshop/admin building area. This includes for two toilets (WC) and wash hand basins. As noted above, this supply will come from the metered connection to the public watermain to the site and a new designated connection will supply the OCGT at Poolbeg. The estimated volume of water required to accommodate the welfare facilities is approximately 11000 litres per year.

3.6.2.3 Foul Water

Currently there is no foul services within the boundary of the proposed development site. The foul water from the new workshop/admin building area on the southern side of the site is proposed to be discharged into the existing foul water manhole to the southern region across the internal Station Road from the building. As noted above, the proposed welfare facilities include for two toilets and wash hand basins.

3.6.3 Emergency Diesel Generator

One small emergency diesel generator will be installed at a rating of less than 1 megawatt thermal. The emergency diesel generator will enable safe shutdown of the OCGT power plant, and provide electricity for critical users (i.e. emergency lighting in the event of total loss of electrical supply). The emergency diesel generator will be tested on a routine basis on load via synchronising to the system, every month, to ensure that the emergency diesel generator plant starts properly when required.

3.7 Lighting and Security

A new lighting arrangement will be provided to ensure a safe work environment for staff on site. New outdoor lighting will be minimised for health and safety requirements. Lighting will consist of LED luminaires due to their sharp cut-off, lower intensity, good colour rendition and dimming capability. 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 OCGT development are proposed below with lux values to be assumed at ground level. These are based on Networks Engineering WI for lighting in ESNB Substation (WI-200-502): [WI-200-502-Design policy for substation lighting.doc \(esb.ie\)](#):

- **Light poles 'LP'**: Approximate locations are shown on the planning drawings. Min 10 lux at ground level;
- **Spot lights**: will be installed to the eaves heights of main buildings, HV switchgear, transformer and maintenance areas - Min 20 lux at ground level;
- **Everywhere else on development**: Min 2 lux at ground level; and
- **Outside development fences**: Existing lighting in Poolbeg Generation station complex.

The facility will be securely fenced, and access controlled. The site is within the Poolbeg Generating station complex which is controlled by a security team.

3.8 Construction Phase Activities

3.8.1 Demolition and Construction Environmental Management Plan

A D&CEMP is included in Appendix C to this EIAR and will be implemented during the construction phase in consultation with Dublin City Council. The D&CEMP will remain a “live” document which will be reviewed regularly and revised as necessary to ensure that the measures implemented are effective.

The primary objective of the D&CEMP is to safeguard the environment, site personnel and nearby sensitive receptors from site activity which may cause harm or nuisance. As such, the D&CEMP sets out a project framework to ensure that key mitigation measures and conditions set out as part of the planning and foreshore 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 D&CEMP;
- Undertake regular audits;
- Continuously check records;
- Set up a contractor reporting structure; and
- Conduct regular meetings (at least fortnightly) where Environmental Health and Safety is an agenda item.

3.8.2 Environmental Clerk of Works

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 D&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).

3.8.3 Demolition and Construction Traffic Management Plan

The appointed Contractor will implement the Demolition and Construction Traffic Management Plan (D&CTMP), in ongoing consultation with Dublin City Council. The implementation of the D&CTMP will mitigate any potential construction traffic impacts on the public road network. All construction activities, including construction traffic, will be managed through the D&CEMP.

3.8.4 Construction Resource and Waste Management Plan (CRWMP)

Prior to commencement of the development, the appointed Engineering, Procurement, and Construction (EPC) Contractor will implement a Construction Resource and Waste Management Plan (included as part of the D&CEMP comprising Appendix C of this EIAR) which will provide for the segregation of all construction wastes into recyclable, biodegradable and residual wastes to facilitate optimum levels of re-use, recovery, and recycling operations. The plan will be 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). 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. re-use, recycle, and recovery) in line with the Waste Hierarchy where technically and economically feasible. The Plan will also deal with any litter arising during the construction phase of the 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. All employees will be required to comply with the obligations under the Plan. The CRWMP 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 15.

3.8.5 Construction Phase Activities

The following sections provides a summary of the indicative construction programme, Pre-construction stage works, construction stage works and construction phase considerations (Health & Safety, etc).

For the purposes of the describing the works activities, the Main OCGT development will consist of the following work area designations:

Contractor's Compound and Laydown Area

This area will consist of:

- Site access along with a HGV haul route into the Main OCGT development;
- Contractor's carparking;
- Contractor's cabins; and
- Construction laydown.

Main OCGT Development Area

This area is envisaged to typically include the following major components:

- An exhaust stack 40m in height;
- Gas Turbine Air Intake;
- Generator Enclosure;
- Gas turbine enclosure including Gas Turbine auxiliaries and loading/ rotor turning area;
- Exhaust Diffuser;
- Gas Turbine Power Control and Electrical C&I Module;
- 9No. Fin Fan Coolers;
- Main Transformer including bund and blast walls;
- Auxiliary Transformer compound including blast walls;
- Demineralised Water Treatment Plant;
- Demineralised Water Tank;
- Raw/Fire Water Tank;
- Distillate Fuel (Secondary)Oil Tank with capacity of 8000m³;
- Fuel Oil Forwarding Pump;
- Fire Fighting Pumphouse;
- 1No emergency diesel generator (<1MW th / 250KWe);
- Generator Circuit Breaker;

- 3-Bay 220kV Indoor Switchgear Building and 3No bolted connections W x 15m H);
- Hydrogen Storage Compound;
- Continuous Emissions Monitoring System (CEMS); and
- Workshop, Stores and Administration Building.

The demolition of:

- Babcock Store;
- Hydrogen Tank; and
- Temporary Control Building.

Gas pipeline routing area

This area will consist of:

- Overground pipe rack from the AGI to the main site for routing of a gas pipeline.

Southern area

This area will consist of:

- Existing Gas Compressor Building; and
- Construction of a new Gas Conditioning Compound which includes: Gas Compressor; and Auxiliaries Building, Gas Compressor Reducing Building and Gas Compressor Cooler.

Eastern area

This area will consist of:

- Demolition of an existing water tank within the Poolbeg Oil Tank Farm (NORA);
- Construction of a new fuel oil tank and baffle walls within existing bund;
- CCGT Stores Building; and
- Construction of two new replacement fire water tanks for NORA.

Figure 3.4: Aerial View of ESB Poolbeg Generating Station looking Northwest showing the Designation of the OCGT Development's Work Areas



Source: ESB

3.8.6 Construction Programme

It is envisaged that two separate construction programme stages will be required to deliver the proposed development.

- Pre-construction stage: Demolition and Enabling Works
 - Demolition of existing buildings and civil enabling works for the site will form the first stage of the works. It is anticipated that the Main Engineering, Procurement, and Construction (EPC) Contractor will sub-contract a Demolition and Enabling Works Contractor (the D&EW Contractor) to perform both the demolition and civil enabling works ahead of the main development works.
- Construction stage: Main OCGT Development Works
 - It is intended that the second and main stage of the proposed development will involve detailed design and construction of the OCGT development. This will be developed and executed by the Main EPC Contractor's design team and subcontractor supply chain. In this stage, the Main EPC Contractor will be expected to:
 - Procure the OCGT technology and all Balance of Plant (BoP)
 - Manage, coordinate, and execute the detailed design and construction of the development in line with planning proposals
 - Be responsible for updating and taking ownership the Demolition and Construction Environmental Management Plan (D&CEMP) prior to commencement of the demolition works, enabling works and main construction activities on site.

The commencement date is subject to the date of grant of planning permission, pre-commencement obligations, and progression of the design to construction stage. The key stages and activities within the construction programme along with construction hours are outlined in Table 3.2 below. The construction is expected to commence in early 2024 and proposed development is expected to be available for operation by circa late 2026.

The timing of stages and activities are approximate based on experience of similar projects and this is meant as a guide, rather than a definitive programme of events. This timeline may vary depending on the time of year, weather conditions and the availability of specialised equipment. If possible, the Main EPC Contractor may seek to improve upon the programme duration.

Demolition & Enabling Works:

It is anticipated that for the first stage of the proposed development, the Demolition and Enabling Works Contractor will:

- Begin demolition and civil enabling works in early Q2 2024; and
- These site works are envisaged to be completed within approximately 8 months from mobilisation and the traffic volume intensity and movement around the site stated in this report are based upon this period.

Main OCGT Development Works:

- Begin mobilising for construction works towards the end of the Demolition and Enabling Works Contract in Q4 of 2024; and
- These site works are envisaged to be completed within approximately 22 months and the traffic volume intensity and movement around the site stated in this report are based upon this period.

Table 3.2: Indicative Construction Programme

Months	Construction Activities
8 months	Demolition & Enabling Works
Months 1 to 8	Site setup • Contractor's compound and laydown area • Site access, temporary hoarding and fencing • Mitigation and monitoring measures
	Demolition works • Soft Strip • Demolition
	Enabling works • Site clearance • Existing services • Geo-Environmental site investigations • Levelling and grading
	Gas compressor building
22 Months	Main OCGT Development Works
1 Month (Month 9)	Site setup • Contractor's compound and laydown area • Site access, temporary hoarding and fencing • Mitigation and monitoring measures
19 Months (Months 10 to 27)	Infrastructure construction • Site raising • Foundation construction • Below ground services and utilities installation

Months	Construction Activities
	Road networks construction
	Building construction
	- Erection of prefabricated units - Erection of structural steel, concrete, masonry structures - Exhaust stack erection
	Equipment installation
	- Erection of prefabricated units - Ancillary works
3 Months (Months 28 to 30)	Commissioning and handover

3.8.7 Working Hours

The working hours for the construction phase are proposed as follows:

Table 3.3: Construction Working Hours – Normal Operations

Day	Working Hours
Monday to Friday	07:00 – 19:00
Saturday	08:00 – 14:00
Sunday or Bank Holiday	N / A

Table 3.4: Construction Working Hours - Heavy Goods Vehicle (HGV) Movements

Day	Working Hours
Monday to Friday	07:00 – 19:00
Saturday	08:00 – 14:00
Sunday or Bank Holiday	N / A

No construction works will take place outside these hours, unless such work:

- Is required under exceptional circumstances; or
- Is carried out with the prior written approval of the local authority.

3.8.8 Workforce

3.8.8.1 Demolition & Enabling Works

During average construction operations, an average of 20 personnel is anticipated on site. Assuming a vehicle occupancy rate of 1.25, this would result in a peak requirement of 16 vehicles and 32 two-way movements per day.

During peak construction operations, a maximum of 35 personnel is anticipated on site. Assuming a vehicle occupancy rate of 1.25, this would result in a peak requirement of 28 vehicles and 56 two-way movements per day.

Given these figures, it is expected that a worst case of up to 28 temporary car parking spaces may be required during peak construction operations.

3.8.8.2 Main OCGT Development Works

During average construction operations, an average of 80-100 personnel is anticipated on site. Assuming a vehicle occupancy rate of 1.25, this would result in a peak requirement of 80 vehicles and 160 two-way movements per day.

During peak construction operations, a maximum of 140 personnel is anticipated on site. Assuming a vehicle occupancy rate of 1.25, this would result in a peak requirement of 112 vehicles and 224 two-way movements per day.

Given these figures, it is expected that a worst case of up to 112 temporary car parking spaces may be required during peak construction operations.

3.8.9 Vehicle Movements

A Demolition and Construction Traffic Management Plan (D&CTMP) will be required to be implemented during both stages of the development. It will ensure that potential impacts resulting from construction traffic on the local community, businesses and other industry adjacent to the site. The Contractor will be required to develop their Demolition and Construction Traffic Management Plans 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.

The OCGT gas turbine and generator equipment along with transformer equipment will likely originate in Europe and will be delivered via ship to Dublin Port or Hammond Lane deep berthing facilities. Liaison with the Dublin Port harbourmaster and Irish Customs will be required as standard. From there, the equipment will be loaded onto the specially purposed tractor-trailer or truck-trailer transport solutions and delivered the short distance to site via Pigeon House Road. It is envisaged that for HGV haulage routes originating from the M50/M1 motorway interchange, the Dublin Port tunnel will be used. From there it is proposed that the haulage route will cross the River Liffey at the Eastlink toll bridge and onwards to Pigeon House Road.

For abnormal loads, haulage will likely take place at night-time 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 Councils during the detailed design phase. It is expected the modular electrical containers and the transformers are to be partially completed off-site and potentially delivered as an abnormal load during the construction phase. For the delivery of the gas turbine and generator plant, it is expected that a special escort will be required.

Full details on the estimate construction traffic plant movements for each phase of the proposed development are discussed in Chapter 14.

From experience on similar construction projects, it is considered that there will be a maximum of six HGV's serving the site during any given daytime hour. This is based upon the knowledge that it takes on average 10 minutes to load a lorry with spoil material. As such, the two-way HGV traffic is unlikely to be higher than 12 vehicles per hour at any point of the day.

Peak HGV traffic movements is likely during the material moving operations associated with the site preparation stage of the construction programme. A site that is continuously operating at peak efficiency can expect 1,760 vehicles per month assuming say 10 vehicles per hour over an 8-hour day and 22 working days in a month. The modulation in the various types of site activities during the site preparation stage will likely see a smaller number of vehicles than this peak value.

3.8.9.1 Construction Site Access and Egress

The main site access is available via the Pigeon House Road through the existing secured entrance to Poolbeg Generation station complex. Direct access to the development will be via this gate and the existing internal roadways within Poolbeg Generating station complex. A secondary access is available to the southern boundary and it is expected that this may only be

limited to heavy deliveries only. If required to be used, this shall be based on providing trained banksmen to ensure traffic and pedestrian management during these limited deliveries.

The primary entrance to the main development site for the demolition, construction and operational phases will be via the construction of a new access gate and entrance roadway onto the internal station road at the south of the proposed development. This entrance has clear lines of sight achievable in the East and West directions. Existing low speed limits for vehicles are enforced within the internal station roads.

It is anticipated that the construction works on the main site will be delineated with temporary fencing during the works, and permanent fencing when completed.

During the construction of the proposed development, it is expected that cranes or long vehicles could also obtain access/egress to north of the main development using internal station roads.

3.8.10 Pre-construction Stage: Demolition and Enabling Works

It is anticipated that the Main EPC Contractor will sub-contract to a Demolition and Enabling Works Contractor (D&EW Contractor) ahead of the Main OCGT Development works.

Figure 3.5: Aerial View of ESB Poolbeg Generating Station looking Northwest showing the Extent of the Proposed Demolition & Enabling Works



Source: ESB

3.8.10.1 Site Setup

Contractor's Compound and Laydown Area

The Contractor's compound and laydown area will be located to the south of the former generation station.

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. Foul waste can be discharged into the local foul drainage system or regularly disposed off-site using appropriate facilities. A suitably banded generator may also be used for power if preferred. An example of a Contractor's site compound layout is likely to include the following:

- Temporary site accommodation incorporating management and engineers' cabins, WC facilities, canteen and drying room facilities.
- Primary materials storage including containerised units and lock ups for tools and equipment.
- COSHH Waste storage and recycling area either within or adjacent to compound
- Car parking for key management and staff.

Site access and construction traffic signage will be established by the Demolition and Enabling Works Contractor in accordance with a Demolition and Construction Traffic Management Plan (D&CTMP). Dedicated primary temporary laydown and storage areas will be identified for construction plant and equipment. These areas will be available for any fabrication which may be necessary.

Site Access, Temporary Hoarding and Fencing

The Contractor will erect a 2.44m high solid timber hoarding to the North, South and East perimeters of the proposed development areas. Controlled pedestrian and gated vehicular access points will also be provided. This is to ensure safety, security and prevent unauthorised access to the site. All timber hoarding will be maintained to a high standard and painted or covered where it is facing public interfaces.

Mitigation and Monitoring Measures

Appropriate mitigation and monitoring arrangements will be put in place in accordance with the Demolition and Construction Environmental Management Plan (D&CEMP).

3.8.10.2 Demolition Works

In the Contractor's Laydown area to south and east of the former thermal generation station building, demolition of the following will be required:

- existing legacy ancillary structures including blockwork walls and fencing .

In the Main OCGT Development area demolition of the following will be required:

- Temporary Control Building to the North;
- Babcock Store building to the South-East;
- Existing reinforced concrete ground slab to the East;
- Existing foundation structures to the North-East; and
- For Secondary Fuel Storage demolition of the Water tank (water capacity 3,200m³).

Note that to the south of the development, there are existing lightweight prefabricated buildings that are used by the Poolbeg CCGT Generation Station for operations and maintenance. These are to be relocated within the Poolbeg Generating station complex. All materials will be segregated, classified and disposed of off-site in line with the existing Industrial Emissions licence for Poolbeg Station, EPA Licence Reg. No. P0577-04.

Building Soft Strip

Ahead of the building demolition works the following will be required:

- Safe isolation of electrical, water, gas and data services;
- General contents stored within buildings (e.g. furniture, paper, equipment, computers, etc.);
- Any Asbestos Containing Materials (ACM) from plant and buildings will be safely identified and removed by an approved Specialist Asbestos Contractor with air testing to be undertaken following works;
- Timber, partitions, false ceilings, glazing, furnishings, general rubbish, electrical equipment, plumbing; and
- The removal and disposal of other hazardous substances, if any, from plant and buildings, by approved Specialist Contractor.

Building Demolition

Following the soft strip of the buildings, it is anticipated that the demolition of the existing structures will involve the following activities:

- Installation of temporary supports as designed and specified by a Chartered Civil and Structural Engineer;
- Careful isolation of building structures from any adjacent structures;
- Demolition of non-load bearing elements such as masonry infill walls, masonry partition walls, steel access platforms, etc;
- The careful and sequential removal of roofs and wall cladding;
- Controlled demolition of the structural frame of each building from roof to ground level, including ground floor slabs, strip footings, ground beams and pile caps as required; and
- Existing foundations, substructures and services which will affect the construction of the plant will be excavated and demolished and diverted where required.

As the site is adjacent to the coastline wind speeds and directions may require monitoring to ensure safe craneage and demolition operations. This may be achieved by daily review of Met Éireann data and through the use of windssocks installed at appropriate locations such that prevailing wind direction is visible to plant operatives at all times.

Water Tank Demolition

Preparation

1. All works will be supervised by experienced demolition site manager. All workers will undergo a site induction prior to commencing works, this will be carried out by the main contractor. The scope and agreed methodology of works will be walked and communicated to the crew before signing off accordingly. All workers will be required to wear full personal protective equipment including hard hat, gloves, glasses, hi visibility vest, and safety boots. Task specific will be required to be worn for certain tasks e.g.; P3 mask, ear defenders/plugs etc.
2. Initial works will involve setting up necessary exclusion zone around the work areas and the placement of the agreed D&CTMP. The D&CTMP will be designed and placed by specialist contractor. Timber hoarding will be erected around the perimeter of the site.
3. Site access will be from inside the Poolbeg Generating Station complex. HGVs will be guided into position within the existing concrete bund by spotters. The Contractor will make use of the area on site as it becomes available throughout demolition works as a secure site compound.
4. All working at heights will take place from MEWP working off a solid compact surface and operated by trained operatives for the duration of works.
5. Task specific lighting is to be put in place where required.

Decommissioning and cleaning of tanks

1. All live services are to be disconnected and made safe prior to commencement of the works.
2. Cleaning of the tank is to be assessed and carried out by specialist contractor. No demolition works will be carried out on the tank until tank are confirmed decommissioned. The specialist contractor will issue a separate RAMS for these works.
3. All water runoff from cleaning of tank shall be collected and disposed of off-site at an appropriate environmentally licenced facility.

Structural demolition of water storage tank

1. On completion of decommissioning and cleaning, demolition to the tank can commence. Working off an MEWP an opening will be formed with the use of a magnetic drill. This will allow the sheers to get a grip and to complete the demolition works
2. Demolition of the water storage tank will be carried out using a high reach excavator machine with a shear attachment.
3. The steel arising from the demolition works will be loaded into skips on-site and removed to a pre-agreed recovery facility.
4. Demolition of the tank will include the removal of hold down bolts, pipework and all other associated infrastructure.
5. Note for the delivery of all site vehicles, a minimum of two spotters will guide the vehicles into position. Public will be given priority as needed.
6. Weather conditions will be monitored for the duration of works and great care or suspension of works is required during windy conditions.
7. Once the tank is removed and skip works to the concrete plinth can commence.
8. An excavator with the use of a breaker will remove the plinth before loading waste into a truck for removal off site.
9. Any steel will be cut and placed into the steel skip. All waste will be recorded on daily waste logs and brought to a licenced facility. All records will be available on request.
10. As mentioned above any hot works will be carried out under hot work permit conditions.
11. Any changes to the Contractor's methodology will be recorded on a safe plan of work.

3.8.10.3 Enabling Works

It is anticipated that enabling works will take place in parallel with the demolition works and will be completed once the existing buildings are raised. During site enabling works, all material will be removed off-site for treatment and disposal at an appropriate facility by an approved and licensed contractor in accordance with EPA Licence Reg. No. P0577-04 and all applicable regulations.

Site Clearance

The Demolition and Enabling Works Contractor is to undertake a programme of site clearance of general debris, fencing, signage and lighting poles across the proposed development area that is typically bounded by the roadways of the existing generation station. The removal and disposal of all hard-standing surfaces within the site boundary line will be required as part of the main clearance operations.

Existing Services

Existing site survey and archive drawing information reveals various underground live and redundant services present within the development footprint. A geophysical survey will be

undertaken to identify existing below ground services including electrical cables and other services. Physical intrusive surveys using careful hand digging techniques will be used to physically verify this desktop information.

In centre of the Main OCGT development area the following works will be required:

- Removal and backfilling of existing redundant underground services. This will include disused foul, gas and surface water drainage along with electrical services to lighting.
- Diversion of existing live underground services will be required to suit the proposed development. This will include a fire ring main, foul and surface water drainage.

In the Ancillary Buildings area the following works will be required:

- Removal and backfilling of existing redundant underground services. This will include disused surface water drainage along with electrical services to lighting.
- Relocation of an Electric Vehicle (EV) charging point.
- Diversion of existing live underground services will be required including a surface water drainage.

Geo-Environmental Site Investigations

It is anticipated that advanced geo-environmental site investigations may also be undertaken by the Demolition and Enabling Works Contractor on behalf of the Main EPC Contractor. This will confirm the underlying ground conditions under the final gas turbine and exhaust stack locations for example. The results of these surveys will be used to inform the final foundation design and piling arrangements.

Levelling and Grading

Levelling and grading of the site to include a soil strip in preparation for the main development works. An area of replacement carparking for the Poolbeg CCGT Generation Station staff will need to be established. This is likely to require existing stone surfaces to be re-graded within the station complex.

Gas Compressor Building

Light internal strip out, refurbishment and repair of cladding to the existing gas compressor building to the south of the development will be undertaken. This is to accommodate its re-purposing and re-use. Asbestos is not expected to be present however it will be removed if found.

3.8.11 Construction Stage: Main OCGT Development Works

It is intended that the second and main stage of the project will involve the detailed design and construction of the OCGT development. This will be developed and executed by the Main EPC Contractor's design team and subcontractor supply chain. In this stage, the Main EPC Contractor will be expected to:

- Procure the OCGT technology and all Balance of Plant (BoP); and
- Manage, coordinate, and execute the detailed design and construction of the development in line with planning proposals.

3.8.11.1 Site Setup

The Contractor's compound and laydown area will be located to the south of the former generation station. The Contractor's compound will be similar to the arrangement outlined above, but with additional capacity for a larger workforce.

3.8.11.2 Infrastructure Construction

Site Raising

Ground level raising is to be undertaken to achieve the required finished levels between buildings and equipment. Material will be sourced from a licenced quarry or from a suitable third-party site. 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.

It is anticipated that a maximum volume of 2100 m³ of material will be required for local site-raising purposes. The material will be imported to site for direct infilling with some short-term stockpiling undertaken to facilitate construction operations where necessary.

Ground improvement and stabilization techniques may be considered by the Contractor if judged necessary to suit the site investigation or crane lifting plans.

Note that site raising requirements on the site to bring the proposed development to the required levels and is reflected in the HGV movements estimated elsewhere in this report.

Foundation Construction

Heavy plant such as the exhaust stack, generator, gas turbine, main transformer have been spatially coordinated so that they are not located on the footprint of existing retained cooling water culverts and electrical ducts to the centre of the site.

According to previous site investigations within the Poolbeg Generation station complex, the following typical stratification from ground level (G.L.) is expected:

- Made Ground (G.L. to 6-7m);
- Granular & Cohesive Fluvio-glacial deposits (7m – 20m);
- Dublin Port Clay (15m – 30m);
- Granular & Cohesive Glacial Till (18m – 40m); and
- Weathered / non-intact Limestone (encountered between depths of 28m and 33m).

The water table is expected at a depth of 2.5m to 4m below ground level and likely to be influenced by the tidal range due to its proximity to the sea. Perched water may also be present in the made ground. It is expected that the majority of foundations will be designed to avoid excavating into the water table.

At the detailed design stage, it is anticipated that piling solutions will be required to meet settlement tolerances for the foundations to all major buildings and structures including the exhaust stack, gas turbine and generator foundations. It is anticipated that:

- Replacement piling techniques such as rotary bored or contiguous flight auger (CFA) will be employed with a rock socket achieved at depth within the limestone bedrock at an approximate depth of 35 to 40m.
- These piling techniques are non-percussive and thus mitigate noise impacts on the surrounding human populations and ecological habitats. Acoustic screens may be employed around the pile auger in order to reduce noise impacts further.

- In order to ensure the stability of the pile bore and mitigate the impact on the below ground water hydrology, the bores for piles will likely need to be sleeved down to the Dublin Port clays or rockhead during concrete placement in order to limit the egress of concrete from the bore and into the soil substrate.
- As the foundations are to be primarily piled directly to rock, this mitigates the heavy foundation loadings on any soil overburden.
- The duration of piling operations is likely to be limited to intermittent periods over the course of six to eight weeks.

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 bearing shallow reinforced concrete pads, rafts, strip footings may be used instead of piling for these structures. The design bearing pressures may be limited to 75 to 100kN/m².

The suitability of the ground to receive heavy abnormal loads from cranes, tractor-trailer, truck-trailer deliveries is to be assessed using plate bearing tests on all haul routes and crane lifting locations. Approved ground improvement techniques may be considered if judged necessary following the site investigation.

Large and/or deep excavations may be required for the foundations of primary plant such as the gas turbine and generator. Some of these foundations may require temporary ground support in the form of sheet piling. The selection of vibratory or percussive sheet piling techniques will need to be assessed for their relatively low noise impacts on sensitive receptors.

Internal Access Road Networks Construction

Internal access roads will be constructed to suit the final permanent layout of the proposed development with road finishes typically to be as shown on planning drawings.

Below Ground Services and Utilities Installation

Construction of the development infrastructure will involve excavation and installation of all below ground services including drainage systems, connections to existing water supplies and power, along with the routing of all cable ducting throughout the site within the specified terminal points.

Services will be surrounded with imported suitable engineered fill and backfilled with either imported fill or with excavated material if this proves suitable.

Temporary works may be installed to provide stable dry excavations, depending upon the results of the site investigation and the contractor's proposed construction methods. Such temporary works may include the use of embedded retaining walls such as sheet piles, or other suitable methods and/or ground water management.

Where works required to install grid cables from the main transformer to the new 3-Bay Indoor Switchgear Building and the existing substations, coordination and permitting of the works will be required with EirGrid, ESB Networks and Poolbeg CCGT Generation Station to ensure operation activities are not affected.

Building Construction

Erection of Prefabricated Units

Where possible, prefabricated building units will be utilised to minimise on-site building works. Prefabricated units will be divided into standard transportable units where possible and will be craned into position.

Erection of Structural Steel, Concrete, Masonry Structures

If the use of prefabricated buildings is not proposed by the Contractor, a suitable designed traditional masonry block, flat roof, single storey building may be constructed. Cladding and insulation will be fixed, and the buildings will be made weather tight. Internal walls will be erected where the building is to be divided. The buildings will then be fitted out with electrical systems, plumbing and drainage.

Exhaust Stack Erection

The exhaust stack will be erected into position using heavy lift craneage equipment. As the site is adjacent to the coastline wind speeds and directions may require monitoring to ensure safe craneage operations. This may be achieved by daily review of Met Éireann data and through the use of windsocks installed at appropriate locations such that prevailing wind direction is visible to plant operatives at all times.

Ancillary Works

Ancillary works will be required to be completed. Such works include, but are not limited to:

- Permanent site fencing, signage and gates;
- Site lighting; and
- Site security systems.

3.8.11.3 Equipment Installation

This construction phase is expected to include the following:

- Installation and commissioning of plant;
- Electrical fit out and commissioning of buildings;
- Installation and commissioning of transformers; and
- Installation and testing of all below ground cables

Factory acceptance testing will be carried out on equipment, at place of manufacture, prior to dispatch to the site.

Site acceptance testing will form part of the program of works. This will consist of inspection of equipment on delivery, pre-installation tests, testing of subsystems prior to commissioning. After the commissioning phase compliance testing will be undertaken to ensure adherence to national standards and regulations.

After the completion of the foundation works, plant and equipment will be installed. Transformers (within housings and modules) will be delivered and erected onto the foundations. Heavy lifting with the use of cranes will be required for some items of plant. Wind direction and data will be monitored using Met Éireann data will be to ensure safe craneage operations.

The commissioning works will be carried out as a progressive process from the final structural checks, pre-commissioning and setting to work of individual component parts, interconnecting pipework, cabling and signalling, through to the overall performance and compliance testing of the plant prior to its commercial operation.

3.8.11.4 Completion and Handover

This construction phase is expected to include the following:

- Energisation and start-up testing;
- Commissioning and compliance testing;

- Restoration of laydown areas;
- Completion of construction and demobilisation;
- Completion and handover of Health and Safety File, technical documentation, full discharge of planning and Building Regulation requirements etc; and
- Formal handover of development for commercial operation.

3.9 Operational Phase Activities

3.9.1 Working Hours

The proposed OCGT will be available to operate 24-hours per day, seven days per week. The proposed OCGT at Poolbeg will operate as required by the demands placed on the grid and the generating capacity available at any time. The proposed OCGT is designed to come on stream quickly as demand on the grid changes. It is expected the plant will operate during peak demand periods on the electricity grid. The plant will not have a permanent staff and will be operated remotely by ESB. There will be regular engineering checks on a weekly basis, security staff and periodic maintenance visits.

3.9.2 Operational Staff

During operation, the proposed OCGT at Poolbeg will operate unmanned, controlled remotely from another ESB site. There will be personnel on site carrying out routine inspections and maintenance on the proposed facility.

3.9.3 Operational Site Access and Security

The facility will be securely fenced, and access controlled. The facility is within the Poolbeg Generating station complex which is controlled by a security entrance via the Pigeon House Road.

3.9.4 Lighting

The proposed OCGT at Poolbeg 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 nighttime maintenance visits comprising lighting from the car park to the control room and other building entrances. The lighting will be for general purpose. 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. No area of the compound will be less than 2 lux.

3.9.5 Drainage and Wastewater Management

3.9.5.1 Surface Water Drainage

The proposed surface water drainage connections are shown in Drawing Number P000422-01-CE21-113-001 with typical details of drainage system components shown on Drawing P000422-01-CE21-600-001.

The proposed drainage design is presented in the Drainage Report ¹. Most of the proposed compound will be surfaced with permeable stone and surface water generated on this area will infiltrate to ground. The proposed drainage design has been developed in accordance with Best Management Practices of Sustainable Drainage Systems (SUDS). The permeable area of the proposed OCGT site will be finished in 50mm single size clean compound stone.

¹ Poolbeg OCGT Drainage Services Report Document no. P000422-01-CE21-R005-000

Surface runoff collected from proposed roads, parking areas, concrete areas and bunded areas will be collected in a new underground drainage network and conveyed into a proposed Klargestor NSFA 200 Full Retention Separator and then to the proposed attenuation tank located in the northern region of the site. The clean rainwater runoff collected from the proposed buildings' roofs will connect to the attenuation tank, bypassing the oil separator. In order to provide for treatment of surface water generated in the bunds, it is proposed to install an 'Entexol SCS001' or equivalent approved oil sensitive bund dewatering system with a 1 litre per second low shear vortex pump with oil separation detection within each bund. This system will ensure only non-contaminated water enters the site drainage network. The bund dewatering system will be fitted with a high oil level alarm and will be connected back to the station control panel.

After the surface water has been attenuated and the maximum outflow restricted by a flow control device to no greater than the flow capacity of the proposed drainage line (60 l/s). The runoff will be discharged to the proposed new surface water discharge point (Easting – 711553, Northing – 758931) into the existing cooling water outfall channel that discharges to the Liffey Estuary Lower Waterbody (IE_EA_090_0300). This new surface water discharge point will be regulated under the IE Licence.

The attenuation tank is designed for a storage capacity of 160 m³ to store stormwater up to the 30-year rainfall event, as per GSDS guidelines. A design capacity to store the stormwater during a 100-year rainfall event is necessary if the stormwater was being discharged to the drains downstream. Since the stormwater is being attenuated and discharged into Dublin Bay, a design capacity to store the stormwater during a 30 – year storm event is acceptable. The dimensions of the attenuation tank are – 20 m (Length) x 6 m (Breadth) x 1 m (Depth).

3.9.5.2 Foul Water

The foul water from the new workshop/admin building area on the southern side of the site is proposed to be discharged into the existing foul water manhole to the southern region across the internal Station Road from the building. The proposed welfare facilities include for two toilets and wash hand basins.

3.9.5.3 Water Treatment Wastewater

The OCGT uses demineralised water in the combustion chamber to reduce nitrogen oxide emissions. The water treatment plant produces demineralised water by removing dissolved solids and chlorine from the potable water.

The demineralisation process will result in residual wastewater. To produce 83,330 litres of demineralised water the plant will generate approximately 36,000 litres of wastewater per hour of operation will be managed by undergoing suitable treatment (details in Section 3.9.7) before it is discharged to the Poolbeg OCGT development surface water drainage system. This discharge will be regulated under the IE Licence. Alternative arrangement for the management of this wastewater will be made if advised by the Environmental Protection Agency and/or IE Licence requirements. In case of emergency, a shutdown valve will be provided at the discharge point from the treatment plant before entering the proposed drainage network.

3.9.5.4 Process Wastewater

Process wastewater will be generated during the demineralisation water treatment process, gas turbine compressor wash cycles and fuel gas scrubber process. A description of each process is provided below:

Demineralisation Waste Treatment Process: The OCGT uses demineralised water in the combustion chamber when running on gas oil to reduce nitrogen oxide emissions. The water

treatment plant produces demineralised water by removing dissolved solids and chlorine from the potable water. The demineralisation process will result in residual wastewater - to produce 83,330 litres of demineralised water the plant will generate approximately 36,000 litres of wastewater per hour of operation. This effluent will be managed by undergoing suitable treatment (as outlined in Section 3.9.7 of this EIAR) before it is discharged to the proposed new surface water discharge point (Easting – 711553, Northing – 758931) into the existing cooling water outfall channel that discharges to the Liffey Estuary Lower Waterbody (IE_EA_090_0300). This new surface water discharge point will be regulated under the IE Licence.

Gas Turbine Compressor Wash Cycle: Wastewater will be generated by the gas turbines during compressor wash cycles. The wastewater will be collected in the bunded Gas Turbine (GT) Area Drain Tanks within the water treatment plant. The contents of each GT Area Drain Tank will be collected by a suitably licenced waste contractor in accordance with the Waste Management Act 1996, and associated regulations for disposal. Wastewaters generated during this process will not be discharged to environment.

Fuel Gas Scrubber Process: Wastewater will also be generated during the fuel gas scrubber process. The wastewater associated with this process will be stored in the bunded fuel gas condensate tank located within the Gas Compressor and Auxiliaries building. Water in this tank will contain hydrocarbons and will be disposed offsite by road tanker in accordance with the Waste Management Act 1996, and associated regulations. Wastewaters generated during this process will not be discharged to the environment.

3.9.6 Industrial Emission Licence

The proposed development will require an Industrial Emissions (IE) licence from the Environmental Protection Agency as the operation fall into the category of industrial activity referred to the First Schedule of the Environmental Protection Agency Act 1996 as amended;

“Combustion of fuels in installations with a total rated thermal input of 50MW or more”

The proposed development is located within the boundary of an existing IE licenced facility: the Poolbeg Generating Station (Registration Number: P0577-04), regulated by the EPA.

Should the application for planning consent be successful, an application to the EPA for a licence review of this existing licence will be progressed to incorporate Poolbeg OCGT within the IE licensed boundary of Poolbeg Generating Station complex.

3.9.7 Chemical Storage

The turbine requires lubricating oils which are stored within reservoirs in the turbine module. The lube oil will be stored in a reservoir tank incorporated into the turbine lube oil skid. The reservoir has a capacity of 25m³.

Coolant oils required for the transformers are typically synthetic or natural ester-based oils. Coolant oils are generally not replaced during the lifetime of the transformer; should any problems occur with the transformer the oil would generally be drained, the transformer repaired and then the oil replaced. As such, it is not expected that the facilities will consume significant volumes of coolant oil during their lifetime.

The transformers at the OCGT at Poolbeg will have secure coolant oil reservoirs and drainage from the transformers will be securely conveyed to oil interceptors prior to discharge to an attenuation tank and from there to the wider surface water drainage system.

The type of water treatment technology to be used in the water treatment plant at the OCGT at Poolbeg will be finalised after awarding the contract. It is envisaged that the water treatment plant will utilise either ion exchange or reverse osmosis and electro-deionisation. This system

has chemical requirements which are described below and the volumes are estimated and are subject to change during detailed design. Chemical types and concentrations are typical and are subject to change during detailed design:

Ion Exchange

- Caustic NaOH 30%;
- Caustic bulk tank 20m³;
- Caustic Measuring Tank 0.7m³;
- Sulphuric H₂SO₄ 96% ;
- Sulphuric Bulk Tank 16.7m³;
- Sulphuric Measuring Tank 0/05m³;

Reverse Osmosis and Electro-Deionisation

- Ferric Chloride 40% - 100m³;
- Sodium Hypochlorite 15% - 100m³;
- Scale Inhibitor – 0.33m³;
- Sodium Bisulphite (NaHSO₃) – 0.5m³;
- Caustic Soda (NaOH) 30% – 4m³;
- Sulphuric Acid (H₂SO₄) 96% – 4m³;
- Citric Acid HOC (COOH) (CH₂COOH)₂ – 0.5m³;
- Sodium Hypochlorite (NaOCl) – 0.2m³;

The chemical tanks specific to water treatment will be contained within the water treatment plant building at the Poolbeg OCGT site.

All chemicals stored on the proposed OCGT 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;
- Spill kit(s) will be stored on site; and
- 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 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.

3.10 Firefighting Systems and Controls

There will be a comprehensive fire detection and fire-fighting system on the site. In each case, a fire protection design basis document containing a fire risk assessment will be developed by the Contractor and this will inform the design of the fire system.

Heat, fire and gas detection systems will be incorporated as appropriate to the fire risk. Where required, flame detection will also be installed.

Firefighting on site will predominately be carried out by manual fire suppression using the fire water hydrant network on site. The existing fire water network on the site may be used for the protection of the equipment that will be installed as required by the local fire authority. Fire

safety evacuation drills & training to be provided as appropriate. NFPA guidance will be followed as appropriate.

Portable extinguishers appropriate to the fire risk will be sited at readily accessible fire points throughout the site.

All switchgear rooms, relay rooms, communications rooms, cable basements, cable tunnels and the control room, will be provided with induced draught smoke/heat extraction fans as appropriate.

As mentioned above, a combined fire water and process water storage tank of approximately 2649m³ will be installed on site for a demand flow rate of 1,900L/min.

Specific items of equipment will have gaseous fire suppressions, for example, the gas turbine enclosure. For the gas turbine, fire and gas detection sensors will be incorporated. A gaseous suppression system will be used upon detection of a fire.

Additionally, monitoring of the concentration of hydrocarbon gas in the ventilation air discharge of the gas turbine enclosure will be included and will trip the turbine when the concentration exceeds a level deemed to be the limit of safe operation.

Fire water discharges will be collected in the surface drainage system and will be discharged from the site after passing through the drainage interceptors. These interceptors will be maintained by ESB throughout the operational life of the site. The secure drainage system will prevent contamination migrating downwards to impact groundwater and will reduce infiltration from rainwater, reducing any potential for residual contamination to be mobilised.

3.11 COMAH

The European Communities, Control of Major-Accident Hazards involving Hazardous Substances (COMAH) Regulations under Directive 2012/18/EU were transposed into Irish legislation through S.I. No. 209 of 2015 Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015. The regulations require operators of establishments where dangerous substances are present, in quantities equal to or in excess of defined threshold, to take all measures necessary to prevent major accidents, limit their consequences and ensure a high level of protection for man and the environment.

Establishments, which fall under the remit of the COMAH Regulations, are classified as either 'lower tier' or 'upper tier' sites depending on the quantities of dangerous substances held on site.

The categories of dangerous substances and preparations from Part 1 of Schedule 1 to the COMAH Regulations are as defined in the Classification, Labelling, and Packaging (CLP) Regulation 2008. Annex I of the CLP Regulation describes the criteria that apply to each classification. The regulations specify lower and upper threshold quantities of 2,500 and 25,000 tonnes respectively for fuel oil. The OCGT at Poolbeg is located within the consultation distance of the National Oil Reserves Agency Ltd. (NORA) fuel storage establishment located to the north which is notified to the Health and Safety Authority (HSA) as an Upper Tier Seveso site and is subject to the provisions of the Chemical Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S.I 209 of 2015).

The proposed development has been subject to a Land Use Planning Assessment in accordance with the 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.

3.12 Decommissioning

The proposed development is expected to be operational for at least 20 years or as long as is required by grid infrastructure. 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.

On decommissioning the following steps will be implemented:

- All plant and equipment will be dismantled and either sold, recycled or disposed of through licenced 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 ensuring that there will be no environmental pollution. The modular nature of the proposed development construction will assist any decommissioning in that modules can be disconnected and removed from site.

4 EIA Report Methodology

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 Guidelines on the information to be contained in Environmental Impact Assessment Reports [Environmental Protection Agency (EPA), 2022], hereafter referred to as 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 approach² 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.

4.1 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

² Principle adopted by the UN Conference on the Environment and Development (1992) states that in order to protect the environment, a precautionary approach should be widely applied, meaning that where there are threats of serious or irreversible damage to the environment, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation. ([Definition from European Commission: \(europa.eu\)](#))

natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge”.

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”.

4.2 EIA Screening and Scoping

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.

Annex I to the amended 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).

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.

In Ireland, Schedule 5 (Part 1 and Part 2) of the Planning and Development Regulations 2001, as amended, transposes Annex I and Annex II to amended EIA Directive 2014/52/EU.

In the context of the Poolbeg Generating Station, the potentially most relevant classes of development in Schedule 5 of the *Planning and Development Regulation 2001*, as amended include;

4.2.1 Part 1 Projects

Class 2(a) relates to:

'A thermal power station or other combustion installation with a heat output of 300 megawatts or more.'

The OCGT will have a nominal capacity of 295 MWe (299 MWe gross) and will have a net electrical efficiency of approximately 39% equating to approximately 756.4 MWth input. The total thermal rating will be 756.4 MW with a net thermal rating of 297 MW of electricity generated. As such, the heat output (i.e. heat emitted from the stack) will be greater than the 300 MW threshold identified in Paragraph 2(a) and an EIA is therefore required.

Class 22 relates to:

'Any changes to or extension of projects listed in this Annex where such a change or extension in itself meets the thresholds, if any, set out in this Annex'

Whilst the proposed OCGT at Poolbeg is located within the existing Poolbeg Generating station complex, it is a stand-alone, new development and does not comprise of any changes or extension of the existing projects currently operating at the site. The proposed OCGT at Poolbeg is entirely independent of the operations and functions of the existing operations within the Poolbeg Generating station complex. Whilst there are shared utility connections (such as GNI, AGI, drainage management), there is nonetheless, no functional interdependency on the site. The proposed development is a stand-alone development, Class 22 is therefore not applicable to the proposed development.

4.2.2 Part 2 Projects

Class 10(b)(iv) relates to:

'Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built up area and 20 hectares elsewhere'

The proposed development may be considered to be a type of 'urban development' as it represents a development type which is predominately focused on urban centres and although it provides electricity to the national grid, development of this nature predominately serves areas of high electricity demand such as urban areas. Irrespective of the limited size of the development and its location within an area zoned by Dublin City Council for the development of heavy industry on the urban periphery, the very nature of the proposed development is 'urban' as an industrial undertaking - an electricity generating facility. The operation of the proposed development is an industrial activity which is required to be regulated by the EPA under a

revised Industrial Emissions Licence (P0577-04). Whilst the proposed development is considered to be a type of 'urban development' under Class 10(b)(iv), the proposed development is not located in a 'business district' (the P&D Regs states that "In this paragraph, "business district" means a district within a city or town in which the predominant land use is retail or commercial use"), as it is within an area zoned for 'as Zone Z7 "Employment (Heavy, as per the Dublin City Development Plan, where surrounding land uses are all predominantly heavy and light industry. In addition, whilst it is considered to be located within a 'built-up area' as per the definition in Article 32 of the P&D Regulations, it does not meet the 10 hectare threshold for a built-up area, as the overall development site covers an area of approximately 8 hectares.

Class 13- Changes, extensions, development and testing relates to:

"13(a) Any change or extension of development already authorised, executed or in the process of being executed (not being a change or extension referred to in Part 1) which would:- "(i) result in the development being of a class listed in Part 1 or paragraphs 1 to 12 of Part 2 of this Schedule, and (ii) result in an increase in size greater than – - 25 per cent, or - an amount equal to 50 per cent of the appropriate threshold, whichever is the greater." "13(c) Any change or extension of development being of a class listed in Part 1 or paragraphs 1 to 12 of Part 2 of this Schedule, which would result in the demolition of structures, the demolition of which had not previously been authorised, and where such demolition would be likely to have significant effects on the environment, having regard to the criteria set out under Schedule 7".

As noted above, the proposed development is a stand-alone project with no functional links or interdependencies with the authorised developments already operating within the Poolbeg Generating Station complex; therefore, no change or extension of these existing already permitted and implemented developments results arising from the proposed development.

Class 14- Works of Demolition relates to:

"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."

The proposed development can therefore be considered to require enabling works which includes 'demolition' works, by virtue of the fact that it requires the dismantling of the existing babcock store, hydrogen tank and temporary control building and existing NORA water tank. Their dismantling will not result in significant effects on the environment based on the scale, nature and duration of the dismantling works required.

4.3 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 2011/92/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 a pre application consultation with the Planning Authority. Further detail is provided in Section 1.5 of this EIAR.

4.4 EIAR Methodology

4.4.1 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.

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

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

4.4.2 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.

The amended EIA Directive also requires consideration of the likely future receiving environment in the absence of the project, refer to Section 3.2 *Do-Nothing* 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”.

4.4.3 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.

4.4.4 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.

4.4.5 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 4.1 *Description of Effects* and as referenced in the EPA Guidelines 2022.

Table 4.1: Description of Effects

Category	Description of Effects
Quality of Effects	Positive Effects
It is important to inform the non-specialist reader whether an effect is positive, negative or neutral	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).

Category	Description of Effects
	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 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

Category	Description of Effects
	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. 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 SO_x and NO_x 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 4.1. 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.

4.4.6 Mitigation and Monitoring

Mitigation by design / avoidance is incorporated into the design of the proposals, as described in Chapter 2 and Chapter 3 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 2022 Guidelines, “offsetting³ 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.

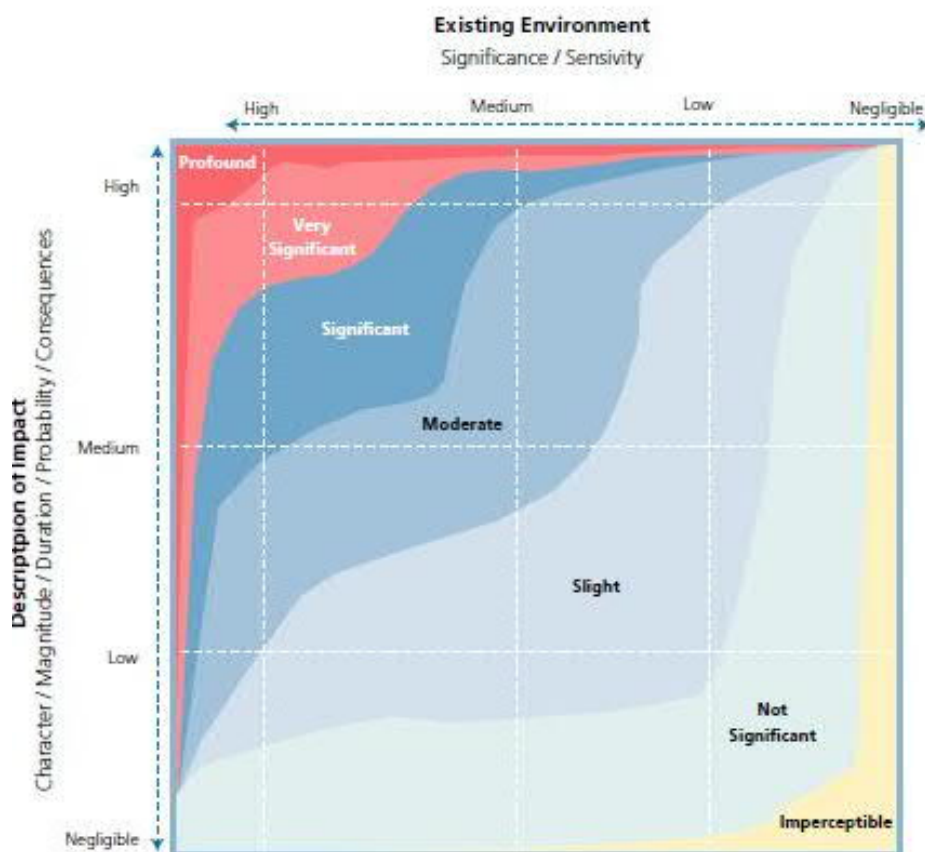
4.4.7 Residual Impacts

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

4.4.8 Decommissioning

The operational life of the proposed OCGT at Poolbeg is expected to be approximately 20 years. Thereafter, the equipment will be decommissioned. The activities associated with the decommissioning phase will be similar to those associated with the construction phase. The existing power plant operated under IE licence number P0577-04 and decommissioning of the proposed OCGT plant will continue to comply with the conditions of this IE licence (Registration Number: P0577-04). Decommissioning impacts are however assessed for each technical chapter of this EIAR.

Figure 4.1: Impact Assessment Methodology



Source: EPA Guidelines 2022

³ 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.

4.4.1 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 2024, with construction complete in 2026.

Further to a review of planning applications undertaken in November 2022, 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 4.2. Where potential cumulative effects are considered to occur these are addressed in the relevant technical chapter of this EIAR.

Table 4.2: Cumulative Effects: Known existing and / or approved and planned relevant development

Development	Reference (planning/ other)	Location	Summary of Details	Date
Production Units	2771/19	Irish Tar & Bitumen Suppliers, Alexandra Road, Dublin 1	The development will consist of: Demolition of an existing single storey building and construction of a new two storey building with a footprint of 14.9m by 5.6m. The building will consist of concrete foundations, blockwork walls, an external cladding and plaster finish, a trapezoidal roof, an internal concrete stairs and an external steel stairs. The building will be subdivided into a production area and store at ground floor level and an office and storerooms at first floor level. The building will be connected to the site's existing storm drainage and electrical services.	18 July 2019
Dublin Port Company MP2 Project https://dublinportmp2.ie/	An Bord Pleanála Ref: 304888 Related FS006893	Dublin Port	15-year permission for development at Oil Berth 3 and Oil Berth 4, Eastern Oil Jetty and at Berths 50A, 50N, 50S, 51, 51A, 49, 52, 53 and associated terminal yards to provide for various elements including new Ro-Ro jetty and consolidation of passenger terminal buildings.	01 July 2020 23 September 2022
Foreshore Application Dublin Port Capital Dredging Project https://www.gov.ie/en/foreshore-notice/e7d34-dublin-port-capital-dredging/	FS007164	Dublin Port	Foreshore application in respect of Capital Dredging at various locations around Dublin Port	Consultation status
Dublin Port Maintenance Dredging https://www.gov.ie/en/foreshore-notice/60147-dublin-port-maintenance-dredging/	FS007132	Dublin Port	Foreshore application in respect of maintenance dredging at various locations in Dublin Port for the years 2022 to 2029.	12 August 2022
Brexit Infrastructure	ABP Ref: SA29N.307352	Dublin Port	The Brexit Infrastructure at Dublin Port project proposed port-cabin structures, resurfacing and amalgamation of 8 existing yards, modification of drainage and lighting, provision of parking, gates, signage and ancillary site works.	Granted 11/9/2020
Liffey-Tolka Project	Dublin City Council Ref: 3084/16	Dublin Port	The Tolka Estuary Greenway / Liffey-Tolka Project consists of works to the Port's private internal road network. The development consists of a high-quality public realm with new and enhanced segregated pedestrian and cycle routes from the interface of Dublin Port and the City immediately to the north of the Tom Clarke Bridge at the River Liffey to the Tolka Estuary.	Granted 4/8/2016

Development	Reference (planning/ other)	Location	Summary of Details	Date
Dublin City Development Plan 2022-2028 <u>Development Plan 2022 - 2028 Dublin City Council</u>	Dublin City Council	Dublin City	The proposed development is located within the Dublin City administrative area. The Dublin City Development Plan includes objectives and policies which are associated with the protection of the natural environment.	14 December 2022
Phase 2 - Mixed use development in Poolbeg West SDZ (refer to https://glassbottle.ie/public-information/)	PWSDZ4058/22	Poolbeg - Dublin City	The proposed Phase 2 development will consist of: amendment to Permission Register Reference PWSDZ3270/19 in those areas where the net site of 2.10 hectares overlaps with the boundaries of the earlier 4.3 hectare infrastructure permission (including amendment to the urban tree planting along the Sean Moore Road interface); and the construction of a residential and mixed-use scheme comprising a floor area of 64,906 sq m (54,682 sq m above basement), together with a basement/undercroft area of 10,224 sq m, comprising 2 No. blocks (identified as Block D and E) to provide: 516 No. apartment units and associated residential amenity facilities; a childcare facility: 5 no. café restaurant units; 2 no. Retail Services; 14 no. Retail Units; 1 no. Foodhall, 1 no. Health Facility: basement car parking; together with associated infrastructural works on the overall site. The proposed development will also include provision of the South Bank Link Road as identified in the SDZ Planning Scheme. The 516 No. apartment units will include 143 No. "Build-To-Rent" apartments (including resident support facilities and resident services and amenities), 52 No. social housing apartments, 77 No. affordable housing apartments and 244 No. apartment units. (The social and affordable housing is provided in accordance with Objective H7 of the Planning Scheme.) Access and servicing of the proposed Phase 2 development will be by way of the central boulevard as permitted (subject to compliance with Condition No. 24e) in the Phase 1 planning permission (PWSDZ3207/21) which also amends the infrastructure permission (Parent Permission) (Reg. Ref. PWSDZ3270/19) amongst other things.	FI -TBC
Phase A - Mixed use development in Poolbeg West SDZ	PWSDZ4380/22	Poolbeg - Dublin City	The proposed development will consist of an office and mixed-use scheme with a total GFA of 45,993sq.m (excl. basement / undercroft UC-02) comprising 2 No. blocks (identified as Blocks A and B). The proposed development includes the removal of tree cover located along the South Bank Road interface. An amendment to the parent permission (PWSDZ3270/19) is also sought and relates to a reduction in the no. of trees proposed (by 1 no. tree) along the Sean Moore Road interface and within the focused site area. The proposed development will consist of: Block A (includes Block AA & AB) of 26,545sq.m and ranging in height	FI-TBC

Development	Reference (planning/ other)	Location	Summary of Details	Date
			from 5-7 storeys over basement/undercroft car parking to include double height (UC-01 & 00 Level) ground floor reception, office, a restaurant/bar, bakery/ café and event space with the upper floors to be used as offices. The offices have been designed to be suitable for a single user or multiple users with subdivisions. Block B of 19,448sq.m, and ranging in height from 5-12 storeys over basement/undercroft car parking to include double height (UC-01 & 00 Level) ground floor reception, games bar and office with the upper floors to be used as offices. The offices have been designed to be suitable for a single user or multiple users with subdivisions. The UC-01 level of Block A includes café, sports and recreation area, collaborative office, storage and building services. The UC-01 level of Block B includes collaborative office, management facilities and building services. Each office block has a number of amenity terraces including at 1st, 3rd, 4th, 5th, 6th and roof level in Block A and at 4th and 6th floor level in Block B. A total of 77 no. commercial car parking spaces (incl. 4 no. disabled access spaces & 16 no. EV spaces) and 2 no. motorbike spaces, located at basement level with vehicular access from the street level (Block A north eastern elevation), the provision of 29 no. on-street car parking spaces (incl. 8 No. EV spaces and 6no, disabled access spaces) and 5 no. loading bays; Provision of 613 No. bicycle parking spaces located at basement level with bicycle ramp access from street level and 130 no. short-stay standard bicycle parking spaces (incl. 4 no. cargo bicycle spaces) located at surface level; Plant rooms, building services and energy centres, water tank, sprinkler rooms, tenant rooms, kitchenette, parcel/courier store, archive store, bin stores, bicycle stores. lockers, showers, changing facilities, facilities management and games bar storage located at basement/UC-01 level; Provision of public realm spaces including 1 no. public square (Pembroke Square), Glass Bottle Lane and public amenity spaces (totalling 1,931sq m); and two new local/side streets (Pembroke Place & Glass Bottle Place) connecting to Southbank Road. The provision of the South Bank Link Road as identified in the SDZ Planning Scheme. The proposed development will include hard and soft landscaping, pedestrian and cycle links, boundary treatments, tree planting, public lighting, green roofs, solar pv panels, and all ancillary works and services necessary to facilitate construction and operation. The scheme also provides for an option which includes for temporary	

Development	Reference (planning/ other)	Location	Summary of Details	Date
			site hoarding should the proposed development proceed ahead of the adjoining Phase 2 Residential Proposal commencing.	
Phase 1B - Mixed use development in Poolbeg West SDZ	PWSDZ3406/22	Poolbeg - Dublin City	Permission for development for a mixed use development (Referred to as Phase1B) on this site of 15.06 hectares including lands known as the Former Irish Glass Bottle & Fabrizia Sites, Poolbeg West, Dublin 4, focused primarily, but not exclusively, on a net site area of 0.76 hectares (identified as within the A3 Lands) in the Poolbeg West Strategic Development Zone (SDZ) Planning Scheme (April 2019).	request extension of time – 02 Feb 2023
Phase 1 - Mixed use development in Poolbeg West SDZ	PWSDZ3207/21	Poolbeg - Dublin City	Permission for development for a mixed use development on a site of 15.3 hectares (including some 0.2 hectares of public domain on Sean Moore Road and the junction with Pine Road), focused primarily, but not exclusively, on a net site area of 2.4 hectares (identified as within the A3 Lands) in the Poolbeg West Strategic Development Zone Planning Scheme (April 2019). The proposed development will consist of: amendment to Permission Register Reference PWSDZ3270/19 in those areas where the net site of 2.4 hectares overlaps with the boundaries of the earlier 4.3 hectare infrastructure permission (including amendments to the streets to be taken in charge, amendments to permitted vehicular and basement access points, materials, urban tree locations and landscaping, and changes in level for permitted streets, parks and public realm and public amenity spaces); and the construction of a residential and mixed-use scheme comprising a floor area of 61,310 sq m (53,048 sq m above basement, together with a basement undercroft area of 8262 sqm, comprising 4 No. blocks (identified as Blocks O, M and K (with Block M comprising two separate structures: a larger block and a smaller townhouse block) to provide: 600 No, apartment units and associated residential amenity facilities; a childcare facility; café restaurant unit; and two retail units; together with associated infrastructural works on the overall site.	24 March 2022
Infrastructural works - Mixed use development in Poolbeg West SDZ	PWSDZ3270/19	Poolbeg - Dublin City	Permission for development at a site forming part of the former Irish Glass Bottle and Fabrizia sites, Poolbeg West, Dublin 4. The application site is located within the Poolbeg West Strategic Development Zone (SDZ) Planning Scheme 2019 area. The proposed development will consist of: streets, transportation, water services and utilities infrastructure; public realm and public amenity spaces; and, temporary landscaping of a school site, to facilitate Phase 1 development as provided for under the approved Poolbeg West SDZ Planning Scheme.	28 January 2020

Development	Reference (planning/ other)	Location	Summary of Details	Date
			The site extending to approximately 4.3 ha forms part of the former Irish Glass Bottle and Fabrizia sites at Poolbeg West, Dublin 4, and is bound to the north west by Sean Moore Road, to the north east by South Bank Road, to the south east by Dublin Port lands and Dublin Bay, and to the south west by Sean Moore Park. A 10 year permission is sought.	
Dublin Waste to Energy Facility - capacity increase (LA Foreshore Application)	ABP-309812-21	Poolbeg – Dublin City	To increase the capacity of the Dublin Waste to Energy Facility ("the Facility", An Bord Pleanála ref: PL29S.EF2022) from 600,000 tonnes per annum to 690,000 tonnes per annum.	17 December 2021
Ringsend FlexGen	3647/20	Poolbeg – Dublin City	Planning permission for development on a c. 6.1 ha site to the south of the existing Dublin Bay Power Station, Pigeon House Road, Dublin 4, D04 Y5N2, and bounded by South Bank Road to the south. The development will consist of a 75 MWe (electrical output) aero derivative gas fired turbine for the generation of electricity	06 August 2021
South Wall BESS	3646/20	Poolbeg – Dublin City	Planning permission for development on a c. 3.5 ha site bounded by Shellybanks Road to the east and by South Bank Road to the south; being also to the south of the existing Dublin Bay Power Station, Pigeon House Road, Dublin 4, D04 Y5N2. The development will consist of: A 30 MW capacity battery energy storage system (BESS) facility within a secured compound	21 August 2021
Poolbeg BESS	3625/20	Poolbeg – Dublin City	Planning permission for development on a c. 5.3 ha site located within the existing Poolbeg Generating Station, Pigeon House Road, Dublin 4 (Eircode D04 XD82), which is licenced by the Environmental Protection Agency (EPA) under an Industrial Emissions (IE) Licence [Ref. P0577-03]. The development will consist of: (a) The demolition of three existing disused modern buildings with a combined floor area of 3,240 sq.m. comprising: (1) a single storey [up to 3.6 m high], c. 166 sq.m. Safety Centre (Pavilion) building; (2) a single storey [up to 4.5 m high], c. 463 sq. m. Store building; (3) a multi-storey [up to 20 m high], c. 2,611 sq.m. Store / Workshop building; (b) Works including: (1) remediation and cladding of exposed northern façade of 5-storey [up to 20.4 m high], redundant former Administration building;	22 June 2021

Development	Reference (planning/ other)	Location	Summary of Details	Date
			(2) cladding of exposed western façade of turbine hall building on eastern boundary of development site; (3) ancillary site clearance, grading and surfacing; (c) Construction and operation of a 75 MW capacity battery energy storage system (BESS) facility within a secured compound including the following elements: (1) Up to 24 battery container unit arrangements comprising: 24 Concrete plinths (c. 110 sq. m., c. 0.5 m high) typically supporting battery containers (c. 2.6 m high); air conditioning (A/C) unit (c. 1.8 m high); inverter unit (c. 3.8 m high); battery transformer unit (c. 3.3 m high); ring main unit (RMU) (c. 3.3 m high); (2) a c. 126 sq. m., c. 4.7 m high control building; (3) industrial/ electrical plant including: (i) 3 lightning monopoles (c. 20 m high); (ii) SCADA communication mast (c. 18 m high); (iii) VAR support unit on concrete plinth (c. 24 sq. m., c. 3.4 m high); (iv) 2 banded house transformers (c. 19.8 sq. m., c. 3.2 m high); (v) spare parts storage container (c. 36 sq. m., c. 2.6 m high); (vi) fenced transformer compound (c. 1,309 sq. m., c. 5.6 m high); (vii) cable trays (and associated service connections); (viii) pole mounted security cameras (c. 8.3 m high); (4) Removal of existing fencing and gates, and installation of: various boundary and internal fencing and gates with different treatments including palisade specification (c. 2.6 m high), and chainlink specification (c. 2.7 m high); (5) ancillary development works including provision of areas of hardstanding, internal access roads, onsite drainage and attenuation, temporary construction laydown areas; and connections to site services networks including: telecommunications, electrical, water supply, surface water drainage/ attenuation, and ancillary cabling.	
Poolbeg FlexGen	3624/20	Poolbeg – Dublin City	The Electricity Supply Board (ESB) intends to apply for planning permission for development on a c. 5.6 ha site located within the existing Poolbeg Generating Station, Pigeon House Road, Dublin 4 (Eircode D04 XD82), which is licenced by the Environmental Protection	22 June 2021

Development	Reference (planning/ other)	Location	Summary of Details	Date
			Agency (EPA) under an Industrial Emissions (IE) Licence [Ref. P0577-03]. The development will consist of a 75 MWe (electrical output) aero derivative gas fired turbine for the generation of electricity	
Continuation of concrete batching	PWSDZ3469/22	Poolbeg – Dublin City	Planning permission for the continuation of use of an existing concrete batching plant and associated facilities (previously granted under Reg. Refs. No 2482/19; 2209/13 & ABP Ref. No PL29S.241965; 1420/04 & ABP Ref. No. PL29S.207144) for a temporary period of five years at South Bank Road, Irishtown, Dublin 4. The application is located within the Poolbeg West Strategic Development Zone (SDZ) Planning Scheme area.	29 April 2022
Grand Canal Storm Water Outfall Extension LA Foreshore Development Application	ABP-313738-22	Grand Canal	Extension of Grand Canal Tunnel stormwater outfall from Inner Basin, Grand Canal Dock, through basin, along Hanover Quay to a new outfall discharging to River Liffey at Sir John Rogersons Quay.	Decision due 28 November 2022
North Wall Power Plant – Temporary Emergency Generation Plant	ABP – SA29N.313918 made under Section 181(1)(a)	Alexandra Road Dublin Port	The development will consist of alterations to the existing North Wall Power Generating station, which include 6no. gas turbines which operate from early 2023 to late 2027, operating for 500 hours per year.	13 September 2021
North Wall Power Plant	2697/20	Alexandra Road Dublin Port	The development will consist of alterations to the existing North Wall Power Generating station, which include the replacement of existing indoor gas turbines with new and more efficient indoor gas turbines, the replacement of one of the two existing exhaust chimney stack's (approx. 70m tall) and its re-construction at a reduced height of 65m to mirror the second existing exhaust stack, the installation of new gas compressors with associated fan coolers, the replacement of existing roof-mounted fan coolers, a fuel oil pumphouse, a demineralised water pumphouse, a new 1,000m3 demineralised water tank (approx. 10m tall), a new 1,000m3 gas oil storage tank (approx. 10m tall), the repurposing of an existing 4,000m3 fuel oil storage tank as a demineralised water storage tank of the same volume, a new fire water tank (approx. 10m tall), a new tanker unloading area comprising a concrete pad, emergency diesel generator, a new administration and welfare building, minor modifications to existing surface water drainage, a new entrance opening on to Alexandra Road and revised internal road layout and minor ancillary plant and equipment structures. The development will also comprise the removal of existing structures including; 70m tall stack and associated boiler, part of the administration building, canteen,	28 August 2020

Development	Reference (planning/ other)	Location	Summary of Details	Date
			stores building and water treatment buildings, gas compressor building as well as a water storage tanks, a bottle storage area and other minor redundant installations. The development will also include all other necessary associated works required to enable the construction and operation of the facility. An Environmental Impact Assessment Report (EIAR) has been prepared and is submitted as part of the planning application. It should be noted that this facility is identified as a Lower Tier site under the COMAH directive, furthermore the facility has an existing Industrial Emissions Licence which is regulated by the Environmental Protection Agency. All required licences and plans will be reviewed as required.	
Ringsend WWTP upgrades https://www.water.ie/projects/local-projects/ringsend/	ABP ref: PA29S.301798	Ringsend – Dublin City	10-year permission for development of the Ringsend wastewater treatment plant upgrade project including a regional biosolids storage facility	24 April 2019

4.4.2 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 will be presented in the EIAR.

5 Population and Human Health

5.1 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 development as described in Chapter 3 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 6);
- Climate (Chapter 7);
- Noise and Vibration (Chapter 8);
- Biodiversity (Chapter 9);
- Surface Water Resources and Flooding (Chapter 10);
- Land, Soils and Hydrogeology (Chapter 11);
- Architecture, Archaeology and Cultural Heritage (Chapter 12);
- Landscape and Visual (Chapter 13);
- Roads and Traffic (Chapter 14);
- Material Assets including waste (Chapter 15); and
- Major Accidents and/ or Disasters (Chapter 16).

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

5.2 Policy and Guidance

The Planning Report which accompanies this application (Ref: 229100184_3_A) 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 chapter are set out in this section.

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

5.2.1 Policies

- Regional Spatial and Economic Strategy (RSES) for the Eastern and Midland Region 2019-2031 (Eastern and Midland Regional Assembly, 2019);
- RSES: Dublin Metropolitan Area Strategic Plan (MASP) (Eastern and Midland Regional Assembly, 2019);

- Dublin City Development Plan (CDP) 2016-2022 (Dublin City Council, 2016);
- Dublin City Development Plan 2022-2028 (Dublin City Council, 2022);
- Docklands Visitor Experience Development Plan (Fáilte Ireland, 2020);
- Dublin Port Masterplan 2040 (Dublin Port Company, 2018); and
- Tourism Development & Innovation a Strategy for Investment 2016-2022 (Fáilte Ireland, 2016).

5.2.2 Guidelines

- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022);
- EirGrid Evidence Based Environmental Study 9: Settlement and Land Use (EirGrid, 2016);
- EirGrid Evidence Based Environmental Study 1: EMF (EirGrid, 2014);
- IWEA Best Practice Principles in Community Engagement and Community Commitment (Irish Wind Energy Association, 2013);
- EIAR Guidelines for the Consideration of Tourism and Tourism Related Projects (Fáilte Ireland, 2019);
- The Institute of Public Health (IPH), Health Impact Assessment Guidance (Pyper et al., 2021) (hereafter the IPH guidance);
- 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; and
- IEMA, Health in Environmental Impact Assessment: A Primer for a Proportionate Approach (Cave et al., 2017). This sets broad principles that have been developed in more detail by the IPH guidance.

5.3 Methodology

5.3.1 Approach to Data Collection

The following information and data sources (Table 5.1) have been considered during the production of this EIAR.

Table 5.1: 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 2016 (Census 2022 only available at national level) Labour Force Data (Monthly)	Demographics Settlements Labour Force Survey
Geodirectory Data	Various	Settlements Land use
Ordnance Survey Ireland (OSI) mapping and aerial photography (www.osi.ie)	Various	Settlements Land use
Dublin City Council Planning Enquiry System (https://www.dublincity.ie/residential/planning/planning-applications/find-planning-application/view-or-search-planning-applications)	Various	Settlements Land use
Corine land cover data (www.epa.ie)	2018	Land use

Data source	Date	Data contents
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

5.3.2 Approach to Impact Assessment

The EPA Guidelines 2022 and Advice Notes (2015) 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. Based on these determinants 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 5.2.

Table 5.2: Categories and Determinants for Population and Human Health Assessment

Category/ Determinant ⁴	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

⁴ Adapted from Table 08 of IPH Guidance 2021.

Category/ Determinant ⁴	Relevance to the Proposed Development
● Community cohesion and social isolation	No
● Indoor environment (indoor air quality, safety, hygiene and level of crowding)	No
● 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	No
● Specialist adaptations (e.g., age or disability)	No
● Flood risk	Yes – Discussed in Chapter 10
● 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 14
● Active travel (pedestrians and cyclists)	Yes – Discussed in Chapter 14
● Public transport (access, connectivity and quality)	Yes – Discussed in Chapter 14
● Health, education and social care journey times	No
● Emergency response times	Yes
● Community severance	Yes
● 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)	Yes
● Sports, leisure and recreational amenities and facilities (including play)	Yes
● Sports, leisure and recreational connectivity and access (including safety)	Yes
● Sports, leisure and recreational age, sensory and mobility considerations	Yes

Category/ Determinant ⁴	Relevance to the Proposed Development
● Injury risk (including drowning and falls)	No
● Waste management (including sanitation systems and wastewater reuse)	Yes – Discussed in Chapter 15
● Police/security and emergency response	No
● Actual and perceived crime	No
● Safeguarding and modern slavery	No
● School accessibility, capacity and quality	No
● Adult skills development	No
● Transitional traffic arrangements (e.g. during construction)	Yes – Discussed in Chapter 14
● Visual landscape/townscape change	Yes – Discussed in Chapter 13
● Visual lighting change (night lighting, overshadowing or reflections)	Yes – Discussed in Chapter 13
● Social networks and culture (including sites of cultural significance)	Yes – Discussed in Chapter 12
● Agricultural landholdings (including loss and severance)	No
● Wider societal benefits to energy infrastructure	Yes
● 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 7, 10
● 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)	Yes
● Health protection (including screening and epidemic response) accessibility, capacity and quality	No
● Occupational health services accessibility, capacity and quality	No

Category/ Determinant ⁴	Relevance to the Proposed Development
● 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 6
● Air quality conditions associated with plant, processes and vehicle emissions	Yes – Discussed in Chapter 6
● Odour	No
● Drinking water quality (including biological and chemical agents)	Yes – Discussed in Chapter 10
● Drinking water – quantity or access	Yes – Discussed in Chapter 10
● Bathing water quality (including biological and chemical agents, disease vectors)	Yes – Discussed in Chapter 10
● Mobilisation of historic pollution	Yes – Discussed in Chapter 10, 11
● Risk of new ground pollution (e.g., industrial agents or accidental spills)	Yes – Discussed in Chapter 10, 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 8
● Vibration	Yes – Discussed in Chapter 8
● 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.

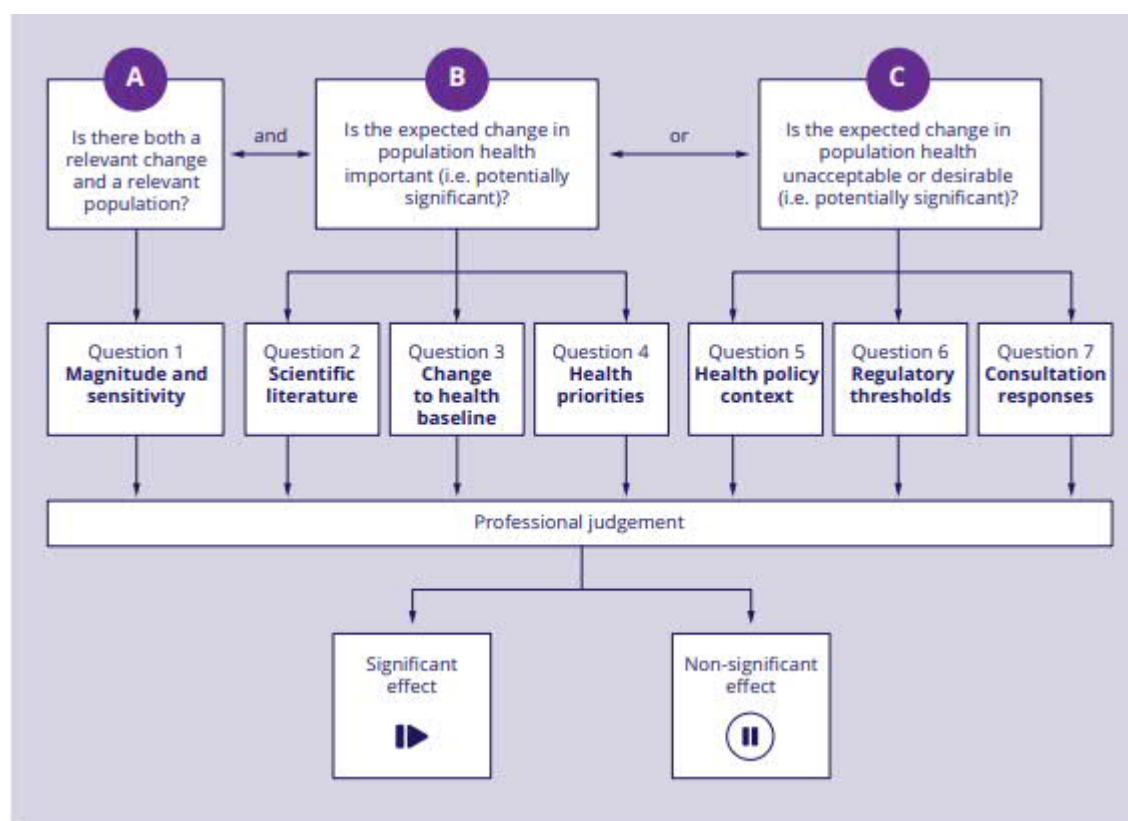
‘Significant’ health effects are those that, based on professional judgement, are important (a positive or negative effect), highly desirable (a positive effect) or unacceptable (a negative effect) for population health with regards to changes triggered by the proposal in question.

The IPH guidance provides a list of questions to be considered for population and human health assessment, as provided in Figure 5.1. 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.

- **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 5.4. The magnitude of impacts is defined in Section 5.5.

- **Scientific Literature:** The guidance documents listed in Section 5.2 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 5.4 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.

Figure 5.1: Determining Significance for Population and Human Health Assessment



Source: Figure M12; IPH Guidance 2021

5.3.3 Study Area

The study area has been 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 Poolbeg OCGT site is located within the ED of Pembroke East A. This is considered as the study area for population and human health assessment as shown in Figure 5.2. Census data

for the wider area of Dublin City and suburbs was also considered in the desk-based assessment.

Figure 5.2: Pembroke East A ED: Study Area for Population and Human Health Assessment



Source: CSO 2016 (Mapping: © OpenStreetMap contributors)

5.4 Receiving Environment

The proposed development is located within the site of the existing Poolbeg Generating station complex in the Poolbeg Peninsula. The Poolbeg Peninsula is located south of Dublin Harbour and east of Dublin City Centre. The Peninsula can be accessed by Pigeon House Road.

The Poolbeg Peninsula is currently providing many of the Dublin region's major power, sewage, storage and port facilities, as well as a number of industrial uses, and it has active deep water berthing and docking facilities on its northern edge. The Peninsula also contains a number of areas of open space, including Sean Moore Park and Irishtown Nature Park. Its southern shore opens on to Dublin Bay and is bordered by a beach. The Sean Moore Park is the starting point for a walking trail along the southern edge of the Peninsula to the Great South Wall. The former Pigeon House Hotel and Fort form a cluster of historic structures in the north eastern part of the peninsula.

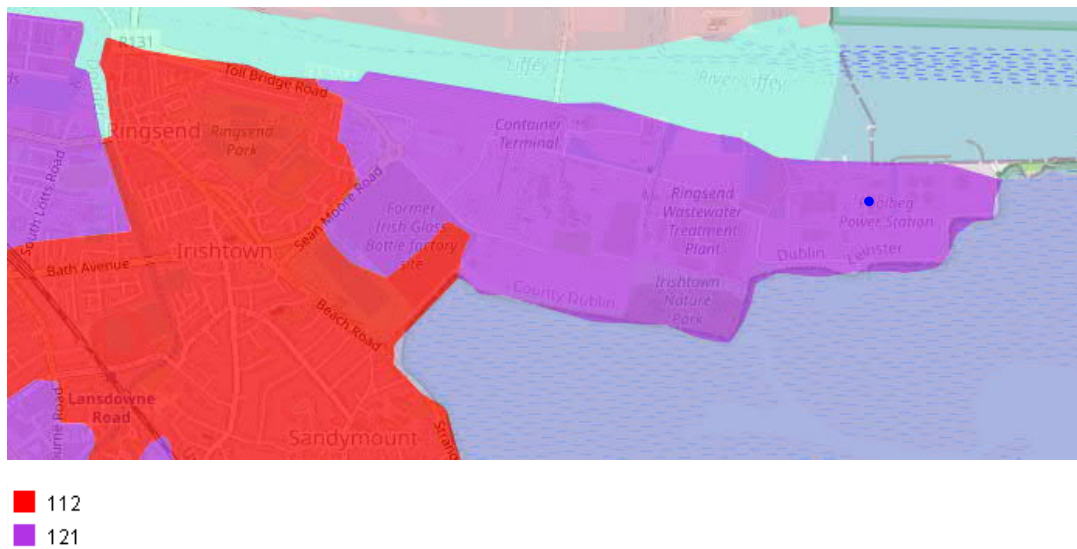
The immediate environment of the proposed development is also dominated by industrial use. To the north of Dublin Harbour is Dublin Port and to the west is Ringsend and southern part of the Dublin Port.

The Peninsula currently has very few residents and no community facilities other than those relating to open space and recreation. Nearby Ringsend, Irishtown and Sandymount are established residential communities with connections to the Peninsula and the city centre and contain schools and some community facilities. The nearest residential property to the proposed development is located approximately 1.4km to the west of the proposed development near Ringsend Park.

5.4.1 Land Use

The Corine Land Cover 2018 map categorises the land use of the development site, and of lands in the immediate vicinity, as Level 1 'Artificial Surfaces' and Level 2 'Industrial, Commercial and Transport Units' (121). The lands west of Sean Moore Road and south of Sean Moore Park, within Pembroke East A ED, are categorised as Artificial Surfaces-Urban Fabric (112). These are the only two Corine land uses within the study area, as shown in Figure 5.3.

Figure 5.3: Corine 2018 Land Use Zoning (Proposed Scheme Location as Blue Dot)

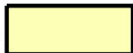


Source: Corine Land Cover Map 2018; EPA 2018 (<https://gis.epa.ie/EPAMaps/>)

As stated in the Dublin CDP 2028, the area of the proposed development is zoned for Employment-Heavy (Z7). Other land uses within the study area, as per Dublin CDP, are Sustainable Residential Neighbourhoods (Z1), Residential Neighbourhoods-Conservation Areas (Z2), District Centres-Incorporating Key District Centres (Z4), Amenity/Open Space Lands/Green Network (Z9), and Strategic Development and Regeneration Areas (SDRA) (Z14). SDRA 6 is within the study area known as 'Docklands – including SDZ area and Poolbeg West.' The land use zoning as per Dublin CDP 2016-2022 is shown in Figure 5.4.

Figure 5.4: Dublin CDP 2016-2022 Land Use Zoning (Proposed Scheme Location as Blue Dot)



Zone Z1	To protect, provide and improve residential amenities	— — — — —	
Zone Z2	To protect and/or improve the amenities of residential conservation areas	— — — — —	
Zone Z4	To provide for and improve mixed-services facilities	— — — — —	
Zone Z9	To preserve, provide and improve recreational amenity and open space and green networks	— — — — —	
Zone Z14	To seek the social, economic and physical development and/or rejuvenation of an area with mixed use of which residential and "Z6" would be the predominant uses	— — — — —	

Source: Dublin City Development Plan 2016-2022; DCC 2016 (<https://viewer.myplan.ie/>)

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

5.4.2 Population (Demographics and Settlement Patterns)

The proposed development is situated in the administrative boundary of Dublin City Council. According to Census 2016, population growth in Ireland increased from 4,588,252 in 2011 to 4,761,865 in 2016 (3.7% growth). According to preliminary results for Census 2022, the population of the country increased to 5,123,536 in 2022 resulting in a growth of 7.8% from 2016.

The population of Dublin City in 2016 was 554,554, having increased from 517,612 in 2011, higher than the national average at 5.3%.

The population of ED Pembroke East A for 2016 is shown in Table 5.3. The population growth in Pembroke East A was similar to the national average (3.02%).

Table 5.3: Population Data for Pembroke East A Electoral Division

Category	Population
Total Females	2,659
Total Males	2,419
Total Population	5,078

Source: 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=53.350089%2C-6.094314%2C12.75>)

As per Census 2016, there are total 1,227 families with ED Pembroke East A. The classification of these family units is shown in Table 5.4.

Table 5.4: Family Structure for Pembroke East A Electoral Division

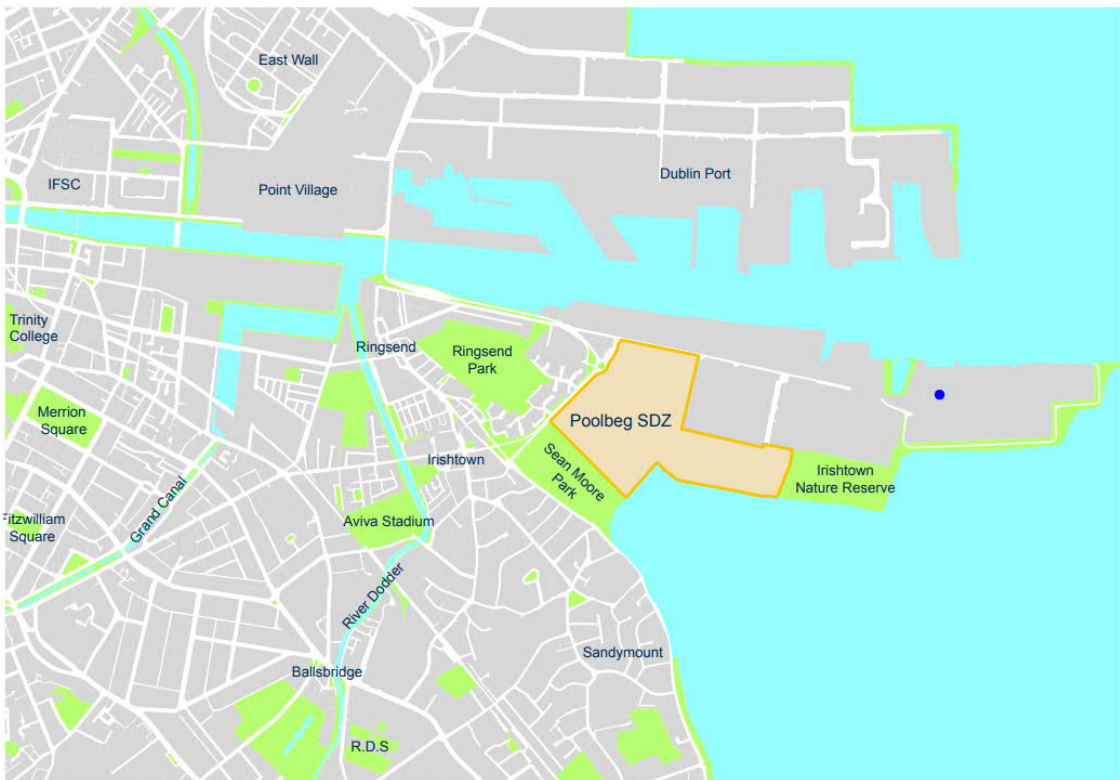
Classification of Family Units	No. of Families
Pre-family	225
Empty Nest	96
Retired	75
Pre-school	119
Early school	111
Pre-adolescent	111
Adolescent	120
Adult	370
Total	1227

Source: CSO 2016 (<https://census2016.geohive.ie/datasets/geohive::families-by-family-cycle-electoral-division-census-2016-theme-4-5-ireland-2016-cso-osi/explore?location=53.327905%2C-6.149840%2C12.75>)

The settlement pattern within the study area is nucleated, as can be observed on the western end of the ED. There are housing estates surrounding the Ringsend Park, including both individual houses and apartment buildings. The housing statistics are detailed in Section 5.4.3. The existing residential settlements are restricted to the west of Sean Moore Road, however new residential neighbourhoods east of the road are proposed as part of the Poolbeg West Planning Scheme.

The Poolbeg West Strategic Development Zone (SDZ) forms a part of the study area. It is an area between Pigeon House Road, Sean Moore Road, and Sean Moore Park, and extends in an easterly direction along Sandymount Strand as far as Irishtown Nature Park (Figure 5.5). The SDZ includes the former Irish Glass Bottle Factory site. The Poolbeg West Planning Scheme published in 2019 by the Dublin City Council aims to create an urban neighbourhood in this area to sustain future populations. It is certain that once these houses are constructed, the population within the ED will increase significantly. The proposed neighbourhood will provide a distinct grid-like settlement pattern within the ED Pembroke East A. Future development of the Irish Glass Bottle Factory site will result in a new residential community on the peninsula.

Figure 5.5: Poolbeg West Strategic Development Zone (Proposed Poolbeg OCGT Location as Blue Dot)



Source: Figure 1.2, Poolbeg West Planning Scheme 2019

5.4.3 Housing

According to Census 2016, there are 2,102 private households within Pembroke East A ED with 51.5% of these comprising of houses and bungalows. A review of publicly available mapping and the Dublin CDP show that all residential development in the Pembroke East A ED is located west of the Sean Moore Road. The closest residential area to the proposed development is located approximately 1.4km to the west near Ringsend Park. Table 5.5 shows the private housing types within Pembroke East A ED.

Table 5.5: Type of Accommodations for Pembroke East A Electoral Division

Type of Accommodations	Households by Type
Houses/bungalows	51.5%
Flats/apartments	47.4%
Bed-sits	0.0%
Caravan/mobile homes	0.0%
Not stated	1.1%

Source: CSO 2016 (<https://census2016.geohive.ie/datasets/geohive::private-households-by-type-of-accommodation-electoral-division-census-2016-theme-6-1-ireland-2016-cso-osi/explore?location=53.338544%2C-6.196529%2C14.99>)

A review of planning applications and publicly available mapping in the area show that there are currently no existing or planned residential developments within 500m of the site. The nearest proposed residential development is approximately 1km west at the site of former Irish Glass Bottle Factory and Fabizia site. This is a part of the Poolbeg West Planning Scheme (Figure

5.5). As per planning laws, 10% of housing units in Poolbeg SDZ will be social housing units. These will be the closest social housing units to the proposed Poolbeg OCGT.

5.4.4 Employment and Economic Activity

The location of the proposed development is within the Poolbeg Peninsula employment hub. As stated in the Dublin CDP 2028, the area is zoned for Employment-Industry (Z7). The key employment within the area is industrial and port related (southern part of Dublin Port).

The unemployment rate has been significantly influenced by the current Covid-19 pandemic. On a seasonally adjusted basis, the numbers unemployed in Ireland in August 2022 stood at 117,200 at 4.3%, reduced from 5.5% in August 2021.

Table 5.6 illustrates employment by industry for the study area. As noted above, the majority of employment within the area is of industrial nature.

Table 5.6: Employment by Industry for Pembroke East A Electoral Division

Industry	Employment by Industry
Agriculture, forestry and fishing	0.0%
Building and construction	3.2%
Manufacturing industries	5.0%
Commerce and trade	33.6%
Transport and communications	15.2%
Public administration	3.8%
Professional services	19.8%
Other	19.5%

Source: CSO 2016 (<https://census2016.geohive.ie/datasets/geohive::persons-at-work-by-industry-sex-electoral-division-census-2016-theme-14-1-ireland-2016-cso-osi/explore?location=53.345557%2C-6.182186%2C14.00>)

5.4.5 Tourism and Recreation

There are no tourist facilities within the study area.

Fáilte Ireland has plans for 10 'Catalyst Projects' as part of its Docklands Visitor Experience Development Plan (VEDP). The closest in proximity to the proposed development is the Docklands WaterLine which runs along the docklands, approximately 2.5km from the proposed development. The Dockland VEDP states that:

'The creation of a multidimensional Docklands WaterLine that when animated the campshires has the scope to blend local culture, heritage, art and biodiversity in a trail that must be an international visitor attraction in its own right. The link from the destination access point of The Custom House to the Port area through artistic innovation and public realm creativity can be transformational. It will attract locals and visitors to embrace what is largely redundant space in terms of current usage.'

5.4.6 Community Facilities and Amenities

5.4.6.1 Existing Facilities

A search of publicly available mapping was done to identify educational, regional, health and community facilities within the study area.

There is a primary school (St. Patrick's Boys' National School) and a college (Ringsend College) within the study area approximately 2.2km west of the Poolbeg Generating Station complex. There is a primary care centre (Irishtown & Ringsend Primary Care Centre) within the study

area approximately 2.1km west of the proposed development site. There are no hospitals within the study area. There are three places of religious significance within the study area: St. Patrick's Roman Catholic Church Ringsend (approximately 2.4km west of the proposed development site), Irishtown Gospel Hall (approximately 2km west of the proposed development site), and St. Matthew's Church of Ireland Irishtown (approximately 2km west of the proposed development site).

There are several community facilities within the study area. The Ringsend and Irishtown Community Centre is located at the far west end of the study area near Tom Clarke Bridge. Ringsend Park is in the heart of Ringsend and Irishtown. The park has soccer and GAA pitches, all weather pitches, a tennis court, basketball court, athletics track and a playground. The Irishtown Stadium and the Ringsend Park are located approximately 1.6km west of the proposed development site. There is a narrow strip of Dodder Park on the western boundary of the study area. The Sean Moore Park, Sandymount Beach and Dublin Bay are located on the southern boundary of the study area and are approximately 1.3km from the proposed development site. The Irishtown Nature Park is the closest community area at a distance of 200m from the proposed development site. A walking trail commences at Sean Moore Park and runs through the Irishtown Nature Park and further along the southern boundary of the Poolbeg Peninsula till the Great South Wall and the Poolbeg Lighthouse.

Poolbeg Yacht and Boat Club is located approximately 1.6km west of the proposed Poolbeg OCGT site and is a popular local club with approximately 240 members using the marina all year round.

The Irishtown Garda Station is approximately 2km west of the proposed development site.

5.4.6.2 Proposed Facilities

The Poolbeg West Planning Scheme proposes several community facilities within the SDZ. This includes a primary school, health centre/ medical facilities, community hub (multi use sports hall/ community facility), a neighbourhood square and parks.

5.4.7 Human Health

5.4.7.1 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. Thus, the population within the study area is considered to have low sensitivity to the proposed works with regards to human health. 112 people within the study area are categorised as having 'Bad' and 'Very Bad' health.

Table 5.7 illustrates the population by general health data for the study area.

Table 5.7: Population by General Health for Pembroke East A Electoral Division

General Health Category	Population by General Health Category
Very Good	57.1%
Good	25.9%
Fair	8.9%
Bad	1.8%
Very Bad	0.4%
Not Stated	5.8%

Source: CSO 2016

(https://census2016.geohive.ie/datasets/981990c446104aaa83974b2289941698_0/explore?location=53.410687%2C-8.329520%2C7.89)

There are no hospitals within the study area, however, there is a primary care centre (Irishtown & Ringsend Primary Care Centre) within the study area approximately 2.1km west of the proposed development site. Healthcare and medical facilities are expected to be proposed as part of the Poolbeg West Planning Scheme.

5.4.7.2 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/m³).

Exposure to natural radon levels in the workplace is governed by the Radiological Protection Act 1991 (Ionising Radon Order 2000) and the Radiological Protection (Miscellaneous Provisions) Act 2014. A reference level for radon in workplaces of 400 Bq/m³ averaged over a period of three months is specified in the Act. In accordance with the Safety, Health and Welfare at Work Act 2005 (as amended), employers are required to identify hazards in the workplace, assess the risk to health and safety from these hazards and put in place measures to eliminate or reduce the risk.

In accordance with this requirement, the Health and Safety Authority require radon measurements to be carried out in all indoor workplaces in High Radon Areas over three consecutive months. If radon levels in the workplace are found to exceed the reference level of 300 Bq/m³ the EPA must be notified immediately and appropriate measures, such as remedial works, implemented to mitigate the risk.

Information on radon levels around the proposed development site was obtained from the national radon map illustrated on EPA radon mapping, which illustrates 10km x 10km grid squares which show the estimated percentage of homes above the reference level for radon. The radon levels illustrated on this map for residential areas within the study area indicate that the site is located within a Low Radon Area; specifically, it is estimated that between 1 – 5% of dwellings are predicted to have radon levels greater than 200 Bq/m³.

5.4.7.3 Industrial Emissions Licence

The existing Poolbeg Generating Station runs under Industrial Emissions (IE) licence no. P0577-04. This licence will be the subject of a review associated with the proposed development. This review licence will include details of resource use and environmental emissions. The licence will include strict conditions on how an activity must operate controlling operations relating to air and noise emissions and emission to land and water.

There are two other IE license facilities within the study area: Synergen Power Limited (P0486-02) approximately 820m from proposed development site; the Hammond Lane Metal Company Limited (P1002-01) approximately 570m from proposed development site.

5.4.7.4 COMAH

The National Oil Reserves agency Ltd (NORA) fuel storage establishment located directly adjacent to the proposed development site is classified as 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). The NORA store both Class III and Class II petroleum (Tanks C1-C4 and D1-D2) and kerosene (Tanks C5) products in bulk tanks see Figure 5.6.

Figure 5.6: NORA Fuel Tanks



Source: ESB

5.5 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; and
- Human Health

The impacts are described using the population and human health determinants listed in Table 5.2.

5.5.1 Do-Nothing

The existing Poolbeg Generating station complex is an Industrial Emissions (IEL) site and will continue to comply with the conditions on the IE licence. If this proposed development does not

go ahead ESB would most likely look to consider options for the landholding in the context for electricity generation.

5.5.2 Construction Phase

5.5.2.1 Land Use

No change in terms of land use is proposed. Neutral / imperceptible impacts on land use are predicted.

5.5.2.2 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 and the fact that workers are expected to commute from the wider Dublin area. The population within the study area is considered to have low sensitivity to proposed works. Neutral / imperceptible impacts on population are predicted.

5.5.2.3 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 and absence of existing and proposed housing within 500m of the proposed works. 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.

5.5.2.4 Employment and Economic Activity

During demolition and enabling works, an average of 20 personnel is anticipated on site with a maximum of 35 personnel during peak construction operations. During main OCGT development works, an average of 80-100 personnel is anticipated on site with a maximum of 140 personnel during peak construction operations.

Employment opportunities will therefore 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. Therefore, temporary imperceptible positive impacts on employment and economic activity are predicted.

5.5.2.5 Tourism and Recreation

The Poolbeg Peninsula is a popular amenity area. The proposed Poolbeg OCGT site borders a road and a walking /cycling route that provides access to the Poolbeg Beach to the west and Poolbeg lighthouse to the east. No construction works are proposed outside the existing Poolbeg Generating station complex and the complex is bound by an earth bund and vegetation along its eastern and southern boundaries. The ability for the local community to use and enjoy the area will not be substantially impacted as people will continue to be able to access and use these popular areas.

Increase traffic from construction vehicles will cause short term disturbance along the local routes. This is likely to have an impact on people trying to access popular recreational areas, such as Irishtown Stadium by causing temporary delays or requiring alternative routes.

However, these are likely to be temporary effects and will be managed using traffic mitigation measures and / or restrictions specified in the Demolition and Construction Traffic Management

Plan (D&CTMP) which will be prepared in advance of construction commencing. The D&CTMP will be prepared by the EPC Contractor prior to the commencement of the works. Requirements for traffic signage, banksmen and vehicle routing onto the Pigeon House Road shall be addressed diligently. If a secondary access is required for the deliveries of transformer units or otherwise the Contractor is to adopt similar mitigation measures and take full account of the proximity of all public use.

Areas of open and recreational space within the study area are of medium sensitivity value as there are limited alternative facilities for communities near to Poolbeg Peninsula. Additionally, on the Peninsula there is Poolbeg lighthouse which people travel from further afield to visit. The magnitude of change is negligible as the community would still be able to access and use the walking and cycling routes and areas of open and recreational space. Therefore, the significance of effect on communities in relation to their ability to use recreational and open space is slight adverse (not significant) during construction with mitigation.

5.5.2.6 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 Poolbeg Generating Station and will not result in any community severance. Temporary imperceptible impacts on emergency response times due to construction traffic are likely to occur. The D&CTMP to be prepared during construction stage will address these concerns and minimise adverse impacts.

5.5.2.7 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 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.

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.

5.5.3 Operation and Maintenance Phase

5.5.3.1 Land Use

No change in terms of land use is proposed. The proposed development is within the existing boundary of the ESB Poolbeg Generating Station and is consistent with the existing character and land use of the area. The proposed development does not share any boundary with the Poolbeg West SDZ. Development of this area will not be inhibited by the proposed development. Neutral / imperceptible impacts on land use are predicted.

5.5.3.2 Population (Demographics and Settlement Patterns)

During the operational phase, the OCGT at Poolbeg will be unmanned, controlled remotely from another ESB site. There will be personnel on site carrying out routine inspections and maintenance on the proposed facility. Given the nature of the proposed development, 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.

5.5.3.3 Housing

Given the nature of the proposed development, the operational phase will not have a significant impact on housing of the area. The proposed development does not share any boundary with the Poolbeg West SDZ. Development of this area will not be inhibited by the proposed development. Neutral / imperceptible impacts on housing are predicted during the operational phase.

5.5.3.4 Employment and Economic Activity

Given the scale of the proposals, significant adverse impacts on economic profile during the operational phase are not likely.

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.

5.5.3.5 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.

5.5.3.6 Community Facilities and Amenities

Due to the location of the site, neutral / imperceptible impacts on community facilities and amenities are predicted during the operational phase.

5.5.3.7 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 Land Use Planning Assessment in accordance with the HSA guidance. Copies of the assessment report accompany this planning application (Appendix D of EIAR). Significant adverse impacts on human health are not likely.

5.5.4 Decommissioning Phase

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. A Decommissioning Management Plan (DMP) will be prepared by ESB. It is recommended that that effects on population and human health receptors are evaluated once the specific activities associated with decommissioning are confirmed. This is because effects on population and human health receptors should be based on the demographic profile of the population of the area at that time, and the location and use of facilities important to the community such as areas of open space, recreational and community facilities. Potential effects should be managed through the DMP and other relevant assessments methods.

5.6 Cumulative Effects

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.

5.7 Mitigation Measures and Monitoring

5.7.1 Construction Phase

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 Demolition and Construction Environmental Management Plan (D&CEMP) is included in Appendix C of this EIAR. The D&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 D&CEMP and D&CTMP. 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.

5.7.2 Operation and Maintenance Phase

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

5.8 Residual Impacts

Significant adverse long-term residual impacts on population and human health are not likely as a result of the proposed development, 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.

6 Air Quality

6.1 Introduction

This chapter presents an assessment of the likely and significant impacts arising from the proposed development on local air quality. The assessment is based on the development as described in Chapter 3 of this EIAR.

The assessment of air quality has been carried out in accordance with best practice alongside national requirements including Environmental Protection Agency Air Dispersion Modelling from Industrial Installations Guidance Note (EPA AG4)⁵ and addresses the construction, operational and decommissioning impacts resulting from emissions to air.

The proposed development will consist of one OCGT with an approximate net output of 299MWe and will operate primarily on natural gas at any time of the day or night to meet peak demand. This assessment has considered three possible operating profiles of the OCGT so that the likely operating profile and worst-case/emergency operating profiles can be accounted for (see Section 6.3.2.2 for further details).

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.

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 existing and proposed development on land immediately adjacent to the proposed development site;
- Evaluation of the dispersion modelling results with reference to relevant air quality criteria; and
- Identification of mitigation measures for both construction and operation phases where necessary.

This assessment considers the proposed development's potential air quality impacts based on a minimum stack height of 34m above ground level. Amongst others, it does not take account of structural requirements or safety issues, nor does it attempt to fulfil the duties set out in EU Directives relating to health and safety in design, since this assessment does not constitute design. Appropriate regulations should be considered by those using this information to develop the stack design.

6.1.1 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. With respect to natural gas

⁵ EPA, Air Dispersion Modelling from Industrial Installations Guidance Note (AG4) (2020) available at [https://www.epa.ie/publications/compliance--enforcement/air/air-guidance-notes/EPA-Air-Dispersion-Modelling-Guidance-Note-\(AG4\)-2020.pdf](https://www.epa.ie/publications/compliance--enforcement/air/air-guidance-notes/EPA-Air-Dispersion-Modelling-Guidance-Note-(AG4)-2020.pdf) [last accessed 20/10/2022]

and gas oil the proposed fuels for the proposed development), the primary pollutants of concern are:

- Oxides of nitrogen (NO_x);
- Carbon monoxide (CO); and
- Sulphur dioxide.

6.1.1.1 Oxides of Nitrogen

Oxides of nitrogen (NO_x) is a term commonly used to describe a mixture of nitric oxide (NO) and nitrogen dioxide (NO_2), referred to collectively as NO_x . 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 NO_x 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 NO_x , by chemical reaction with ozone and other chemicals in the atmosphere.

6.1.1.2 Carbon Monoxide

Carbon monoxide (CO) is a colourless, odourless gas that 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. The major source of carbon monoxide is road traffic, particularly in urban areas.

CO is produced under conditions of inefficient combustion, and it is therefore in an operator's best interest to keep CO emissions as low as possible without causing a rise in emissions of other pollutants, such as NO_2 . CO is rapidly dispersed away from the source and is relatively inert over the timescales relevant for its dispersion.

6.1.1.3 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.

Sulphur dioxide (SO_2) could be emitted from the proposed development when operating on gas oil. Emissions data generated for the proposed development based on combustion of a 'typical' gas oil, likely to be supplied to the proposed development, result in an SO_2 exhaust gas composition of 0.2ppmv. This equates to a de minimus emission rate in grams per second for SO_2 and is several orders of magnitude lower than the gas oil NO_x emission rate for the proposed development.

It is acknowledged that the proposed development cannot guarantee the sulphur content of the gas oil. Although there could be some variability in the SO_2 emissions, the emission concentrations would meet the requirements of the BAT-AELs (see Section 6.2.1).

Given the resulting de minimis SO_2 mass emission rate based on the likely sulphur content of gas oil, the maximum operation of gas oil per year (up to 500 hours) and given the baseline SO_2 concentrations in the area are also low (see Section 6.4.2), operation of the proposed development would therefore be unlikely to result in significant impacts with respect to SO_2 .

Notwithstanding the above, a sensitivity test has been undertaken to assess the process contribution from the proposed development using different SO₂ emission rates and the resulting predicted environmental concentration. The sensitivity test is presented in Appendix E.

6.2 Policy and Guidance

The Planning Report which accompanies this application (Ref: 229100184_3_A) 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.

6.2.1 Legislation

6.2.1.1 Air emissions

As discussed above, the proposed development will consist of one 299MWe OCGT. As the proposed development's total thermal input is greater than 50MW, the emissions limits specified under Chapter III of the Industrial Emissions Directive⁶ (IED) and the associated 'BAT-AELs' within the Best Available Techniques (BAT) Reference Document for Large Combustion Plants⁷ would apply. The applicable annual and daily emission limits for NO_x, CO and SO₂ from BAT are presented below in Table 6.1.

Table 6.1: Emissions Limits Applicable to the Proposed development (mg/Nm³)

Pollutant	Emission Limit ^(a)			
	Natural gas		Gas oil	
	Annual	Daily	Annual	Daily
Nitrogen oxides (NO _x as NO ₂)	15-35	25-50	-	145-250
Carbon monoxide (CO)	5-40	-	100	-
Sulphur Dioxide (SO ₂)	-	-	35-60	50-66

Notes: ^(a) Concentrations referenced to 15% O₂, dry, 0°C, 1.013 kPa atm.
The proposed development would meet all other emissions requirements of the IED

6.2.1.2 Ambient Air Quality

Directive 2008/50/EC⁸ 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, including NO₂ and SO₂, 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.

The Air Quality Standards Regulations⁹ implement the EU Ambient Air Quality Directive (2008/50/EC) and define the air quality standards currently applicable in Republic of Ireland.

Table 6.2 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

⁶ Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control)

⁷ European Commissions (2017) Best Available Techniques (BAT) Reference Document for Large Combustion Plants

⁸ 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.

⁹ Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011)

standards (AQS). Standards for the protection of vegetation and ecosystems are referred to as 'critical levels'.

Table 6.2: Statutory Ambient Air Quality Limit Values and Objectives

Pollutant	Averaging period	AQS / Critical Level ($\mu\text{g}/\text{m}^3$)	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
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 EU 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)¹⁰ (2020) they have been included within this assessment.

¹⁰ Environmental Protection Agency Office of Environmental Enforcement (2020), 'Air Dispersion Modelling from Industrial Installation Guidance Note (AG4) available at [https://www.epa.ie/publications/compliance--enforcement/air/EPA-Air-Dispersion-Modelling-Guidance-Note-\(AG4\)-2020.pdf](https://www.epa.ie/publications/compliance--enforcement/air/EPA-Air-Dispersion-Modelling-Guidance-Note-(AG4)-2020.pdf) [last accessed 20/10/2022]

6.2.2 Policies

6.2.2.1 National Planning Policy

National Planning Framework

The National Planning Framework (NPF)¹¹ 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 of relevance (number 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.'

6.2.2.2 Regional Planning Policy

Spatial and Economic Strategy for the Eastern and Midland Region

This Regional Spatial and Economic Strategy (RSES)¹², prepared by the Eastern and Midland Regional Assembly, is a strategic plan and investment framework to shape future growth and to better manage regional planning.

This policy objective states:

'To reduce harmful emissions and achieve and maintain good air quality for all urban and rural areas in the Region and to work with local authorities and the relevant agencies to support local data collection in the development of air quality monitoring and to inform a regional air quality and greenhouse gas emissions inventory.'

6.2.2.3 Local Policy

Dublin City Development Plan 2016-2022

The Dublin City Development Plan¹³ was adopted on 23rd September 2016 and forms the statutory development plan for the city. It provides the city's development strategy until 2022 and provides policies and objectives which will be used for determining planning applications.

The policies of relevance to air quality in this assessment are SI24 and SI25. Policy SI24 states that:

'It is the policy of Dublin City Council: To monitor and improve air quality in accordance with national and EU policy directives on air quality and, where appropriate, promote compliance with established targets.'

Policy SI25 states that:

¹¹ Government of Ireland (2018) National Planning Framework, available at <https://npf.ie/wp-content/uploads/Project-Ireland-2040-NPF.pdf>

¹² Eastern and Midland Regional Assembly (2020). Regional Spatial and Economic Strategy 2019-2031, available at https://emra.ie/dubh/wp-content/uploads/2020/05/EMRA_RSES_1.4.5web.pdf

¹³ Dublin City Council (2016) Dublin City Development Plan. Available at: <https://www.dublincity.ie/sites/default/files/2020-08/written-statement-volume-1.pdf>

'It is the policy of Dublin City Council: To seek to preserve and maintain air and noise quality in the city in accordance with good practice and relevant legislation.'

Further to this, the objectives of relevance to air quality in this assessment are SI020 and SI022. Objective SI020 states that:

'It is an Objective of Dublin City Council: To promote sustainable design and construction to help reduce emissions from the demolition and construction of buildings.'

Objective SI020 states that:

'It is an Objective of Dublin City Council: To maintain and manage a Dublin ambient air quality monitoring network and to make available to the public the resulting air quality measurements.'

Dublin City Development Plan 2022-2028

DCC has published a new Dublin City Development Plan¹⁴. The Dublin City Development Plan 2022-2028 will provide the city's development strategy until 2028.

The policy of relevance to air quality in this assessment is SI35 'Management of Air Quality', which states that:

'It is the Policy of Dublin City Council: To monitor, pro-actively manage and improve air quality in the city through integrated land use and spatial planning measures to avoid, mitigate and minimise unacceptable levels of air pollution in accordance with national and EU policy Directives on air quality and, where appropriate, drive compliance with established targets.'

Further to this, the objectives of relevance to air quality in this assessment are SI021 'Air Quality Data Collection' and SI022 'City Ambient Air Quality Monitoring Network'. Objective SI021 'Air Quality Data Collection' states that:

'It is an Objective of Dublin City Council: To reduce harmful emissions and to achieve and maintain good air quality in the city by working with the Dublin local authorities and relevant agencies in the collection of local data through the Dublin City ambient air quality monitoring network.'

Objective SI022 'City Ambient Air Quality Monitoring Network' states that:

'It is an Objective of Dublin City Council: To maintain and manage a Dublin City ambient air quality monitoring network in conjunction with the EPA and to commit to make available to the public the resulting air quality measurements through the <https://dublincityairandnoise.ie/> website in real time, where feasible.'

6.2.3 Guidance

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

- Environmental Protection Agency Air Dispersion Modelling from Industrial Installations Guidance Note (EPA AG4)¹⁵;
- Institute of Air Quality Management (IAQM) Guidance on the assessment of dust from demolition and construction¹⁶;

¹⁴ Dublin City Council (2022). Development Plan 2022-2028, available at <https://www.dublincity.ie/residential/planning/strategic-planning/dublin-city-development-plan/development-plan-2022-2028>

¹⁵ 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](https://www.epa.ie/publications/compliance--enforcement/air/air-guidance-notes/EPA-Air-Dispersion-Modelling-Guidance-Note-(AG4)-2020.pdf)

¹⁶ Institute of Air Quality Management (2014). 'Guidance on the assessment of dust from demolition and construction.'

- Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes¹⁷; and
- Environmental Protection UK and Institute of Air Quality Management (2017), 'Land-Use Planning and Development Control: Planning for Air Quality'.

6.3 Methodology

6.3.1 Approach to Data Collection

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

Table 6.3 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
Siemens Energy ESB OCGT<299MW F class data sheet	2022	Emissions parameters for proposed OCGT
'Air dispersion modelling of proposed Flexgen plant at Poolbeg generating station, Dublin 4' report by AWN Consulting	2020	Emission parameters for existing assets at Ringsend, Poolbeg and Dublin Bay Power Plant
'Environmental Impact Assessment Report, North Wall Emergency Power Generation Plant' by Mott MacDonald	2022	Emission parameters for proposed assets at North Wall
'Dublin Waste to Energy Project, Environmental Impact Statement' (available at: https://epawebapp.epa.ie/licences/lic_eDMS/090151b2800f9ce8.pdf)	2006	Emission parameters for existing assets at Dublin Waste to Energy
'Proposed Amendments to Annual Tonnage at Dublin Waste to Energy Facility, Pigeon House Road, Dublin, Environmental Impact Assessment Report (available at: https://epawebapp.epa.ie/licences/lic_eDMS/090151b28081d84f.pdf)	2022	Confirms that licenced exhaust volumetric flow rate likely to be lower than licenced despite proposed capacity increase at Dublin Waste to Energy

6.3.2 Approach to Impact Assessment

6.3.2.1 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 PM₁₀ 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

¹⁷ National Roads Authority (2011), 'Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes'

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.

Guidance from the IAQM recommends splitting the construction activities into four separate source categories and determining the dust risk associated with each of these individually. This assessment has determined the risk of each of the following categories:

- Demolition;
- Earthworks;
- Construction; and
- Trackout

The risk of each source for dust effects can be described as 'negligible', 'low risk', 'medium risk' and 'high risk' depending on the nature and scale of the construction activities and the proximity of sensitive receptors to the construction activities or site boundary. The assessment is used to identify the mitigation measures proportional to the level of risk to reduce the effects such that they are not significant.

The assessment considers three separate effects from dust:

- Annoyance due to dust soiling;
- Harm to ecological receptors; and
- The risk of human effects due to increased exposure to PM₁₀.

Step 1 of the assessment applies screening criteria to the proposed development which states that an assessment will be required where there is:

- A 'human receptor' within:
 - 350m of the boundary of the site; and / or
 - 50m of the route(s) used by construction vehicles on the public highway up to 500m from the site entrance(s)
- An 'ecological receptor' within
 - 50m of the boundary of the site; and / or
 - 50m of the route(s) used by construction vehicles on the public highway up to 500m from the site entrance(s).

To assess the likely dust risk, the need to quantify the overall dust emission magnitude (Small, Medium or Large) from each of the dust sources identified (demolition, earthworks, construction and trackout) is first established in alignment with the criteria provided in Appendix E.

The sensitivity of the surrounding area is determined for each activity using the matrices provided in Tables 1.2 to 1.5 in Appendix E. The sensitivity of the area is based on the distance of the source to the closest receptors, the receptors sensitivity and in the case of PM₁₀ effects, the local background concentration. The highest level of area sensitivity defined for dust effect has been conservatively used in this assessment.

The final step of the assessment combines the dust emission magnitude and the sensitivity of the surrounding area using the matrices presented in Tables 1.6 to 1.9 in Appendix E to determine the dust risk categories for each activity for dust soiling and health effects.

The dust risk category defined for each dust source and effect is then used to determine appropriate site-specific mitigation measures to be adopted. It should be noted that, in line with the recommendations of IAQM guidance, significance is only assigned to construction effects following mitigation. Results of the dust assessment are presented in Section 6.6.2.

Construction Site Plant and Machinery Emissions

Construction requires the use of different equipment such as excavator, cranes and on-site generators. All construction plant has 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 surrounding road traffic contributions on the local road network, from other industrial sources or the proposed developments 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 6.8.

Construction Road Traffic Emissions

The National Roads Authority (NRA) provides 'Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes'.¹⁸ The guidance advises that where construction road traffic would lead to a change in annual average daily traffic (AADT) flows of more than 10% close to sensitive receptors, then the assessment of traffic emissions should be undertaken.

Environmental Protection UK (EPUK) and IAQM¹⁹ guidance 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 (LDV's less than 3.5 tonnes) per day.

The construction of the proposed development will take 30 months and is expected to require 10-50 HDV movements in any one day. Given the location of the proposed development (an area of industrial activity at Dublin Port), there are already likely to be many vehicle movements, especially HDVs, on existing roads in the area. The construction of the proposed development is therefore unlikely to exceed the criteria provided by NRA 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.

6.3.2.2 Operational Phase

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);

¹⁸ National Roads Authority (2011), 'Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes'

¹⁹ Environmental Protection UK and Institute of Air Quality Management (2017), 'Land-Use Planning and Development Control: Planning for Air Quality'

- AERMAP (AERMOD Terrain Pre-processor);
- AERMET (AERMOD Meteorological Pre-processor); and
- 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 will provide additional generating capacity during periods of high demand where existing power producers cannot meet requirements and it will also provide installed backup capacity to facilitate the increased use of renewable energy technologies, such as solar, and wind energy. By providing installed backup capacity, that can respond quickly to shortfalls in production, during periods when the energy available from the renewable technologies is reduced due to low winds for example, the proposed development is contributing to the shift to renewable energy sources.

In an average year, the OCGT at Poolbeg will likely operate on natural gas for up to a total of 1,000 hours, with 2 hours a month operating on gas oil for testing purposes (normal operating scenario). However, given the uncertainties regarding when the OCGT will need to operate, a worst-case operating scenario has also been considered assuming continuous operation of the proposed development on natural gas (except for the 2 hours a month when gas oil testing is undertaken).

An additional emergency operating scenario has also been considered to represent a worst-case scenario when natural gas is unavailable and therefore when the OCGT will need to operate on gas oil. This scenario assumes that the proposed development will operate for up to 500 hours per year on gas oil and will operate on natural gas for the remaining 8260 hours.

All modelling scenarios assume the OCGT will operate at full load. A summary of the modelling scenarios considered are presented below:

- Scenario 1A – normal operating scenario:
 - Proposed development operating in isolation at 100% load, for 1000 hours per year on natural gas and 2 hours a month on gas oil for maintenance testing.
- Scenario 2A – worst case natural gas operating scenario:
 - Proposed development operating in isolation at 100% load, for 8736 hours per year on natural gas and 2 hours a month on gas oil for maintenance testing.
- Scenario 3A – emergency operating scenario:
 - Proposed development operating in isolation at 100% load, for 500 hours per year on gas oil and 8260 hours on natural gas.

The proposed development was also modelled operating on gas oil for 8760 hours per year with NO_x emissions of 50mg/Nm³ (subject to OEM confirmation of gas turbine capability at that

emission requirement) as per BAT requirements and the calculation ground level concentrations of NO₂ were comparable to Scenario 2A. While modelled for completeness, this is not considered a valid scenario in practice as the proposed development only has a secondary fuel obligation to maintain a store of three days of gas oil. While the request for operation on gas oil could be recurring during the year for duration of up to 72 hours for each requested period, the practicality of the time to actually source and re-fill (if previously consumed) the three days of gas oil between gas oil operation periods make continuous operation on gas oil not a valid scenario.

For Scenario 1, long-term (annual mean) impacts have been accounted for in the dispersion model using varying emission factors to reflect a realistic operating profile whilst enabling the assessment to utilise the preferred approach of applying the model's chemical reaction scheme to account for the NO_x to NO₂ relationship (see Section 'NO_x to NO₂ Relationship' below). Operational hours were assumed to occur between 6am and 8am in the morning and between 4pm and 7pm in the evening with a greater number of daily operational hours in colder months (maximum of 5 hours per day) and a lower number of hours during warmer months (minimum of 1 hour per day). The 2 hours a month for gas oil testing was assumed to occur between 12pm and 2pm on the first day of each month. It should be noted that in this scenario the proposed development may operate outside of these time windows and these have been used as a realistic case for the dispersion modelling only.

For Scenario 3, it is not possible to predict when the OCGT will need to operate on gas oil as this would only occur in emergencies. In accordance with the USEPA Methodology outlined within AG4, the emission rates for gas oil and natural gas operation have been factored down by the annual number of hours they could possibly operate in an emergency (500/8760 for gas oil and 8260/8760 for natural gas). The two factors have then been included in the model to calculate the worst-case annual average process contributions from the OCGT at receptors for this scenario.

To capture the worst-case short-term (1-hour) impacts, Scenario 1 and 2 have assumed continuous operation on natural gas for 8760 hours per year while Scenario 3 has assumed continuous operation on gas oil for 8760 hours per year. The short-term impacts therefore assume that operation on either natural gas or gas oil would coincide with the worst-case meteorological conditions for dispersion.

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.'

Given the energy generation capacity of the proposed development and that of the existing and other proposed developments in the study area, cumulative modelling scenarios for the above three scenarios has also been undertaken. The cumulative assessments assume all plant would operate simultaneously and would coincide with the worst meteorological conditions. However, this is a conservative assumption as the majority of the assets/developments would operate for fewer hours than assumed in the assessment. The assets also have different operating profiles so would be unlikely to all be operating at the same time.

The cumulative scenarios consider the proposed development in addition to:

- The existing assets at Poolbeg (the Flexgen Aero OCGT currently under construction, two CCGTs and one auxiliary boiler;
- The existing and proposed assets at Ringsend (the Flexgen Aero OCGT currently under construction and a proposed new OCGT²⁰);
- North Wall emergency power generation (six OCGT units);
- Dublin Bay Power Plant CCGT; and
- Dublin Waste to Energy (Covanta) Plant.

For the cumulative scenarios for the three operating scenarios proposed above, the following operation hours and fuels have been assumed:

Table 6.4: Operation Hours for the Cumulative Scenarios

Development	Asset	Operating Hours/Fuel		
		Scenario 1B – normal operation cumulative	Scenario 2B – worst case natural gas operation cumulative	Scenario 3B – emergency operation cumulative
Poolbeg	Proposed OCGT	1000, natural gas 24, gas oil (2 hours testing per month)	8736, natural gas 24, gas oil (2 hours testing per month)	500, gas oil 8270, natural gas
	Flexgen Aero OCGT	1000, natural gas 24, gas oil (2 hours testing per month)	8736, natural gas 24, gas oil (2 hours testing per month)	500, gas oil 8270, natural gas
	2x CCGT	8760, natural gas	8760, natural gas	500, gas oil 8270, natural gas
	Auxiliary boiler	1460, natural gas (4 hours per day)	1460, natural gas (4 hours per day)	1460, gas oil (4 hours per day)
Ringsend	New OCGT	1000, natural gas 24, gas oil (2 hours testing per month)	8736, natural gas 24, gas oil (2 hours testing per month)	500, gas oil 8270, natural gas
	Flexgen Aero OCGT	1000, natural gas 24, gas oil (2 hours testing per month)	8736, natural gas 24, gas oil (2 hours testing per month)	500, gas oil 8270, natural gas
North Wall	6x OCGT	500, natural gas	500, natural gas	500, natural gas
Dublin Bay Power Plant	CCGT	8760, natural gas	8760, natural gas	8760, natural gas
Covanta Plant	Energy from Waste	8760, natural gas	8760, natural gas	8760, waste

Stack Emission Parameters

Table 6.5 summarises the stack emission parameters assumed for the proposed development. The relevant emissions data for firing on natural gas and gas oil has been provided by one of the potential plant manufacturers. Modelled NO_x emissions concentrations are based on emissions limits provided by the potential plant supplier and meet the BAT-AELs (see Section 6.2).

For short-term (1-hour) averaging periods, scenario 1 and 2 as defined above, are based on continuous operation on natural gas with an annual emission limit of 35mg/Nm³. While the daily BAT-AEL of 50mg/Nm³ may slightly increase the predicted short-term maximum concentrations, scenario 3 demonstrates the maximum short-term impacts of gas oil operation all year and is based on a BAT-AEL of 250mg/Nm³. Scenario 3 therefore includes a conservative prediction of

²⁰ New OCGT proposed to be installed at Ringsend is the same design as at Poolbeg and has been included in the cumulative modelling as a worst case.

short-term impacts as the daily BAT-AEL for gas oil operation is five times higher than the daily BAT-AEL for natural gas operation.

Table 6.5: Stack Emission Parameters

Parameter	Unit	Natural gas	Gas Oil
Stack height ^(a)	m	34	34
Stack diameter	m	7.2	7.2
Exit temperature	°C	587	546.5
Volumetric flow rate (Actual)	Am ³ /s	1718.0 ^(b)	1645.6 ^(c)
Exit velocity	m/s	42.2	40.4
Volumetric flow rate (Normal)	Nm ³ /s ^(d)	627.6	592.2
NOx emission concentration	mg/Nm ³ ^(d)	35	250
NOx emission rate	g/s	22.0	148.1
CO emission concentration	mg/Nm ³ ^(d)	40	100
CO emission rate	g/s	25.1	59.2

Source: Siemens Energy ESB OCGT<299MW F class data sheet

Notes: Arithmetic errors may occur due to rounding
SO₂ emissions presented in Appendix E

^(a) As informed by the stack height determination. Amongst others, it does not take account of structural requirements or safety issues, nor does it attempt to fulfil the duties set out in EU Directives relating to health and safety in design, since this assessment does not constitute design. Appropriate regulations should be considered by those using this information to develop the stack design.

^(b) Reference conditions = 12.4% O₂, 587°C, 8.4% H₂O

^(c) Reference conditions = 13.4% O₂, 546.5°C, 5.5% O₂

^(d) Reference conditions = 15% O₂, 0°C, dry, 1013 mbar

Table 6.6 presents the stack emission parameters for the existing and proposed plant at Poolbeg, North Wall, Dublin Bay Power Plant and Dublin Waste to Energy plant that have been incorporated into the cumulative assessments for the proposed development. It also has regard to a OCGT plant at Ringsend, which an application for consent is expected to be made to Dublin City Council.

Table 6.6: Stack Emission Parameters for Existing and other Proposed Emission Sources – Operating on Natural Gas

Parameter	Unit	Poolbeg		Ringsend		North Wall		Dublin Bay Power		Dublin Waste to Energy	
		Flexgen Aero OCGT	Auxiliary boiler	CCGT 14	CCGT 15	Flexgen Aero OCGT	New OCGT	Units 1-4	Units 5-6	CCGT	Stack 1 and 2
Stack Location	WGS 1984, UTM Zone 29N	687385, 5913565	687338, 5913747	687305, 5913753	687328, 5913753	686079, 5913601	686216, 5913646	685613, 5914760 685633, 5914761 685653, 5914761 685615, 5914792	685635, 5914792 685655, 5914792	686069, 5913694	686433, 5913696 686427, 5913697
Stack height	m	30	30	75	75	30	34	11	11	70	100
Stack diameter	m	3.7	0.5	5.2	5.2	3.7	7.2	2.8	2.8	6.5	2.4
Exit velocity	m/s	37.7	25.2	31.0	31.5	37.7	42.2	40.6	41.6	23.1	17.9
Volumetric flow rate (Actual)	Am³/s	405.4	5.0	659.0	669.8	405.4	1718.0	250.0	256.0	767.2	80.8
Exit temperature	°C	446	233	108.2	122.6	446	587	529.0	551.0	113.9	55.0
NOx emission concentration	mg/Nm³ (15% O₂, dry)	35	500	40	40	35	35	50	50	65	400
NOx emission rate	g/s	6.0	1	17.3	17.3	6.0	22.0	4.4	4.4	47.2	30.6

Source: Siemens Energy ESB OCGT<299MW F class data sheet
AWN consulting, 2020. Air dispersion modelling of proposed flexgen plant at Poolbeg generating station, Dublin 4
Mott MacDonald, 2022. Environmental Impact Assessment Report, North Wall Emergency Power Generation Plant
Elsam Dublin Waste to Energy Ltd., 2006. Dublin Waste to Energy Project, Environmental Impact Statement https://epawebapp.epa.ie/licences/lic_eDMS/090151b2800f9ce8.pdf

Note: Due to the uncertainties regarding emergency operation of the North Wall plants, an adjustment factor of 500/8760 has been applied to the emission rate of 4.4g/s for the annual model runs. This is in accordance with the approach recommended in AG4 for air dispersion modelling for emergency generators, emergency operation. However, for hourly averaging periods, the models have been run assuming the emission rates in the table above.

Table 6.7: Stack Emission Parameters for Existing and other Proposed Emission Sources – Operating on Gas Oil

Parameter	Unit	Poolbeg				Ringsend		Dublin Bay Power Plant
		Flexgen Aero OCGT	Auxiliary boiler	CCGT 14	CCGT 15	Flexgen Aero OCGT	New OCGT	CCGT
Stack Location	WGS 1984, UTM Zone 29N	687385, 5913565	687338, 5913747	687305, 5913753	687328, 5913753	686079, 5913601	686216, 5913646	686069, 5913694
Stack height	m	30	30	75	75	30	34	70
Stack diameter	m	3.7	0.5	5.2	5.2	3.7	7.2	6.5
Exit velocity	m/s	37.7	25.2	31.0	31.5	37.7	40.4	23.1
Volumetric flow rate (Actual)	Am ³ /s	405.4	5.0	659.0	669.8	405.4	1645.6	767.2
Exit temperature	°C	446	233	108.2	122.6	446	546.5	113.9
NOx emission concentration	mg/Nm ³ (15% O ₂ , dry)	35	500	40	40	35	250	65
NOx emission rate	g/s	6.0	1.0	17.2	17.2	6.0	148.1	47.1

Source: AWN consulting, 2020. Air dispersion modelling of proposed flexgen plant at Poolbeg generating station, Dublin 4
Mott MacDonald, 2022. Environmental Impact Assessment Report, North Wall Emergency Power Generation Plant

Note: Due to the uncertainties regarding emergency operation on gas oil, an adjustment factor has been applied to the emission rates for sources operating less than 8760 hours per year for annual model runs e.g. the flexgen aero OCGT has been assumed to operate for 500 hours a year so has an adjustment factor of 500/8760 has been applied to the emission rate of 15.1g/s. This is in accordance with the approach recommended in AG4 for air dispersion modelling for emergency generators, emergency operation. However, for hourly averaging periods, the models have been run assuming the emission rates in the table above.

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 Appendix E and displayed in Figure 6.1 to Figure 6.3.

Figure 6.1: Modelled Buildings around the Poolbeg Stacks (Proposed OCGT, Flexgen Aero, Auxiliary Boiler, CCGGT 14 and 15)



Figure 6.2: Modelled Buildings around the Ringsend (Flexgen Aero and Proposed OCGT), Dublin Bay Power Plant and Dublin Waste to Energy Plant Stacks



Figure 6.3: Modelled Buildings around the North Wall Stacks



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.

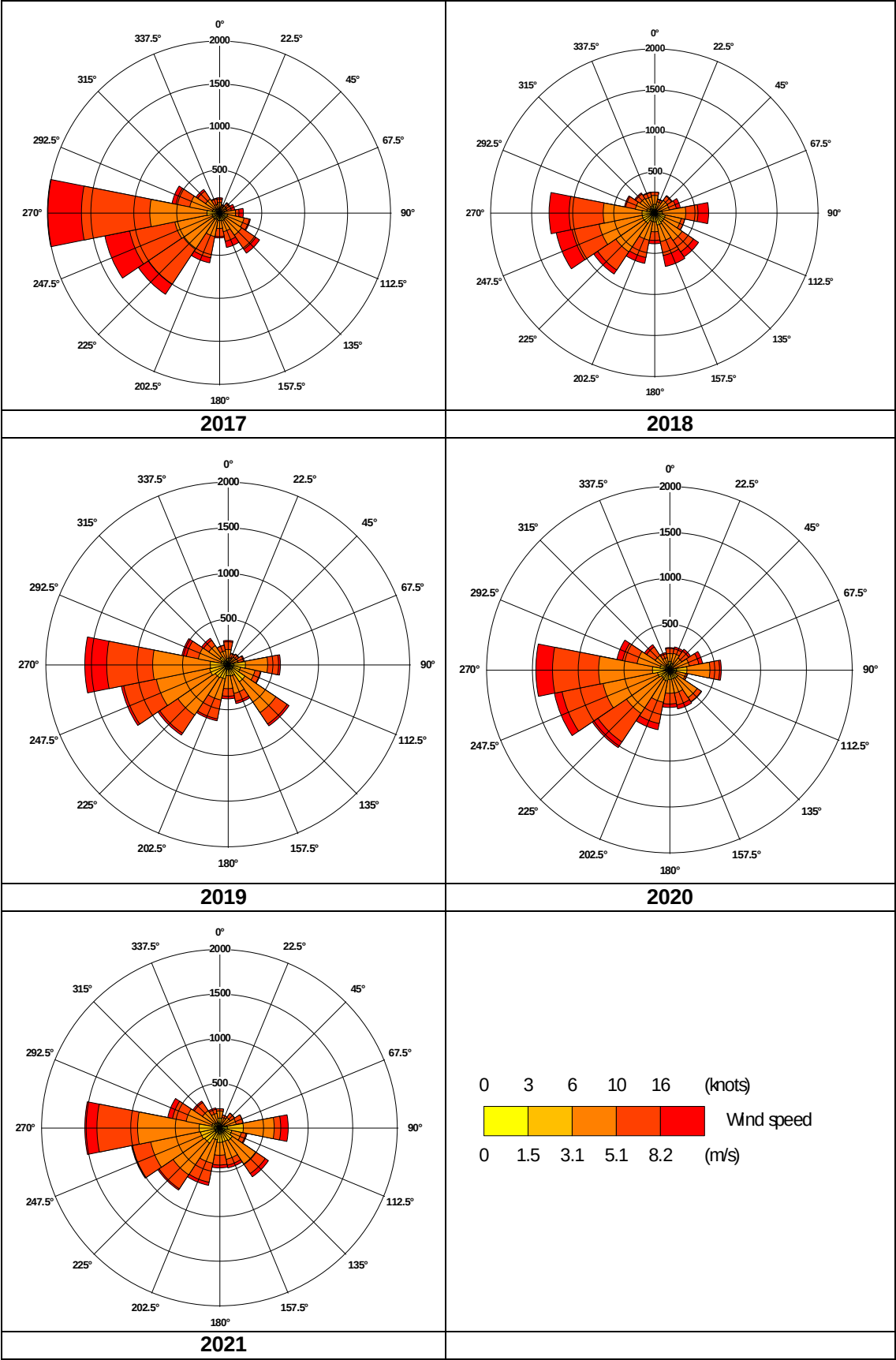
For meteorological data to be suitable for dispersion modelling purposes, a number of meteorological parameters need to be measured on an hourly basis. These parameters include wind speed, wind direction, cloud cover and temperature. There are only a limited number of sites where the required meteorological 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 (2017 – 2021).

Meteorological data was sourced from Met Éireann and obtained from their monitoring site at Dublin Airport (approximately 9.8km northwest of the OCGT at Poolbeg) as this was the meteorological site most representative due to 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 6.4 illustrate that in all five meteorological years there is a dominance of strong winds from the west.

Figure 6.4: Wind Roses for Dublin Airport (2016 – 2020)



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. Although the study area is relatively flat and therefore gradients are below 1 in 10m, terrain has been included in this assessment for completeness.

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. Land cover data within a 1km radius of the Dublin Airport meteorological station was used as this resulted in surface roughness values most representative of the land surrounding the proposed development site.

Receptors

The dispersion modelling has been used to predict ground level pollutant concentrations at regular intervals across an inner 2km² grid with a 50m horizontal resolution, an intermediate 6km² grid with a 100m horizontal resolution and an outer 10km² grid with a 500m horizontal resolution, centred on the proposed development site. Predicted concentrations have been compared against the relevant AQS for the protection of human health. The highest impacts from the proposed development are located within the domain of the 2km² modelled high resolution grid and therefore meet the requirements of EPA AG4.

As discussed in Section 6.2.1.2, the AQS do not apply at

1. any locations situated within areas where members of the public do not have access and there is no fixed habitation
2. 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 site boundaries at the proposed development site, Ringsend, North Wall, Dublin Bay Power Plant and Dublin Waste to Energy Plant site in all scenarios. See Figure 6.5 for the site boundaries.

The dispersion modelling has also been used to predict ground level pollutant concentrations at sensitive human health closest to the site. These locations assessed as 'discrete receptors' have been selected to represent the closest sensitive receptors to the site, which includes multiple residential receptors. Human health discrete receptors included in the model are presented in Table 6.8 and Figure 6.5.

Twelve Natura 2000 sites and fourteen pNHAs (proposed Natural Heritage Areas) are within a 10km radius of the application site and have been included in the assessment. Section 6.5.3 demonstrates that the highest predicted impacts at modelled ecological receptors are not significant. Therefore, the inclusion of sites within 10km radius is adequate as predicted concentrations decrease with increasing distance. Ecological designated sites considered within the assessment are presented in Table 6.9 and Figure 6.6. Further details of the ecological designated sites are provided in Chapter 9 Biodiversity.

Table 6.8: Human Health Discrete Receptors Included in the Model

ID	Grid reference (WGS1984, UTM Zone 29N)	
	X	Y
HH1	685966	5912096
HH2	685871	5912373
HH3	685803	5912708
HH4	685630	5912993
HH5	685490	5913130
HH6	685525	5913236
HH7	685366	5913531
HH8	685461	5913815
HH9	685573	5913965
HH10	685369	5913998
HH11	685088	5914065
HH12	684726	5914136
HH13	684551	5914173
HH14	684441	5914619
HH15	684491	5914977
HH16	684542	5915173
HH17	685196	5916180
HH18	685799	5915995
HH19	686269	5915973
HH20	686719	5915814
HH21	687402	5916072
HH22	687834	5915873
HH23	688292	5915645
HH24	688316	5915498
HH25	686740	5914360
HH26	686552	5914550
HH27	686563	5914830
HH28	687062	5914820

Note: Human health receptors modelled at a height of 1.5m
Grid references rounded to 0 decimal places.

Table 6.9: Ecological Designated Sites Considered within the Assessment

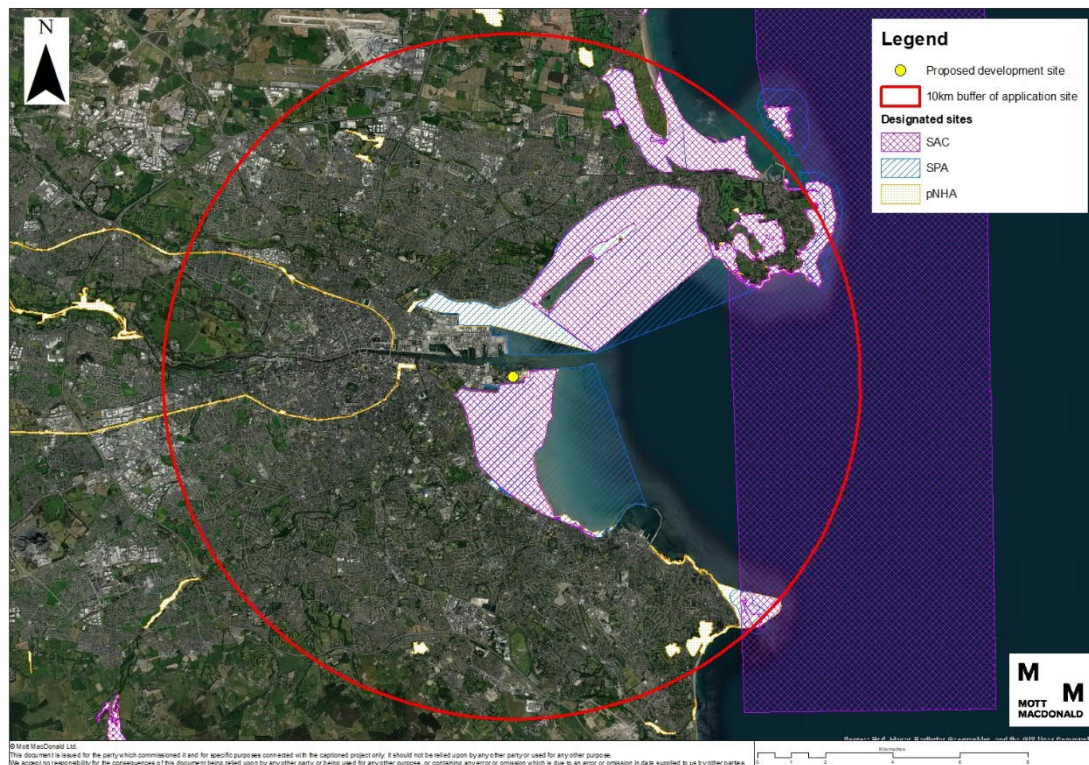
Site Name	Site Designation	Site Code
South Dublin Bay SAC	SAC	000210
North Dublin Bay SAC	SAC	000206
Baldoyle Bay SAC	SAC	000199
Rockabill to Dalkey Island SAC	SAC	003000
Howth Head SAC	SAC	000202
Ireland's Eye SAC	SAC	002193
South Dublin Bay and River Tolka Estuary SPA	SPA	004024
North Bull Island SPA	SPA	004006
Baldoyle Bay SPA	SPA	004016
Dalkey Islands SPA	SPA	004172

Site Name	Site Designation	Site Code
Howth Head Coast SPA	SPA	004113
Ireland's Eye SPA	SPA	004117
South Dublin Bay pNHA	pNHA	000210
North Dublin Bay pNHA	pNHA	000206
Dalkey Coastal Zone And Killiney Hill pNHA	pNHA	001206
Boosterstown Marsh pNHA	pNHA	001205
Grand Canal pNHA	pNHA	002104
Royal Canal pNHA	pNHA	002103
Howth Head pNHA	pNHA	000202
Baldoyle Bay pNHA	pNHA	000199
Fitzsimon's Wood pNHA	pNHA	001753
Santry Demesne pNHA	pNHA	000178
Ireland's Eye pNHA	pNHA	000203
Sluice River Marsh pNHA	pNHA	001763
Dolphins, Dublin Docks pNHA	pNHA	000201

Figure 6.5: Modelled Human Health Receptors



Figure 6.6: Ecological Receptors



NO_x to NO₂ 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 (NO₂) at source. The NO oxidises in the atmosphere in the presence of sunlight, ozone and volatile organic compounds to form NO₂, 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 NO₂, 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 NO₂/NO_x chemistry should also be undertaken.

AERMOD incorporates two options for modelling NO₂/NO_x 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 (O₃) to NO₂ and oxygen (O₂). For dispersion modelling applications where there are isolated elevated point sources, PVMRM represents a more refined approach as it accounts for entrained O₃ along the plume. 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 NO₂/NO_x ratio
 - A ratio of 0.1 has been applied meaning that 10% of the NO_x that leaves the stack is already in the form of NO₂.

- Final equilibrium NO₂/NO_x ratio
 - A ratio of 0.9 has been applied meaning that the final balance between NO and NO₂ will be 10% NO and 90% NO₂.
- Background ozone (O₃) concentration
 - An ozone concentration of 53µg/m³ has been used in this assessment based on the maximum measured annual average²¹ concentration at a Zone A (Dublin conurbation) site in 2019 and 2020²². The maximum measured concentration is a conservative assumption as the ratio of NO₂/NO_x is dependent upon the number of moles of O₃ available for the reaction, i.e. the more O₃ available for reaction, the higher the conversion of NO to NO₂.

Operational Road Traffic Emissions

EPUK and IAQM²³ guidance indicate that an assessment of traffic emissions is only likely to be required where a development generates an additional annual average flow of greater than 100 HDVs per day or greater than 500 LDVs per day. Considering the type of proposed development and the number of operational staff, it is unlikely that either the LDV or the HDV flows will exceed these thresholds at any point during the operational phase. On this basis, no further considerations have been given to the effects of operational road traffic on ambient air quality.

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 10 kilometre radius of the proposed development site as presented in Table 6.8 and Figure 6.6.

Critical Levels – Atmospheric NO_x

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 6.4.

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 been derived from dispersion modelling. Deposition rates were calculated using empirical methods within Habitats Directive Guidance (AQTAG.06)²⁴ as follows:

²¹ Annual mean calculated as an 8 hour rolling mean average

²² Whilst monitoring data from 2020 should be treated with caution due to COVID-19 restrictions, the annual mean measured ozone concentration in 2020 was the same as 2019 and has therefore been adopted for this assessment.

²³ Environmental Protection UK and Institute of Air Quality Management (2017), 'Land-Use Planning and Development Control: Planning for Air Quality'

²⁴ Air Quality Advisory Group, 2014, AQTAG06 Technical guidance on detailed modelling approach for an assessment for emissions to air.

1. Calculate dry deposition flux from ground level NO_x

$$\begin{array}{ccccc} \text{Dry deposition flux} & = & \text{NO}_x \text{ ground level concentration} & \times & \text{deposition velocity} \\ (\mu\text{g}/\text{m}^2/\text{s}) & & (\mu\text{g}/\text{m}^3) & & (0.0015^{25} \text{ m/s}) \end{array}$$

2. Convert from dry deposition flux ($\mu\text{g}/\text{m}^2/\text{s}$) to dry nitrogen deposition ($\text{kg}/\text{ha}/\text{yr}$) by multiplying the dry deposition flux by 96 for NO_x.
3. For acidification - convert to units of equivalents ($\text{keq}/\text{ha}/\text{yr}$), which is a measure of how acidifying the chemical species can be, by multiplying the dry nitrogen deposition ($\text{kg}/\text{ha}/\text{yr}$) 0.071428 for nitrogen.

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.

6.3.3 Study Area

As discussed in 6.3.2.1, the construction dust assessment will consider human receptors within 350m of the boundary of the site and 50m of the routes used by construction vehicles on the public highway up to 500m from the site entrances. The assessment will also consider ecological receptors within 50m of the boundary of the site and 50m of the routes used by construction vehicles on the public highway up to 500m from the site entrances. This is in accordance with the IAQM guidance (see Section 6.3.2.2).

As discussed in Section 6.3.2.2, the assessment of the operation phase will consider the impacts on air quality up to 10km 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; as demonstrated in Section 6.6.2, the greatest impacts are found within 2km of the proposed development.

6.4 Receiving Environment

6.4.1 Overview

Information on existing air quality in Ireland can be obtained from the EPA, 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 A. In accordance with Irish EPA guidance (AG4), background data should be obtained from monitoring sites which are classified as 'urban background' or 'suburban' wherever possible.

The closest, most representative monitoring sites that monitor NO₂ are the urban monitors 'Dublin Port' and 'Ringsend', which are located approximately 1.5km north-west and 2.3km west of the proposed development respectively. Although the monitors are classified as 'urban traffic' sites, they are considered most representative of baseline conditions in the study area due to their close proximity to the Dublin Port area and therefore the proposed development.

However, the Dublin Port site is a relatively new monitor so only has data from 2020 onwards. Data from 2020 and 2021 is not considered representative of baseline conditions as it has the potential to be impacted by effects associated with the coronavirus (Covid-19) pandemic, such

²⁵ Relevant for low lying features such as grassland

as a reduction in traffic movements resulting in reduced monitored pollutant concentrations. Therefore, only the Ringsend monitor has been considered further in this assessment. While data from 2020 and 2021 has been presented for reference, it has not been used to inform the baseline concentrations for the assessment.

Only one Zone A site has consistently monitored CO since 2017. This site is located on Winetavern Street at an urban background site in the centre of Dublin (approximately 5.6km west of the site) and therefore is considered most representative of conditions at the proposed development with respect to CO concentrations.

6.4.2 Baseline data

Data for Ringsend and Winetavern Street has been obtained from the EPA data archive and is summarised in Table 6.10. Concentrations monitored are well below the respective objectives.

Baseline SO₂ concentrations in the area are low and emission rates of SO₂ from the proposed development are likely to be de minimis, as discussed in Section 6.1.1. However, the impact of the proposed development on SO₂ concentrations is considered in Appendix E and SO₂ concentrations presented in Table 6.10 have been adopted as the baseline.

Table 6.10: Annual Mean Pollutant Concentration

Site Name	Location (ITM)		Pollutant	Averaging Period	Annual Mean Concentration (µg/m ³)					
	X	Y			2017	2018	2019	2020	2021	Ave*
Ringsend	718098,	733861	NO _x	Annual mean	54.3 (62)	50 (94)	45.0 (96)	32.4 (99)	33.6 (99)	47.5
Ringsend	718098,	733861	NO ₂	Annual mean	21.9 (62)	27 (94)	24 (96)	18 (91)	19.2 (99)	25.5
Ringsend	718098,	733861	SO ₂	Annual mean	4.3 (62)	3.3 (90)	1.4 (98)	2.1 (100)	2.7 (87)	2.4
Winetavern Street	715080,	734066	CO	8 hour rolling	14,000 (96)	2000 (100)	3000 (94)	3000 (100)	4000 (97)	2500

Source: EPA Data Archive

Note: Data capture (%) shown in brackets

* Average based on 2018 and 2019 data (see section below for details)

6.4.3 Summary

EPA AG4 suggests that baseline concentrations should be averaged over the most recent two to three years available. Due to the uncertainties regarding the data from 2020 and 2021 and the low data capture rates in 2017 at the Ringsend site, baseline concentrations used in the assessment have been determined based on an average of 2018 and 2019 annual mean data from the Ringsend and Winetavern Street automatic monitors.

Hourly maximum concentrations can be substantially higher than the 99.79th percentile of annual hourly means (for comparison with the standard) and it is therefore not recommended to use these values in the assessment. UK Environment Agency guidance²⁶ suggests that short term (1-hourly) background concentrations can be estimated by doubling the annual mean

²⁶ Environment Agency (UK), Horizontal Guidance Note H1 [<https://www.gov.uk/government/publications/h1-environmental-risk-assessment-for-permits-overview>]

background concentrations. This process has been applied to NO₂ concentrations used for this assessment.

Baseline concentrations used in the assessment are summarised in Table 6.11. The use of monitoring data from the Ringsend monitor for the baseline concentrations is considered to be conservative as this monitor will include contributions from existing plant which have also included within the dispersion model (such as the existing plant at Poolbeg, the Dublin Waste to Energy Plant and Dublin Bay Power Plant). Therefore, there will be some 'double counting' of the process contributions from these plant in the assessment from the baseline concentration and dispersion modelling.

Table 6.11: Baseline Concentrations used in the Assessment

Pollutant	Averaging Period	Baseline Concentration (µg/m ³)
NO _x	Annual	47.5
NO ₂	1-hour	51.0
	Annual	25.5
CO	8 hour rolling	2500

6.5 Likely Significant Impacts

6.5.1 Do-Nothing

In the event of the Do Nothing scenario the proposed site would remain an undeveloped open area brown field site. ESB have identified this site as being strategic for electricity generation due to its proximity to grid and gas networks as well as being close to the electricity load centre of Dublin city. If this proposed development does not go ahead ESB would most likely look to consider options for the landholding in that context.

6.5.2 Construction Phase

The magnitude and sensitivity descriptors that have been applied to assess the overall effect of the construction phase are presented in Appendix E. Table 6.12 presents a summary of the dust emission magnitude assigned to each construction activity based on these descriptors.

Table 6.12: Dust Emission Magnitude

Activity	Dust Emission Magnitude	Justification
Demolition	Small	The total demolition volume will be less than 20,000m ³ and demolition activities will be less than 10m in height. Materials include those with low potential for dust release such as metal, timber and cladding but also those with high potential such as concrete.
Earthworks	Medium	Although the application site has an area greater than 10,000m ² , it is expected that there will be between 5 and 10 heavy earth-moving vehicles active at any one time. There will also be no major earth bank bunds expected and the total material moved will be approximately 33,000m ³ . Further to this, the soil consists of made ground, gravels, sands and clays and as such is not considered to be a potentially dusty soil type.
Construction	Medium	The total building volume is assumed to be between 25,000m ³ and 100,000m ³ . It is expected that piling will take place on site but no onsite concrete batching, sandblasting or crushing and screening. Further to this, it is expected that materials of low potential for dust release such as metal, timber and cladding will be used, along with potentially dusty materials such as concrete.
Trackout	Medium	It is expected that there will be between 10 and 50 HDV outward movements in any one day. Roads will have a tarmac finished and the soil consists of

Activity	Dust Emission Magnitude	Justification
		made ground and gravels and as such is not considered to be a potentially dusty soil type.

Table 6.13 and Table 6.14 present the sensitivity of the area to effects caused by construction activities and is based on the criteria presented in Appendix E.

Figure 6.7 and Figure 6.8 present the dust assessment buffers. These are based on IAQM guidance as set out in Section 6.3 (Methodology), above. There are three ecological designated sites within 50m of the proposed development site entrance; South Dublin Bay SAC, South Dublin Bay pNHA, and South Dublin Bay and River Tolka Estuary SPA. Therefore, ecological designations have been considered in this assessment.

Table 6.13: Receptor Sensitivity of the Area to Dust Soiling and Health Effects of PM₁₀

Activity	Dust soiling		Health effects of PM ₁₀	
	Sensitivity	Comment	Sensitivity	Comment
Demolition	Medium	There is one medium sensitivity receptor (Pigeon House Lab performing arts theatre) located within 20m of the proposed development to the west. There are also between 10 and 100 medium sensitivity receptors (recording studio and vehicle parking spaces) within between 20m and 350m of the proposed development, as well as at least one low sensitivity receptor (industrial properties) within 350m.	Low	Background monitored annual PM ₁₀ concentration in 2019 for Ringsend is 19µg/m ³ ²⁷ . There is one medium sensitivity receptor (Pigeon House Lab performing arts theatre) located within 20m of the proposed development to the west, as well as another within 100m.
Earthworks	Medium		Low	
Construction	Medium		Low	
Trackout	Medium	There is one medium sensitivity receptor (Pigeon House Lab performing arts theatre) within 20m of the route used by construction vehicles, up to 200m from the site entrance, as well as another that is within 50m of the route (a recording studio). In addition to this, there is at least one low sensitivity receptor (industrial properties) within 50m of the route.	Low	There is one medium sensitivity receptor (Pigeon House Lab performing arts theatre) sensitive to health effects of PM ₁₀ less than 20m from the route used by construction vehicles on the public highway, up to 200m from the site entrance.

²⁷ EPA Data Archive – Summary Data Tables

Table 6.14: Receptor Sensitivity of the Area to Ecological Effects

Activity	Ecological effects	
	Sensitivity	Comment
Demolition	High	The South Dublin Bay SAC/pNHA are located within 20m of the demolition, earthworks and construction areas and within approximately 200m of the trackout area.
Earthworks		
Construction		The South Dublin Bay and River Tolka Estuary SPA is located within 50m of the demolition, earthworks and construction areas and within approximately 200m of the trackout area. Both the SAC and SPA have been internationally designated, whilst the pNHA has been nationally designated. A precautionary approach has been undertaken and it has been assumed that the ecological receptors are all sensitive to dust.
Trackout		

The overall risk of receptors to dust soiling effects, PM₁₀ and ecological effects are presented in Table 6.15. Risk is based on the criteria presented in Tables 1.6 to 1.9 in Appendix E.

Table 6.15: Summary of the Risk of Construction Effects

Activity	Dust soiling effects	PM ₁₀ effects	Ecological effects
Demolition	Low	Negligible	Medium
Earthworks	Medium	Low	Medium
Construction	Medium	Low	Medium
Trackout	Low	Low	N/A

Notes: N/A – not applicable as there are no sensitive receptors within a distance of 50m of the route used by construction vehicles.

The overall risk of dust soiling effects from the construction phase is deemed to be 'low' for demolition and trackout, and 'medium' for earthworks and construction, whilst for PM₁₀ health effects, the overall risk is deemed to be 'negligible' for demolition and 'low' for earthworks, construction and trackout. Further to this, the overall risk of ecological effects is deemed to be 'medium' for demolition, earthworks and construction. Mitigation measures appropriate for the proposed development have been presented in Section 6.7.1.

Figure 6.7: Construction Dust Assessment Buffers (Demolition, Earthworks and Construction)

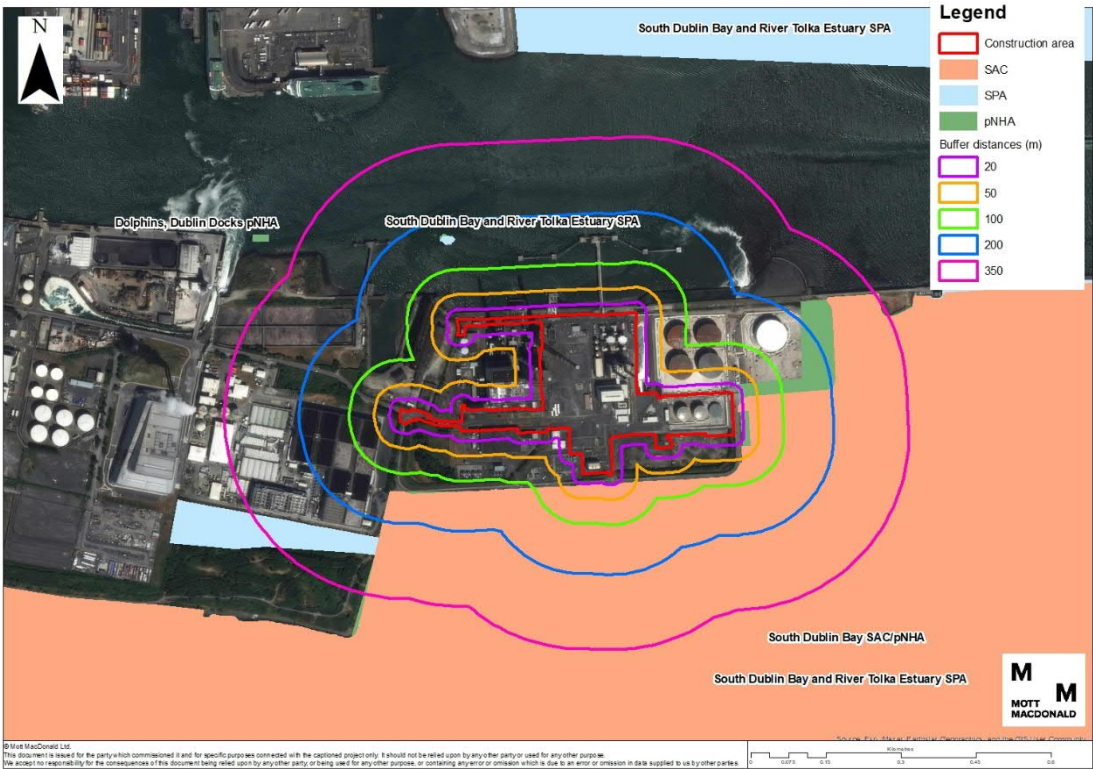
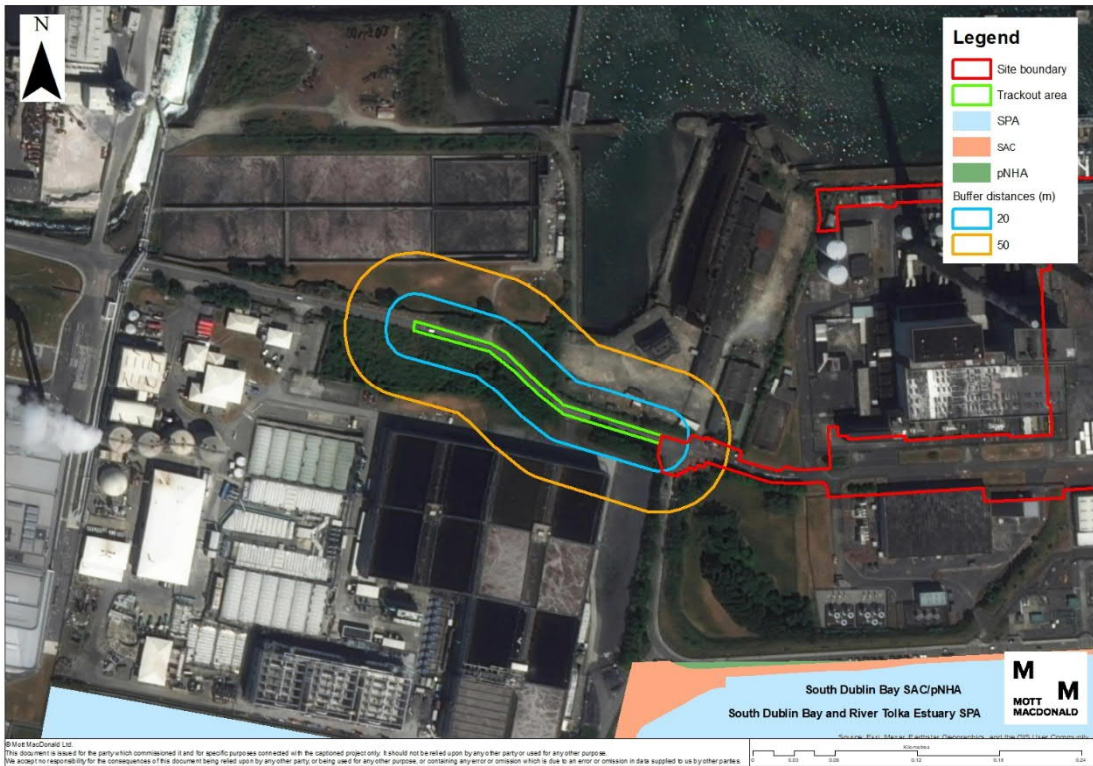


Figure 6.8: Construction Dust Assessment Buffers (Trackout)



6.5.3 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 1A – normal operating scenario:
 - Proposed development operating in isolation at 100% load, for 1000 hours per year on natural gas and 2 hours a month on gas oil for maintenance testing.
- Scenario 2A – worst case natural gas operating scenario:
 - Proposed development operating in isolation at 100% load, for 8736 hours per year on natural gas and 2 hours a month on gas oil for maintenance testing.
- Scenario 3A – emergency operating scenario:
 - Proposed development operating in isolation at 100% load, for 500 hours per year on gas oil and 8260 hours on natural gas.

As discussed in section 6.3.2.2, the modelling of the short-term averaging periods have assumed continuous operation of the proposed development on natural gas for Scenarios 1A and 2A with an annual emission limit of 35mg/Nm³ (see Table 6.1) (and therefore the same short-term results for these scenarios are predicted). While the daily BAT-AEL of 50mg/Nm³ may slightly increase the predicted short-term maximum concentrations, scenario 3A assumes continuous operation of the proposed development on gas oil based on a BAT-AEL of 250mg/Nm³ (see Table 6.1). Scenario 3 therefore includes a conservative prediction of short-term impacts as the daily BAT-AEL for gas oil operation is five times higher than the daily BAT-AEL for natural gas operation. Continuous operation has been assumed for the short-term averaging periods so that the impacts are considered based on the worst-case meteorological conditions for dispersion.

This section only considers the impact of the proposed development operating in isolation. The results from scenarios 1B, 2B and 3B (the cumulative scenario of the proposed development running alongside existing nearby plants) are presented in Section 6.7.

6.5.3.1 Human Health Receptors

Table 6.16 to Table 6.18 present the proposed development's maximum predicted 1-hour and annual mean NO₂ concentrations and 8-hour rolling CO concentrations for scenarios 1A, 2A and 3A for comparison against the respective AQS. All predicted concentrations for these averaging periods are taken from the maximum offsite gridded receptor location²⁸.

Baseline concentrations are based on the average 2018 to 2019 concentrations from the nearby Ringsend and Winetavern Street monitors, which have been obtained from the EPA data archive, as summarised in Table 6.11.

In all three scenarios, the proposed development's process contribution (PC) is less than maximum allowable process contribution (MAPC) for the 1-hour NO₂, annual mean NO₂ and 8 hour rolling CO averaging periods. Baseline concentrations (BC) assumed for the assessment are relatively high, however the predicted environmental concentrations (PEC) do not exceed

²⁸ 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 site boundary, Ringsend and North Wall sites and nearby industrial buildings which are included within dispersion modelling as they are adjacent to the site boundary. Health and safety legislation (rather than ambient air quality standards) would be applicable at these locations.

70% of the AQS. Overall, the proposed development's maximum modelled PC and PEC for both the short and long term averaging periods are not likely to cause a significant effect.

Table 6.16: Scenario 1A: Modelled Maximum Results ($\mu\text{g}/\text{m}^3$)

Pollutant	Averaging Period	AQS	MAPC	PC	PC as % of AQS	PC as % of MAPC	BC	PEC	PEC as % of AQS
NO ₂	1 hour 99.79	200	111.8	9.7	4.9	8.7	51.0	60.7	30.4
	annual mean	40	10.9	0.03*	0.1	0.3	25.5	25.5	63.8
CO ^(a)	8 hour rolling	10000	5625	23.0	0.2	0.4	2500	2523.0	25.2

Notes: AQS: Air quality standard; MAPC: Maximum allowable process contribution, e.g., for annual NO₂ the MAPC is calculated using the equation $(40 - \text{BC}) \times 0.75$; PC: Process contribution; BC: Baseline concentration; PEC: Predicted environmental concentration
Short-term averaging periods based on continuous operation on natural gas while the long-term averaging period is based on 1000 hours per year on natural gas and 24 hours per year on gas oil
*Result presented to 2 decimal places however this is not an indication of model accuracy

Table 6.17: Scenario 2A: Modelled Maximum Results ($\mu\text{g}/\text{m}^3$)

Pollutant	Averaging Period	AQS	MAPC	PC	PC as % of AQS	PC as % of MAPC	BC	PEC	PEC as % of AQS
NO ₂	1 hour 99.79	200	111.8	9.7	4.9	8.7	51.0	60.7	30.4
	annual mean	40	10.9	0.2	0.6	2.1	25.5	25.7	64.3
CO	8 hour rolling	10000	5625	23.0	0.2	0.4	2500	2523.0	25.2

Notes: AQS: Air quality standard; MAPC: Maximum allowable process contribution e.g., for annual NO₂ the MAPC is calculated using the equation $(40 - \text{BC}) \times 0.75$; PC: Process contribution; BC: Baseline concentration; PEC: Predicted environmental concentration
Short-term averaging periods based on continuous operation on natural gas while the long-term averaging period is based on 8736 hours per year on natural gas and 24 hours per year on gas oil

Table 6.18: Scenario 3A: Modelled Maximum Results ($\mu\text{g}/\text{m}^3$)

Pollutant	Averaging Period	AQS	MAPC	PC	PC as % of AQS	PC as % of MAPC	BC	PEC	PEC as % of AQS
NO ₂	1 hour 99.79	200	111.8	19.2	9.6	17.2	51.0	70.2	35.1
	annual mean	40	10.9	0.3	0.7	2.8	25.5	25.8	64.5
CO	8 hour rolling	10000	5625	62.9	0.6	1.1	2500	2562.9	25.6

Notes: AQS: Air quality standard; MAPC: Maximum allowable process contribution, e.g., for annual NO₂ the MAPC is calculated using the equation $(40 - \text{BC}) \times 0.75$; PC: Process contribution; BC: Baseline concentration; PEC: Predicted environmental concentration
Short-term averaging periods based on continuous operation on gas oil while the long-term averaging period is based on 500 hours per year on gas oil and 8260 hours per year on natural gas.

The modelled hourly and annual NO₂ concentrations at the worst-case discrete receptors (the receptors which experiences the highest concentrations) for scenarios 1A, 2A and 3A are presented in Table 6.19 and Table 6.21 respectively. The results at all modelled receptors are presented in full in Section 3 of Appendix E.

The maximum hourly mean NO₂ PC at the receptors experiencing the greatest impact across all three scenarios is below 5% of the AQS and the resultant PECs are below 31% of the 1-hour

AQS. The annual mean NO₂ PCs are below 1% of the AQS and the resultant PECs are below 64% of annual mean AQS. The 8 hour rolling CO PCs are below 0.1% of the AQS and the resultant PECs are below 26% of the CO AQS.

Table 6.19: Hourly 99.79 percentile NO₂ Results at Worst-case Human Health Discrete Receptor (µg/m³)

Scenario	Worst case receptor	AQS	PC	PC as % of AQS	BC	PEC	PEC as % of AQS
1A ^(a)	HH5	200	3.4	1.7	51.0	54.4	27.2
2A ^(a)	HH5		3.4	1.7		54.4	27.2
3A ^(b)	HH6		9.6	4.8		60.6	30.3

Notes: AQS: Air quality standard; PC: Process contribution; BC: Baseline concentration; PEC: Predicted environmental concentration

(a) Results based on continuous operation on natural gas

(b) Results based on continuous operation on gas oil

Table 6.20: Annual Mean NO₂ Results at Worst-case Human Health Discrete Receptor (µg/m³)

Scenario	Worst case receptor	AQS	PC	PC as % of AQS	BC	PEC	PEC as % of AQS
1A	HH6	40	0.007*	<0.1	25.5	25.5	63.8
2A	HH6		0.04	0.1		25.5	63.9
3A	HH5		0.05	0.1		25.6	63.9

Notes: AQS: Air quality standard; PC: Process contribution; BC: Baseline concentration; PEC: Predicted environmental concentration

*Results presented to 3 decimal places however this is not an indication of model accuracy

Table 6.21: 8 Hour Rolling CO Results at Worst-case Human Health Discrete Receptor (µg/m³)

Scenario	Worst case receptor	AQS	PC	PC as % of AQS	BC	PEC	PEC as % of AQS
1A ^(a)	HH25	10000	6.2	0.1	2500	2506.2	25.1
2A ^(a)	HH25		6.2	0.1		2506.2	25.1
3A ^(b)	HH9		13.3	0.1		2513.3	25.1

Notes: AQS: Air quality standard; PC: Process contribution; BC: Baseline concentration; PEC: Predicted environmental concentration

(a) Results based on continuous operation on natural gas

(b) Results based on continuous operation on gas oil

Figure 6.9 to Figure 6.13 present contour plots for scenarios 1A to 3A for the NO₂ 1-hour and annual mean PECs. The plots demonstrate that across all three scenarios, there is a very small annual NO₂ impact. In particular for Scenario 1A, there is no discernible impact as the annual mean NO₂ PCs are so small. Nonetheless, the greatest annual mean NO₂ impacts are experienced to the north-east of the proposed development over the sea where there the AQS would not apply.

For the hourly mean NO₂ averaging period, the greatest hourly mean NO₂ impacts for all scenarios are experienced to the west of the proposed development on industrial land and to the north east of the proposed development over the sea (where the AQS would not apply).

Across all scenarios, the areas of highest impact cover a very small area and drop off quickly. This is due to the stacks being sufficiently high to allow good dispersion of pollutants.

Figure 6.9: Scenario 1: 1-hour NO₂ 99.79 percentile PEC - Proposed Development (µg/m³)



Notes: Minimum contour level: 53µg/m³; Maximum contour level: 61µg/m³; Contour interval 1µg/m³; Meteorological year 2018, baseline NO₂ 51.0µg/m³. PEC = Predicted Environmental Concentration

Figure 6.10: Scenario 1: Annual mean NO₂ PEC - Proposed Development (µg/m³)



Notes: Minimum contour level: 25.520µg/m³; Maximum contour level: 25.534µg/m³; Contour interval 0.002µg/m³ (contours presented to 3 decimal places to demonstrate where the maximum concentrations are however this is not an indication of model accuracy), Meteorological year 2017, baseline NO₂ 25.5µg/m³, PEC = Predicted Environmental Concentration

Figure 6.11: Scenario 2: 1 Annual mean NO₂ PEC - Proposed Development (µg/m³)



Notes: Minimum contour level: 25.63 $\mu\text{g}/\text{m}^3$; Maximum contour level: 25.73 $\mu\text{g}/\text{m}^3$; Contour interval 0.02 $\mu\text{g}/\text{m}^3$, (contours presented to 2 decimal places to demonstrate where the maximum concentrations are however this is not an indication of model accuracy), Meteorological year 2017, baseline NO_2 25.5 $\mu\text{g}/\text{m}^3$, PEC = Predicted Environmental Concentration

Figure 6.12: Scenario 3: 1-hour NO_2 99.79 percentile PEC - Proposed Development ($\mu\text{g}/\text{m}^3$)



Notes: Minimum contour level: 57 $\mu\text{g}/\text{m}^3$; Maximum contour level: 71 $\mu\text{g}/\text{m}^3$; Contour interval 1 $\mu\text{g}/\text{m}^3$, Meteorological year 2018, baseline NO_2 51.0 $\mu\text{g}/\text{m}^3$, PEC = Predicted Environmental Concentration

Figure 6.13: Scenario 3: Annual mean NO₂ PEC - Proposed Development (µg/m³)



Notes: Minimum contour level: 25.7µg/m³; Maximum contour level: 25.8µg/m³; Contour interval 0.02µg/m³, Meteorological year 2017, baseline NO₂ 25.5µg/m³. PEC = Predicted Environmental Concentration

6.5.3.2 Ecological Receptors – Critical Levels

Table 6.22 presents predicted annual mean NO_x concentrations at the modelled ecological receptors, for comparison against the NO_x standard for the protection of sensitive vegetation and ecosystems for scenarios 1A to 3A.

The maximum NO_x PC is predicted at 'South Dublin Bay and River Tolka Estuary' SPA, which is approximately 20m north of the proposed development. For Scenario 1A and 2A the annual mean NO_x PC at this receptor is less than 0.3µg/m³ (1% of the AQS of 30µg/m³). For Scenario 3A, the annual mean NO_x PC at this receptor is less than 0.4µg/m³ (1.4% of the AQS of 30µg/m³). Therefore, the increases in NO_x concentrations as a result of the proposed development are below or close to 1% of the NO_x AQS in all scenarios, which is considered negligible.

While the background NO_x concentration of 47.5µg/m³ adopted for this assessment exceeds the AQS of 30µg/m³, the PC to atmospheric NO_x at ecological sites is negligible and therefore the impacts are considered imperceptible.

Table 6.22: Annual Mean NO_x Results at Ecological Receptors (µg/m³)

Receptor	AQS	Scenario 1A		Scenario 2A		Scenario 3A	
		PC	PC as % of AQS	PC	PC as % of AQS	PC	PC as % of AQS
South Dublin Bay SAC	30	0.04	0.1	0.29	1	0.40	1.3
North Dublin Bay SAC		0.03	0.1	0.21	0.7	0.28	0.9
Baldoyle Bay SAC		0.01	<0.01	0.04	0.1	0.05	0.2

Receptor	AQS	Scenario 1A		Scenario 2A		Scenario 3A	
		PC	PC as % of AQS	PC	PC as % of AQS	PC	PC as % of AQS
Rockabill to Dalkey Island SAC		0.01	<0.01	0.08	0.3	0.11	0.4
Howth Head SAC		0.01	<0.01	0.07	0.2	0.09	0.3
Ireland's Eye SAC		<0.01	<0.01	0.04	0.1	0.05	0.2
South Dublin Bay and River Tolka Estuary SPA		0.04	0.1	0.3	1	0.41	1.4
North Bull Island SPA		0.03	0.1	0.21	0.7	0.28	0.9
Baldoyle Bay SPA		<0.01	<0.01	0.03	0.1	0.04	0.1
Dalkey Islands SPA		<0.01	<0.01	0.01	<0.01	0.01	<0.01
Howth Head Coast SPA		0.01	<0.01	0.06	0.2	0.08	0.3
Ireland's Eye SPA		<0.01	<0.01	0.04	0.1	0.05	0.2
South Dublin Bay pNHA		0.04	0.1	0.29	1	0.40	1.3
North Dublin Bay pNHA		0.03	0.1	0.22	0.7	0.29	1
Dalkey Coastal Zone And Killiney Hill pNHA		<0.01	<0.01	0.01	<0.01	0.01	<0.01
Boosterstown Marsh pNHA		<0.01	<0.01	0.01	<0.01	0.01	<0.01
Grand Canal pNHA		0.01	<0.01	0.04	0.1	0.05	0.2
Royal Canal pNHA		<0.01	<0.01	0.03	0.1	0.03	0.1
Howth Head pNHA		0.01	<0.01	0.07	0.2	0.09	0.3
Baldoyle Bay pNHA		0.01	<0.01	0.04	0.1	0.05	0.2
Fitzsimon's Wood pNHA		<0.01	<0.01	0.01	<0.01	0.01	<0.01
Santry Demesne pNHA		<0.01	<0.01	0.03	0.1	0.04	0.1
Ireland's Eye pNHA		<0.01	<0.01	0.04	0.1	0.05	0.2
Sluice River Marsh pNHA		<0.01	<0.01	0.01	<0.01	0.02	0.1
Dolphins, Dublin Docks pNHA		0.01	<0.01	0.05	0.2	0.06	0.2

Notes: PC: Process contribution
PCs presented to at least one significant figure to differentiate impacts at different ecological sites and is not an indication of model accuracy.

6.5.3.3 Ecological Receptors – Critical Loads (Nitrogen Deposition)

Contributions to nitrogen deposition (eutrophication) at each ecological site have been derived from the dispersion modelling. The maximum nitrogen deposition predicted (in Scenario 3A) is 0.04 kg/ha/year and occurs at South Dublin Bay and River Tolka Estuary SPA. When applying a very conservative critical load of 5 kg/ha/yr, the process contribution is less than 1% of the critical load. On this basis, the process contribution from the proposed development is considered negligible and therefore there are no likely significant effects at assessed ecological receptors.

6.5.3.4 Ecological Receptors – Critical Loads (Acidification)

Contributions to nitrogen acid deposition at each ecological site have been derived from the dispersion modelling. The maximum nitrogen acid deposition predicted (in Scenario 3A) is 0.003 keq/ha/year and occurs at South Dublin Bay and River Tolka Estuary SPA indicating that predicted contributions of nitrogen to acid deposition are very small and hence are considered negligible and therefore there are no likely significant effects at assessed ecological receptors.

6.5.4 Decommissioning Phase

Decommissioning phase impacts are commensurate with the construction phase impacts presented above. The no significant impacts are associated with the construction phase, and therefore the decommissioning phase, provided mitigation measures appropriate to the level of risk are implemented. Potential mitigation measures are presented in section 7.8 below.

6.6 Cumulative Effects

6.6.1 Construction Phase

The proposed development was assessed on its individual construction phase impact and it was concluded in Section 6.6.1 that the risk of dust soiling effects and PM₁₀ effects from the proposed development are 'Negligible' to 'Medium' without mitigation. The application of the mitigation measures proposed in Section 6.8 will further reduce risk.

Any future developments which may be constructed simultaneously with the proposed development will be required to implement mitigation measures and associated CEMPs submitted with their respective planning applications; planning permission is subject to conditions to ensure that plans and particulars are adhered too, including mitigation measures to minimise environmental impacts. Therefore, it concluded that there will be no significant cumulative impacts during the construction phase.

6.6.2 Operational Phase

As discussed in Section 6.3.2.2 ('Model Scenarios – Cumulative'), given the energy generation capacity of the proposed development and that of the existing developments adjacent to the proposed development site, cumulative scenarios have been modelled. The cumulative scenarios have considered the impact of the proposed development in addition to:

- The existing assets at Poolbeg (the Flexgen Aero OCGT, two CCGTs and one auxiliary boiler;
- The existing and proposed assets at Ringsend (the Flexgen Aero OCGT and new OCGT²⁹);
- North Wall emergency power generation (six OCGT units);
- Dublin Bay Power Plant CCGT; and
- Dublin Waste to Energy (Covanta) Plant.

For each cumulative scenario (1B, 2B and 3B), different operating profiles for the proposed development and existing development have been assumed (see Table 6.4 for details).

The assessment of cumulative effects considers the 1 hour NO₂, annual mean NO₂ and 8 hour rolling CO. This assessment of cumulative impact is considered conservative as it assumes all plant would operate simultaneously and would coincide with the worst meteorological conditions. However, the majority of the assets/developments would operate for fewer hours than assumed in the assessment and have different operating profiles so would be unlikely to all be operating at the same time.

Baseline concentrations are based on the average 2018 to 2019 concentrations from the nearby Ringsend and Winetavern Street monitors which have been obtained from the EPA data archive, as summarised in Table 6.11. The use of the Ringsend monitor for the baseline concentrations is considered to be conservative as this monitor will include contributions from existing plant which are also included within the dispersion model (such as the existing plant at

²⁹ New OCGT proposed to be installed at Ringsend is the same design as at Poolbeg and has been included in the cumulative modelling as a worst case.

Poolbeg, the Dublin Waste to Energy Plant and Dublin Bay Power Plant). Therefore, there will be some 'double counting' of the process contributions from these plant in the assessment.

6.6.2.1 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 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?
- **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 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.

6.6.2.2 Cumulative Effects

Question 1

Modelled results show that there are no exceedances of the AQS in the region of overlap between the proposed installation and other existing or proposed installations.

Table 6.22 to Table 6.24 presents the maximum cumulative predicted 1-hour and annual mean NO₂ concentrations and 8-hour rolling CO concentration for scenarios 1B, 2B and 3B for comparison against the AQS. All predicted concentrations for these averaging periods are taken from the maximum offsite gridded receptor location. Meanwhile, Table 6.25 to Table 6.28 presents the maximum cumulative process contributions (CPC) at the worst-case human health discrete receptors across the three scenarios and averaging periods. The results at all modelled human health receptors are presented in full in Section 3 of Appendix E.

In all three cumulative scenarios, the 1-hour NO₂, annual NO₂ and 8 hour rolling AQS are not predicted to be exceeded at the maximum offsite gridded receptor location or the worst-case human health discrete receptors.

Question 2

The proposed development, in all three scenarios, operating in isolation does not exceed 25% of the hourly NO₂, annual mean NO₂ or 8 hour rolling CO AQS at any location and is demonstrated in Table 6.16 to Table 6.21 in Section 6.6.2.

Furthermore, as presented in Table 6.22 to Table 6.28, relative to the cumulative process contribution (CPC), the maximum PC from the proposed development is minimal both at gridded receptors and discrete human health receptors.

The greatest CPC is associated with the hourly NO₂ averaging period in scenario 3B. This maximum offsite impact is located adjacent to the North Wall site and modelling demonstrates that 62.5% of the CPC at this location is from the North Wall site itself while less than 1% is from the proposed development.

The proposed development is having a minimal cumulative contribution to the respective AQS in the region of overlap between proposed development and other existing installations.

Table 6.23: Scenario 1B: Modelled Maximum CPC Results (µg/m³) – Cumulative

Pollutant	Averaging Period	AQS	Proposed development PC at location of max CPC	Max CPC	CPC as % of AQS	BC	PEC	PEC as % of AQS
NO ₂	1 hour 99.79	200	0.5	125.4	62.7	51.0	176.4	88.2
	Annual mean ^(b)	40	0.03	5.5	13.8	25.5	31.0	77.5
CO	8 hour rolling	10000	1.1	236.0	2.4	2500	2736	27.4

Notes: CPC: Cumulative Process contribution (cumulative PC from proposed development plus existing assets at Poolbeg, Ringsend, North Wall, Dublin Bay Power Plant and Dublin Waste to Energy plant); BC: Baseline concentration; PEC: Predicted environmental concentration
Results presented are at the predicted maximum point of impact at offsite locations and may differ for each plant

Table 6.24: Scenario 2B: Modelled Maximum CPC Results (µg/m³) – Cumulative

Pollutant	Averaging Period	AQS	Proposed development PC at location of max CPC	Max CPC	CPC as % of AQS	BC	PEC	PEC as % of AQS
NO ₂	1 hour 99.79	200	0.5	125.4	62.7	51.0	176.4	88.2
	Annual mean ^(b)	40	0.2	6.3	15.9	25.5	31.8	79.6
CO	8 hour rolling	10000	1.1	236.0	2.4	2500	2736	27.4

Notes: CPC: Cumulative Process contribution (cumulative PC from proposed development plus existing assets at Poolbeg, Ringsend, North Wall, Dublin Bay Power Plant and Dublin Waste to Energy plant); BC: Baseline concentration; PEC: Predicted environmental concentration
Results presented are at the predicted maximum point of impact at offsite locations and may differ for each plant.

Table 6.25: Scenario 3B: Modelled Maximum CPC Results (µg/m³) – Cumulative

Pollutant	Averaging Period	AQS	Proposed development PC at location of max CPC	Max CPC	CPC as % of AQS	BC	PEC	PEC as % of AQS
NO ₂	1 hour 99.79	200	1.3	127.0	63.5	51.0	178.0	89.0
	Annual mean ^(b)	40	0.3	7.5	18.6	25.5	33.0	82.4
CO	8 hour rolling	10000	2.8	236.2	2.4	2500	2736.2	27.4

Notes: CPC: Cumulative Process contribution (cumulative PC from proposed development plus existing assets at Poolbeg, Ringsend, North Wall, Dublin Bay Power Plant and Dublin Waste to Energy plant); BC: Baseline concentration; PEC: Predicted environmental concentration
Results presented are at the predicted maximum point of impact at offsite locations and may differ for each plant.

Table 6.26: Hourly 99.79 percentile NO₂ Results at Worst-case Human Health Discrete Receptor (µg/m³) – Cumulative

Scenario	Receptor	AQS	Proposed development PC	CPC	CPC as % of AQS	BC	PEC	PEC as % of AQS
1	HH5	200	3.4	52.0	26.0	51.0	103.0	51.5

Scenario	Receptor	AQS	Proposed development PC	CPC	CPC as % of AQS	BC	PEC	PEC as % of AQS
2	HH5		3.4	52.0	26.0		103.0	51.5
3	HH7		9.0	95.4	47.7		146.4	73.2

Notes: CPC: Cumulative Process contribution; BC: Baseline concentration; PEC: Predicted environmental concentration

Table 6.27: Annual Mean NO₂ Results at Worst-case Human Health Discrete Receptor (µg/m³) – Cumulative

Scenario	Receptor	AQS	Proposed development PC	CPC	CPC as % of AQS	BC	PEC	PEC as % of AQS
1	HH24		<0.1	2.7	6.8		28.2	70.5
2	HH24	40	<0.1	2.9	7.3	25.5	28.4	71.1
3	HH24		<0.1	3.2	7.9		28.7	71.7

Notes: CPC: Cumulative Process contribution; BC: Baseline concentration; PEC: Predicted environmental concentration

Table 6.28: 8 hour Rolling CO Results at Worst-case Human Health Discrete Receptor (µg/m³) – Cumulative

Scenario	Receptor	AQS	Proposed development PC	CPC	CPC as % of AQS	BC	PEC	PEC as % of AQS
1	HH7		4.8	69.7	0.7		2569.7	25.7
2	HH7	10000	4.8	69.7	0.7	2500	2569.7	25.7
3	HH7		11.7	91.2	0.9		2591.2	25.9

Notes: CPC: Cumulative Process contribution; BC: Baseline concentration; PEC: Predicted environmental concentration

6.6.2.3 Operational Cumulative Effects Summary

The cumulative impacts of the proposed development have been assessed with other relevant nearby existing developments using dispersion modelling. Despite the conservative modelling assumptions (such as operation hours for the short-term AQS and the baseline concentration assumed for the assessment), the cumulative assessment demonstrates that there are no exceedances of the hourly NO₂, annual NO₂ or 8 hour rolling CO AQS at offsite gridded locations or discrete human health receptors. The proposed development's process contribution also does not exceed 25% of the relevant AQS and therefore the proposed development has a minimal cumulative contribution. On this basis, the cumulative impacts associated with the operation of the proposed development are not significant.

6.7 Mitigation Measures and Monitoring

6.7.1 Construction phase

The construction phase is predicted to have a 'Negligible to Medium Risk' in terms of dust soiling and PM₁₀ effects with no mitigation in place. Best practice mitigation measures adapted from the IAQM guidance are presented below and will be implemented through the D&CEMP.

- Communication and Site Management
 - Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary
 - Display the head or regional office contact information

- It is recommended that community engagement be undertaken before works commence on site explaining the nature and duration of the works
- Record all dust and air quality complaints, identify causes and take appropriate measures to reduce emissions in a timely manner and record the measures taken
- Make a complaint log available to the planning authority, when requested
- 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
- Monitoring
 - Carry out regular site inspections, record inspection results and make an inspection log available to the planning authority, when requested
 - 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
 - Preparing and maintaining the site
 - Plan site layout so that machinery and dust causing activities are located away from receptors as far as possible
 - Erect solid screens or barriers around dusty activities or the construction site boundary that are at least as high as any stockpiles
 - 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 reused on site, cover as described below
 - Cover, seed or fence stockpiles to prevent wind whipping
 - Ensure all vehicles switch off engines when stationary - no idling vehicles
 - Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment, where practicable
- Operations
 - Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction
 - Ensure an adequate water supply on the site for 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 available
 - 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
 - No bonfires and burning of waste materials
- Measures specific to demolition
 - Ensure effective water suppression is used during demolition operations
 - Avoid explosive blasting, using appropriate manual or mechanical alternatives
 - Bag and remove any biological debris or damp down such material before demolition
- Measures specific to construction
 - Ensure sand and other aggregates are stored in designated areas and ensure that appropriate control measures are in place
- Measures specific to trackout;
 - Avoid dry sweeping of large areas

- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport, where practicable
- Record all inspections of haul routes

6.7.2 Operation phase

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 Climate

This chapter is divided into two separate aspects relating to climate:

- Effects of the Scheme on climate: the effects of GHG emissions arising from the proposed Scheme on climate change. The receptor in this situation is the global atmosphere and the ensuing effect on climate itself.
- Resilience of the proposed development to present-day and future weather and climate due to climate change.

The chapter is structured in two distinct sections based upon these two separate aspects of climate. Firstly, the assessment for the GHG emissions of the proposed development is provided, followed by the assessment of climate resilience of the proposed development.

7.1 Greenhouse Gas (GHG) Emissions

7.1.1 Introduction

This section presents an assessment of the likely and significant impacts arising from the proposed development on climate change. The assessment is based on the development as described in Chapter 3 of this EIAR.

Throughout the section, reference is made to Greenhouse Gas (GHG) emissions, these consist of any atmospheric gas that absorbs thermal radiation emitted by the Earth's surface and traps the heat in the atmosphere, keeping the surface at a warmer temperature than would otherwise be possible. These commonly refer to the following gases, as covered in the IPCC Guidelines for National Greenhouse Gas Inventories³⁰:

- Carbon dioxide (CO₂);
- Methane (CH₄);
- Nitrous oxide (N₂O); and
- Fluorinated gases (e.g. SF₆, hydrofluorocarbons, and perfluorocarbons).

7.1.2 Policy and Guidance

The Planning Report which accompanies this application (Ref: 229100184_3_A) describes the wider policy and legislative context applicable to the proposed development. Policies and guidance documents of potential relevance to the climate impacts are set out in this section.

The following policy and guidance documents have been used to inform this section of the EIAR.

7.1.2.1 International Climate Change Legislation and Policy

Ireland is a party to the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. Both provide a legal framework for addressing global climate change. Building on the UNFCCC process, the Paris Agreement is a global treaty established with the intention of developing a unified approach to combating climate change. Agreed in December 2015, the Paris Agreement aims to restrict global temperature rise to well below 2°C above pre-

³⁰ IPCC (2006), IPCC Guidelines for National Greenhouse Gas Inventories. Available at: <https://www.ipcc.ch/report/2006-ipcc-guidelines-for-national-greenhouse-gas-inventories/> (accessed 20/10/2022).

industrial levels, and to pursue efforts to limit the temperature increase to 1.5°C³¹. All countries will aim to play their role in curbing emissions through their nationally determined contributions (NDC). Since the Paris Agreement, countries have reconvened at Glasgow in 2021 and agreed to pledge further cuts to emissions at the following conference as well as phase down the use of coal³².

7.1.2.2 EU Legislation

EU ETS³³

The European Union's Emissions Trading Scheme (ETS) is designed to bring about reductions in GHG emissions at least cost, covering the following gases and sectors:

- CO₂ emissions from energy intensive industry, aviation, and electricity and heat generation;
- N₂O from the production of nitric, adipic and glyoxylic acids and glyoxal; and
- Perfluorocarbons (PFCs) from the production of aluminium.

It is the “cornerstone” of the EU's policy to combat climate change and reduce GHG emissions. It has undergone three phases to date, with Phase 4 starting in 2021 and ending in 2030. Prior to the 2021 revision of the EU ETS in the Fit for 55 packages³⁴, the reduction in emissions required by the end of Phase 4 was of at least 43% by 2030 relative to 2005 levels. Under the fit for 55 package, the proposed European Commission target is to achieve 61% of emissions reductions by 2030 in the sectors covered by the EU ETS.

EU Effort Sharing Regulation³⁵

Under the EU Effort Sharing Regulation (ESR), Ireland has a target of reducing GHG emissions for sectors not included in the EU Emissions Trading Scheme (EU ETS) by 20% below 2005 levels by 2020 and a 30% reduction by 2030. The sectors covered by EU ESR are:

- Transport (except aviation and non-domestic shipping);
- Buildings;
- Agriculture;
- Industrial installations and gases not covered by the EU ETS and their waste; and
- Non-combustion related emissions from energy and product use.

Fit for 55³⁴

Realising the need to step up its ambition to reach climate neutrality by 2050, the EU made several revisions to previous laws and released five new proposals as part of its “Fit for 55” package. Most notably, the new GHG emissions net reduction target by 2030 was changed to 55% from 40% compared to 1990 levels. Revisions include increasing the uptake of renewable energy from 32% to 40%, a 42% reduction of non-ETS GHGs instead of 30% for Ireland in the Effort Sharing Regulation, an ambition of 61% of emissions reductions by 2030 in the sectors covered by the EU ETS, and the introduction of a Carbon Border Adjustment Mechanism (CBAM). Although this new package has not yet become legally binding, it is currently being discussed by the European Parliament and European Council.

³¹ UNFCCC (2015), Paris Agreement. Available at: [Paris Agreement \(All language versions\) | UNFCCC](#) (accessed 20/09/2022)

³² UNFCCC (2021), Report of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement on its third session, held in Glasgow from 31 October to 13 November 2021. Available at: https://unfccc.int/sites/default/files/resource/cma2021_10_add1_adv.pdf (accessed 20/09/2022).

³³ EU (2003), Regulation (EU) 2003/87. Available at: [EUR-Lex - 32003L0087 - EN - EUR-Lex \(europa.eu\)](#) (accessed 20/09/2022)

³⁴ European Commission (2020), Stepping up Europe's 2030 climate ambition. Available at: [EUR-Lex - 52020DC0562 - EN - EUR-Lex \(europa.eu\)](#) (accessed 20/09/2022)

³⁵ EU (2018), Regulation (EU) 2018/842. Available at: [EUR-Lex - 32018R0842 - EN - EUR-Lex \(europa.eu\)](#) (accessed 20/09/2022)

F-Gas Regulations³⁶

The objective of the F-gas regulation is to control the emission related to fluorinated greenhouse gases (F-gasses), including hydrofluorocarbons (HFCs). In the short term it seeks to limit the sale of the most important F-gases with the aim of phasing them down to one fifth of their 2014 sales by 2030. The use of F-gases is also banned when less harmful alternatives are widely available such as in fridges, air conditioning, or asthma sprays. Additionally, all existing equipment will require checks, servicing and recovery of the gases at the end of the equipment's life to prevent any further emissions.

This regulation is now being reviewed by the European Commission with a view to update it to ensure it aligns with Fit for 55.

7.1.2.3 National Legislation

Climate Action and Low Carbon Development Act 2015³⁷

The Climate Action and Low Carbon Development Act 2015 set out the legislative framework in which the Irish Government will ensure the transition to “a low carbon, resilient and environmentally sustainable economy by the end of the year 2050”. The main goals of the Act are to lay out the tools through which the transition will be achieved, these being:

- The National Mitigation Plan, which specifies the policy measures that will be required to manage and remove GHGs at a level appropriate to achieve the transition. It must be published at least every five years, the first was published in 2017;
- The national adaptation framework, which details the strategy that different sectors and local authorities must follow to reduce the vulnerability of the Irish State with regards to the effects of climate change. This too must be published at least every five years; and
- An independent Climate Change Advisory Council, which will advise the Government in its preparation, submission, and approval of the mitigation plan and adaptation framework, as well as publishing its own report on the progress made by the Irish State.

The progress made in tackling climate change is presented yearly in the Annual Statement.

Climate Action and Low Carbon Development (Amendment) Act 2021³⁸

The Climate Action and Low Carbon Development Act 2015 was amended in 2021 with a new objective for 2050 of a “climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy”. The purpose of the amendment was to strengthen the ambition of the Irish Government in addressing climate change by setting in legislation some of the suggestions made by the Climate Action Plan (see below, Climate Action Plan 2019, 2021) such as the five-year Carbon Budgets. These must be consistent with the Paris Agreement and other international obligations and will include all forms of GHG emissions. The first two carbon budgets, over a period up to 2030, will have to lead to a 51% reduction in emissions compared to the 2018 baseline with the first carbon budget formally being approved by the Irish Government in February 2022. The Irish Government has also approved the sector-specific emission ceilings within the carbon budget. Finally, local authorities will also have to prepare their own action plans for adaptation as well as mitigation, rather than just adaptation as set in the original Act.

³⁶ EU (2014) Regulation (EU) No 517/2014 of the European Parliament and of the Council on fluorinated gases and repealing Regulation (EC) No 842/2006

³⁷ Irish Government (2015); Climate Action and Low Carbon Development Act 2015 (2015). Available online at: [Climate Action and Low Carbon Development Act 2015 \(irishstatutebook.ie\)](https://www.irishstatutebook.ie/eli/2015/act/30/enacted/en/html) (accessed 20/09/2022)

³⁸ Department of the Environment, Climate and Communications (2021); Climate Act signed into law. Available online at: [gov.ie - Ireland's ambitious Climate Act signed into law \(www.gov.ie\)](https://www.gov.ie/en/ireland-s-ambitious-climate-act-signed-into-law/) (accessed 21/09/2022)

Carbon Budgets³⁹

The Irish Carbon Budgets are three five-year economy-wide carbon budgets proposed by the Climate Change Advisory Council and approved by the Government and Oireachtas. These are set out to help Ireland meet its 51% reduction in GHG emissions by 2030 and continue working towards its 2050 net-zero goal.

- 2021-2025: 295 Mt CO₂eq. This represents an average reduction in emissions of 4.8% per annum for the first budget period;
- 2026-2030: 200 Mt CO₂eq. This represents an average reduction in emissions of 8.3% per annum for the second budget period; and
- 2031-2035: 151 Mt CO₂eq. This represents an average reduction in emissions of 3.5% per annum for the third provisional budget.

To put this in perspective, total 2018 Irish GHG emissions were 68.3 Mt CO₂eq. It should also be noted that these budgets can be revised if new obligations are imposed by the EU, through other international agreements, or due to significant scientific advances.

To support carbon budget targets, in 2022 the government set sectoral emissions ceilings for the electricity, transport, buildings, industry and agriculture sectors. For the electricity sector, a ceiling of 3 Mt CO₂eq has been set for 2030, equivalent to a 75% reduction from 2018⁴⁰. The Government also committed additional resources for solar, off-shore wind, green hydrogen, agroforestry and anaerobic digestion to further accelerate the reduction of emissions.

7.1.2.4 National Policy

National Policy Position, 2014⁴¹

The National Policy Position recognised the challenge of reducing Ireland's emissions as well as setting the objective of an 80% reduction of CO₂eq emissions by 2050 compared to 1990 across the electricity generation, built environment and transport sectors, as well as “approaching” carbon neutrality in the agricultural and land-use sector. The strategies set out to achieve this were first outlined in the first National Mitigation Plan (2017)⁴². Moving forward, climate policy in Ireland will be a continual and dynamic process with frequently updated national plans to be adopted over the period to 2050.

Climate Action Plan 2019, 2021⁴³ and 2023⁴⁴

The Climate Action Plan was first published in 2019 and detailed the proposed cross-sectoral policy measures for addressing climate change by setting out 200 different actions that could be implemented to meet its 2030 targets consistent with a net zero target by 2050. Some of the main actions were aimed at increasing electricity generated from renewables to 70% through the Government's flagship support scheme, reducing EU ETS industry emissions by 10-15% compared to projections, and increasing the number of Electric Vehicles (EV) and Light Electric Vehicles (LEVs) to 936,000. The plan noted the need for Ireland to reduce its GHG emissions by 7% annually to meet its 2030 objectives, which would require a step up in its effort. There have been two updates to the Climate Action Plan in 2021 and 2023. The Climate Action Plan

³⁹ Irish Government (2022); Carbon Budgets. Available online at: gov.ie - Carbon Budgets (www.gov.ie) (accessed 20/09/2022)

⁴⁰ gov.ie - Government announces sectoral emissions ceilings, setting Ireland on a pathway to turn the tide on climate change (www.gov.ie) (accessed 18/10/2022)

⁴¹ Department of the Environment, Climate and Communications; National Policy Position. Available at: gov.ie - National Policy Position on Climate Action and Low Carbon Development (www.gov.ie) (accessed 20/09/2022)

⁴² Department of the Environment, Climate and Communications; National Mitigation Plan 2017. Available at: gov.ie - National Mitigation Plan (www.gov.ie) (accessed 20/09/2022)

⁴³ Department of the Environment, Climate and Communications; Climate Action Plan 2021. Available at: <https://www.gov.ie/en/publication/6223e-climate-action-plan-2021/> (accessed 20/09/2022)

⁴⁴ gov.ie - Climate Action Plan 2023 (www.gov.ie)

2023 is the first to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021 and following the introduction of the economy-wide carbon budgets and sectoral emissions ceilings. The sectoral carbon budgets for electricity are 40 Mt CO₂eq (2021-2025 period) and 20 Mt CO₂eq (2026-2030 period) respectively. Key measures for the electricity sector include:

- Contribute to a reduction in annual sectoral emissions to 3 Mt CO₂eq by 2030 (75% reduction from 2018 levels);
- Accelerate and increase the deployment of renewable energy to replace fossil fuels. This includes increasing delivery of onshore wind, offshore wind and solar to achieve 80% of electricity demand from renewable energy by 2030;
- Target 6 GW of onshore wind and up to 5GW of solar by 2025;
- Target 9 GW onshore wind, 8 GW solar, and at least 5 GW of offshore wind by 2030 (and an additional 2 GW offshore wind for green hydrogen production);
- Deliver and accelerate a flexible system to support renewables., with a minimum of 2 GW of new flexible gas-fired power generation by 2030;
- Manage electricity demand growth. Deliver a Demand Side Strategy to ensure 20-30% demand side flexibility by 2030; and
- Achieve further emissions reduction through the electrification of other sectors, such as transport and heating.

Programme for Government – Our Shared Future (Government of Ireland 2020)⁴⁵

The Programme for Government set out the objectives of the government in response to the Covid-19 fallout but also contained several commitments regarding the climate crisis such as enshrining net-zero into Irish law, an annual average of 7% reduction in GHG emissions, retrofitting houses, electrification of transport, a ban on new diesel and petrol cars by 2030, and no new licences for gas exploration. Additionally, there will be an extensive reshape of investment in transport to ensure a modal shift towards public transport, cycling, and walking.

7.1.2.5 Local Policy

As highlighted in Section 7.1.2.3 the Climate Action and Low Carbon Development (Amendment) Bill 2021 requires each local authority to make a five year “local authority climate action plan” that specifies mitigation and adaptation measures to be adopted. They should also consult, co-ordinate, and co-operate with other local authorities where appropriate.

Climate Action Regional Offices (CARO)⁴⁶

Four regional offices were set up, funded by the Department of Environment, Climate and Communications, to coordinate regional and local level action on climate change, as a response to the National Adaptation Framework published in 2018. Dublin City Council (DCC) sits within the Dublin Metropolitan Climate Action Regional Offices (CARO) with CARO’s main objective to help the four local authorities within the Dublin area in the preparation of their Climate Action Plan, facilitate collaboration between these local authorities, raise awareness of the impacts of climate change, develop a knowledge hub, and facilitate stakeholder engagement into climate action policy development and implementation.

⁴⁵ Department of the Taoiseach (2020); Programme for Government: Our Shared Future. Available online at: [gov.ie – Programme for Government: Our Shared Future \(www.gov.ie\)](https://www.gov.ie/en/programme-for-government-our-shared-future/) (accessed 21/09/2022)

⁴⁶ CARO.ie (2022). Available online at: <https://www.caro.ie/>(accessed 20/09/2022)

Dublin City Council (DCC) Climate Action Plan, 2019⁴⁷

The DCC Climate Action Plan 2019 was produced with the Codema, which is Dublin's Energy Agency, and the Dublin Metropolitan Climate Action Regional Office (CARO). It contains 219 actions covering five sectors – Energy and Buildings, Transport, Flood Resilience, Nature-Based Solutions and Resource Management (Waste and Water). Key targets include:

- 33% improvement in DCC's Energy efficiency by 2020;
- 40% reduction in DCC's GHG emissions by 2030;
- Making Dublin climate resilient; and
- Engage and inform citizens on climate change.

In 2021, the DCC published an update report to review progress of the CAP and found that 86.4% of the actions are still ongoing, 7.5% have been completed, and 6% had not been started with the remaining 1.5% as new actions recently added. The report also found that energy efficiency improved by 49.2%, surpassing the target set in 2019, and achieved a reduction of 26% in GHG emissions.

Covenant of Mayors⁴⁸

The Covenant of Mayors is an initiative of local governments to commit and achieve Climate and Energy targets, initially within the EU but now including 57 countries. The DCC signed the renewed Covenant of Mayors in 2021 to commit to reaching Climate Neutrality by 2050, this means that the council will have to further reduce its emissions, strengthen its mitigation and adaptation measures, and reduce energy poverty.

7.1.2.6 Guidelines

This assessment was prepared with reference to the following guidance documents:

- Institute of Environmental Management & Assessment (IEMA) Guide: Assessing Greenhouse Gas Emissions and Evaluating their Significance, second edition (February 2022)⁴⁹;
- Environmental Protection Agency, Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR) (2022);
- European Commission (EC), Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (2013); and
- Publicly Available Specification 2080 (PAS), PAS 2080: 2016 Carbon Management in infrastructure.
 - World Resources Institute GHG Protocol Corporate Standard.
 - RICS 2021 Whole Life Carbon Assessment for the Built Environment (RICS), 1st edition⁵⁰.

Assessing Greenhouse Gas Emissions and Evaluating their Significance (IEMA)

IEMA's guide on Assessing Greenhouse Gas Emissions and Evaluating their Significance (second edition, 2022), hereafter referred to as "IEMA guidance", provides a recommended approach to the treatment of GHG emissions within an Environmental Impact Assessment (EIA) and how these should be reported within an Environmental Impact Assessment Report (EIAR).

⁴⁷ Dublin City Council; Dublin City Council Climate Action Plan 2019 – 2024. Available online at: [Dublincity.ie - Dublin City Council Climate Action Plan 2019 – 2024 \(www.dublincity.ie\)](https://dublincity.ie/dublin-city-council-climate-action-plan-2019-2024). Accessed (21/09/2022)

⁴⁸ Covenant of Mayors. Available online at: covenantofmayors.eu – Covenant Initiative (www.covenantofmayors.eu) (accessed on 21/09/2022).

⁴⁹ EMA - Launch of the Updated EIA Guidance on Assessing GHG Emissions - February 2022

⁵⁰ Whole Life Carbon Assessment for the Built Environment, 1st edition (rics.org)

It sets out assessment principles and key steps in the assessment as well as providing advice on addressing the significance of projects' emissions. In its latest version (February 2022), the guide emphasises the importance of mitigation measures, which should be considered from the outset of the project and throughout the project's lifetime.

PAS 2080 Carbon Management in Infrastructure⁵¹

PAS 2080 (2016) sets out a common approach and understanding to managing whole life carbon in the provision of economic infrastructure based upon the findings of the Infrastructure Carbon Review⁵². It promotes reduced GHG emissions, reduced cost infrastructure delivery, more collaborative ways of working, and a culture of challenge in the infrastructure value chain.

7.1.3 Methodology

7.1.3.1 Approach to Data Collection

The completion of a climate impact assessment requires collection of relevant activity data and carbon emission factors for each emission source within the defined assessment boundaries and scope (see Section 7.1.3.2). As the Poolbeg OCGT is at preliminary design stage, activity data has been obtained from project design specifications, and relevant reports (including other sections of this EIAR report) where activities, materials, machinery, and energy required for the project's construction and operation stages are estimated at this stage. GHG emission factors have been obtained from recognised industry reference sources. All data sources used in the production of this section of the Climate Chapter are summarised in Table 7.1 below.

Table 7.1: Data Sources used to inform the GHG section of this Climate Chapter

Data source	Date	Data contents
Sustainable Energy Authority of Ireland (SEAI) Conversion Factors ⁵³	September 2022	Energy and fuels GHG emission factors published by SEAI
United Kingdom's Department for Business, Energy & Industrial Strategy (BEIS) Conversion Factors 2021: full set for advanced users – revised January 2022 ⁵⁴	September 2022	Energy and fuels GHG emission factors published by BEIS
Mott MacDonald's in-house GHG accounting tool, the Moata Carbon Portal ⁵⁵	Version 2022	GHG assessment tool (independently accredited to standards)
Air Quality and Climate Modelling Scenarios Table	September 2022	OCGT operation and fuel consumed under different scenarios, provided by ESB
Siemens Energy ESB OCGT <299MW F class, Estimated SGT5-400F Gas Turbine Performance	August 2022	OCGT performance data (combustion mass balance and emissions), provided by ESB
Construction Methodology Report, Poolbeg 299 MW Open Cycle Gas Turbine (OCGT)	August 2022	Estimated bulk material and metal material quantities for proposed development construction
Poolbeg 299MW OCGT EIAR Chapter 8 Noise and Vibration	October 2022	Estimated onsite machinery use during proposed development construction
Poolbeg 299MW OCGT EIAR Chapter 14 Roads and Traffic	August 2022	Estimated vehicle movements to and from site.

⁵¹ BSI (2016) PAS 2080: Carbon management in infrastructure (accessed 20/09/2022)

⁵² HM Treasury (2013) Infrastructure Carbon Review. Available online at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/260710/infrastructure_carbon_review_251113.pdf (accessed 20/09/2022).

⁵³ Conversion Factors | SEAI Statistics | SEAI (accessed 30/09/2022)

⁵⁴ Greenhouse gas reporting: conversion factors 2021 - GOV.UK (www.gov.uk) (accessed 30/09/2022)

⁵⁵ Moata Carbon Portal - Mott MacDonald

Data source	Date	Data contents
Poolbeg 299MW OCGT EIAR Chapter 15 Material Assets including Waste	November 2022	Landfill and recovery sites
CESMM4: Civil Engineering Standard Method of Measurement, Fourth edition (CESMM4) ⁵⁶	October 2022	Construction materials and construction processes GHG emissions

7.1.3.2 Impact Assessment

The approach followed to complete the climate impact assessment has been based on IEMA's guidance as well as "Guidelines on the information to be contained in Environmental Impact Assessment Reports" (EPA, 2022) which will be referred to EPA's guidance hereafter. The guide indicates that assessments should follow the principles set out in referenced GHG quantification guidelines, such as the GHG Protocol Corporate Standard, which are: relevance, completeness, consistency, transparency, and accuracy. The guide does not specify a specific approach, but it provides a framework of six steps that an assessment should incorporate. These steps have been followed in completing this impact assessment and are explained and presented in the sections below.

GHG Assessment Scope and Boundaries

The activities that take place in the construction and operation of an infrastructure project, such as the proposed development, generate GHG emissions directly and indirectly. Typical direct GHG emissions during the construction phase include emissions from combustion of fossil fuels for machinery operation and vehicle movements on site. Indirect GHG emissions (emissions that do not occur in the project site boundary but occur elsewhere because of project activities) include emissions associated with the consumption of grid electricity, and emissions arising from the production and transport to site of the construction materials and equipment installed. After construction, direct and indirect GHG emissions arise from the operation and maintenance of the project over its operational life and from end-of-life decommissioning.

The different activities that give rise to GHG emissions for an infrastructure project can be categorised according to their lifecycle stage (as defined by PAS2080 and EN15804 Standards):

Figure 7.1: Life Cycle Stages and Modules for Infrastructure GHG Emissions Assessment (based on PAS2080)

	Product Stage			Construction Stage		Use Stage									End- of - Life Stage				Benefits beyond the system boundary			
	Preliminary studies	Raw material supply	Transport	Manufacturing	Transport to building site	Installation into building	Use/application	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Other operational processes	Users' utilization of infrastructure	Deconstruction/demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling
A0	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	B8	B9	C1	C2	C3	C4	D	D	D	

⁵⁶ CESMM4 | CESMM (icevirtuallibrary.com)

To assess the climate impact of the proposed OCGT at Poolbeg, the boundaries set out for the GHG assessment include activities during the construction of the proposed development and during operation of the plant over its lifetime. In particular, the following project lifecycle stages have been included in the assessment:

- Construction activities: Product stages (A1, A2, A3) and construction process stages (A4, A5); and
- Operation activities: Operational energy use (B6).

Under other operational processes (B7) there is a potential GHG emission source from leakage of SF₆ insulation gas from switchgear. For the proposed development ESB has specified that all low voltage (LV) and medium voltage (MV) equipment should be SF₆ free. For the required 220kV GIS switchgear which currently is only commercially available with SF₆ insulation gas, the leakage rate will not exceed 0.5% (closed type pressure system and as per IEC 62271-203 High voltage switchgear and control gear Part 203 standard). The quantity of SF₆ gas to be contained in the 220kV GIS switchgear is not known yet, therefore GHG emission from SF₆ annual leakage have not been calculated at this stage, although due to the very low specified leakage rate it is very likely they will be immaterial.

Under construction activities, transport of construction workers to site and temporary accommodation has been excluded, based on professional judgment of materiality. Under use stage activities, maintenance, repair, replacement, and refurbishment of plant as these have yet to be defined and will be subject to the contract agreement and materiality considerations. Other use activities such as operational water use, and end-of-life stage activities are also excluded for the same reasons. With regards to exclusion of life cycle modules, IEMA's guidance indicates "*Certain life cycle modules (or stages) can be excluded if these exclusions are clearly highlighted and justified by the practitioner using professional judgement and in accordance with the materiality and cut-off guidance*". Such guidance is that life cycle stages can be excluded where expected emissions are less than 1% of total emissions and where all such exclusions total a maximum of 5% emissions. Given the nature of the project it is expected that over its lifetime more than 95% of GHG emissions will arise from operational energy use (B6), therefore exclusion of other use activities indicated above is justified.

Baseline

To assess and report the net GHG emissions impact of the proposed OCGT at Poolbeg, it is necessary to establish a baseline against which the proposed development can be compared.

In the main Poolbeg OCGT development area (physical boundary of the plant), there are pre-existing buildings, foundations, and ground slabs that will require demolition before the OCGT plant can be built, with no existing sources of GHG emissions arising from these. Therefore, the baseline GHG emissions within the physical boundary of the project are zero.

As the impacts of GHG emissions and climate change are not geographically limited, it is not pertinent or relevant to set out a geographical boundary near the project physical site boundary to establish a baseline.

With regards to the impact of the proposed OCGT at Poolbeg to the sector level, a sectoral baseline can be set out based on available regional or national data. As an electricity generation project, the sectoral baseline has been determined at national level by using the Irish Government's published sectoral emissions ceilings which show the sector's total GHG emissions in 2018 were a total of 10.5 million tonnes of carbon dioxide equivalents (MtCO₂eq)⁵⁷.

⁵⁷ [gov.ie - Government announces sectoral emissions ceilings, setting Ireland on a pathway to turn the tide on climate change](https://www.gov.ie/en/news/2020-09/government-announces-sectoral-emissions-ceilings-setting-ireland-on-a-pathway-to-turn-the-tide-on-climate-change/)
(www.gov.ie)

The set ceiling sets out a high pace GHG emissions reduction trajectory to limit emissions in 2030 to 2-4 MtCO₂eq.

Table 7.2: Electricity Sector Emission Ceiling, Climate Action Plan

Sector	2018 Emissions (MtCO ₂ eq.)	2030 Target Emissions (MtCO ₂ eq.)	% Reduction Relative to 2018
Electricity	10.5	2-4	62-81%

Assessment Methodology

The GHG assessment methodology consists of the collection of activity data, and relevant carbon emission factors, to calculate GHG emissions for each of the project stages and emission sources within the assessment boundary and scope. In doing so, the principles of relevance, completeness, consistency, transparency, and accuracy have been followed. As per IEMA's guidance, several scenarios have been assessed to ensure both normal (expected) and reasonable worst-case outcomes are assessed. Also, in following the principles of relevance and accuracy, bespoke emissions factors through mass balance (stack emission mass flows) have been used to calculate operational GHG emissions.

In completing the GHG assessment for the construction activities (lifecycle stages A1 to A5), the following approach has been followed:

- The construction materials embodied carbon (lifecycles stages A1 to A3) has been calculated using Mott MacDonald's in-house carbon management tool, the Moata Carbon Portal. Construction materials quantities and types have been taken from "Construction Methodology Report, Poolbeg 299 MW Open Cycle Gas Turbine (OCGT)". Where the material type is not specified in this report, reasonable material type assumptions have been made based on professional judgement. For example, average engineering steel has been used to estimate GHG emissions from construction metalwork and associated plant use requirements.
- GHG emissions from the transport of construction materials to site (A4) and transport of demolition waste to landfill/recovery sites (A5) have been calculated from materials quantities and the distance travelled.
- For construction materials two different transport routes have been considered: most materials have been assumed to be a normal load and have a transport distance of 50km by rigid average heavy goods vehicle (HGV) (as per RICS guidance). Abnormal load (plant and metalwork) has been assumed to be transported by container ship as specified in the "Poolbeg 299MW OCGT EIAR Chapter 14 Roads and Traffic" of this EIAR. The ship transport distance has been assumed to be 790km (port of origin Havre, France), and additional road distance of 200 km on HGV (as recommended for specialised materials in RICS).
- Demolition waste quantities have been obtained from "Construction Methodology Report, Poolbeg 299 MW Open Cycle Gas Turbine (OCGT) (ESB 2022)". In addition, 2% of materials used for construction activities have been assumed to be lost to waste based on professional judgement.
- Waste transport has been accounted for in two different ways to account for disposal and recovery. 50% of the generated waste material has been assumed to be recovered, this is achievable given that there is local infrastructure to process C&D waste ("Poolbeg 299MW OCGT EIAR Chapter 15 Material Assets including Waste"), with an average distance to local recovery sites to be 13.2 km. The 50% sent to landfill will travel an average of 17.4km. None of the materials can be used as potential sources of waste to energy so none will be sent to the nearby "Covanta" generation site.

- Due to a lack of specific Irish emission factors, the GHG emissions from waste disposal have been calculated using the Department for Business, Energy and Industrial Strategy (BEIS, UK) for landfill disposal (Conversion Factors 2021: full set for advanced users – revised January 2022). An estimate of the construction equipment used on site has been taken from the " Poolbeg 299MW OCGT EIAR Chapter 8 Noise and Vibration " of this EIAR. Plant and machinery typical fuel use has been taken primarily from CESMM4. Fuel emission factors have been taken from BEIS Conversion Factors 2021.
- All fuel emission factors include well to tank (WTT) emissions.

To assess GHG emissions from the operation of the proposed Poolbeg OCGT (lifecycle stage B6) mass balance data from the proposed OCGT plant's design technical specification provided by the client has been used. This method is more specific to the plant's design and therefore has been deemed to be more accurate than the use of fuel consumption data and carbon emission factors from reference sources. In addition to direct emissions from combustion of fuel in the OCGT plant, the indirect GHG emissions from fuel production and transport to site known as well to tank (WTT) impacts have also been estimated.

For operation of the proposed OCGT plant, five different plant operation scenarios have been assessed to understand the climate impact under proposed normal operation, worst case, and emergency operation. These are summarised in Table 7.3 below.

Table 7.3: Scenarios Modelled to Assess Operational GHG Emissions

Description	Units	OCGT Operation Scenarios				
		1 – normal operation	2 – worst case natural gas operation	3 – emergency operation	4 – emergency operation (low NOx)	5 – worst case diesel operation
Natural gas operation	hours/year	1000	8760	8270	8270	0
Diesel operation	hours/year	24	0	500	500	8760

7.1.3.3 Assumptions and Limitations

Any GHG emissions assessment at design stage is an estimate of the proposed development based on best available data. There is an inherent limitation in GHG carbon assessments, as the assessment is based on the project design at the time. The final constructed asset will not have the same carbon emissions as estimated due to differences in the final design, materials' procurement specification and construction practices on site. The final operational GHG emissions may be higher or lower than estimated depending on the final operation hours for the plant and plant performance efficiency during its operational lifetime.

Therefore, the GHG emissions quantitative results obtained from this assessment are only an estimate, developed for the only purpose of evaluating the likely impact of the proposed development on the climate.

7.1.3.4 Evaluation of Significance

Table 7.4 sets out the significance criteria, adapted from the IEMA guidance. The significance criteria are related to the context on which the project is developed and its alignment with sectoral or national set targets for climate change mitigation, such as set national trajectories to net zero and sectoral carbon budgets.

Table 7.4: Significance Criteria

Scale of effect	Description	Significance
Major adverse	Emissions are not mitigated, or only comply with do-minimum standards.	Significant
Moderate adverse	Emissions are partially mitigated, but do not align to relevant policy decarbonization goals.	Significant
Minor adverse	Emissions fully align to applicable policy requirements and good practice.	Not significant
Negligible	Emissions reductions are well beyond applicable policy and design standards towards net zero, with minimal residual emissions.	Not significant
Beneficial	Net impacts are below zero, having a positive climate impact.	Significant

7.1.3.5 Study Area

The assessment of the effects on climate does not have a physical study area *per se* as the receptor (the global climate) for GHG emissions is not spatially defined. Climate change resulting from GHG emissions will lead to social, environmental, and economic impacts felt globally, regardless of where they are emitted.

7.1.4 Receiving Environment

As described above, GHG emissions are not geographically limited and have a global effect rather than a specific local receptor to which a level of sensitivity can be assigned. Therefore, the receptor of GHG emissions from the project is the global atmosphere.

7.1.5 Likely Significant Impacts

7.1.5.1 Construction Phase

The construction phase impact assessment has included GHG emissions arising from the following activities (relevant lifecycle stages in brackets):

- Production of construction materials, also known as materials' embodied carbon (A1, A2, A3);
- Delivery of construction materials to site (A4);
- Energy used in construction activities (A5), including demolition of existing infrastructure; and
- Transport of demolition waste to disposal site and waste disposal emissions (A5).

The estimated GHG emissions for the proposed Poolbeg OCGT construction phase are presented in Table 7.5. These include GHG emissions from demolition of existing assets, enabling works and construction of the proposed Poolbeg OCGT. As these are based on best available data and assumptions (as described in Section 7.1.3.3) they should only be considered indicative at this stage.

Table 7.5: GHG Emissions Estimate from Project Construction Phase

Stage	Emissions Stage	GHG Emissions (approx. tonnes CO ₂ eq)	GHG emissions (approx. tonnesCO ₂ eq)
Demolition and Enabling Works	A1-A3	1,362	2,602
	A4	214	
	A5	1,026	
Main Development	A1-3	11,438	13,587
	A4	838	
	A5	1,312	

Table 7.6: Summary of Estimated Construction GHG Emissions by Lifecycle Stage and Total

A1-3 emissions	A4 emissions	A5 emissions	Total
Tonnes CO ₂ e	Tonnes CO ₂ eq	Tonnes CO ₂ eq	Tonnes CO ₂ eq
12,800	1,051	2,338	16,190

7.1.5.2 Operation and Maintenance Phase

The operation phase climate impact assessment has included GHG emissions arising from the following activities:

- Energy consumption during operation of the Poolbeg OCGT plant and emergency generator (B6).

The GHG assessment results are outlined in Table 7.7 and Table 7.8. These show total direct GHG emissions of circa 160,000 tonnes of CO₂eq. per year under normal operation of the OCGT plant. In addition, when the well to tank (WTT) emissions are included (these are indirect emissions from the manufacturing and transport of the fuel to the site) the total GHG emissions under the normal scenario increase to circa 187,000 tonnes of CO₂eq. per year.

Table 7.7: Poolbeg OCGT Plant Operational GHG Emissions under Different Scenarios

Description	Units	1 – normal operation	2 – worst case natural gas operation	3 – emergency operation	4 – emergency operation (low NO _x)	5 – worst case diesel operation
Flue gas CO ₂ mass flow (from Nat gas)	kg/s	43	43	43	43	43
Flue gas CO ₂ mass flow (from Nat gas)	kg/h	155,319	155,319	155,319	155,319	155,319
Flue gas CO ₂ mass flow (from diesel)	kg/s	51	51	51	51	51
Flue gas CO ₂ mass flow (from diesel)	kg/h	182,395	182,395	182,395	182,395	182,395
Natural gas GHG emissions	tCO ₂ eq/year	155,319	1,360,598	1,284,491	1,284,491	-
Diesel GHG emissions	tCO ₂ eq/year	4,377	-	91,197	91,197	1,597,778
Total GHG emissions (direct)	tCO₂eq/year	159,697	1,360,598	1,375,689	1,375,689	1,597,778

Table 7.8: Poolbeg OCGT Plant WTT GHG Emissions under Different Scenarios

Description	Units	1 – normal operation	2 – worst case natural gas operation	3 – emergency operation	4 – emergency operation (low NO _x)	5 – worst case Diesel operation
Natural gas WTT GHG emission factor	KgCO ₂ eq/kWh (NCV)	0.03474	0.03474	0.03474	0.03474	0.03474

Description	Units	1 – normal operation	2 – worst case natural gas operation	3 – emergency operation	4 – emergency operation (low NOx)	5 – worst case Diesel operation
Diesel WTT GHG emission factor	KgCO ₂ eq/kWh (NCV)	0.063	0.063	0.063	0.063	0.063
WTT Natural gas GHG emissions	tCO ₂ e/year	26,015	227,890	215,143	215,143	-
WTT Diesel GHG emissions	tCO ₂ eq/year	1,036	-	21,579	21,579	378,071
WTT total GHG emissions	tCO₂eq/year	27,051	227,890	236,722	236,722	378,071

When compared to the sectoral baseline for Ireland's electricity sector, these annual emissions will likely result in an increase of 1.5% over the 2018 baseline emissions for the Irish electricity sector.

With regards to GHG emissions from SF₆ leakage, as described in the methodology section there is no data available on quantity of SF₆ gas to be contained in the switchgear. To confirm the expected immateriality of emissions from this source, an assessment has been completed assuming 100 kg of SF₆ gas was contained. This produced an estimate of GHG emissions of 12 tCO₂eq per year, which compared with the emissions from other sources presented above would confirm its immateriality.

7.1.5.3 Decommissioning Phase

The climate impact for the proposed development demolition after its end of life is reached has not been assessed, due to lack of data and uncertainty regarding the final disposal date and route for disposal. Based on professional judgement, these are likely to not be material compared to the project whole life emissions.

7.1.5.4 Project Whole Life

Assuming the project whole life of 20 years, the whole life GHG emissions can be estimated by adding operational emissions over 20 years of plant operation to the construction emissions. This results in estimated total project whole life GHG emissions of circa 3.75 MtCO₂eq. These results indicate that more than 99% of the project's whole life GHG emissions are likely to originate from the operation of the OCGT plant (stage B6).

This whole life GHG emissions estimate is based on assuming the OCGT plant would operate under the "normal" scenario. Also as indicated in Section 7.1.3.2 all calculations are based on best available data, which is likely to be updated as the proposed development progresses through procurement, construction, and operation.

7.1.6 Cumulative Effects

GHG emissions are cumulative in nature, impacting the global atmospheric concentration of emissions. Additional development in the local area does not result in a greater local climate change effect from the Proposed Development (or vice versa). IEMA's guidance states that "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".

7.1.7 Significance of Effects

To evaluate the significance of the proposed Poolbeg OCGT effects on the climate, the likely impact of the proposed development on climate is compared against national set targets for climate change mitigation and with sectoral commitments. As described in Section 7.1.3.2 the Irish Government set ceiling for the electricity sector aims to reduce emissions to 2-4 MtCO₂eq per year by 2030, compared to 10.5 MtCO₂eq per year in 2018. This means a significant GHG emission reduction trajectory for the sector up to 2030.

Based on the GHG emissions assessment the likely impact of the proposed development will be significantly adverse, as the use of natural gas or diesel as fuel results in significant annual GHG emissions which will not contribute to the set national targets and sectoral ceilings described above. However, the proposed development purpose is to provide additional generating capacity during periods of high demand or when renewable energy sources cannot meet demand. Therefore, this development will facilitate the increased use of renewable energy technologies by providing energy to the national grid during periods when the energy available from the renewable technologies is insufficient. In this sense the purpose of the project does support the national and sectoral climate mitigation targets.

7.1.8 Mitigation and Monitoring Measures

For effective climate change impact mitigation, project GHG emissions reduction measures should be considered and implemented through all project delivery stages, starting at project design and construction and continuing through project operation and up to end of life and decommissioning. The proposed climate change mitigation measures for this proposed OCGT are outlined below.

7.1.8.1 Design Phase

Proposed climate mitigation measures at design stage:

- Carefully evaluate plant design options and technology specification to ensure final plant design delivers in efficiency and performance, consequently reducing the amount of fuel consumed and GHG emissions released once the plant is in operation; and
- Where possible, specify electrical equipment without SF₆ insulation gas. When not possible, ensure all SF₆ containing equipment complies with or exceeds applicable European and national legislation to minimise leakage.

7.1.8.2 Construction Phase

Proposed climate mitigation measures at construction stage:

- Where possible, minimise the quantity of materials used, and aim to reuse and or repurpose local materials instead of procuring or importing new ones. For example, consider if some of the materials from the decommissioning of the existing site can be used in enabling works, rather than disposed of to landfill;
- Where possible use low carbon materials. This is of particular importance for high embodied carbon materials such as steel, and materials used in large quantities like concrete;
- Notwithstanding the above, it is important to consider the durability of materials or equipment and their maintenance, replace and refurbishment requirements over the project life. Selection should aim to reduce the overall project climate impact, not only the embodied carbon when constructed;
- Where possible, minimise transport distances and select low carbon transport methods such as shipping or train transportation;

- Select energy efficient construction materials and vehicles, ensure rational use to minimise emissions; and
- Ensure the climate mitigation measures within the Demolition and Construction Environmental Management Plan are applied.

7.1.8.3 Operation and Maintenance Phase

As the results of the GHG assessment demonstrate, the greatest sources of GHG emissions for the OCGT plant at Poolbeg will arise from the fuel consumption during operation (stage B6), therefore it will be very important to closely monitor energy consumption and to implement any possible energy saving measures during operation.

The following mitigation measures are proposed:

- Minimise the use of diesel during plant operation. Diesel emissions per unit of energy output are greater than natural gas emissions, therefore this fuel should be avoided whenever possible;
- Ensure maintenance and operation procedures are followed as per design and manufacturer specifications to ensure maximum efficiency of plant is achieved. This minimises the amount of fossil fuel required to achieve a defined power output;
- Continuously monitor OCGT plant performance parameters to ensure operation in optimal efficient conditions;
- Monitor stack emissions and report plant GHG emissions on a regular basis, continuously look for options to reduce emissions;
- Review on a regular basis the availability and feasibility of deploying low carbon fuels and implement when feasible. For example, biomethane or green hydrogen might become available and feasible to implement in the medium to long term;
- If high voltage switchgear with SF₆ as insulation gas is installed, ensure monitoring and adequate maintenance to prevent leakage; and
- Include all monitoring and mitigation measures proposed above in the project Demolition and Construction Environmental Management Plan.

7.1.8.4 Decommissioning Phase

At the end of its operational life, it is important that plant's decommissioning activities are planned as to minimise climate impacts. Many of the mitigation measures described in the construction phase with regards to machinery operation and transport will be applicable to the decommissioning phase. In addition, the final disposal route for the decommissioned materials should be such that materials are wherever possible reused and repurposed, or recycled, with disposal to landfill only as a last alternative.

7.1.9 Residual Impacts

While opportunities for GHG mitigation have been identified in Section 7.1.8, these are not quantifiable at this stage of the project, therefore, this residual effect assessment assumes that no mitigation has been implemented and thereby presents a worst-case assessment.

As the level of design information becomes more detailed, the potential carbon savings can be quantified.

7.2 Climate Resilience

7.2.1 Introduction

This section presents a high-level assessment of the resilience of the proposed development to present-day and future weather and changes to the climate due to climate change. The assessment is based on the development as described in Chapter 3 of this EIAR.

This section details the potential impacts of climate change on the proposed development and outlines considerations for appropriate mitigation that will be reviewed and implemented during the next stage of design.

7.2.2 Policy and Guidance

The Planning Report that accompanies this application (Ref: 229100184_3_A) describes the wider policy and legislative context applicable to the proposed development. Policies and guidance documents of potential relevance to the climate impacts are set out in this section.

The following policy and guidance documents have been used to inform this section of this Climate Chapter of the EIAR.

7.2.2.1 International Climate Change Legislation and Policy

Ireland is a party to the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. Both provide a legal framework for addressing global climate change. Building on the UNFCCC process, the Paris Agreement is a global treaty established with the intention of developing a unified approach to combating climate change. Agreed in December 2015, the Paris Agreement aims to restrict global temperature rise to well below 2°C above pre-industrial levels, and to pursue efforts to limit the temperature increase to 1.5°C⁵⁸. All countries will aim to play their role in curbing emissions through their nationally determined contributions (NDC). Since the Paris Agreement, countries have reconvened at Glasgow in 2021 and agreed to pledge further cuts to emissions at the following conference as well as phase down the use of coal⁵⁹.

7.2.2.2 National Legislation

National Policy on Climate Action and Low Carbon Development⁶⁰

Ireland's first piece of climate action policy on its coherent journey towards a low-carbon, climate resilient and sustainable economy was the Climate Action and Low-Carbon Development National Policy Position, which was launched in 2014. The policy position:

- Recognises the threat of climate change for humanity.
- Anticipates and supports mobilisation of a comprehensive international response to climate change, and global transition to a low-carbon future.
- Recognises the challenges and opportunities of the broad transition agenda for society.
- Aims, as a fundamental national objective, to achieve transition to a competitive, low-carbon, climate resilient and environmentally sustainable economy by 2050.

⁵⁸ UNFCCC (2015), Paris Agreement. Available at: [Paris Agreement \(All language versions\) | UNFCCC](#) (accessed 20/09/2022)

⁵⁹ UNFCCC (2021), Report of the Conference of the Parties serving as the meeting of the Parties to the Paris Agreement on its third session, held in Glasgow from 31 October to 13 November 2021. Available at: https://unfccc.int/sites/default/files/resource/cma2021_10_add1_adv.pdf (accessed 20/09/2022).

⁶⁰ Department of the Environment, Climate and Communications (2013) National Policy Position on Climate Action and Low Carbon Development. Available from: gov.ie - [National Policy Position on Climate Action and Low Carbon Development \(www.gov.ie\)](#). [Accessed May 2022].

The policy position also sets out a high-level roadmap for future climate policy in Ireland, based on the adoption of a series of national plans addressing both climate adaptation and greenhouse gas mitigation efforts in the period to 2050.

Climate Action and Low-Carbon Development Act, 2015 (Amended 2021)⁶¹

The Act was the first piece of legislation following the launch of the National Policy Position. The Act provides the statutory basis for the national transition laid out in the national policy position. It provides arrangements for achieving transition to a low-carbon, climate-resilient and environmentally sustainable economy by 2050. The Act includes the following key elements:

- Places on a statutory basis a 'national climate objective', which commits 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.
- A National Long Term Action Strategy will be prepared every five years.
- Introduces a requirement for each local authority to prepare a Climate Action Plan which will include both mitigation and adaptation measures and be updated every five years.

National Adaptation Framework (NAF), 2018⁶²

The NAF specifies the national strategy for the application of adaptation measures in different sectors and by local authorities in order to reduce the vulnerability of Ireland to the adverse impacts of climate change and realise any positive impacts. Adaptation actions under this framework range from building adaptive capacity through to policy and finance-based actions.

Additional key actions under the framework include:

- Putting in place revised governance and reporting arrangements.
- Formalising the status of existing guidelines.
- Formalising long term operational support for key sectors.
- Facilitating the establishment of regional local authority climate action offices.
- Increasing awareness around climate adaptation and resilience.
- Integrating climate adaptation into key national plans and policies.

Climate Action Plan, 2023⁶³

The Climate Action Plan provides a detailed plan on how to reduce Ireland's emissions and enhance climate resilience to ensure Ireland is put on a more sustainable path. The plan details a number of actions to achieve this aim. The supplementary Annex to the Plan is to be published early in 2023, but was not available at the time of writing of this EIAR.

Table 12.6 of the CAP outlines actions with regards to electricity for the period 2023 – 2025, these mostly relate to renewable energy. However, there is a measure to '*deliver in the order of 2GW of new flexible gas-fired power generation to support renewables*'.

⁶¹ Department of the Environment, Climate and Communications (2021) Climate Action and Low Carbon Development (Amendment) 2021. Available from: [gov.ie - Climate Action and Low Carbon Development \(Amendment\) Bill 2021 \(www.gov.ie\)](http://gov.ie - Climate Action and Low Carbon Development (Amendment) Bill 2021 (www.gov.ie)). [Accessed May 2022].

⁶² Department of the Environment, Climate and Communications (2018) National Adaptation Framework. Available from: [gov.ie - National Adaptation Framework \(NAF\) \(www.gov.ie\)](http://gov.ie - National Adaptation Framework (NAF) (www.gov.ie)). [Accessed: May 2022].

⁶³ Department of the Environment, Climate and Communications (2023) Climate Action Plan 2023. Available from: [gov.ie - Climate Action Plan 2023 \(www.gov.ie\)](http://gov.ie - Climate Action Plan 2023 (www.gov.ie))].

Electricity and Gas Networks Sector- Climate Change Adaptation Plan⁶⁴

This is the first sectoral Adaptation Plan for the energy networks (electricity and gas) sector, prepared under the National Adaptation Framework. The Plan focusses on the energy networks (electricity and gas), specifically electricity generation and electricity and gas transmission and distribution infrastructures and interconnectors. The Plan is to be viewed as the first step towards reducing vulnerability and building resilience in the sector. The Plan also:

- Examines the impacts of climate change and weather-related events, both past and projected, on the energy networks.
- Details how the energy sector must prepare for and adapt to new climate conditions.
- Sets a methodology for identifying areas of vulnerability, the steps that can be taken and measures put in place to avoid or minimise future adverse impacts within the sector and to exploit opportunities.

Dublin City Council Climate Change Action Plan 2019-2024⁶⁵

Dublin's four local authorities developed individual Climate Change Action Plans as a collaborative response to the impact that climate change is having, and will continue to have, on the Dublin region. The Dublin City Council Climate Action Plans features a range of actions across five key areas, which include energy and buildings, transport, flood resilience, nature-based solutions and resource management. By addressing these areas, the council aims to collectively address four targets:

- A 33% improvement in the Council's energy efficiency by 2020.
- A 40% reduction in the Council's greenhouse gas emissions by 2030.
- To make Dublin a climate resilient region, by reducing the impacts of future climate change-related events.
- To actively engage and inform citizens on climate change.

7.2.3 Methodology

This assessment is a high-level screening of potential impacts associated with climate change on the scheme receptors and identification of potential mitigation measures that will be considered and implemented as required at the next stage of design. The screening involves the following steps:

- Legislation and policy review – a review of national and local policy and guidance relating to climate change adaptation and resilience and it's applicability to the scheme.
- Receiving environment – identification of receptors, in this case features of the of scheme that may be impacted by climate change.
- Climate baseline – identification of current and future climate baseline for the site over the lifetime of the scheme. The current baseline includes information about the state of current (1981-2010) climate variables (1981-2010), including temperature, precipitation and wind, as well as information on extreme weather events experienced in the vicinity of the site. Information on current climate is based on Met Éireann records. The future baseline includes information on projected change in climate variables over the 21st century, based on information from the World Bank Climate Change Knowledge Portal.

⁶⁴ Government of Ireland (2019) Electricity & Gas Networks Sector- Climate Change Adaptation Plan. Available from: [gov.ie - Electricity and Gas Networks Sector Climate Change Adaptation Plan \(www.gov.ie\)](http://gov.ie - Electricity and Gas Networks Sector Climate Change Adaptation Plan (www.gov.ie) [Accessed: December 2022]) [Accessed: December 2022]

⁶⁵ Dublin City Council (2019) Climate Change Action Plan 2019-2024. Available from: [2019-dcc-climate-change-action-plan.pdf \(dublincity.ie\)](http://2019-dcc-climate-change-action-plan.pdf (dublincity.ie) [Accessed July 2022].) [Accessed July 2022].

- Potential impacts – high level identification of potential impacts on scheme receptors from climate hazards associated with change in climate variables (future baseline), based on literature review and experience of the project team in carrying out similar assessments. Impacts from climate change during the construction phase are not in the scope of the assessment as construction phase is short (in climatic terms) and there is not expected to be a significant change in climate over this period. Impacts from climate change during the operation of the project during its approximately 20 year lifespan are in scope. Decommissioning activities are not expected to be subject to significant climate change but should be planned and implemented in accordance with the climate 'as-is' at the time the decommissioning phase commences. As such, the impacts of climate change on decommissioning are not included within this assessment.
- Identification of mitigation measures – high level identification of potential measures that could be taken to mitigate the impacts from climate hazards, based on literature review and experience of the project team in carrying out similar assessments. The specified mitigation measures should be considered for inclusion at the next design stage.

The approach is based on the initial steps set out in the IEMA EIA Guidance on Climate Change Adaptation but does not include a full risk assessment.

The high level screening approach taken in this chapter provides an indication of potential impacts from climate change but the significance of these has not been assessed. This means that additional mitigation measures may need to be incorporated into the next stage of design. The following steps have not been taken in this assessment and will be undertaken at the next stage of design:

- Identification of embedded mitigation measures – this assessment does not include identification or verification of measures already embedded in design or operational plans that mitigate the potential impacts of climate change. Consultation will be undertaken with design teams and relevant environmental discipline teams to identify how designs have taken climate change into account and embedded mitigation measures already incorporated.
- Significance assessment – the significance of potential impacts has not been assessed at this stage. As part of the assessment at the next design stage, the significance of each potential impact will be determined, based on the embedded mitigation that has been identified in the previous step. This will be carried out in line with Table 4.1.
- Designs and/or operational plans will be adjusted as necessary to mitigate significant impacts of climate change on the scheme that are present following the incorporation of embedded design. The high level screening approach taken in this chapter provides an indication of potential impacts from climate change but the significance of these has not been assessed. This means that additional mitigation measures may need to be embedded into the next stage of design. It is recommended that at the next stage, the significance of climate impacts is assessed and designs or operational plans adjusted as necessary to mitigate the impacts of climate change on the scheme.

7.2.3.1 Assumptions and Limitations

The assessment in this report is based on freely available information available from third parties for reporting purposes, being observational data from local weather stations, a number of readily available climate change projections and a range of existing climate change datasets and literature at the time of writing this assessment. The following limitations and disclaimer should be noted:

- Climate change projections: climate projections are not predictions or forecasts but simulations of potential scenarios of future climate under a range of hypothetical emissions scenarios and assumptions. The results, therefore, from the experiments performed by

climate models cannot be treated as exact or factual, but projection options. They represent internally consistent representations of how the climate may evolve in response to a range of potential forcing scenarios and their reliability varies between climate variables.

For a single emission scenario, projections can vary significantly as a function of the model used and how it is applied, so that there is a wide uncertainty band in the results. Scenarios exclude outlying “surprise” or “disaster” scenarios in the literature and any scenario necessarily includes subjective elements and is open to various interpretations.

Generally global projections are more certain than regional, and temperature projections more certain than those for precipitation. Further, the degree of uncertainty associated with all climate change projections increases for projections further into the future. Climate models and associated projections are updated on a regular basis, implying changes in the forecasted future climate.

- Validation of information: Mott MacDonald has not independently verified the observational or projection data and does not accept responsibility or liability for any inaccuracies or shortcomings in this information. Should these information sources be modified by these third parties we assume no responsibility for any of the resulting inaccuracies in any of our reports. Issued reports are relevant to the project information provided and are not intended to address changes in project configuration or modifications which occur over time. The data is obtained to provide a general ‘sense check’ on the published literature on existing observational and climate projections for the region

We have not undertaken any climate modelling and rely solely on freely available data on climate projections in this region. Accordingly, any further research, analysis or decision-making should take account of the nature of the data sources and climate projections and should consider the range of literature, additional observational data, evidence and research available - and any recent developments in these.

7.2.4 Receiving Environment

7.2.4.1 Project Receptors

Since the purpose of the climate resilience assessment is to determine impacts of climate change upon the proposed development, the receiving environment for this aspect refers to the receptors that constitute the proposed development. These receptors include the physical assets, asset operations and site staff, plus local ecology, watercourses and communities that may be affected by the proposed development emissions in-combination with the impacts of climate change.

The receiving receptors that are included within this assessment are those outlined in section 3.3:

- OCGT generating unit and associated plant and equipment as described in Table 3.1;
- CEMS Skid ;
- Ancillary extension to the existing gas Above Ground Installation (AGI);
- Gas Compressor Reducing Building and compound ;
- Demineralised Water Treatment Plant;
- Demineralise Water Tank;
- Raw/Fire Water Tanks ;
- Secondary fuel storage tank and 2no. Water Tanks;
- Workshop / Stores & Administration Building;
- Electricity Connection to the National Grid; and

- Onsite operational staff (plant will operate unmanned but there will be personnel on site carrying out routine inspections and maintenance).

7.2.4.2 Present Day Climate Baseline

Ireland's climate is described by the climate averages for 1981-2010 summarised by Met Éireann⁶⁶. Ireland's climate is dominantly influenced by the Atlantic Ocean and therefore does not suffer from the extremes of temperatures experienced by other countries at similar latitudes. Mean temperature generally range between 9°C and 10°C with higher mean temperatures in coastal regions. Summer is the warmest season, followed by autumn, spring and winter. Highest rainfall occurs in the western half of Ireland and on high ground, with rainfall decreasing towards the northeast. Averaged over all of Ireland, mean annual rainfall is 1230mm. The driest seasons are spring and summer with mean rainfall of 260mm and autumn and winter with a mean rainfall of 350mm.

The summary of 1981-2010 climate averages show that, averaged over the country, there has been an increase of 5% in rainfall totals between the periods 1961-1990 and 1981-2010 with all seasons showing an overall increase in rainfall. There has also been an increase of 0.5°C in mean temperature between the 1961-1990 and 1981-2010 periods. Minimum and maximum temperatures have also increased by 0.5°C with all seasons showing a rise in temperature with spring and summer seasons showing the largest differences between the two time periods with an increase of 0.7°C.

7.2.4.3 Future Climate Baseline

Climate projections for Ireland from Nolan, P. and Flanagan, J. (2020)⁶⁷ are summarised in Table 7.9.

Table 7.9: Climate Projections for Ireland (Nolan, P. and Flanagan, J. 2020)

Climate variables	Climate projections summary (2041-2060 relative to 1981-2000)	Resultant future climate
Temperature	Mean annual temperature is projected to increase up to 1.2 °C and 1.6 °C for the RCP4.5 and RCP8.5 scenarios respectively. Summer months are projected to increase up to 1.3 °C and 1.8 °C for the RCP4.5 and RCP8.5 scenarios respectively. Winter months are projected to increase up to 1.2 °C and 1.6 °C for the RCP4.5 and RCP8.5 scenarios respectively.	Ireland is projected to experience an increase in ambient air temperature across both emission scenarios.
Precipitation	Decreases in precipitation are projected for the summer months with up to an 11% decrease and 17% decrease for the RCP4.5 and RCP8.5 scenarios respectively. Frequencies of heavy precipitation events show notable increases over the year and in the winter and autumn months with projected increases in frequency of up to 19%.	Ireland is projected to experience drier summers and wetter winters across both emission scenarios. Ireland is also projected to see an increase in heavy rainfall events throughout the year.
Heatwaves	Heatwave events are projected to increase with a range of 1 to 8 events for the RCP4.5 scenario and from 3 to 15 for the RCP8.5 scenario. There is a clear gradient across Ireland where the highest number of heatwaves is projected to occur in the south-east. This is relative to the 1981-2000 baseline which observed 1 to 6 heatwaves across Ireland.	Ireland is projected to experience an increase in heatwave events across both emission scenarios with most heatwave events occurring in the south-east.
Frost and ice days	Number of frost days is projected to decrease by 45% and 58% for the RCP4.5 and RCP8.5 scenarios respectively.	Ireland is projected to experience a decrease in frost

⁶⁶ Met Éireann (2012) A summary of Climate Averages for Ireland. Available from: [normals_supplement_1_ANNUAL_2010.qxd \(met.ie\)](#). [Accessed: May 2022].

⁶⁷ Nolan, P. and Flanagan, J. (2020) High-resolution Climate Projections for Ireland – A multi-model ensemble approach. Available from: [Climate Change | Environmental Protection Agency \(epa.ie\)](#). [Accessed: May 2022].

Climate variables	Climate projections summary (2041-2060 relative to 1981-2000)	Resultant future climate
	Number of ice days is projected to decrease by 68% and 78% for the RCP4.5 and RCP8.5 scenarios respectively.	and ice days due to rising ambient air temperatures.
Snowfall	Snowfall is projected to decrease with reductions of 51% and 60% for the RCP4.5 and RCP8.5 scenarios respectively.	Ireland is projected to experience a decrease in snowfall events due to rising ambient air temperatures.
Wind speed	Mean 10-m wind speeds are projected to decrease for all seasons up to 3.4% and 5.4% for the RCP4.5 and RCP8.5 scenarios respectively.	Ireland is projected to experience a decrease in average wind speeds throughout the year across all emission scenarios.

Climate projections for Dublin from the World Bank CCKP are presented in Table 7.10.

Table 7.10: Climate Projections for Dublin (World Bank CCKP)

Climate variables	Baseline (1995-2014)	Climate Scenario (Anomaly change, SSP5-8.5, 50 th percentile)			
		2020-2039	2040-2059	2060-2079	2080-2099
Mean air temperature (°C change)	Annual: 9.7	Annual: +0.6	Annual: +1.3	Annual: +2	Annual: +3
	Summer: 14.4	Summer: +0.9	Summer: +1.8	Summer: +2.7	Summer: +4.3
	Winter: 5.7	Winter: +0.4	Winter: +1	Winter: +1.7	Winter: +2.4
Maximum temperature (°C change)	Annual: 13.5	Annual: +0.6	Annual: +1.2	Annual: +2.1	Annual: +3.1
	Summer: 18.9	Summer: +0.9	Summer: +1.8	Summer: +2.9	Summer: +4.4
	Winter: 9.1	Winter: +0.5	Winter: +0.9	Winter: +1.8	Winter: +2.4
Minimum temperature (°C change)	Annual: 6	Annual: +0.6	Annual: +1.2	Annual: +2	Annual: +3.2
	Summer: 10.5	Summer: +0.8	Summer: +1.7	Summer: +2.6	Summer: +4.3
	Winter: 2.4	Winter: +0.4	Winter: +1	Winter: +1.8	Winter: +2.6
Precipitation (% change)	Annual: 84.4mm	Annual: -0.26	Annual: -1.1	Annual: -0.8	Annual: -1.3
	Summer: 68.3mm	Summer: -3.8	Summer: -9.1	Summer: -15	Summer: -20.2
	Winter: 103.3mm	Winter: +1.12	Winter: +5	Winter: +12.1	Winter: +19.4

Projections for Dublin generally follow the climate trends projected for Ireland. In general, temperatures are projected to increase throughout the year with warmer summers and winters. Precipitation is projected to see small changes on average across the year with larger seasonal variations following a trend of drier summers and wetter winters. The frequency of extreme events across Ireland such as heatwaves are projected to increase substantially while cold-weather related events such as frost and ice days and snowfall may experience large reductions. These projections are in line with climate change trends identified in the observed changes in climate for Ireland between 1981-2010.

7.2.5 Potential Likely Significant Impacts and Recommended Mitigation Measures

This section outlines the potential impacts that the project may face due to climate change throughout its operational lifetime (20 years) and through the decommissioning phase. As outlined within Section 7.2.2.1, a full climate change risk assessment has not been conducted. As such, potential impacts have not been evaluated for likely significance.

Table 7.11 summarises potential impacts and provides recommended mitigations for these impacts, which will be considered during the next phase of design.

Mitigations can take one of two forms:

- Embedded - Some measures are embedded into the design of the proposed development. For example, inclusion of climate change allowances within flood modelling and the application of climate change uplifts to drainage design. Embedded mitigations already present within the proposed development design have not been fully reviewed at this stage.
- Operational – these are secondary mitigation measures such as asset management planning and asset maintenance that should be carried out throughout the lifetime of the proposed development to continue to provide protection against evolving climate hazards. Such mitigations may also include future refurbishments, upgrades or changes to assets and processes at the appropriate time in the future, based on how significantly the climate continues to change and the evolving resilience needs of the proposed development.

Embedded mitigations should be considered and incorporated within the next design phase of the proposed development. Operational mitigations will be the responsibility of the maintainer throughout the operational lifetime.

Table 7.11: Potential Impacts of Climate Change upon the Proposed Development

Change in climate variable	Climate hazard	Description of potential climate impact	Affected Asset(s)	Mitigations to be reviewed and considered at the next design stage
Increased heavy rainfall events	Fluvial flooding from the River Liffey	Flooding and severe precipitation events may result in damage to assets such as machinery, the substation, generators and buildings, affecting operations and leading to reduced output or time lost.	OCGT generating unit and operations buildings	It is noted within Chapter 10: Surface Water and Flooding that flood risk modelling included the CFRAM Mid Range Future Scenario Maps (Figure 5.4) consider a 20% increase in rainfall and 500mm sea level rise. The 0.1% AEP MR Scenario shows flooding in the Northern Nora Tanks and some flooding along the Poolbeg road network. However, the OCGT site and Nora Tanks in the south east corner remains largely unaffected. A desktop review of the published mapping (www.floodinfo.ie) indicates that there are no records of historic flooding within the immediate area of the proposed development.
	Surface flooding due to heavy rainfall onto site			Reviews of the flood risk at the site will be carried out at the next design stage to consider whether further increases in allowances for climate change are required, including as part of a review of drainage and flood prevention system, and requirements for further mitigation . Mitigation may consider the use of nature-based solutions, such as vegetation planting to slow surface flows, where feasible.
	Access and egress issues due to flooded access routes	Danger to operational workforce and issues for road tankers accessing / moving around the site.	Onsite maintenance staff	It is noted within Chapter 10: Surface Water and Flooding, that a short section of internal road within the wider Poolbeg Generating Station complex is topographically lower than the predicted 0.1% annual exceedance probability tidal flood level allowing for climate change. There is, however, no critical infrastructure proposed for this location and an alternative route to the site is available that is not in a flood risk zone. If additional emergency access and egress routes are not viable, the next stage of design will consider implementation of wet weather management plans and provisioning of temporary flood defences and procedures and ensure staff training for dealing with hazardous weather conditions.
	Flood water ingress	Contamination of demineralised water treatment plant and storage tanks	water and fuel tanks	Flood risk reviews at the next design stage will consider upgrading site drainage to prevent water ingress into plant and tanks. Mitigation during the operational phase will include periodic inspections and maintenance of storage tanks and transfer pipes.
	Scour	Scour damage and corrosion of pipework and structures leading to damage to pipework and plant assets	OCGT and water pipework OCGT generating unit and operations Buildings	Flood risk reviewed at the next design stage will consider runoff routes for rainfall to prevent scour of pipework and plant. At the operational phase, periodic inspections and maintenance will be carried out of assets that may be potentially affected, to include monitoring of deterioration of equipment and structures.

Change in climate variable	Climate hazard	Description of potential climate impact	Affected Asset(s)	Mitigations to be reviewed and considered at the next design stage
	Changes to water quality at receiving water bodies	Increased surface runoff from site leading to increased risk of foul water / contamination of runoff. Chapter 10: Surface Water and Flooding reports that surface water runoff-off discharges will have a negligible impact upon water quality. Increased rainfall in the future would further reduce contamination levels.	Receiving waterbodies	Consideration of placing pipework below ground will be carried out during the next design stage. The next stage of design will consider climate changes to precipitation as part of the management of runoff, to prevent risks of further contamination due to increased rainfall intensity due to climate change. Increase monitoring of the discharge water as the climate changes and consideration of methods to cool the water prior to discharge if frequent breaches occur.
		Shrinkage and desiccation of ground leading to cracks, strength loss and instability. Foundations may be affected.	Structural foundations, buried pipes and cabling	The geotechnical assessments at the next stage of design will consider future ground conditions, temperature and rainfall when designing new foundations and specifications of foundation depth. Monitor during the operational phase will include ground movements and repair when necessary.
Reduced rainfall	Increased drought risk	Reduced water availability on site / increased costs for water affecting potable water supply, OCGT water supply and cooling water	OCGT generating unit and operations	The next stage of design will consider plans for alternative (emergency) water sources available on a short term basis, and will also consider avoiding the inclusion of water-cooling system or replacement with an air cooling, a dry cooling, or a circulating system to improve equipment performance during droughts.
Temperature increases (including average temperatures and temperature extremes)	Increased risk of extreme high temperatures / heatwaves	Exacerbated temperature extremes and/or sustained high temperatures may inhibit power infrastructure performance and export. This is due to the envelope of the operating temperature ranges of the generators and electrical equipment being reached. This can cause electrical faults and increase the risk of fire.	OCGT generating unit and operations electrical equipment, cooling systems, substation)	The next stage of design will consider the design of key or critical elements using materials with higher temperature threshold specification. The operational phase will include monitoring deterioration of equipment and structures.

Change in climate variable	Climate hazard	Description of potential climate impact	Affected Asset(s)	Mitigations to be reviewed and considered at the next design stage
		Cracking, reduced strength and increased rate of deterioration of metallic and reinforced concrete assets due to high temperatures.		
		Cracking, strength loss and more rapid deterioration of concrete due to high temperatures.	Buildings, internal access roads, concrete water tanks, buildings and other structures	During the construction phase, monitoring and adjustment of the curing process of the concrete for new structures will be carried out to minimise risk of future high temperatures on the deterioration rate of the structure. The operational phase will include monitoring deterioration of structures.
		Loss of productivity and risks to workers health (heat stress and dehydration).		
		Inability to operate and maintain the plant in the high temperatures.	Onsite staff Buildings	The next stage of design will include the appropriate design of offices and administration buildings to remain cool in high temperatures, including passive cooling to avoid the need for mechanical cooling (air conditioning). New structures and machinery will be designed to a higher temperature threshold specification to avoid maintenance requirements at hottest parts of the day.
Increasing average temperatures and maximum temperatures		Overheating of office and administration buildings.		
		Stack emission concentrations of Oxides of Nitrogen and Sulfur Oxide may be breached. High temperatures (combined with low wind) may negatively impact the dispersion of emissions in the air and breach air quality regulations.	Local air quality	As noted in Chapter 6: Air Quality, during the operation phase, no exceedances of the hourly NO ₂ , annual NO ₂ or 8-hour rolling CO AQS are predicted. This means that there is not considered to be likely risk to human health. A review will be carried out at the next design stage to ensure changes to ambient air temperatures due to climate change will not affect acceptable emission concentrations. Emission levels and air quality will be monitored and if levels become significant, an Air Pollution Plan will be implemented.
Changing temperature variability	Reduced risk but occasional, sporadic cold snaps including extreme cold	Risk of damaging gas turbines, risk of freezing and plant shutdown, risk to site access from deep snow, risk to canal transportation from freezing,	OCGT generating unit and operations Pipework and other metallic equipment	The next design stage will identify bedding/material that is suitably resistant to temperature fluctuations, such as gravel casing to around vulnerable pipes, plus pipes and cables with material resistant to freezing conditions. The operational phase will include monitoring of the deterioration of structures and equipment.

Change in climate variable	Climate hazard	Description of potential climate impact	Affected Asset(s)	Mitigations to be reviewed and considered at the next design stage
	weather, ice and snow	risk to pipelines from freezing, poor working conditions. Decreasing temperatures will likely decrease electricity demand for cooling and increase fuel oil and natural gas demand for heating. Inability to meet customer demand if infrastructure damaged and service disrupted. Disruption to power transmission and distribution.	Mechanical and electrical equipment	
Increase in extreme weather including storms, high winds and lightning	High winds	Structural damage resulting from storminess and high winds.	Buildings, internal access roads, concrete water tanks, buildings and other structures	The next stage of design will include design of structures to withstand wind loads that account for future climate changes. Additionally, where possible the design will include locating any sensitive new structures in sheltered areas to act as a barrier against high winds.
	Lightning strike	Electrical faults leading to power outages, due to storms and lightning strike	OCGT generating unit and operations	Lightning risk is typically considered within plant design and will utilise earthed shielded copper cabling
	Storms, higher winds, lightning	Staff access to the site could be restricted during extreme storm events with the potential shut down of operations if staff not able to access site.	Onsite staff	Use of an appropriate hazardous weather plan during construction and operation to ensure staff health and safety when working in or following hazardous conditions
		Increased risk of physical damage to transmission infrastructure affecting the ability to transfer power to the national grid	Interdependent transmission infrastructure / gird connection and water supply	The next stage of design will consider any additional mitigation needed to protect transmission infrastructure, or to allow for its ease of repair following storm events. The operational phase will include monitoring of the deterioration of structures and equipment.

8 Noise and Vibration

8.1 Introduction

This chapter presents an assessment of the likely and significant impacts arising from the proposed development on receptors sensitive to Noise and Vibration. The assessment is based on the development as described in Chapter 3 of this EIAR.

8.2 Policy and Guidance

The Planning Report which accompanies this application (Ref: 229100184_3_A) describes the wider policy and legislative context applicable to the proposed development. Policies and guidance documents of potential relevance to Noise and Vibration are set out in this section.

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

8.2.1 Policies

The Environmental Noise Regulations (ENR)⁶⁷ transposes the EU Directive 2002/49/EC⁶⁸ (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 2018⁶⁹.

The project site falls within the Dublin agglomeration⁷⁰ and therefore it is within the scope of the ENR. However, this is mainly concerned with the strategic management of noise within the agglomeration whereas the IE Licence regulations give powers to the Environmental Protection Agency (EPA), as the competent authority, to place controls on noise from industrial sites. The Environmental Protection Agency has produced guidance relevant to the proposed development. EPA noise guidance⁷¹ sets out the information to be contained in Environmental Impact Assessment Reports.

Nuisance due to noise is dealt with by the Environmental Protection Agency Act⁷² and the Protection of the Environment Act 2003⁷³, which 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.

⁶⁷ Environmental Noise Regulations, 2006 (S.I. No. 140 of 2006).

⁶⁸ 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.

⁶⁹ The European Communities (Environmental Noise) Regulations 2018 (Statutory Instrument No. 549/2018).

⁷⁰ <https://gis.epa.ie/EPAMaps/> [Last accessed 20/09/2022]

⁷¹ Environmental Protection Agency Guidelines on the information to be contained in Environmental Impact Assessment Reports, May 2022

⁷² Government of Ireland. Environmental Protection Agency Act, 1992.

⁷³ Government of Ireland. Protection of the Environment Act, 2003.

8.2.2 Guidelines

8.2.2.1 Construction Noise

In lieu of Irish construction noise methodology or statutory guidelines, British Standard (BS) 5228 Part 1⁷⁴ (BS 5228) has been adopted for the assessment of effects at noise sensitive receptors. 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. Based on the BS 5228 Part 1 'Example method 1 – the ABC method' in BS 5228 Part 1 (2009+A1:2014), noise levels generated by site activities are deemed to be potentially significant if the predicted construction noise level at the receptor exceeds the applicable threshold value. The threshold value is assigned based on the representative baseline ambient noise level for the receptor. BS 5228 states: *"The assessor then needs to consider other project-specific factors, such as the number of receptors affected and the duration and character of the impact, to determine if there is a significant effect"*.

8.2.2.2 Construction Vibration

Vibration during the construction of the proposed development is assumed to be negligible at residential distances given the long separation distance to the nearest receptor and is not considered further. However, the assessment considers the potential impact of construction vibration on nearby built heritage assets in terms of cosmetic and structural damage.

BS 5228 'Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration' (2009+A1:2014)⁷⁵ provides comprehensive 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).

BS 5228 Part 2 includes guidance on the levels of vibration that would be necessary to cause structural damage to different types of buildings. It states that low frequency vibration at a ppv of 15mm/s may cause cosmetic damage in un-reinforced or light framed structures e.g. for residential/light commercial use, and 50mm/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 Part 2 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 Part 2 gives:

- 7.5mm/s for (light-framed) residential and light commercial buildings; and
- 25mm/s for (heavy-framed) 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."*

⁷⁴ British Standards Institution BS 5228 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise, 2009 + A1:2014.

⁷⁵ British Standards Institution BS 5228 Code of practice for noise and vibration control on construction and open sites –Part 2: Vibration, 2009 + A1:2014.

The German Standard DIN 4150 'Structural Vibration –Part 3: Effect of Vibration on Structures' (1999)⁷⁶ includes guideline values for the evaluation of short-term vibration on buildings with regards to potential damage. The values are presented as a function of frequency and apply at the building foundation. The short-term levels of vibration in the frequency bands having the most stringent levels are as follows:

- 3mm/s for particularly sensitive buildings;
- 5mm/s for residential buildings; and
- 20mm/s for industrial and commercial buildings.

The Association of Noise Consultants Guidelines 'Measurement and Assessment of Groundborne Noise and Vibration' (2012)⁷⁷ reviews the various criteria for building damage which concludes: *"To be below damage criteria, vibration in any direction should not exceed 3mm/s ppv for transient vibration and 2.5mm/s (below 2mm/s at 1Hz) for continuous vibration (anywhere in the structure). Higher vibration may not necessarily cause damage."* With respect to the above discussion, it is considered that an appropriate value for the onset of significance for occupied receptors would be 1mm/s. The onset of significance for non-residential receptors i.e. the potential for cosmetic damage is considered to commence at:

- 3mm/s for sensitive/susceptible buildings; and
- For other non-residential receptors e.g. commercial and industrial buildings, a continuous ppv of more than about 7mm/s would be required to cause cosmetic damage.

8.2.2.3 Operational Noise

The Environmental Protection Agency 'Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)' (2016)⁷⁸ describes a methodology to assess and control the predicted and actual 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 in planning permission. The British Standard 5228 'Code of Practice for Noise and Vibration Control on Construction and Open Sites –Part 1: Noise' and 'Part 2: Vibration' (2009+A1:2014) are referenced as relevant guidance. The EPA 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 facility 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 within 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:

⁷⁶ Das Deutsche Institut für Normung e.V. (DIN), 1999. Standard 4150 'Structural Vibration – Part 3: Effect of Vibration on Structures'.

⁷⁷ Association of Noise Consultants, 2012. 'Measurement and Assessment of Groundborne Noise and Vibration'.

⁷⁸ Environmental Protection Agency Office of Environmental Enforcement Guidance Note for Noise Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4). January 2016.

- Daytime: 40 dB L_{AF90} ;
- Evening: 35 dB L_{AF90} ; and
- 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 $L_{Ar,T}$; and
- 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 $L_{Ar,T}$; and
- Night-time (23:00 to 07:00) 45 dB $L_{Aeq,T}$.

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”.

8.2.2.4 Operational Vibration

Operational vibration due to the proposed development is assumed to be negligible given the long separation distance to the nearest sensitive receptor (minimum of ~1,320m) and is not considered further.

8.3 Methodology

8.3.1 Approach to Data Collection

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

Table 8.1: Data Sources Used to Inform the Noise and Vibration Chapter of this EIAR

Data source	Date	Data contents
Ringsend Wastewater Treatment Plant Upgrade Project, Environmental Impact Assessment Report, Volume 3, Part A.	June 2018	Operational noise levels used in the cumulative impact assessment and baseline noise levels for 2016
ESBI South Wall BESS, Noise Impact Assessment - Rev.4, Hoare Lea, 8 June 2018.	June 2018	Baseline noise levels for 2018
Dublin Waste-to-Energy Compliance Environmental Noise Monitoring Report – Quarter 2, 2019.	2019	Baseline noise levels for 2019
Environmental Impact Assessment Report (EIAR) Assessment of Four ESB Projects (Flexgen and BESS), Poolbeg Peninsula	October 2020	Operational noise levels used in the cumulative impact assessment
Dublin Waste-to Energy Annual Environmental Noise Monitoring Report – 2022, Altum Scientific	May 2022	Baseline noise levels for 2022
Environmental Impact Assessment Report North Wall Emergency Power Generation Plant, Rev. E, Mott MacDonald	June 2022	Operational noise levels used in the cumulative impact assessment
Environmental Impact Assessment Report Ringsend 299MW Open Cycle Gas Turbine (OCGT) Power Plant, Mott MacDonald	August 2022	Operational noise levels used in the cumulative impact assessment

8.3.2 Approach to Impact Assessment

8.3.2.1 Construction Noise

'Example method 1 –the ABC method' of BS 5228 describes a methodology for determining significance of effect. Table F.1 of the standard is replicated in Table 8.2 and the levels at which a significant effect is indicated.

Table 8.2: Threshold of Potential Significant Effects due to Construction Noise at NSLs

Assessment category and threshold value period	Threshold value $L_{Aeq,T}$ dB		
	Category A	Category B	Category C
Night-time (any day 23.00-07.00)	45	50	55
Evenings and Weekends (weekdays 19.00-23.00, Saturdays 13.00-23.00, and Sundays 07.00-23.00)	55	60	65
Standard working hours (weekdays 07.00-19.00 and Saturdays 07.00-13.00)	65	70	75

8.3.2.2 Construction Vibration

Table 8.3 presents threshold values for the assessment of vibration during construction and apply at any time of day.

Table 8.3: Threshold Values for the Assessment of Construction Vibration

Type of effect	NSL	Threshold value ppv mm/s
Cosmetic or structural damage	Light-framed buildings	3.0
	Industrial and commercial heavy framed buildings	7.5

8.3.2.3 Operational Noise

Table 8.4 presents the threshold values given by the NG4 guidance for the assessment of operational noise impacts.

Table 8.4: Threshold Values for the Assessment of Operational Noise

Time period	Daytime 07:00 – 19:00	Evening 19:00 – 23:00	Night-time 23:00 – 07:00
Threshold value	55 dB $L_{A,T}$	50 dB $L_{A,T}$	45 dB L_{Aeq}

8.3.2.4 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.

NSLs are defined within the NG4 guidance as “Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other facility or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels.” Table 8.5 sets out typical classes of sensitive receptors and classification of noise sensitivity respectively. However, the assessment criteria for noise account for sensitivity receptor by using different magnitudes of impact to identify significant effects, rather than using a significance matrix.

Table 8.5: Criteria for Sensitivity of NSLs

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).
Low	Receptors where distraction or disturbance from noise is 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.

8.3.2.5 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. EPA 2022 guidance notes the following terminology in Table 8.6 to be used to determine the significance of effects.

Table 8.6: 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.

8.3.2.6 Summary of Significance of Effect Criteria

Table 8.7 below summarises the significance of effect criteria applied within this assessment. The proposed development introduces new temporary or permanent impacts therefore all the potential effects are adverse.

Table 8.7: Significance of Effect

Category	Significance of effect
Construction vibration	It is considered that there is potential for a significant (adverse) effect to occur where vibration due to construction activity is predicted to exceed 3.0 mm/s at light-framed buildings or 7.5mm/s at industrial and commercial heavy-framed buildings, and expose the receptor to these levels for a period of 10 or more days of working in any 15 consecutive days.
Construction noise	It is considered that there is potential for a significant (adverse) effect to occur where noise due to construction is predicted to exceed the appropriate threshold

Category	Significance of effect
	values given in Table 8.2, and expose the receptor to these levels for a period of 10 or more days of working in any 15 consecutive days.
Operational noise	It is considered that there is potential for a significant (adverse) effect to occur where noise due to operation is predicted to exceed the appropriate threshold values given in Table 8.4.

8.3.3 Study Area

The study area for the assessment of potential noise and vibration impacts includes NSLs selected based on proximity to the proposed development, baseline conditions and exposure to the potential impacts associated with the proposed development. The study area includes NSLs that are representative of all receptors where the relevant threshold values for noise and vibration have the potential to be exceeded, rather than a fixed buffer distance.

8.4 Receiving Environment

8.4.1 Location

The location of the proposed development is within the major section of Poolbeg peninsula as shown in Figure 8.2. The closest noise-sensitive receptors are dwellings in the area of Dublin Bay. The approximate location of the closest residential development has been included as NSL4 and is approximately 1,320m from the proposed development.

Surrounding industrial receptors are considered to have low sensitivity and due to the nature of their use are not expected to result in significant effects.

Figure 8.1: Map Showing the Closest NSLs to the Proposed OCGT Power Plant

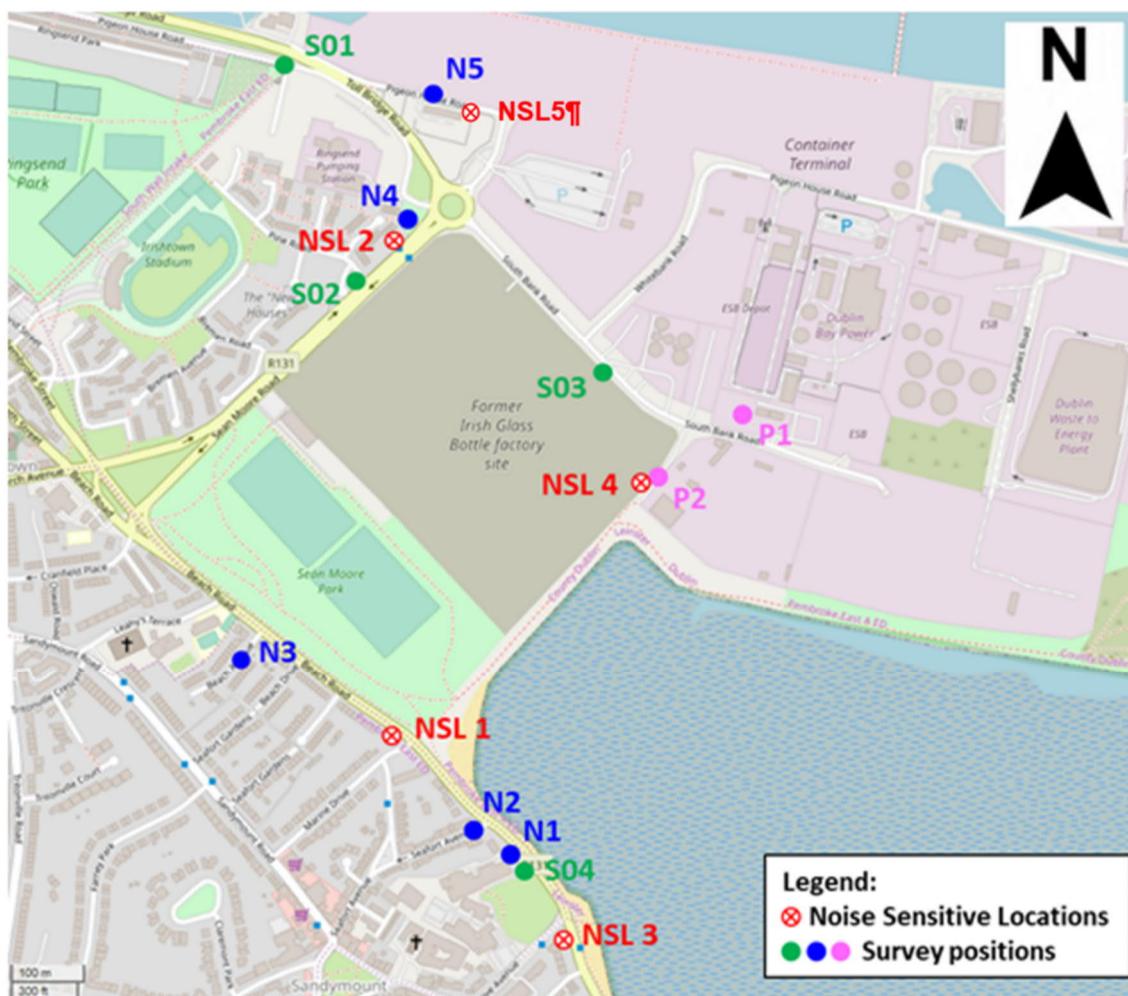


Source: © OpenStreetMap contributors. Data is available under the Open Database Licence, and cartography is licenced as CC BY-SA.

8.4.2 Noise Monitoring

Four baseline noise surveys were undertaken in 2016⁷⁹, 2018⁸⁰, 2019⁸¹ and 2022⁸², which acquired instantaneous noise levels at receptors in the Dublin Bay area. The measurements were carried out over intervals of minimum durations of fifteen minutes. Table 8.8 presents the measured values rounded to the nearest decibel. The measurement locations are indicated on the mapping in Figure 8.2.

Figure 8.2: Location of Baseline Noise Surveys



Source: © OpenStreetMap contributors. Data is available under the Open Database Licence, and cartography is licenced as CC BY-SA

Table 8.8: Summary of Baseline Noise Survey Results

Measurement Date	ID	Daytime [a]		Night-time [b]	
		L _{Aeq,T} dB	L _{A90,T} dB	L _{Aeq,T} dB	L _{A90,T} dB
June 2016	S01	65	58 – 60	53 – 57	41 – 43
	S02	71 – 72	60 – 61	56 – 57	38 – 47

⁷⁹ Ringsend Wastewater Treatment Plant Upgrade Project, Environmental Impact Assessment Report, Volume 3, Part A, June 2018.

⁸⁰ ESBI South Wall BESS, Noise Impact Assessment - Rev.4, Hoare Lea, 8 June 2018.

⁸¹ Dublin Waste-to-Energy Compliance Environmental Noise Monitoring Report – Quarter 2, 2019.

⁸² Dublin Waste-to-Energy Annual Environmental Noise Monitoring Report – 2022, Altum Scientific.

Measurement Date	ID	Daytime [a]		Night-time [b]	
		L _{Aeq,T} dB	L _{A90,T} dB	L _{Aeq,T} dB	L _{A90,T} dB
May 2018	S03	64 – 67	51 – 57	39 – 51	37 – 38
	S04	65 – 67	50 – 56	62 – 63	38
	P1	54	47	50	47
	P2	53	51	50	44
May 2019	N1	74	57 – 59	70	44 – 45
	N2	59 – 61	46 – 47	46 – 49	32 – 35
	N3	51	45 – 46	40 – 41	31 – 32
	N4	65 – 69	61	47 – 48	44 – 45
	N5	56 – 58	50 – 53	44	42
May 2022	N1	70 – 71	50 – 54	60 – 65	39 – 42
	N2	58 – 62	42 – 45	44	35 – 36
	N3	53 – 56	45 – 47	40 – 41	35 – 36
	N4	68 – 71	63 – 64	48 – 51	45 – 47
	N5	61	56 – 57	50 – 51	49

[a] S01 to S04 – L_{Aeq,15min}, L_{A90,15min}; P1 to P2 – L_{Aeq,16hr}, Typical L_{A90,5min}; N1 to N5 – L_{Aeq,30min}, L_{A90,30min}

[b] S01 to S04 – L_{Aeq,15min}, L_{A90,15min}; P1 to P2 – L_{Aeq,8hr}, Typical L_{A90,5min}; N1 to N5 – L_{Aeq,30min}, L_{A90,30min}

The baseline noise climate of the area surrounding the proposed project site is industrial in nature. The dominant sources of noise affecting the baseline noise climate associated with NSLs 1 to 4 are given in Table 8.9.

Table 8.9: Baseline Noise Levels Associated with NSLs

NSL	Representative survey ID	Baseline noise climate	Daytime		Night-time	
			L _{Aeq,T} dB	L _{A90,T} dB	L _{Aeq,T} dB	L _{A90,T} dB
NSL1	N2 and N3 [#]	Local road traffic on Beach Road	51	45	40	31
NSL2	S02 and N4 [#]	Heavy traffic on the nearby roundabout, Sean Moore Road and Eastlink; ship engine and operational noise from South Bank Marine Terminal during night-time	65	61	47	44
NSL3	S04 [#] , N1 and N2	Local road traffic on Beach Road	65	50	62	38
NSL4	S03, P1 and P2 [#]	Heavy vehicles accessing to the Kilsaran Concrete site on Southbank Road; site operational noise; activities from the dock (container handling, rumble from ship engines)	53	51	50	44
NSL5	N5 and S01	Dublin Port, road traffic noise from Eastlink and Pigeon House Road, birdsong.	56	50	44	41

[#] The selected survey IDs are used to represent the baseline noise levels.

Based on the BS 5228 'Example method 1 – the ABC method' the representative L_{Aeq} values indicate that the assessment threshold values for the NSLs are those presented in Table 8.10 for noise during the construction phase in the day and night-time periods.

Table 8.10: Assessment Threshold Values for Construction Noise

		NSL1	NSL2	NSL3	NSL4	NSL5
Daytime	Representative L_{Aeq} dB	51	65	65	53	56
	Rounded to the nearest 5 dB	50	65	65	55	55
	Category	A	B	B	A	A
	Threshold value	65	70	70	65	65
Night-time	Representative L_{Aeq} dB	40	47	62	50	44
	Rounded to the nearest 5 dB	40	45	60	50	45
	Category	A	B	C	C	B
	Threshold value	45	50	55	55	50

The representative L_{A90} values in Table 8.7 exceed the thresholds corresponding with Quiet Areas although at NSL1 the measured level at the night-time threshold is exceeded by only a small margin.

The NSLs are within areas that would not be identified as Quiet Areas and the General Noise Criteria defined in the NG4 Guidance as a limit on operational noise are applicable.

8.5 Characteristics of the Proposed Development

The assessment is based on the proposed development as described in Chapter 3 of this EIAR.

8.6 Likely Significant Impacts

8.6.1 Do Nothing

In the Do-Nothing scenario, there would be no change on the baseline conditions as the existing infrastructure will remain as is, therefore significant impacts are not likely.

8.6.2 Construction Phase

8.6.2.1 Construction Noise

The Construction Methodology Report has been used to develop a description of the activities that are expected to occur during the main stages of the construction phase, which is subdivided into demolition and enabling works, and the main OCGT development works. Construction plant and equipment requirements are used with the database of noise emission values presented in Annexes C and D of BS 5228 Part 1. This provides the basis of the noise calculations that account for the separation distance between working areas to the nearest NSLs to predict received noise levels due to the combination of equipment to be utilised in each stage. The plant and reference noise levels are presented in Table 8.11.

Table 8.11: Noise-emitting Plant Expected to be Used During the Construction Phase

Activity	Plant description	Qty	%on time	Ref.	$L_{Aeq,10m}$ dB ¹
A. Demolition and Enabling Works	Air compressor	1	75	D.7-29	74
	Mobile crane	1	25	C.3-43	70
A1. Site set up	Small tools	1	25	C.4-69	85
	Diesel generator	1	100	C.4-78	66

Activity	Plant description	Qty	%on time	Ref.	L _{Aeq,10m} dB ¹
A.2 Demolition	Forklift truck	1	50	C.2-35	71
	Water pump	1	75	C.4-88	68
	Air compressor	2	75	D.7-29	74
	Bulldozer	1	25	C.5-14	86
	Compactor	1	50	C.2-42	78
	Mobile crane	1	25	C.3-45	82
	Small tools	1	25	C.4-69	85
	Diesel generator	1	100	C.4-78	66
	Excavator	1	50	C.2-15	76
	Backhoe loader	1	50	C.2-8	68
	Grader	1	50	C.6-31	86
	Jackhammer	1	50	C.1-6	83
	Tele-handler	1	50	C.4-45	82
	Lorry	1	50	C.8-19	79
	Concrete truck	1	25	C.4-29	80
	Fuel tanker	1	25	C.4-15	76
A.3 Enabling works	Air compressor	2	75	D.7-29	74
	Bulldozer	2	50	C.5-14	86
	Compactor	2	50	C.2-42	78
	Mobile crane	2	50	C.3-45	82
	Small tools	2	25	C.4-69	85
	Diesel generator	2	75	C.4-78	66
	Excavator.	1	50	C.2-15	76
	Loader	1	50	C.2-8	68
	Forklift	2	50	C.2-35	71
	MEWP	2	50	C.4-59	78
	Water pump	2	75	C.4-88	68
	Lifting platform	1	25	C.4-57	67
	Telescopic crane	1	25	C.4-45	82
	Tipper lorry	1	50	C.8-19	79
	Concrete truck	1	50	C.4-29	80
	Fuel tanker	1	50	C.4-15	76
B. Main OCGT Development Works B1 Site set up	Air compressor	1	75	D.7-29	74
	Mobile crane	1	25	C.3-43	70
	Small tools	1	25	C.4-69	85
	Diesel generator	1	100	C.4-78	66
	Forklift	1	50	C.2-35	71
	Water pump	1	75	C.4-88	68
	Excavator	1	50	C.2-15	76
	Lorry	1	50	C.8-19	79
B2 Infrastructure works	Air compressor	1	50	D.7-29	74
	Articulating boom	1	50	C.4-53	77
	Bulldozer	1	50	C.5-14	86
	Compactor	1	50	C.2-42	78
	Concrete pump	1	50	C.4-26	75

Activity	Plant description	Qty	%on time	Ref.	L _{Aeq,10m} dB ¹
	Tracked crane	1	50	C.3-28	67
	Mobile crane	1	50	C.3-45	82
	Diesel generator	1	100	C.4-78	66
	Excavator	1	25	C.3-24	74
	Forklift truck	1	50	C.2-35	71
	Water pump	1	75	C.4-88	68
	Vibratory piling rig	1	25	C.3-8	88
	Tele handler	1	50	C.4-45	82
	Concrete truck	1	50	C.4-29	80
	Fuel tanker	1	50	C.4-15	76
	Lorry	1	50	C.8-19	79
B3 Building construction	Concrete pump	1	50	C.4-26	75
	Tracked crane	1	50	C.3-28	67
	Wheeled crane	1	50	C.3-43	70
	Telescopic crane	1	50	C.3-45	82
	Diesel generator	1	75	C.4-78	66
	Tele handler	1	50	C.2-35	71
	MEWP	1	50	C.4-59	78
	Lifting platform	1	50	C.4-57	67
	Telescopic crane	1	50	C.4-45	82
	Concrete truck	1	50	C.4-29	80
	Fuel tanker	1	50	C.4-15	76
B4 Equipment installation	Tracked crane	1	50	C.3-28	67
	Wheeled crane	1	50	C.3-43	70
	Telescopic crane	1	50	C.3-45	82
	Tele handler	1	50	C.2-35	71
	MEWP	1	50	C.4-59	78
	Lifting platform	1	50	C.4-57	67
	Telescopic plane	1	50	C.4-45	82
	Concrete truck	1	50	C.4-29	80

Note 1: Uncorrected reference value for a single item operating continuously

Table 8.12 presents the predicted construction noise levels at each NSL. This shows that at all NSLs, no threshold values are predicted to be exceeded if the activities are undertaken during the day or night-time periods. Consequently, potential noise impacts during construction are assessed as not significant.

Table 8.12: Predicted Noise Levels During the Construction Phase

NSL	Daytime/night-time threshold values dB(A)	Distance to the site boundary (m)	Predicted L _{Aeq} dB (free field) for each activity						
			A1	A2	A3	B1	B2	B3	B4
NSL1	65/45	1,730	28	36	38	29	35	32	30
NSL2	70/50	1,860	24	28	34	27	31	27	24
NSL3	70/55	1,670	34	40	41	33	40	36	31
NSL4	65/55	1,320	30	38	40	32	38	33	32
NSL5	65/50	1,650	34	36	36	34	29	26	25

8.6.2.2 Construction Vibration

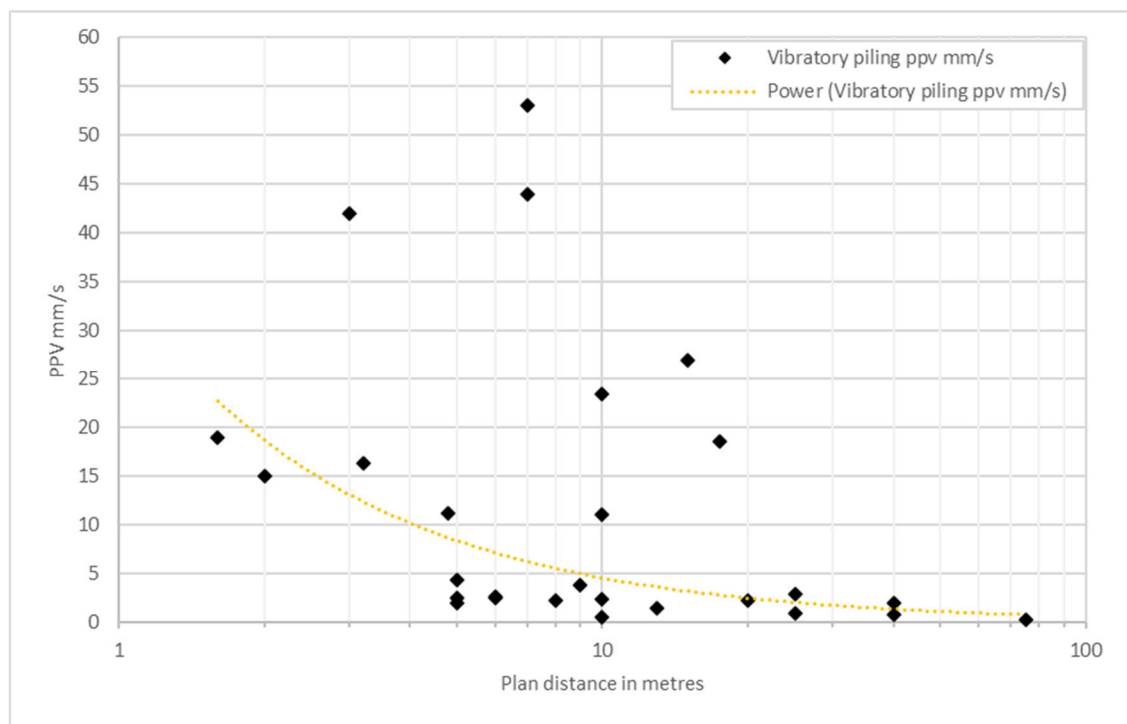
The activity which is expected to generate the highest levels of ground-borne vibration is vibratory piling. Figure 8.3 presents vibration levels as a function of distance with reference to the case history data presented in Annex D of BS 5228 Part 2. This shows:

- The 3.0mm/s threshold value for light-framed buildings is not exceeded beyond ~80m plan distance from the works; and
- The 7.5mm/s threshold value for heavy-framed buildings is not exceeded beyond ~20m plan distance from the works.

All the NSLs are significantly further from the works than these distances (minimum of ~1,320m). Consequently, potential vibration impacts during construction are assessed as not significant.

However, where vibratory piling works are expected to be undertaken, the proximity to other structures within the Poolbeg Generating Station complex should be considered. Mitigation and monitoring may be required to prevent cosmetic or structural damage.

Figure 8.3: Case History Data for Vibratory Piling



Source: BS 5228 Part 2 Annex D Table D.10

8.6.3 Operation and Maintenance Phase

A three-dimensional acoustic model was developed, and the sources of operational noise were represented as elements assigned the noise emission values presented in Table 8.13 and Table 8.14. The values are based on datasheets provided by the manufacturer of candidate equipment.

Table 8.13: Noise Emission Levels for Standard OCGT Power Plant Equipment – Sound Pressure Levels at 1m

Item	Octave band sound pressure level at 1m at (centre frequencies in Hertz)- dB(L)									dB(A)
	31.5	63	125	250	500	1000	2000	4000	8000	
GT enclosure	84	92	80	81	78	80	80	73	63	85
GT enclosure ventilation	93	92	91	82	75	74	82	74	64	85
Skid gas	85	87	79	76	73	75	74	70	59	80
Generator enclosure	83	79	88	78	77	82	79	73	60	85
Diffuser (indoor)	87	95	79	78	75	78	82	72	59	85
Diffuser (outdoor)	89	88	84	83	82	73	81	73	63	85
Vertical duct (indoor)	79	91	85	82	74	81	79	73	64	85
Air intake body (outdoor)	88	79	78	69	66	76	76	67	47	80
Air intake inlet (outdoor)	99	102	91	84	77	78	77	75	73	85
Closed cycle pumps	86	87	83	80	78	81	80	71	63	85
Stack body	91	83	76	66	64	64	64	59	52	70
Gas station	85	77	68	59	56	62	67	70	72	75
Gas compressors enclosure	84	89	84	82	78	77	79	79	73	85

Table 8.14: Noise Emission Levels for Standard OCGT Power Plant Equipment – Sound Power Levels

Item	Octave band sound power level (centre frequencies in Hertz) dB(L)									dB(A)
	31.5	63	125	250	500	1000	2000	4000	8000	
Fin fan coolers (total)	110	107	100	98	92	87	85	82	75	95
Step-up transformer	99	96	111	94	90	77	73	68	65	96
Unit transformer	99	98	96	86	79	79	74	67	59	85
Stack Outlet	124	117	110	99	93	87	78	70	64	98

Table 8.15 presents the predicted operational noise levels at each NSL. This is extent of the predicted 45 dB(A) noise contour as shown in Figure 8.4.

Table 8.15: Predicted Noise Levels During the Operational Phase

NSL	Daytime/evening/night-time threshold values dB(A)	Predicted L _{Aeq} dB (free field)
NSL1	55/50/45	23.8
NSL2	55/50/45	23.3
NSL3	55/50/45	24.2
NSL4	55/50/45	24.1

NSL	Daytime/evening/night-time threshold values dB(A)	Predicted L_{Aeq} dB (free field)
NSL5	55/50/45	18.2

The results show that operational noise due to the proposed OCGT power plant are not expected to exceed the daytime, evening and night-time threshold values at any NSL. Consequently, potential noise impacts during operation are assessed as not significant.

Figure 8.4: Predicted Contour Describing the Spatial Extents of the Predicted Operational Noise Level of 45 dB(A)



8.6.4 Decommissioning Phase

A Decommissioning Management Plan (DMP) will be prepared in accordance with the IE licence (review) requirements. Furthermore, it is expected that the proximity of sensitive receptors may change over the operational lifetime of the Project. However, impacts during decommissioning are expected to be of a similar magnitude to those during construction but generally of shorter duration. Temporary impacts due to general site activities and road traffic in decommissioning the proposed development site are also expected to be insignificant with a low risk of adverse effects due to noise based on the proximity of existing NSLs.

8.7 Cumulative Effects

Developments that are considered to have the potential to result in cumulative noise impacts with the proposed development include:

- Ringsend OCGT Power Plant;
- Ringsend Flexgen;
- Poolbeg Flexgen;
- South Wall BESS;
- Poolbeg BESS;

- North Wall Power Plant;
- Ringsend Wastewater Treatment Plant (WwTP);
- Dublin Waste to Energy Facility; and
- North Wall Emergency Power Generation.

8.7.1 Construction Noise

Construction activity for the various developments may occur simultaneously resulting in temporary combined noise impacts at the NSLs. The phasing of activities and the inherent variability in the nature of construction noise make it difficult to predict the combined impacts without a large degree of uncertainty.

With reference to the predicted noise levels during the construction phase of the proposed development given in Table 8.10, these show that the levels are significantly below the daytime threshold values and therefore could not be identified as the primary cause of any exceedance of the threshold values. In most cases, this also applies to the night-time impacts although the majority of works will be undertaken during the daytime. It is concluded that the proposed development is not expected to result in cumulative impacts with the potential to exceed the daytime threshold values at any NSL. Consequently, potential cumulative noise impacts during construction are assessed as not significant.

8.7.2 Operational Noise

With reference to the predicted noise levels during the operational phase of the proposed development given in Table 8.13, these show that the levels are significantly below the daytime, evening and night-time threshold values. Consequently, the noise levels due to the project would not contribute to the threshold values being exceeded either directly or as a result of cumulative impacts.

It is concluded that the proposed development is not expected to result in cumulative impacts with the potential to exceed the daytime, evening or night-time threshold values at any NSL. Consequently, potential noise impacts during operation are assessed as not significant.

8.8 Mitigation Measures and Monitoring

8.8.1 Construction Phase

The majority of construction activity that generates noise is expected to be undertaken within daytime working hours. Predicted noise impacts due to daytime construction works do not indicate potential significant effects. Where works are required to be undertaken within the night-time period, the predicted noise impacts, based on the assumed plant utilisation, are also expected to be within the corresponding threshold values.

Monitoring of vibration during piling with the potential to affect nearby buildings/structures should be based on ppv and may require time histories to be acquired. The measured levels should be compared with the threshold values given in Table 8.3.

The preferred positions to measure are low down on the structure with the transducers fixed at or within the outer wall of the foundation. In the case of horizontal vibration, amplification arises in buildings and tends to increase with building height. Vertical vibration will result in higher vibration levels in suspended floors/elements at mid-span positions.

The measurement chain should be calibrated and traceable to national standards within an accredited calibration laboratory no more than two years before any valid measurement.

8.8.2 Operational Phase

The prediction of operational noise indicates that the levels arising from the proposed development at NSLs, are expected to be well below daytime, evening and night-time threshold values. The noise levels due to the project would not contribute to the threshold values being exceeded either directly or as a result of cumulative impacts. There is no specific requirement for mitigation or monitoring of noise during operation.

8.9 Residual Impacts

There are no significant residual noise or vibration impacts due to the construction and operational phases of the proposed development.

9 Biodiversity

9.1 Introduction

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’*.

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

Mitigation measures are provided to avoid / reduce significant effects on biodiversity receptors and residual effects are determined.

9.2 Policy and Guidance

The Planning Report which accompanies this application (Ref: 229100184_3_A) describes the wider policy and legislative context applicable to the proposed development. Policies and guidance documents of potential relevance to the Biodiversity chapter are set out in this section

The following legislation and guidance documents below have been used to inform this chapter of the EIAR.

9.2.1 Legislative Context

In order to assess the potential impacts on the prevailing biodiversity arising from the proposed works at the Poolbeg OCGT, due regard was given to the following relevant legislation:

- EIA Directive (2014/52/EU);
- EC (2021) Assessment of Plans and Projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC;
- EC (2018) Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC Commission Notice C (2018) 7621;
- Planning and Development Acts 2000 – 2018 and Planning and Development Regulations 2001-2019;
- Wildlife Act 1976 to 2022;
- Flora (Protection) Order 2022;
- EU Water Framework Directive 2000/60/EC; and
- European Communities (Birds and Natural Habitats) Regulations 2011 (as amended).

9.2.2 Guidelines

The biodiversity chapter has been prepared in accordance with the following guidance:

- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Version 1.1. (Chartered Institute of Ecology and Environmental Management (CIEEM), 2018, updated 2019);
- (EPA 2022); Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)

Other relevant guidance considered is referenced throughout this chapter.

9.3 Methodology

9.3.1 Desk Study

A desktop assessment was carried out to identify features of ecological importance which have potential to be affected by the proposed development. The assessment included a review 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).

Principal sources of information utilised for the desktop assessment included:

- A comprehensive desk study was carried out by Mott MacDonald of existing biodiversity survey information of the Poolbeg peninsula including the site. This information was collected by Mott MacDonald ecologists and subconsultants during 2019, 2020 and 2021. These surveys informed the Biodiversity Impact Assessment and Request for Further Information documents submitted for the adjacent Poolbeg BESS and Poolbeg FlexGen developments, both of which have since been granted planning permission (Planning ref: 3624/20 and 3625/20). Information from previous surveys was considered where relevant in the biodiversity section of this EIAR and findings of the desk study are outlined in Section 9.4.2.
- Existing relevant mapping and databases e.g. species (protected and rare) and habitat distribution sourced from the Environmental Protection Agency (EPA), the National Biodiversity Data Centre (NBDC) and the National Parks and Wildlife Services (NPWS);
- 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;
- EPA (Water Framework Ireland Map viewer) databases for information on surface water features within proximity to the proposed development; and
- Water Quality in Ireland 2010-2015 (EPA, 2017).

Known records of protected and rare plant and animal species occurring in the vicinity of the proposed development site were provided to Mott MacDonald previously by the NPWS Scientific Unit.

9.3.2 Field Survey

9.3.2.1 Previous Field Surveys 2019, 2020 and 2021

The habitats at the proposed development site were included in previous surveys on the wider Poolbeg peninsula by Mott MacDonald ecologists. Habitats were classified based on Fossitt (2000) and were assessed for their suitability to support features / species of ecological importance in previous years to inform EIAR for similar projects on the Poolbeg peninsula adjacent or close to the site. Schedule three invasive species⁸³ were also previously surveyed.

⁸³ Plants listed in Part 1 and non-native animal species listed in Part 2 of the Third Schedule of S.I No. 477 of 2011, European Communities (Birds and Natural Habitats) Regulations 2011, as amended.

Faunal assessments of the site included 1) bird community assessment, 2) mammal community assessment, 3) bat assessment and 4) invasive species community survey.

Bat surveys were carried out to assess the presence or absence of bat roosts within the buildings by MERC Consultants on behalf of ESB. A daytime presence / absence roost survey, emergence survey and a daytime swarm survey were carried out on the 30 October 2019 and 31 October 2019.

In addition to winter bird surveys conducted by other consultants, a targeted wintering bird survey within the South Dublin Bay and River Tolka Estuary SPA was conducted each month (five survey days) between February and March 2020 by MKO consultants. The aim of the survey was to identify the presence of foraging or roosting Special Conservation Interests (SCI) within the adjacent SPA to inform the assessment of potential for adverse effects on site integrity.

A visit to the Poolbeg peninsula including the site was initially conducted on 22 July 2021 to inform potential for the site to be used by mobile features of interest associated with European sites including nesting gull species (Herring gull - *Larus argentatus* and Lesser black-backed gull - *Larus fuscus*) and Peregrine (*Falco peregrinus*). The area was also searched for evidence of schedule three listed invasive plant species.

9.3.2.2 Biodiversity Survey 2022

The 2022 surveys, focussed on the proposed site and environs, were conducted on 30 June 2022 and 20 July 2022 to inform this EIAR. The walkover survey recorded habitats and key plant species. Habitats were categorised according to the Heritage Council's 'A Guide to Habitats in Ireland' (Fossitt, 2000) to level 3. The habitat mapping exercise had regard to the 'Best Practice Guidance for Habitat Survey and Mapping' (Smith et al., 2010). Satellite imagery was used together with Global Positioning System (GPS) to accurately enable field navigation. Habitat categories, protected fauna (otter, badger), common fauna, birds, characteristic plant species, invasive species and other ecological features were recorded.

Checks were conducted immediately north of the site boundary for black guillemot nests. This area included the quay walls at the Liffey estuary edge.

The 2022 surveys provided an up-to-date ecological baseline of the proposed OCGT development site and formed the basis, together with previous desk information available, of this biodiversity impact assessment. Potential impacts were considered in light of the desk and field survey findings, and conclusions on potential impacts were determined thereafter.

9.3.3 Limitations

All areas within the footprint of the proposed development were accessed for survey. No significant limitations to the surveys arose.

9.3.4 Ecological Evaluation and Assessment of Impacts

9.3.4.1 Study Area (Ecological Zone of Influence)

CIEEM (2019) 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 Zone of Influence (Zol) varies depending on the construction and operational activity and the sensitivity of the receptor (e.g., flora, birds, terrestrial mammals) to the effect encountered.

The Zol identified for the various ecological receptors are as outlined below:

- The footprint of the proposed development for direct damage to habitats.
- A study carried out on the potential for effects via impacts on air quality and climate arising from the proposed development has been carried out as part of this EIAR. Within this assessment the Zol for dust effects to ecological receptors was identified as 50m. As such, the Zol is taken as 50m for dust effects within this EIAR.
- 40m for detectable noise effects⁸⁴ to wetland bird species. The noise study found that the construction phase works noise will fall to below 65dB within up to 40m of the proposed development. As such, areas of suitable mudflat habitat in the vicinity of works are taken as the Zol for the construction related noise impacts to wintering birds.
- Catchment wide Zol for surface waterbodies.

9.3.4.2 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 is reproduced in Table 9.1 below.

In accordance with NRA guidelines (2009) and CIEEM (2019), impact assessment is only undertaken of Key Ecological Receptors (KERs). These are features within the zone of influence of the proposed scheme which 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 of local importance (higher value) or higher as per NRA value criteria. Features of local importance (lower value) are not considered in the guidance to be KERs and are therefore excluded from impact assessment.

Table 9.1: 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

⁸⁴ Cutts, N., Phelps, A., & Burdon, D. (2009). Construction and waterfowl: Defining sensitivity, response, impacts and guidance. Report to Humber INCA by the Institute of Estuarine and Coastal Studies, University of Hull. EN (2003) The Humber Estuary European Marine Site: English Nature’s advice given under Regulation, 33(2).

Ecological Value	Description
Nationally Important	Sites or waters designated or proposed as an 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 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

9.3.4.3 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 reproduced in Table 9.2 below.

Table 9.2: Impact Magnitude and Duration Criteria

Impact magnitude	Definition
Quality of Effects	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

Impact magnitude	Definition
	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).
Significance of Effects	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
Duration and Frequency of Effects	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 Once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually

9.4 Receiving Environment

9.4.1 Outputs of Desk Study

The wider environment within the Poolbeg peninsula including the site comprises a heavily industrialised area with a mixture of power generation, wastewater treatment, waste management and other commercial enterprise. Additionally, the peninsula supports a number of large industrial/municipal installations. Existing facilities within the wider Poolbeg Peninsula include, but are not limited to the following; the ESB Poolbeg Generating Station which operates under the IE licence P0577-04 Dublin Bay Power which operates under IE Licence P0486-02, Dublin Waste to Energy Limited (Covanta) which operates under IE Licence W0232) and

Ringsend Wastewater Treatment Plant (WWTP) which operates under a Section 4 Discharge Licence LDW/001/93. The existing operational activities of these facilities have been considered within the baseline assessment.

The site is comprised entirely of hardstanding ground with adjacent buildings and structures. There are a number of amenity grassland areas to the south of the site including the following of ecological importance; Poolbeg compensatory grassland and the Irishtown Nature Park are located ca. 400m south west of the site. The coastal areas immediately north and south of the Poolbeg peninsula are internationally important for wintering birds and some marine habitats and have been predominantly designated as European sites (SAC/ SPA).

The 2022 walkover surveys coupled with the desktop assessment, concluded that protected species are unlikely to occur within the site and environs. This assessment is based on the actively used industrial nature of the environs and existing hardstanding habitats covering the proposed site. There are no natural habitats or natural watercourses within or in proximity to the proposed development site. As such there is very limited potential for the site to support protected mammals, birds, aquatic or invertebrate species.

9.4.1.1 Designated Sites

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 the highest 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.

The site boundary of the proposed OCGT development within the Poolbeg site does not overlap with any European sites.

Relevant European sites in the wider area identified as potentially within the ZoI of the proposed development, i.e. with potential source-pathway-receptor (S-P-R) connectivity, and their qualifying interests/special conservation interests are listed in Table 9.3. Other European sites not listed were considered and it was assessed that no additional sites are likely to be within the ZoI of the proposed development.

Table 9.3: European Sites with potential S-P-R Connectivity considered

Site Name and Code	Qualifying Interests / Special Conservation Interests	Distance and Potential Connectivity
South Dublin Bay SAC [000210]	Tidal Mudflats and Sandflats [1140] <i>Salicornia</i> Mud [1310]	Located approximately 250m east and <50m south of the site. Given the close location of the proposed development relative to the European site boundary, potential for surface water runoff from the site during construction, and proposed additional storm water overflow for treated effluent during operation, a viable source pathway connector link has been identified.
North Dublin Bay SAC	Tidal Mudflats and Sandflats [1140] Annual Vegetation of Drift Lines [1210] <i>Salicornia</i> Mud [1310] Atlantic Salt Meadows [1330] Mediterranean Salt Meadows [1410]	Located approximately 1.9km northeast of the site. Given the close location of the proposed development relative to the European site boundary, potential for surface water runoff from the site during construction, and proposed additional storm water overflow for treated effluent during operation, a viable source pathway connector link has been identified.
South Dublin Bay and River Tolka Estuary SPA [004024]	Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] Oystercatcher (<i>Haematopus ostralegus</i>) [A130] Ringed Plover (<i>Charadrius hiaticula</i>) [A137] Grey Plover (<i>Pluvialis squatarola</i>) [A141] Knot (<i>Calidris canutus</i>) [A143] Sanderling (<i>Calidris alba</i>) [A144] Dunlin (<i>Calidris alpina</i>) [A149] Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] Redshank (<i>Tringa totanus</i>) [A162] Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] Roseate Tern (<i>Sterna dougallii</i>) [A192] Common Tern (<i>Sterna hirundo</i>) [A193] Arctic Tern (<i>Sterna paradisaea</i>) [A194] Wetland and Waterbirds [A999]	The closest point is an isolated common tern breeding colony 220m northwest of the site. The rest of the SPA is located approximately 250m east and <50m south of the site. While the site is of no value for wintering birds, concentrations of certain ex situ wintering bird species use the coastal area immediately north of the site (< 50m) and may be disturbed hence, a viable source pathway connector link has been identified.
North Bull Island SPA [004006]	Light-bellied Brent Goose (<i>Branta bernicla hrota</i>) [A046] Shelduck (<i>Tadorna tadorna</i>) [A048] Teal (<i>Anas crecca</i>) [A052] Pintail (<i>Anas acuta</i>) [A054] Shoveler (<i>Anas clypeata</i>) [A056] Oystercatcher (<i>Haematopus ostralegus</i>) [A130] Golden Plover (<i>Pluvialis apricaria</i>) [A140] Grey Plover (<i>Pluvialis squatarola</i>) [A141] Knot (<i>Calidris canutus</i>) [A143] Sanderling (<i>Calidris alba</i>) [A144] Dunlin (<i>Calidris alpina</i>) [A149] Black-tailed Godwit (<i>Limosa limosa</i>) [A156] Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] Curlew (<i>Numenius arquata</i>) [A160] Redshank (<i>Tringa totanus</i>) [A162] Turnstone (<i>Arenaria interpres</i>) [A169]	The closest point is approximately 2km north of the site. While the site is of no value for wintering birds concentrations of certain ex situ wintering bird species use the coastal area immediately north of the site and may be disturbed hence, a viable source pathway connector link has been identified.

Site Name and Code	Qualifying Interests / Special Conservation Interests	Distance and Potential Connectivity
	Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] Wetland and Waterbirds [A999]	
Rockabill to Dalkey Island SAC {003000}	Reefs [1170] Harbour Porpoise (<i>Phocoena phocoena</i>) [1351]	Located approximately 6.5km east of the site. Harbour porpoise are wide ranging and may utilise the River Liffey estuary and foraging individuals may be temporarily affected/ disturbed by noise/ vibration associated with the construction phase of the development hence, a viable source pathway connector link has been identified . No effects will arise to reefs.

Sites of National Importance

Natural Heritage Areas (NHA) are the basic wildlife designation in Ireland. These areas are considered nationally important for the habitats present or hold species of plants and animals whose habitats needs protection. 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). Proposed Natural Heritage Areas (pNHA) were published on a non-statutory basis in 1995 and have not since been statutorily proposed or designated. NHA and pNHAs within 1km of the site are predominantly contiguous with European site boundaries and are discussed in Table 9.3 above. They include:

- The South Dublin Bay pNHA (000210). The pNHA covers the same spatial extents South Dublin Bay SAC (000210).
- The Dolphins Dublin Docks pNHA (000201). The closest dolphin is approximately 250m north of the site and is included in South Dublin Bay and River Tolka Estuary SPA. A more distant dolphin (>500m) located in the pNHA, but not the SPA, is considered outside the ZOI of the development.
- The North Dublin Bay pNHA (000206) is located approximately 1.2km north-east of the site and covers the spatial extent of North Dublin Bay SAC.

There are no additional NHAs considered likely to be within the Zone of Influence (Zoi) of the proposed Poolbeg OCGT development.

Other Designated Sites

Other sites of nature conservation in relation to the proposed Poolbeg OCGT development are discussed hereunder.

- Two Ramsar sites are located within the Zoi of the four proposed developments which include; the Sandymount Strand / Tolka Estuary (832) and North Bull Island (406). These sites cover the same extents as South Dublin Bay SAC and North Dublin Bay SAC respectively. There are no further Ramsar sites within the vicinity of the proposed OCGT works site.
- Dublin Bay is designated as a UNESCO Biosphere reserve due to the rare and internationally important habitats and species it supports
- Bull Island Nature Reserve is within North Dublin Bay SAC. The flora and fauna of interest in the reserve are the same as those of North Dublin Bay SAC and North Dublin Bay pNHA. It is located 4km north-east of the Poolbeg site.
- North Bull Island is preserved as a Wildfowl Sanctuary (WFS 19). It is excluded from the "Open Season Order". It is located 4.5km North-East of Poolbeg site and is within North Bull Island SPA and North Dublin Bay SAC.

9.4.1.2 Records of rare and protected species and habitats

A review of published records of plants and animals protected under law, and invasive species listed in the Third Schedule of the Birds and Habitats Regulations was undertaken. This review included a data check of Biodiversity Ireland website⁸⁵ of the 2km grid squares which encompass the proposed development site (O13W & O23B). The results are outlined in Table 9.4 below.

Table 9.4: Records of Rare/Protected Fauna within 2km of the Proposed Development (O13W & O23B) from the National Biodiversity Data Centre

Name	Date of Record	Grid square	Title Dataset	Location in relation to the proposed development	Designation(s)
Common Frog (<i>Rana temporaria</i>)	07/03/2003	O13W	Irish National Frog Database	Recorded within 2km square	EU Habitats Directive: Annex V; Wildlife Acts.
European Otter (<i>Lutra lutra</i>)	04/05/1980	O13W	Otter Survey of Ireland 1982	Recorded within 2km square	EU Habitats Directive: Annex II & Annex IV; Wildlife Acts
Harbour Porpoise (<i>Phocoena phocoena</i>)	18/05/2012	O13W	IWDG Cetacean Strandings Database	Recorded stranded on Sandymount Strand, approx. 1km south.	EU Habitats Directive: Annex II & Annex IV; Wildlife Acts.
				Recorded stranded on Sandymount Strand, approx. 700m south.	
Grey Seal (<i>Halichoerus grypus</i>)	15/09/2013	O13W	Atlas of Mammals in Ireland 2010-2015	Live animal seen at Pigeon House Quay within Liffey Estuary, approx. 500m north.	EU Habitats Directive: Annex II & Annex IV; Wildlife Acts.
Common Seal (<i>Phoca vitulina</i>)	27/07/2018	O23B	Mammals of Ireland 2016-2025	Live animal seen north of the Great South Wall, approx. 1km east.	EU Habitats Directive: Annex II & Annex V; Wildlife Acts.
Common Dolphin (<i>Delphinus delphis</i>)	03/02/2012	O23B	IWDG Cetacean Strandings Database	Recorded stranded on Sandymount Strand, approx. 800m south.	EU Habitats Directive: Annex IV; Wildlife Acts.
Daubenton's Bat (<i>Myotis daubentonii</i>)	24/05/2011	O13W	National Bat Database of Ireland	Recorded in vicinity of Aviva Stadium, approx. 1.5km west, during EIS surveys.	EU Habitats Directive: Annex IV; Wildlife Acts.
Leisler's Bat (<i>Nyctalus leisleri</i>)	24/05/2011	O13W	National Bat Database of Ireland	Recorded in vicinity of Aviva Stadium, approx. 1.5km west, during EIS surveys.	EU Habitats Directive: Annex IV; Wildlife Acts.
Common Pipistrelle (<i>Pipistrellus pipistrellus</i>)	24/05/2011	O13W	National Bat Database of Ireland	Recorded in vicinity of Aviva Stadium, approx. 1.5km west, during EIS surveys.	EU Habitats Directive: Annex IV; Wildlife Acts.
	25/08/2011	O23B		Recorded at the Pigeon House site, adjacent to the proposed Poolbeg BESS.	

⁸⁵ <https://maps.biodiversityireland.ie/Map>

Name	Date of Record	Grid square	Title Dataset	Location in relation to the proposed development	Designation(s)
Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>)	24/05/2011	O13W	National Bat Database of Ireland	Recorded in vicinity of Aviva Stadium, approx. 1.5km west, during EIS surveys.	EU Habitats Directive: Annex IV; Wildlife Acts.
Lesser Noctule (<i>Nyctalus leisleri</i>)	24/05/2011	O13W	National Bat Database of Ireland	Recorded in vicinity of Aviva Stadium, approx. 1.5km west, during EIS surveys.	EU Habitats Directive: Annex IV; Wildlife Acts.

A number of protected bat species have been recorded within the 2km grid squares surrounding the Poolbeg site. The habitats within the Poolbeg peninsula are predominately man-made and are dominated by existing industrial developments. The national Bat Database habitat suitability tool The Biodiversity Ireland Website (Lundy *et al.*, 2011) indicates that the Poolbeg Peninsula has an overall suitability index of 17.44, indicating that the habitats within the peninsula are unfavourable to bat species.

Invasive plant species listed in Part 1 of the Third Schedule recorded within the immediate area surrounding the Poolbeg site included stands of Japanese knotweed (*Fallopia japonica*). Additionally, previously recorded invasive fauna species includes American mink (*Neovison vison*), and grey squirrel (*Sciurus carolinensis*).

Known locations of Japanese Knotweed within 1km of the Poolbeg site are outlined below:

- Irishtown Nature Reserve (c.a. 500m SW of site); and
- Coastal path east of Sean More Park, bordering Sandymount beach (> 1km SW of site).

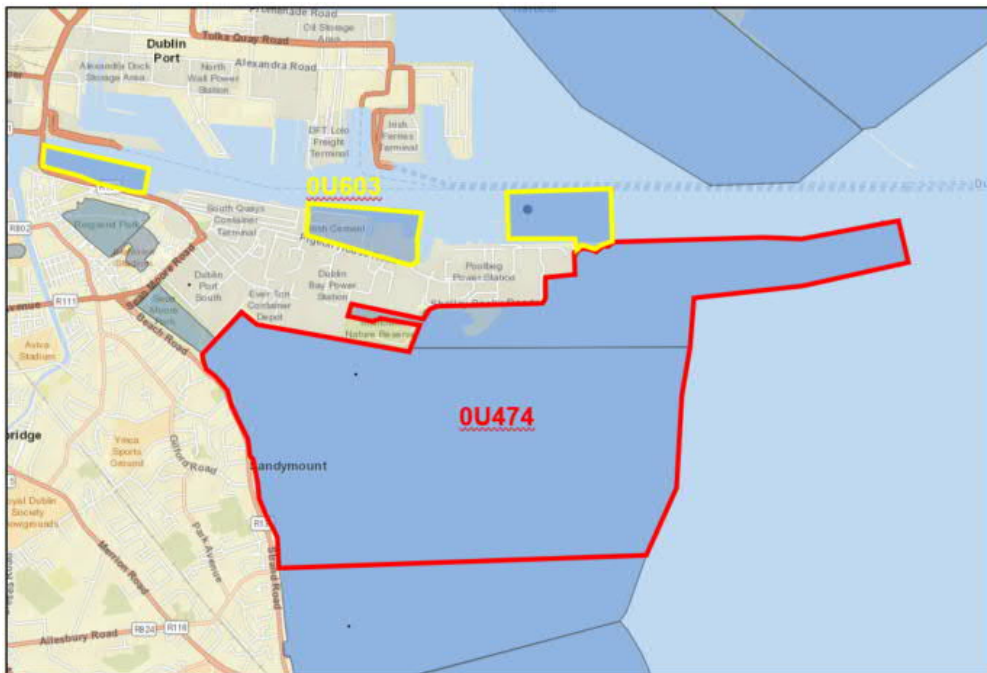
None of these areas include the Poolbeg site and most are being treated to eradicate them. The project will not interact with these existing stands of Japanese Knotweed.

9.4.1.3 Wintering Birds

Irish Wetlands Bird Survey (I-WeBS)

The Irish Wetland Bird Survey (I-WeBS), a joint scheme of BirdWatch Ireland and the National Parks and Wildlife Service (NPWS), monitors the numbers of wintering waterbirds in Ireland at a range of sites throughout the country. There are a number of sub-sites of Dublin Bay located within proximity to the proposed development, refer to Figure 9.1.

Figure 9.1: I-WeBS Subsites in Close Proximity to the Proposed Development



Source: BirdWatch Ireland⁸⁶

Note all yellow outline are subsite OU603

The subsite of 'Poolbeg (Liffey)' (code: OU603) covers sections of the Liffey Estuary north of the Poolbeg peninsula, approximately 57m from the proposed developments. The subsite 'Sydney Parade Ave – Poolbeg' (OU474) covers the tidal flats of North Sandymount Strand, ca. 40m from the proposed developments. Following a request for data, BirdWatch Ireland provided the annual peak counts for subsites OU474 and OU603 on the 24/03/2020. The annual peak counts recorded for subsite OU474 are outlined in Table 9.5 below.

Table 9.5: WeBS data for Subsite OU474 (Sydney Parade Ave - Poolbeg)

Species	1% National	1% International	Mean 5-yr Peak Count (2013/14 – 2017/18)	Overall Peak Count (2013/14 – 2017/18)
Kittiwake			8	40
Mute Swan	90	100	1	2
Light-bellied Brent Goose	350	400	432	706
Shelduck	100	2500	8	14
Wigeon	560	14000	5	17
Teal	360	5000	26	128
Long-tailed Duck			0	1
Red-breasted Merganser	25	860	6	13
Little Grebe	20	4700	0	0
Great Crested Grebe	30	6300	10	30
Cormorant	110	1200	18	82
Shag			0	1
Little Egret	20	1100	6	9

⁸⁶ <https://bwi.maps.arcgis.com/apps/View/index.html?appid=1043ba01fcb74c78bc75e306eda48d3a>

Species	1% National	1% International	Mean 5-yr Peak Count (2013/14 – 2017/18)	Overall Peak Count (2013/14 – 2017/18)
Grey Heron	25	5000	1	2
Oystercatcher	610	8200	691	1031
Ringed Plover	120	540	84	223
Golden Plover	920	9300	80	350
Grey Plover	30	2000	3	8
Lapwing	850	72300	2	9
Knot	160	5300	782	1670
Sanderling	85	2000	167	440
Dunlin	460	13300	1947	4870
Snipe			0	1
Black-tailed Godwit	200	1100	5	15
Bar-tailed Godwit	170	1500	41	89
Curlew	350	7600	55	91
Greenshank	20	3300	3	6
Redshank	240	2400	151	261
Turnstone	95	1400	46	160
Black-headed Gull	-	20,000	763	1200
Common Gull	-	16,400	9	32
Lesser Black-backed Gull	-		1	2
Herring Gull	-	10,200	27	82
Great Black-backed Gull	-	4,200	3	5
Sandwich Tern	-	-	0	2
Common Tern	-	-	0	2

A total of 36 species have been recorded within the 'Sydney Parade Ave – Poolbeg' (0U474) subsite over the most recent five-year data period. Of these species, seven have been recorded in numbers of national importance; Brent goose, oystercatcher, knot, ringed plover, sanderling, redshank and dunlin; and one in numbers of international importance; light bellied Brent goose. The annual peak counts recorded for subsite 0U603, the closest location to the site, are outlined in Table 9.6 below.

Table 9.6: Annual Peak Counts of Wintering Bird Species Recorded at Subsite 0U603

Species	1% National	1% International	Annual Peak Count (2016/17)
Light-bellied Brent Goose	360	400	290
Wigeon	560	14000	13
Teal	360	5000	55
Red-breasted Merganser	25	860	12
Red-throated Diver	20	3000	1
Great Crested Grebe	30	6300	6
Cormorant	110	1200	48
Grey Heron	25	5000	1
Oystercatcher	610	8200	139
Ringed Plover	120	540	1
Sanderling	85	2000	6

Species	1% National	1% International	Annual Peak Count (2016/17)
Dunlin	460	13300	250
Black-tailed Godwit	200	1100	285
Curlew	350	7600	16
Redshank	240	2400	45
Turnstone	95	1400	19
Black-headed Gull	n/a	20,000	750
Common Gull	n/a	16,400	120
Lesser Black-backed Gull	n/a	5500	1
Herring Gull	n/a	10,200	18
Great black backed gull	n/a	4,200	8

A total of 22 species have been recorded at the Poolbeg (Liffey) (0U603) I-WeBS monitoring site. It is noted that this is a recently established monitoring subsite and as such only one year of data is currently available (2016/17). Of these 22 species, only black-tailed godwit have been recorded in numbers of national importance.

Low tide roosting counts were carried out under the I-Webs monitoring programme in 2011/2012 which identified the location of roosting sites of the Special Conservation Interests within the SPA (NPWS, 2014). The majority of roosting sites of the wintering species were recorded at the leeward side of Bull Island which included subsites; 0U465 (Wooden Bridge-Causeway), 0U466 (North of Causeway) and 0UL47 (Kilbarrack), all located an excess of 2.5km north of the Poolbeg Peninsula. A large number of roosting sites were also recorded at the subsite 0U460 (Dún Laoghaire - Seapoint) located approximately 3.3km south of the Poolbeg Peninsula.

Winter Bird Survey (2019)

As part of the Poolbeg West SDZ enabling works planning application (planning reference number: PWSDZ3270/19), winter bird surveys were undertaken at the north-western extent of North Sandymount Strand during the 2018/19 season (Scott Cawley, 2019). The winter bird survey covered the area of North Sandymount Strand between Poolbeg Beach and the Sandymount Martello Tower i.e. the coastal area south of the proposed development. Key summary data is summarised and compared with recent I-Webs data and MKO 2020 surveys in Table 9.7.

Winter Bird Survey (2020)

A winter bird survey was undertaken within the South Dublin Bay and River Tolka Estuary SPA over a five-day survey, between February and March 2020. This survey was conducted by MKO consultants on behalf of Mott MacDonald to inform the EIAR/ NIS for projects adjacent to the site. The aim of the survey was to identify the presence of foraging and roosting SCIs within the adjacent SPA.

The study area was established as a 300m radius from each of the four proposed development site boundaries as per Cutts et al (2013). A list of the waterfowl species recorded during the surveys are listed in below.

Key locations and highest numbers of SCIs recorded in the MKO surveys included:

- Black headed gull: recorded in nationally important numbers on-site on four of the five visits undertaken with a peak count of 839 on 1 March 2020. The south-side of the South Wall, Shellybanks Beach and the water outfall at the northern-side base of the South Wall were the most important areas for this species.
- Bar-tailed godwit: 274 birds were recorded at the water outfall at the northern-side base of the South Wall on 2 March 2020. This flock contained nationally important numbers.
- Herring gull: 169 birds were recorded at the water outflow at the north-side base of the South Wall on 1 March 2020.
- Dunlin: 116 birds were recorded at Shellybanks Beach on 2 March 2020.
- Redshank: the peak total count recorded on-site included 178 birds, with the largest flock of 131 birds recorded at Shellybanks beach on 5 March 2020.
- Light-bellied Brent geese: 30 were recorded on 25 February 2020, feeding in on the compensatory grassland north of the Irishtown nature reserve. In addition, a total of 439 light-bellied Brent geese were recorded using Sandymount strand as a night-time roost on the 6 March. This constitutes as nationally important flock.

Additionally, significant numbers of SCIs were recorded outside of the 300m survey area from the proposed development site boundaries. Two high-tide communal roosts were identified 1km and 2.5km from the Poolbeg Peninsula. Nationally important numbers of dunlin (700) and sanderling (90) were recorded at the first roost area and nationally important numbers of bar-tailed godwits (400) and dunlin (700) were recorded at the second-high tide communal roost. Night-time roosting of light bellied Brent geese outside the 300m survey radius were also recorded before dawn.

Key summary MKO (2020) data is compared with recent I-Webs and Scott Cawley (2019) data in Table 9.7.

Table 9.7: Available Data on the Usage of North Sandymount Strand by SCI Species

SCI Species	1% National	1% Inter- national	I-WeBS		Scott Cawley Ltd. (2019)	MKO survey (2020)
			Mean 5-yr Peak Count (2013/14 – 2017/18)	Overall Peak Count (2013/14 – 2017/18)	Annual Peak Count (2018/19)	Peak Count (2020)
Light-bellied Brent Goose	350	400	432	706	210	30
Shelduck	100	2500	8	14	10	18
Teal	360	5000	26	128	0	112

SCI Species	1% National	1% Inter- national	I-WeBS		Scott Cawley Ltd. (2019)	MKO survey (2020)
Oystercatcher	610	8200	691	1031	677	132
Ringed Plover	120	540	84	223	175	0
Golden Plover	920	9300	80	350	0	0
Grey Plover	30	2000	3	8	2000	0
Knot	160	5300	782	1670	550	7
Sanderling	85	2000	167	440	600	0
Dunlin	460	13300	1947	4870	1392	116
Black-tailed Godwit	200	1100	5	15	225	37
Bar-tailed Godwit	170	1500	41	89	260	278
Curlew	350	7600	55	91	14	14
Redshank	240	2400	151	261	164	178
Turnstone	95	1400	46	160	28	41
Black-headed Gull	-	20000	763	1200	498	839
Red-breasted Merganser	25	860	6	13	10	0
Great-crested Grebe	30	6,300	10	30	0	0

Orange = exceeds 1% national population estimate; Red = exceeds 1% international population estimate.

The most important habitat for waterfowl species within the survey area were identified by MKO as;

- Shellybanks Beach (located immediately east of the Poolbeg Peninsula),
- the water outfall at the north-side base of the south wall (located immediately north of the Poolbeg Peninsula),
- the compensatory grassland (located immediately north of Irishtown Nature Reserve) and the south side of the South Wall (located east of the Poolbeg Peninsula).

Based on these previous surveys all these areas where SCI birds concentrate are at least 200m from the proposed development in coastal/ marine habitats and hence considered outside the ZOI of the project.

These locations are all in undeveloped coastal and intertidal marine areas.

The site of the proposed development is not important for wintering birds. The north Sandymount strand area near the Poolbeg site continues to support significant (Internationally) numbers of wintering birds with existing operational impacts from developments on the Poolbeg peninsula.

9.4.1.4 Breeding Birds

The proposed development site is unsuitable for breeding birds and no previous breeding bird data is available for the site as it is developed and completely disturbed. The nearest breeding bird areas of note are outlined as follows.

Tern Species

Three tern species: roseate tern (*Sterna dougallii*), common tern (*Sterna hirundo*), and Arctic tern (*Sterna paradisaea*), are listed as SCIs of the South Dublin Bay and River Tolka Estuary SPA (NPWS, 2015). These species are designated for both breeding and staging populations. The main roosting sites for the tern species are the exposed sand banks in south Dublin Bay

primarily between the Martello Towers at Sandymount (NPWS, 2015), which are located over 1km south of the Poolbeg Peninsula. In addition, the expansive sandflats on Sandymount Strand serve as a post-breeding staging site for tern species (Tierney *et al.* 2016).

Sandymount Strand is located approximately 1.7km south-west of the Poolbeg Peninsula. Both the breeding and staging sites are located outside the ZoI for noise effects (outside the 300m buffer). It was noted, however, that both Common tern and Arctic tern also breed in the Dublin Docks, on man-made mooring structures which include the ESB dolphin, the CDL dolphin and the two floating pontoons, which are located to the north of the Poolbeg Peninsula (NPWS, 2015) in the Liffey estuary relatively close to the site (closest is approximately 220m).

Peregrine Falcon

Peregrine Falcon (*Falco peregrinus*) have been breeding for many years at the disused power station stacks at the Pigeon House. The stacks are located ca. 50m from the Poolbeg site. Breeding peregrine falcon use a foraging core range of 2km and use the wider environs of the Poolbeg peninsula.

9.4.1.5 Marine Mammals

Dublin Bay supports protected marine mammals which includes harbour porpoise (*Phocoena phocoena*), harbour seal (*Phoca vitulina*) and grey seal (*Halichoerus grypus*).

Surveys of harbour porpoise within Rockabill to Dalkey Island SAC have determined that the highest concentrations of the species occur in the northern extent of the site, in proximity to Lambay and Rockabill Islands (located approximately 20km and 30km northeast of Poolbeg peninsula) while lower comparative concentrations have been recorded in the southern extent of the site, approximately 15km at its closest point to the proposed development (Berrow *et al.*, 2014 and Berrow & O'Brien, 2013). Foraging harbour porpoise may use the Liffey estuary at least occasionally for foraging, hence a source-pathway-receptor link was identified between the designated marine species and temporary noise disturbance during construction works for the proposed development.

Two harbour seal breeding colonies in Dublin Bay are located within the SAC at Lambay Island (NPWS, 2013). There are three grey seal breeding sites within Dublin Bay (Ó Cadhla *et al.*, 2013). The largest of these is located at Lambay Island (ca. 20km north), with the other two sites located at Ireland's Eye (ca. 10.5km north-east) and Dalkey Island (10km south-east).

The breeding and resting sites of harbour and grey seals are all located an excess of 10km from the proposed development. A review of available data has shown that the areas of open water within the surrounding environment of the proposed development sites (i.e. the Liffey Estuary and Sandymount Strand) are not significant ex-situ areas for these species. However, foraging seal species may use the Liffey estuary at least occasionally for foraging, hence a source-pathway-receptor link was identified between the designated marine species and temporary noise disturbance during construction works for the proposed development.

Harbour porpoise and seal species may potentially use coastal areas within 1km of the proposed development for foraging. As such potential noise disturbance during construction effects on these species are considered in the assessments.

9.4.1.6 Bats

Bat surveys were conducted of three buildings proposed to be demolished adjacent to the site at the proposed Poolbeg BESS site on 30 October 2019 and 31 of October 2019. Dusk and dawn surveys were carried out to establish bat activity in the locality.

A roost assessment survey of all three buildings both externally and internally, was also undertaken. All buildings were checked for signs of bat use (e.g. droppings, urine stains, grease staining, physical wear scratches etc.) as well as definitive signs of bat absence (e.g. well-sealed joints, coating of old cobwebs etc). The aim of the survey was to determine the presence/absence of roosting bats and identify any suitable roost features within the buildings to be demolished.

No active bat roosts were identified within the buildings surveyed. No evidence of bat activity was identified during the internal or external inspection of the buildings. Additionally, no bats were seen during the emergence survey and none were seen returning or swarming during the dawn survey.

No features potentially suitable for roosting bats exist on the site or adjacent areas.

The site was considered to be unsuitable for bats in previous surveys. The site is within an exposed coastal area and is highly disturbed and industrialised. There is very little optimal foraging habitat for bats at the Poolbeg peninsula, and any existing habitat is highly fragmented. The entire area is also excessively lit by artificial lighting which further discourages bats from using the area.

9.4.1.7 Review of Previous Ecological Assessments (Poolbeg Peninsula)

A review of previous ecological assessments undertaken for projects in the surrounding area of the proposed development was also carried out. An appraisal of results from relevant past ecological assessments associated with these projects is presented below and was used to inform the baseline for the proposed development.

Four ESB Projects (FlexGen & BESS), Poolbeg Peninsula (Location at Poolbeg and Ringsend (Planning ref:3625/20,3624/20, 3646/20 and 3647/20)

Mott MacDonald conducted baseline ecological surveys (winter bird, breeding bird, habitat, bat and walkover surveys) and desk surveys to inform the EIAR, NIS and Request for Further Information documents submitted for these projects located close to (<1km) or adjacent to the proposed Poolbeg project. No significant ecological receptors were noted within these sites and sensitive ecological receptors such as designated sites, marine and coastal birds, habitats and mammals and breeding Peregrine (Poolbeg chimneys) were assessed and no significant impacts were identified. The Poolbeg BESS and Poolbeg Flex Gen both were granted planning consent and construction at the site is ongoing.

Poolbeg West SDZ Enabling Works (Planning ref. no. PWSDZ3270/19)

The Poolbeg West Strategic Development Zone (SDZ) covers the former IGB and Fabrizia sites at Poolbeg, directly north of Sean Moore Park. Previous ecological surveys included general walkovers and targeted bat and breeding/wintering bird surveys. The only mammal recorded within the survey area was red fox, and no signs of any protected mammal species were recorded.

Bat activity surveys recorded an overall low level of bat activity, with three species recorded; common pipistrelle, soprano pipistrelle and Leisler's bat. No roosts or suitable trees/buildings were identified.

Breeding bird surveys recorded a total of 21 species within the survey site including five amber-listed species (robin, linnet, greenfinch, house sparrow and swallow) and one red-listed species recorded as a flyover (herring gull). The majority of these species are associated with the scrub, hedgerow and grassland habitats present within the site.

The proposed development does not contain extents of these habitats and is almost entirely composed of hardstanding with little to no vegetation. It is therefore not expected that species recorded at the former IGB and Fabrizio lands to the west would be present at the proposed development site.

Ringsend Wastewater Treatment Plant Upgrade Project (Planning ref. no: 3669/19)

Irish Water are proposing the Ringsend Wastewater Treatment Plant Upgrade Project. An element of the project will include upgrade works at the existing Wastewater Treatment Plant at Ringsend which is located approximately 60m west of the Poolbeg BESS development.

Ecological field surveys to inform the project did not record any signs of protected flora/fauna. It concluded that the site does not contain suitable habitat for breeding birds, roosting bats or large mammals. Japanese knotweed was recorded along the internal road near the eastern boundary of the WWTP.

Dublin Port Company Berth 47A Access Bridge & Storage Area (Planning ref. no.: 3711/18)

Berth 47A is situated on the northern side of the Poolbeg peninsula, approximately northwest of the Poolbeg site. It is the location of the tidal outlet from Covanta (Dublin's Waste-to-Energy Facility, also known as the Poolbeg Incinerator). The project involved the construction of an access bridge across the tidal outlet and some additional hardstanding area.

An ecological walkover survey was completed at the site on 18 July 2018 in order to inform the submitted Environmental Report. No evidence of any protected fauna was recorded and no features suitable for roosting bats were noted. Several stands of Japanese knotweed were recorded within the site and are currently being controlled.

Poolbeg 220kV Station – Shunt Reactance Coil Project (Planning ref. no.: 2789/14)

This project involved the construction of two 50MVar shunt reactance coil units within, and at the southern boundary of, the existing Poolbeg Generating station complex. This site is located directly south of the Poolbeg site.

A Planning and Environmental Considerations Report was submitted as part of the planning application for this project. The report was informed by an ecological walkover survey at the site in February 2014. No rare / protected flora or fauna were recorded within the site during this walkover survey.

9.4.2 Outputs of Field Surveys 2022

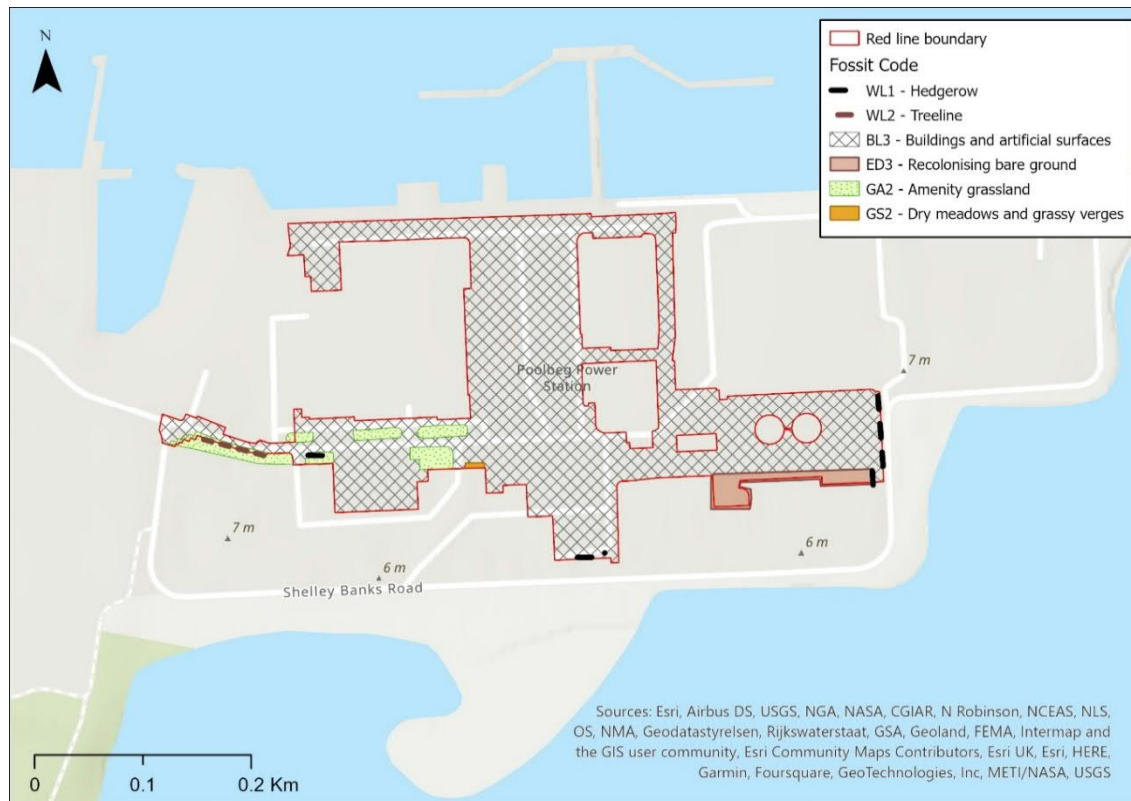
9.4.2.1 Habitats and Flora

A description of the habitats within the vicinity of the Poolbeg site and proposed OCGT development site boundaries are presented hereunder. Habitats were described in accordance with Fossitt (2000).

The Poolbeg site currently comprises entirely made/ built ground (BL3) including concrete, tarmac and gravelled areas (refer to Figure 9.2). Buildings including the Poolbeg stacks occur adjacent to the site.

A habitat map is provided in Figure 9.2 below.

Figure 9.2: Habitat Map



Source: Mott MacDonald

Figure 9.3: Existing Made Ground and Infrastructure which covers the entire Poolbeg Site



Source: Mott MacDonald

The site is bounded by an existing internal roadway on the northern and western sides. There are lighting columns, site cabins and some underground services on the site. There is also an existing roadway on the northern and western sides of the site. Plants occur sporadically around the edges of the site and included Butterfly Bush (*Buddleja davidii*) a moderately invasive species common in built up areas throughout Dublin. Other species noted were mainly around the periphery of the site in areas of recolonising bare ground (ED3) and included;

<i>Achillea milifolium</i>	Yarrow
<i>Angallis arvensis</i>	Scarlet pimpernal
<i>Anthyllis vulneraria</i>	Kidney vetch
<i>Arrhenatherum elatius</i>	False oat grass
<i>Hordeum murinum</i>	Wall barley
<i>Leontodon saxatilis</i>	Lesser hawkbit
<i>Malva sylvestris</i>	Common mallow
<i>Matricaria discoidea</i>	Pinappleweed
<i>Limbarda crithmoides</i>	Golden samphire
<i>Linaria purpurea</i>	Purple toadflax
<i>Medicago lupulina</i>	Black medick
<i>Papaver rhoeas</i>	Common poppy
<i>Potentilla repens</i>	Creeping cinquefoil
<i>Sececio vulgaris</i>	Groundsel
<i>Sonchusoleraceus</i>	Smooth sowthistle
<i>Tussilago farfara</i>	Coltsfoot

The existing habitats within the site were assessed as having negligible ecological value. Sandymount Strand is situated approximately 30m south of the site and is separated by an existing berm, planted treeline, security fencing and the Shellybanks Road. The Liffey estuary is located north of the site.

9.4.2.2 Wintering Birds

Extensive previous winter bird surveys have established the sensitivity of areas in the vicinity of the proposed development, refer to Section 9.4.1. No winter bird survey was required for this project as sufficient information is available to inform impacts and mitigation for wintering birds.

9.4.2.3 Breeding Birds

Given the nature of the habitats within the proposed development site, there is negligible potential for the site to support breeding birds. The site is completely disturbed by ongoing activity and no birds were recorded in surveys conducted in August 2022 which is within the bird breeding season. The Poolbeg stacks close to the site continue to be a regular nesting and roosting site for a pair of Peregrine, including during 2022.

A breeding tern (Common and Arctic tern) colony uses a pontoon in the Liffey estuary approximately 220m from the site. Extensive activity was noted here by terns during the site visit in August 2022. It was noted also that no black guillemot breeding sites were observed immediately north of the site on quay walls adjacent to the Liffey estuary.

9.4.2.4 Bats

No features potentially suitable for roosting bats exist on the site or adjacent areas.

9.5 Summary of Key Ecological Receptors

The key ecological receptors identified from desk and field studies potentially within the Zone of Influence of the proposed development are evaluated in accordance with the evaluation criteria set out in Table 9.1. 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 in Table 9.8.

The key ecological receptors identified from desk and field studies potentially within the Zone of Influence of the proposed development are evaluated in accordance with the evaluation criteria set out in Table 9.1. 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 in Table 9.8.

Table 9.8: Ecological Valuation and Identification of Key Ecological Receptors (KER)

Habitats/Species	Ecological Value (as per NRA guideline)	Potential to occur within the Zol of Poolbeg	Key Ecological Receptors
Designated Sites			
South Dublin Bay SAC (000210)	International	Yes – due to the potential for indirect impacts due to a degradation of water quality impacts.	Yes
North Dublin Bay SAC (000206)	International	Yes – due to the potential for indirect impacts due to a degradation of water quality impacts.	Yes
South Dublin Bay and River Tolka Estuary SPA (004024)	International	Yes – due to the proximity of the SPA to proposed development sites there is potential for the disturbance of the SCI species and potential for indirect impacts due to a degradation of water quality impacts.	Yes
Lambay Islands SAC (000204)	International	Potential for seals from this site to use coastal habitat within Zol of the project.	Yes
North Bull Island SPA (004006)	International	Yes –there is potential for disturbance to SCI associated with this SPA.	Yes
Rockabill to Dalkey Island SAC (003000)	International	Yes –there is potential for disturbance to SCI (Harbour Porpoise) associated with this SAC.	Yes
North Dublin Bay pNHA (000206)	National	Yes – due to the potential for indirect impacts due to a degradation of water quality impacts	Yes
Dolphin, Dublin Docks pNHA (000201)	National	Yes – due to the proximity to the four proposed developments there is potential for the disturbance of the sites scientific interests.	Yes
South Dublin Bay pNHA (000210)	National	Yes – due to the potential for indirect impacts due to a degradation of water quality impacts.	Yes
Habitats and Flora			
Buildings and artificial surfaces (BL3)	Negligible Ecological Value (no evaluation)	Yes – All artificial surfaces will be removed to facilitate the proposed works.	No
Fauna			
Bat species	Local Importance (Lower Value)	No - No suitable roosting or foraging habitat was identified within the footprint of the works.	No

Habitats/Species	Ecological Value (as per NRA guideline)	Potential to occur within the Zol of Poolbeg	Key Ecological Receptors
Wintering birds	International Importance	Yes – potential for disturbance to off site wintering species during construction and demolition works associated with the proposed development (see SPA sites above).	Yes
Breeding birds (tern population and Peregrine)	International Importance	Yes –potential for off site disturbance of breeding terns and Peregrine during construction phase.	Yes
Marine mammals	International Importance	Yes –harbour porpoises, grey seal and harbour seal may occur occasionally in adjacent coastal waters within the Zol of the proposed developments.	Yes

9.6 Likely Significant Impacts

A description of the likely significant impacts to Key Ecological Receptors (Table 9.8) is summarised below during the construction, operation and maintenance and decommissioning phase of the proposed development.

9.6.1 Do Nothing Scenario

In terms of the Do-Nothing scenario, there will be no changes to the existing site. The Poolbeg Generating Station will continue to operate under the existing IE Licence and will continue to comply with the conditions of the licence. Consequently, no impacts on biodiversity are likely.

9.6.2 Construction Phase Impacts

The nature of the proposed OCGT works at the Poolbeg site is outlined in Chapter 3. The entire development is located within existing made ground. The construction phase of the proposed development will involve the placement of new and/or the upgrading of existing infrastructure. This work will require excavation of existing hard surfaces and removal of materials i.e. disturbance of surface concrete made ground/ soil and subsoil through excavations.

A new stormwater discharge outfall is required to be constructed at the northern site boundary that will discharge from the existing outfall into the adjacent marine environment during the operational phase.

9.6.2.1 Habitats (Site and Adjacent Areas)

Habitat Damage/Loss

No Key Ecological Receptors exist on the site. Made ground habitats (bare ground, and artificial surfaces) within the Poolbeg site will be removed to facilitate the construction works. These habitats were identified as having negligible biodiversity value. As such, the loss of these habitats would not constitute a significant negative effect on biodiversity. No direct impacts will arise to adjacent coastal and estuarine habitats including European and Nationally protected sites.

Habitat Degradation (Adjacent Coastal Habitats)

Runoff of Sediment and Construction Pollution

The adjacent Liffey Estuary and Sandymount strand include coastal intertidal and subtidal marine habitat. The construction works associated with the Poolbeg OCGT development has the potential to result in accidental pollution events and the runoff of sediment if not appropriately managed, particularly in the event of heavy rainfall. There are no open drainage ditches or watercourses located within the Poolbeg site. The Poolbeg OCGT development site boundary is located ca. 20m north of Sandymount strand area and 30m south of the River Liffey Estuary. There are no significant areas of vegetation on or surrounding the site. Considering the proximity of the development site to the marine environment and the lack of impermeable boundaries surrounding the site, a risk of the runoff of construction pollution and/or sediment exists during the site construction phase. This runoff is likely to be of small scale and given the high dilution and existing turbid nature of the adjacent marine environment impacts are likely to be imperceptible.

Dust

Table 6.14 (Chapter 6) outlined receptor sensitivity of the area to ecological effects and Table 6.15 summarises risk of construction effects. The overall risk of dust soiling effects from the construction phase is deemed to be 'low' for demolition and trackout, and 'medium' for earthworks and construction, whilst for PM₁₀ health effects, the overall risk is deemed to be 'negligible' for demolition and 'low' for earthworks, construction and trackout. Further to this, the overall risk of ecological effects is deemed to be 'medium' for demolition, earthworks and construction. The assessment is precautionary and based on ecological receptors being of "high" sensitivity.

Further consideration of these worst case temporary localised dust impacts is provided below.

The only protected habitat which occurs within the spatial limits of dust effects is mudflats and sandflats [1140] which is designated within the South Dublin Bay SAC. The mudflat/sandflat habitat comprises fine, muddy sediment, the temporary deposition of dust within the habitat will not result in any change or impact to the habitat.

The proposed development will have no likely effects on winter birds due to dust. Measurable dust effects will not arise in areas regularly used by SCI birds or at more important areas for SCI bird species. Possible impacts are temporary and any possible dust will disperse rapidly given works are relatively small scale ground works including break out of existing concrete/ hard surfaces. Prey species for wintering birds associated with mudflats (e.g. *Angulus tenuis* – bivalves) are typically concentrated away from the high tide mark (where dust deposition if it occurs, is most likely). In summary mudflat invertebrate communities would not be affected by temporary exposure to well dispersed dust deposition. Temporary dust impacts will not affect foraging, roosting or loafing areas for SCI bird species in the short, medium or long term.

In summary there is no potential for dust to result in significant negative effects on Key Ecological or other ecological receptors.

Protected and Invasive Plant Species

There are no previous records of protected or invasive plant species recorded within the boundary of the Poolbeg OCGT proposed development site. There are previous records of invasive plant species recorded in close proximity to the proposed development. There is potential for invasive species to be spread by construction traffic into the site if not properly managed. The effects of introducing non-native invasive plant species during the construction works on the site would not be significant given baseline ecology.

Considering the built nature of the proposed development site, avoidance of adjacent coastal areas, sensitivity of coastal habitat (saline habitats not likely to be at risk); the introduction of

invasive species is unlikely and would lead to a slight negative effect at a local geographic scale in a worst case scenario.

9.6.2.2 Wintering and Breeding Birds

Noise and Visual Disturbance

Noise impacts are detailed in Chapter 8 of this EIAR. The construction works associated with the proposed development will result in a temporary increase in noise. The worst-case construction phase noise levels of the development were predicted using a three-dimensional acoustic model and noise contour maps, depicting the spatial limits of noise potentially produced.

The noise effects for the Poolbeg OCGT development including piling are summarised in Table 9.9.

Table 9.9: Construction Phase Noise levels of the proposed Poolbeg OCGT

Key Construction Phases	Works	Activity LAeq,10m dB	Distance to 65 dB(A) buffer
A. Demolition and Enabling Works	A1. Site set up	80.6	55m
	A2. Demolition	88.8	130m
	A3. Enabling works	90.3	155m
B. Main OCGT Development Works	B1. Site set up	82.4	65m
	B2. Infrastructure works	88.7	130m
	B3. Building construction	84.7	85m
	B4. Equipment installation	84.1	80m

Cutts et al. (2013) & Cutts et al. (2009) determined that waterfowl species, generally, have been documented to habituate to regular noise levels below 70 dB(A). A study by Wright et al. (2010) investigated the effects of impulsive noise on shorebirds and reported that noise disturbance levels above 65.5 dB(A) are more likely to result in some behavioural response than not. The noise associated with the proposed development has been modelled as potentially reaching in a worst case scenario of 90dB(A) up to 155m from certain enabling works noise sources within the site planning boundary. These noises sources would be localised and of a temporary nature and effects are discussed below.

No effects are likely to ecological receptors due to vibration, refer to Chapter 8 for more details.

Disturbance to Foraging Sites

A review of previous surveys and studies undertaken within Dublin Bay, in conjunction with the results of the winter bird survey, concluded that the most important foraging sites for protected waterfowl species within the immediate area of the Poolbeg site include 1) the compensatory grassland to the West; 2) the intertidal areas located to the South; 3) the Shellybanks Beach; 4) the water outflow at the North-side base of South Wall and; 5) the intertidal habitat located South-side of the South Wall.

With reference to potential noise levels outlined above, coastal areas located immediately north and south of the Poolbeg site, were identified to occur within the noise that will have fallen to 65dB(A) at a maximum of 155m from actual noise sources within the site. This noise would possibly reach receptor birds at the edge of intertidal areas to south of site, and subtidal areas north of the site. This includes the coastal strip north of the site boundary, which may be used by duck species such as teal. Mudflats here are typically not exposed hence it is not of significant importance for most SCI birds.

The coastal area south of the site is typically disturbed and the extensive mud and sand flats used by birds are outside 150m from noise sources exceeding 70dB(A) – which may arise at the north of the site only. Construction noise levels at all other important foraging sites are below 55 dB(A) and therefore will not result in any disturbance.

Construction works undertaken at the Poolbeg site during winter, particularly at low tide, may consequently result in a short-term localised disturbance effect to low numbers of wintering bird species. This would possibly occur during initial site enabling works and piling foundations. This noise disturbance would constitute a short term slight negative effect on wintering bird species at a local scale.

Disturbance to Roosting birds and breeding Tern and Peregrine

No regular winter bird roost sites were recorded within 300m of the proposed development site. Winter roost sites are well identified in the area and not within the Zol of the proposed development.

Common tern and Artic tern breed on the ESB dolphin, which is located approximately 220m north of the Poolbeg Peninsula (NPWS, 2015b). Construction works at the Poolbeg OCGT development will not result in elevated noise levels within the range of 55-60 dB(A) in proximity to the ESB dolphin site. It is also noted that background noise levels within the Poolbeg Peninsula are already elevated because of the currently operating commercial industry. Roosting/ nesting terns are habituated to disturbance within the area. The proposed OCGT construction works will be screened from the ESB Dolphin by existing buildings and structures located to the North of the OCGT development site. This assessment also considers the high tolerance and habituation of breeding tern species at this location to ongoing noise and river based disturbance (shipping etc). The noise from the site will be intermittent and low at the Tern colony and will not measurably add to existing high noise level backdrop (tern colony noise and other developments). In summary, the proposed OCGT construction works will not likely result in disturbance to breeding and roosting tern and other waterbird species.

A regular peregrine falcon nest has been recorded at the disused Poolbeg power station stacks, located adjacent to the site. Breeding peregrine falcon use a foraging core range of 2km (SNH 2010). No suitable habitat exists on the site. No effects are likely on foraging habitat for peregrine populations at a local geographical scale.

The nest site occurs within the Zol of noise disturbance of the proposed construction works. Studies however indicate that peregrine falcon regularly nest within highly disturbed sites such as quarries and urban centres and become tolerant or habituate to human disturbance (Ruddock & Whitfield 2007 and Kettle et al, 2019). Potential negative effects on the peregrine falcon nest are therefore assessed as imperceptible.

Visual Disturbance

The use of construction lighting and the movement of machinery and site personnel across the site may result in temporary visual disturbance to birds in the Liffey estuary north of the site. The south of the site is well screened by trees and an existing berm and no visual disturbance is likely. This is assessed as a temporary imperceptible effect on wintering and breeding bird species including breeding terns, foraging wintering waterfowl species and Peregrine.

9.6.2.3 Marine Mammals

As outlined for wintering birds, possible habitat for harbour porpoise and seals in the Liffey estuary was identified to occur within the noise level threshold range of 65 dB(A) i.e. noise would be detectable.

Given these species will only occur very sporadically for foraging purposes and be predominantly feeding on the water surface or below, no significant effects are likely. However, vibration impacts from piling may be detectable therefore brief imperceptible effects are likely.

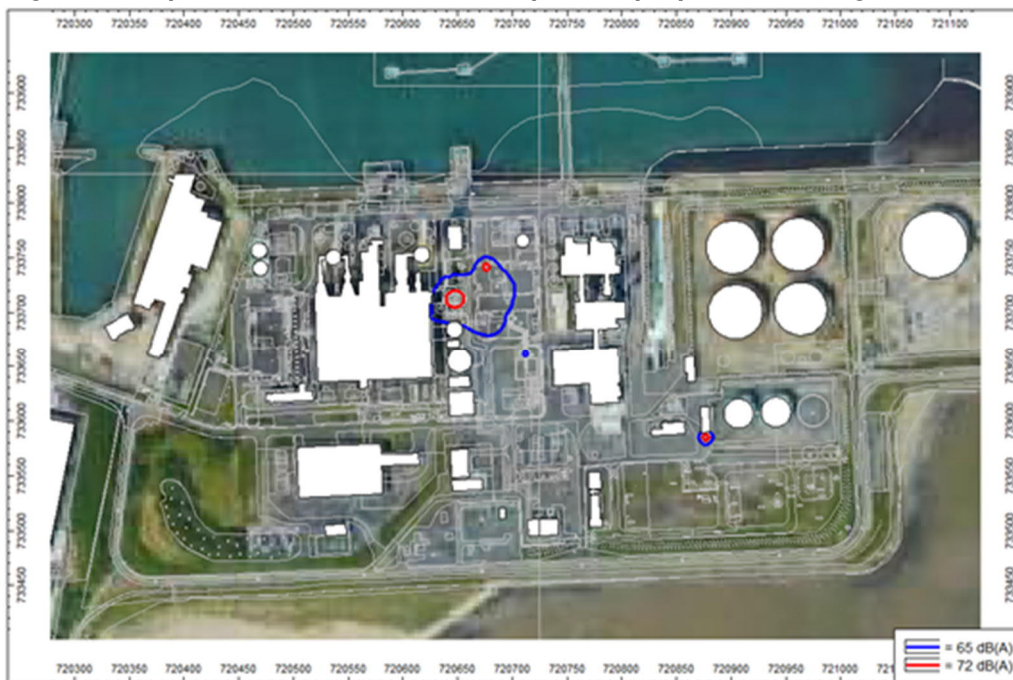
9.6.3 Operational and Maintenance Phase Impacts

Noise and Visual Disturbance

The Poolbeg OCGT development will operate as required by the demands placed on the grid and the generating capacity available at any time. During operation, the facility will be unmanned with weekly site inspections, meetings and maintenance works. Disturbance will be minor and will be limited to within the ESB Poolbeg Generating Station Complex.

The facility will generate noise during operation. The operational noise impacts of the facility were predicted using a three-dimensional acoustic model and noise contour mapping was produced and is shown in Figure 9.4 below. The noise contour map for the Poolbeg OCGT indicates that slightly elevated noise levels will be highly localised and contained within the site. Thus, there is no potential for significance disturbance during the operation of the facility.

Figure 9.4: Operational Noise Contour Map of the proposed Poolbeg OCGT



Source: Mott MacDonald

Surface Water Pollution

Potential operational surface water pollution impacts are discussed in Chapter 11 of the EIAR.

Wastewater from the gas turbine will be collected in its own dedicated Gas Turbine (GT) Area Drain Tank within the water treatment plant. The contents of GT Area Drain Tank will be collected by a suitably licenced waste contractor in accordance with the Waste Management Act 1996, and associated regulations for disposal. Wastewaters generated during this process will not be discharged to drain.

Treated wastewater discharge will be regulated under the IE Licence. Alternative arrangement for the management of this wastewater will be made if advised by the Environmental Protection

Agency and/or IE Licence requirements. In case of emergency, a shutdown valve will be provided at the discharge point from the treatment plant before entering the proposed drainage network.

The effects of drainage on biodiversity are considered to be imperceptible.

Air Quality

Section 6.6.2.2 outlines maximum NO_x⁸⁷ concentrations to the closest potential sensitive ecological receptor. The closest predicted ecological receptor is 'South Dublin Bay and River Tolka Estuary' SPA, which is approximately 20m north of the proposed development.

The increases in NO_x concentrations as a result of the proposed development are below or close to 1% of the NO_x AQS in all scenarios investigated in Chapter 6, which is considered negligible.

While the background NO_x concentration of 47.5µg/m³ adopted for this assessment exceeds the AQS of 30µg/m³, the PC to atmospheric NO_x at ecological sites is negligible and therefore the impacts are considered imperceptible.

Collision Risk

The design of the proposed turbine enclosure within the Poolbeg OCGT development does not comprise any large windows or other reflective surfaces which may be associated with bird strikes on buildings. The elevation of the turbine module is not significantly higher than other buildings associated with the Poolbeg Generating Station which are located directly to the north of the Poolbeg OCGT site. There were no regular commuting flyways identified between the foraging habitats on the intertidal area to the south of the Poolbeg peninsula, whilst other roosting or foraging areas to the north of the site are not expected to be impacted upon.

Lighting

The Poolbeg OCGT facilities will not be lit permanently as there is no requirement for the site to be permanently occupied. Lighting will be provided 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 sensors and timers to turn off.

New outdoor lighting will be minimised for health and safety requirements. Lighting will consist of LED luminaires due to their sharp cut-off, lower intensity, good colour rendition and dimming capability. 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 will be no upward tilt.

Any lighting will be cowed and downward facing to minimise light splay. Lighting will avoid nearby coastal areas that may be used by bats and birds.

The effects of lighting on biodiversity are considered to be negligible.

9.7 Decommissioning Phase

Should the OCGT plant at Poolbeg be decommissioned the equipment will be dismantled and removed from site and the site left as a level platform. Impacts during decommissioning are expected to be of a similar type and magnitude to those anticipated during construction but generally of a shorter duration.

⁸⁷ NO_x is shorthand for nitric oxide (NO) and nitrogen dioxide (NO₂), the nitrogen oxides that are most relevant for air pollution

9.8 Cumulative Effects

Existing developments were considered in a cumulative effects assessment. Given effects from the project alone are at worst imperceptible to ecological receptors no significant cumulative effects, are identified for the project alone or cumulatively with other projects. Other projects are subject to mitigation and planning conditions to protect local biodiversity in particular European sites. It is noted that invasive species in particular Japanese Knotweed (schedule 3 listed invasive plant species) are being actively treated and eradicated throughout the Poolbeg peninsula. Other existing and proposed projects are required to follow existing licences for air and water discharges to the local environment.

9.9 Mitigation Measures and Monitoring

9.9.1 Construction Phase

9.9.1.1 Environmental Clerk of Works (EnCoW)

An EnCoW will be appointed to ensure that the mitigation measures outlined in this document and any associated Method Statements are implemented in full. The EnCoW will have suitable environmental qualifications and experience. The EnCoW will be managed by the building contractor with oversight by the owners Engineer/ ESB.

The EnCoW will oversee monitoring during the construction phase of the project and will ensure that works are being carried out in accordance with the agreed Contractor's Demolition and Construction Environmental Management Plan (D&CEMP), method statements, safety procedures and any planning conditions associated with the consent etc. A Senior Resident Engineer will also be appointed by ESB to liaise with the landowners (if required) in the development works area.

The EnCoW with the Resident Engineer (as required) will ensure that the contractors on the site are informed and managed in relation to the following;

- Installation of noise reducing hoarding is done correctly and to a sufficient standard (see below).
- Are informed and made aware of the ecological sensitivities of adjacent areas including; the coastal environment, nearby Peregrine nesting sites and the nearest (off site) Japanese Knotweed (Schedule 3 invasives) growing areas that will need to be avoided.
- Ecological sensitivities will be communicated to contractors through an initial tool box talk and through ongoing communication/ site presence.

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 be responsible for consultation with environmental bodies including the National Parks and Wildlife Services (NPWS). The EnCoW will be responsible for carrying out regular monitoring of the Contractor's D&CEMP.

If works do not start for at least two years following planning consent then a schedule 3 invasive survey will be required on the site to ensure no Japanese Knotweed in particular has established. Updated adaptive mitigation will be required if a survey records this species and this would be managed by the EnCoW.

No additional specific ecological survey, monitoring or other survey requirements are required for this site as it is completely made ground and no ecological receptors occur on the site or immediate vicinity.

9.9.1.2 Water Pollution Controls

Sediment control in the construction and post-construction stages are outlined 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 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.
- Providing impermeable mats (plastic sheeting) as covers to mounded excavated material and open excavations during periods of heavy rainfall.

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.

9.9.1.3 Disturbance to Birds and Marine Mammals

To minimise disturbance, noise reducing hoarding will be erected around the northern edge of the proposed development sites if works are proposed during the wintering season (September-April inclusive).

Further to this it is proposed that following detailed design and geological investigation works on ground conditions, there will be clarity on locations where piling (and associated increased vibration/ noise) will arise. At these locations noise hoarding will be installed locally around the works area. The noise hoarding barrier material will have a mass per unit area exceeding 7kg/m^2 in accordance with the recommendations of BS 5228 Part 1:2009+A1:2014 Part B.4⁸⁸. There will be no gaps at the joints, for example, plywood panels with a minimum thickness of 13mm would achieve this. The length of a barrier is typically at least five times greater than its height. A shorter barrier is bent round the noise source. The minimum height of barriers will be such that no part of the noise source will be visible from the receiving point. The barrier is therefore likely to be at least 2m high.

The site engineer in consultation with the EnCoW will ensure that piling locations have noise hoarding set up correctly in advance of piling works commencing and this will be monitored by the site EnCoW to ensure it is effective, and for example no gaps exist in the hoarding that reduce their effectiveness.

9.9.2 Operational and Maintenance Phase

9.9.2.1 Water Pollution Runoff

During the operational phase of the proposed development surface runoff collected from proposed roads, parking areas, concrete areas and bunded areas will be collected in a new underground drainage network and conveyed into a proposed Klargestor NSFA 200 Full Retention Separator and then to the proposed attenuation tank located in the northern region of the site. The clean rainwater runoff collected from the proposed buildings' roofs will connect to the attenuation tank, bypassing the oil separator. In order to provide for treatment of surface water generated in the bunds, it is proposed to install an 'Entexol SCS001' or equivalent approved oil sensitive bund dewatering system with a 1 litre per second low shear vortex pump with oil separation detection within each bund. This system will ensure only non-contaminated

⁸⁸ [Code of Construction Practice.pdf \(publishing.service.gov.uk\)](#)

water enters the site drainage network. The bund dewatering system will be fitted with a high oil level alarm and will be connected back to the station control panel.

This proposed approach will ensure operational water pollution controls do not affect adjacent coastal areas adjacent to the site. As noted previously the proposed development is located within the boundary of an existing IE licenced facility: the Poolbeg Generating Station (Registration Number: P0577-04), regulated by the EPA.

Should the application for planning consent be successful, an application to the EPA for a licence review of this existing licence will be progressed to incorporate Poolbeg OCGT within the IE licensed boundary of Poolbeg Generating Station.

9.9.3 Decommissioning Phase

Mitigation measures during decommissioning will be similar to construction phase as required.

9.10 Residual Effects

No adverse residual effects are identified in relation to biodiversity following implementation of mitigation measures outlined.

10 Surface Water Resources and Flooding

10.1 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 3 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 11 of this EIAR.

10.2 Policy and Guidance

The Planning Report which accompanies this application (Ref: 229100184_3_A) 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 are set out in this section.

10.2.1 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. the WFD; and
- European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003), which gave legal effect to the WFD in Ireland.

10.2.1.1 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

10.2.1.2 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 Flooding 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.

10.2.1.3 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 guidance⁸⁹ has been considered in this study when assessing the impact of the future climate change on flood risk.

10.2.2 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);

⁸⁹ Flood Risk Management, Climate Change Sectoral Adaptation Plan, prepared by the Office of Public Works, September 2019

- River Basin Management Plan for Ireland 2018 - 2021 (Department of Housing, Planning and Local Government, 2018; and
- 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.

10.2.2.1 Flood Risk

A Flood Risk assessment was carried out by ESB for the proposed development (ESB P000422-01-CE21-R004-00). A copy of this report is appended to this EIAR (See Appendix F1).

The Flood Risk Guidelines 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.

10.3 Methodology

10.3.1 Approach to Data Collection

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

Table 10.1: Data Sources used to inform the Surface Water Resources and Flood Risk 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 2013-2018	2019	Water quality
Environment Protection Agency WFD Status 2013-2018	2019	WFD status, risks and objectives
EPA 2022 EcoStatus Value and Assessment Technique	2022	WFD status where unassigned
Dublin City Council (flood risk assessments /studies/mapping)	Various	Identified flood risk
OPW Flood Mapping (https://www.floodinfo.ie/map/floodmaps/)	Various	Identified flood risk
Topographical data	Various	Flood risk
OSI Mapping	Various	Flood risk

10.3.2 Approach to Impact Assessment

The impact assessment methodology applied is based on that described in Chapter 4 EIA Report Methodology 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 (document P000422-01-CE21-R004-000), 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 10.2 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 10.2: 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 10.4 sets out the criteria for rating magnitude Table 10.5 sets out the criteria for rating significance.

Table 10.3: 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

Importance	Criteria	Typical Examples
		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 10.4: 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 >10mm Minor loss of fishery Calculated risk of serious pollution incident >0.5% annually Slight reduction in amenity value
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 10.5: 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)

10.3.3 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 OCGT at Poolbeg and the additional land required temporarily for construction. The study area has been confined to the land required for the proposed OCGT and the immediate receiving surface waterbodies.

10.4 Receiving Environment

The following sections present details of the receiving environment as it relates to surface water resources and flood risk.

10.4.1 Surface Water Quality

Poolbeg Peninsula is located within the Liffey and Dublin Bay catchment (WFD Catchment 09) which includes the area drained by the River Liffey and by all streams entering tidal water between Sea Mount and Sorrento Point, County Dublin, draining a total area of approximately 1,616km². The largest urban centre in the catchment is Dublin City.

The Water Framework Directive (2000/60/EC) 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 Directive 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 Liffey Estuary Lower to the north of the peninsula is a transitional water body classified as being of Moderate Status. Dublin Bay located south of the peninsula is a coastal water body classified as being of Good Status.

The Poolbeg OCGT development site boundary is located ca. 20m north of Sandymount strand area and 30m south of the River Liffey Estuary. The existing Poolbeg Generating Station complex currently discharges storm water, cooling water and neutralised wastewater to the River Liffey Estuary.

The water quality status of the closest receiving waterbodies is described below.

Table 10.6: WFD Waterbody and Current Status adjacent to the Poolbeg OCGT

Waterbody Name (WFD)	WB Code	Type	Transitional Waterbody WFD Status 2016 - 2021	Coastal Waterbody WFD Status 2016-2021	WFD Risk Status – 2 nd Cycle
Liffey Estuary Lower	IE_EA_090_300	Transitional	Moderate	N/A	At risk
Dublin Bay	IE_EA_090_000	Coastal	N/A	Good	Not at risk

10.4.2 Protected Areas

The site boundary of the proposed OCGT within the existing Poolbeg Generating Station Complex does not overlap with any European sites. Located approximately 20m from the Poolbeg Generating Station complex, South Dublin Bay Special Area of Conservation (SAC) (site code 000210) and South Dublin Bay and River Tolka Estuary Special Protection Area (SPA) (site code 004024) run directly adjacent to the eastern and southern borders of the Poolbeg Peninsula. Both North Dublin Bay Special Area of Conservation (SAC) (site code 000206) and North Bull Island Special Protection Area (site code 004006) occur approximately 2km from the site.

There are no Natural Heritage Areas (NHAs) within the study of the proposed Poolbeg OCGT development. The closest NHA to the proposed OCGT development is Skerries Islands NHA (001218), which is situated approximately 26km to the North of the Poolbeg site. No source-pathway-links were identified between the NHA and the proposed OCGT development.

There are a number of EU designated bathing waters within Dublin Bay that are monitored by the EPA. There are also a number of bathing waters that are monitored by local authorities because swimming or recreational activities are known to take place there. Halfmoon and Shellybanks are bathing waters that are monitored by Dublin City Council. Sandymount Strand is monitored by the EPA and is classified as having 'sufficient water quality'. Dollymount strand is also monitored by the EPA and is classified as having 'good water quality'.

10.4.2.1 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.

10.4.3 Nutrient Sensitive Areas

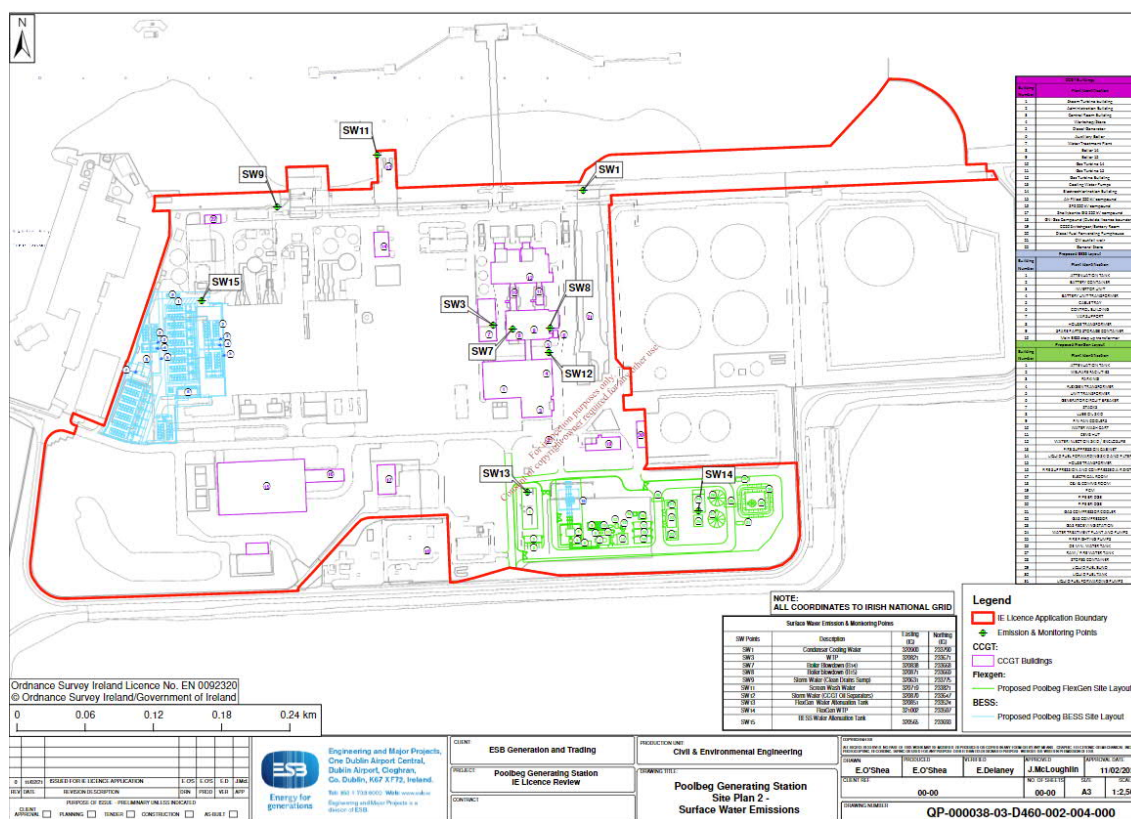
The Urban Waste Water Treatment Regulations 2001, as amended (which transpose the Urban Wastewater Treatment Directive (91/271/EEC) into Irish law and update the Environmental Protection Agency Act, 1992 (Urban Waste Water Treatment) Regulations 1994, as amended) list nutrient sensitive waters in the Third Schedule.

The Liffey Estuary has been designated as a nutrient sensitive area. According to the EPA, the Poolbeg Generating Station complex is not a significant source of nutrient to the estuary. Ringsend WWTP located within the Poolbeg Peninsula currently discharges in the Lower Liffey Estuary. The EPA has noted that the Ringsend WWTP and combined sewer overflows are potential significant pressures within the estuary.

10.4.4 Existing surface water discharge

The existing activities at the Poolbeg Generating Station Complex currently operates under IE Licence No. P0577-04 regulated by the EPA. The location of the existing emission and discharge surface water points for the IE licence for the Poolbeg Generating Station Complex are shown in Figure 10.1.

Figure 10.1: Surface Water Emissions (extracted from IE P0577-04)



There are six existing emissions to surface water; namely SW1, SW3, SW7, SW8, SW 11 and SW14. The largest emission is cooling water (SW1) located at the north eastern corner of the site. Surface water emissions are monitored at the site and there were no incidents in the period 2017-2019.

There are four existing storm water discharges from the complex; namely SW9, SW12, SW13 and SW15. These discharge to the Liffey Estuary Lower Waterbody. During the period 2017-2019 there was one breach of a trigger level at SW9 relating to pH, which was investigated and rectified. The following information was extracted from the 2022 Inspectors report for the licence review.

Table 10.7: Poolbeg Generating Station Complex (IE Licence P0577-04)

Emission ref	Monitored Parameters	Abatement	Drainage Areas
SW9	Visual (weekly) pH, COD (Quarterly)	Class I Full retention oil separators	Existing CCGT
SW12	Visual (weekly) pH, Temp, SS, ammonia, mineral oils, fats, oils and greases COD (Quarterly)	Class I Full retention oil separators	Poolbeg Thermal station (Discommissioned)
SW13	Visual (weekly) pH, conductivity, total	Class I full retention oil interceptors (required by	FlexGen compound

Emission ref	Monitored Parameters	Abatement	Drainage Areas
	petroleum hydrocarbons, (Weekly)	RD); Bunds with high oil level alarm and oil sensitive dewatering system; Attenuation tank that controls	
SW15	Visual (weekly); pH, conductivity, total petroleum hydrocarbons (TPH) (weekly)	Class I full retention oil interceptors (required by RD); Bunds with high oil level alarm and oil sensitive dewatering system; Attenuation tank that controls discharge	Battery Energy Storage System (BESS) area – impermeable areas

10.4.5 Flood Risk

The Planning System and Flood Risk Management Guidelines (November 2009) identify three flood zones:

- Flood Zone A – where the probability of flooding is highest (greater than 1% or 1 in 100 for river flooding or 0.5% or 1 in 200 for coastal flooding) and where a wide range of receptors would be vulnerable;
- Flood Zone B – where the probability of flooding is moderate (between 0.1% or 1 in 1000 and 1% or 1 in 100 for river flooding and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 for coastal flooding); and
- Flood Zone C – where the probability of flooding is low and in any one year, Zone C has less than 1 in 1,000 year (<0.1%) chance of flooding from rivers, estuaries or the sea.

A Flood Risk Assessment (FRA) report of the proposed development site has been prepared by ESB (ESB P000422-01-CE21-R004-00). 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 F1 of this EIAR. The FRA report identified that the proposed development site lies within Flood Zone C.

A desktop review of the published mapping (www.floodinfo.ie) indicates that there are no records of historic flooding within the immediate area of the proposed development.

10.4.6 Assessment of Sensitivity of the Receiving Environment

As noted above, the surface water on site drains directly to the Liffey Estuary Lower to the north (via four storm water discharge points SW9, SW12, SW13 and SW15).

With reference to Table 10.6, it is noted that the Liffey estuary is of moderate status. However, with reference to Table 10.2, the sensitivity of the Liffey Estuary Lower is Extremely High due to the linkage with the European designated sites - South Dublin Bay SAC and South Dublin Bay and River Tolka Estuary SPA.

10.5 Likely Significant Impacts

10.5.1 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 Poolbeg Generating station complex is an Industrial Emissions (IEL) site and will continue to comply with the conditions of the IE licence.

10.5.2 Construction Phase

Given the nature of the proposed development, 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.

The construction phase for the proposed development comprises pre-construction works, demolition works and plant construction works, as described in Chapter 3 of this EIAR.

10.5.2.1 Surface Water Quality and Drainage

No instream works are required, all works will be carried out within the site. The site comprises a generally flat area of made ground and so incident rainfall will generally soak into the ground.

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. During construction the elevation of the site will be regraded using granular fill (equivalent to 2100m³ of material). 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 which flows into the attenuation tank.

The receiving waterbodies are considered to be of international importance and of high sensitivity given their designation as a SAC/SPA. Pollutants mobilised by incident rainfall and migrating with surface water runoff could enter Liffey Estuary Lower (IE_EA_090_0300) or Dublin Bay (IE_EA_090_0300) 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 run off which may enter unprotected drains. Polluting matter entering drains has the potential to discharge to either Dublin Bay to the south and the Liffey Estuary to the north. The magnitude of any such pollution incidents is likely to be small/ Moderate, presenting a significant profound adverse impact of temporary duration on Dublin Bay and the Liffey Estuary prior to implementation of mitigation measures.

It is not anticipated that any excavations will require dewatering. Should dewatering be required this will be managed under a method statement to prevent silty water discharging to drains or surface water receptors. A negligible magnitude of impact is assessed resulting in a 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 bodies (Lower Liffey Estuary and Dublin Bay).

10.5.2.2 Water Supply and Drainage Infrastructure

The Contractor's compound and laydown area will be located to the south of the decommissioned Poolbeg generation station. 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. Foul waste can be discharged into the local foul drainage system or regularly disposed off-site using appropriate facilities. A suitably banded generator may also be used for power if preferred. A temporary disruption to services may be required to facilitate connection to the network. A negligible magnitude of impact is assessed resulting in an imperceptible effect.

10.5.2.3 Flood Risk

The proposed Poolbeg OCGT site is located approximately 20m from the sea in Dublin Bay at its outermost boundary. A Flood Risk assessment has been prepared which shows the proposed site is located in Flood Risk Zone C. The proposed site is not located within an area considered to be at risk from flooding from river or sea. It should be noted that a short section of internal road within the wider Poolbeg Generating Station complex is lower than the predicted 0.1% annual exceedance probability tidal flood level allowing for climate change, however, there is no critical infrastructure proposed for this location and an alternative route to the site is available which is not within the flood risk zone.

The FRA contains the CFRAM Mid Range Future Scenario Maps (Figure 5.4) which considers an 20% increase in rainfall and 500mm sea level rise. The 0.1% AEP MR Scenario shows flooding in the Northern Nora Tanks and some flooding along the Poolbeg road network. However, the OCGT site and Nora Tanks in the south east corner remains largely unaffected.

10.5.3 Operation and Maintenance Phase

10.5.3.1 Water Supply

Water will be supplied to site via the existing Irish Water connection which runs along the station road within the Poolbeg Generation station complex. The water connection will be used to supply the firefighting system, demineralised water treatment plant and staff welfare facilities. Water will also be stored in proposed common firewater process water storage tank that has approximately 2650m³ in volume.

10.5.3.2 Potable Water

A potable water supply will be required for the proposed welfare facilities within the workshop/admin building area. This includes for two toilets (WC) and wash hand basins. This supply will come from the metered connection to the public watermain to the site. The estimated volume of water required to accommodate the welfare facilities is approximately 11,000 litres per year. 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.

10.5.3.3 Demineralised Water

Demineralised water will only be required for water injection into the gas turbine to reduce nitrogen oxide (NOx) emissions when running on secondary fuel (gas oil). The demineralised water will be produced in an on-site water treatment plant using industry-standard technology. The proposed demineralised water treatment plant will remove any contaminants, chlorine, salt and minerals from water before use. The demineralised water will be stored in the proposed demineralised water tank.

When operating on gas oil, it is expected that the turbine will require 83,330 litres per hour of demineralised water. It is anticipated that equipment requiring the process water will be operational for 2 hours per month for gas oil operation testing purposes. Assuming 70% retention from the water treatment plant, the plant is estimated to use approximately 119,050 litres of raw water per hour of operation. This would amount to a monthly demand of

approximately 240,000 litres of raw water. A negligible magnitude of impact is assessed resulting in an imperceptible effect.

A pre connection request was made to Irish Water. Water will be supplied to site via the existing Irish Water connection which runs along the station road within the Poolbeg Generation station complex. The water supply will come from the designated metered connection currently supplying the Poolbeg CCGT.

The bunded chemical tanks specific to water treatment will be contained within the Demineralised water treatment plant building at the Poolbeg OCGT site. In the event of accidental leakage or spillage, a shutdown valve will be provided at the discharge point from the treatment plant before entering the drainage network. A negligible magnitude of impact is assessed resulting in an imperceptible effect. The effect is considered to be imperceptible as there will not be any intervention on the surface water regime on a local or regional scale.

10.5.3.4 Surface Water Runoff/ Drainage

During the operational phase surface water run-off from proposed roads, parking areas, concrete areas and bunded areas will discharge via the proposed oil interceptor (Klargester NSFA 125 Class 1 Full Retention Oil Interceptor) to the proposed attenuation tank. After the flow has been attenuated to a rate of 60l/sec, the water will then discharge to the proposed new surface water discharge point (Easting – 711553, Northing – 758931) into the existing cooling water channel that discharges to the Liffey Estuary Lower Waterbody (IE_EA_090_0300). This new surface water discharge point will be regulated under the IE Licence.

Surface water run-off collected from the proposed buildings' roofs will bypass the oil interceptor and discharge to the proposed attenuation tank. As noted above there are existing discharge points associated with the existing IE licence, these will continue to be operated and maintained in compliance with the existing Industrial Emissions Licence with associated sampling requirements to be conditioned by the EPA. All chemicals and oils will be stored in suitably bunded areas and with weather protection.

Operational impacts in terms of water quality due to surface water run-off discharges will be imperceptible. After the surface water has been attenuated and the maximum outflow restricted by a flow control device to no greater than the flow capacity of the proposed drainage line (60 l/s. This proposed approach will ensure operational water pollution controls do not affect adjacent coastal and transitional waters adjacent to the site. As noted previously the proposed development is located within the boundary of an existing IE licenced facility: the Poolbeg Generating Station (Registration Number: P0577-04), regulated by the EPA. According to the EPA, the Poolbeg Generating Station complex is not a significant source of nutrient to the estuary.

Should the application for planning consent be successful, an application to the EPA for a licence review of this existing licence will be progressed to incorporate Poolbeg OCGT within the IE licensed boundary of Poolbeg Generating Station.

The effects of drainage on surface water resources are considered to be negligible and imperceptible.

10.5.3.5 Foul Water

The Foul Water from the new workshop/admin building area on the southern side of the site is proposed to be discharged into the existing foul water manhole to the southern region across the road from the new Admin building.

Operational impacts in terms of foul water discharges will be negligible and imperceptible effect.

10.5.3.6 Process Wastewater

During operation, process wastewater will be generated during the demineralisation water treatment process, gas turbine compressor wash cycles and fuel gas scrubber process. A description of each process is provided below:

Demineralisation Waste Treatment Process: The OCGT uses demineralised water in the combustion chamber when running on secondary fuel to reduce nitrogen oxide emissions. The water treatment plant produces demineralised water by removing dissolved solids and chlorine from the potable water. The demineralisation process will result in residual wastewater. This effluent will be managed by undergoing suitable treatment (as outlined in Section 3.9.7 of this EIAR) before it is discharged to the Poolbeg OCGT development surface water drainage system. The surface water drainage will discharge via the proposed oil interceptor (Klargester NSFA 125 Class 1 Full Retention Oil Interceptor) to the proposed attenuation tank. After the flow has been attenuated to a rate of 60l/sec, the water will then discharge to the proposed new surface water discharge point (Easting – 711553, Northing – 758931) into the existing cooling water outfall channel that discharges to the Liffey Estuary Lower Waterbody (IE_EA_090_0300). This new surface water discharge point will be regulated under the IE Licence.

Gas Turbine Compressor Wash Cycle: Wastewater will be generated by the gas turbines during compressor wash cycles. The wastewater will be collected in the bunded Gas Turbine (GT) Area Drain Tanks within the water treatment plant. The contents of each GT Area Drain Tank will be collected by a suitably licenced waste contractor in accordance with the Waste Management Act 1996, and associated regulations for disposal. Wastewaters generated during this process will not be discharged to the environment.

Fuel Gas Scrubber Process: Wastewater will also be generated during the fuel gas scrubber process. The wastewater associated with this process will be stored in the bunded fuel gas condensate tank located within the Gas Compressor and Auxiliaries building. Water in this tank will contain hydrocarbons and will be disposed offsite by road tanker in accordance with the Waste Management Act 1996, and associated regulations. Wastewaters generated during this process will not be discharged to the environment. Operational impacts in terms of process wastewater discharges will be imperceptible.

10.5.3.7 Flood Risk

A Flood Risk Assessment (FRA) report of the proposed development site has been prepared by ESB. The FRA report (see Appendix F1 - ESB P000422-01-CE21-R004-000) 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, based on the assessment undertaken.

Based on the conclusions of the FRA report the proposed development is suitable in terms of flood risk.

10.5.4 Decommissioning Phase

The proposed development is expected to be operational for at least 20 years or as long as is required by grid infrastructure. On cessation of activities the plant will be decommissioned, and the site remediated and restored 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.

10.6 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 Table 4.2 in Chapter 4 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.

10.7 Mitigation and Monitoring Measures

10.7.1 Construction Phase

- 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 on site and prevented from entering drains; 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 run-off and protecting drains.
- All construction works will be carried out in accordance with the Demolition and Construction Environmental Management Plan (D&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.
- Concrete will be brought to site by covered truck. Wet concrete operations adjacent to watercourses will be avoided where possible.
- The Contractor will ensure that all concrete truck wash watering / cleaning is undertaken offsite where possible and remote from watercourses.
- Silt fences (to Hy-Tex Premium specification or similar) and silt traps will be installed prior to commencement of works and will be inspected daily to inform adaptive management as required. The locations of same will be determined by the EnCoW.
- Where works on other projects within the same study area 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, 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:
 - Fuels, chemicals, liquid and solid waste will be stored on impermeable surfaces;
 - 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 underground cable installation works.

10.7.2 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.

10.7.3 Decommissioning Phase

The proposed development will be decommissioned in accordance with the Decommissioning Management Plan (DMP), under IE licence P0577.

In accordance with IE licence P0577, the DMP will be reviewed on an annual basis and updated as necessary.

10.8 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 Dublin Bay to the south or to the Liffey Estuary to the north, the effects on surface water and drainage are considered to be negligible resulting in an imperceptible effect.

The existing Poolbeg Generating Station is a licensed activity under the IE licensing regime, as regulated by the EPA. Should the application for planning consent be successful, an application to the EPA for a licence review of this existing licence will be progressed to incorporate the Poolbeg OCGT within the IE licensed boundary of Poolbeg Generating station complex.

With the implementation of the mitigation measures proposed, the Poolbeg OCGT 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.

11 Land, Soil and Hydrogeology

11.1 Introduction

This chapter presents an assessment of the likely and significant impacts arising from the proposed development on Land, Soils, and Hydrogeology. The assessment is based on the development as described in Chapter 3 of this EIAR.

This chapter considers the potential impacts during construction, operation and decommissioning associated with:

- Land and Soils;
- Geology and Contamination; and
- Hydrogeology.

Proposed environmental control measures and additional mitigation measures to prevent, reduce and/or offset the anticipated potential impacts are presented as appropriate.

The assessment of the likely significant effects arising from the proposed Poolbeg OCGT on surface water is presented in Chapter 10 *Surface Water Resources and Flooding*. The assessment of impacts on biodiversity is discussed in Chapter 9 *Biodiversity*.

11.2 Policy and Guidance

The Planning Report which accompanies this planning application describes the wider policy and legislative context applicable to the proposed development. Policies and guidance documents of potential relevance to Land, Soils and Hydrogeology are set out in this section. These policy and guidance documents have been used to inform this chapter of the EIAR.

Legislation relevant to this chapter includes:

- 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);
- S.I. No. 722 of 2003 European Communities (Water Policy) Regulations which implement EU Water Framework Directive (2000/60/EC) establishing a framework for the Community action in the field of water policy and provide for implementation of 'daughter' Groundwater Directive (2006/118/EC) on the protection of groundwater against pollution and deterioration. Since 2000 water management in the EU has been directed by the Water Framework Directive (2000/60/EC) (as amended by Decision No. 2455/2011/EC; Directive 2008/32/EC; Directive 2008/105/EC; Directive 2009/31/EC; Directive 2013/39/EU; Council Directive 2013/64/EU; and Commission Directive 2014/101/EU (WFD). The WFD was given legal effect in Ireland by the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003); S.I. No. 684 of 2007: Waste Water Discharge (Authorisation) Regulations 2017, resulting from EU Directive 80/68/EEC on the protection of groundwater against pollution caused by certain dangerous substances (the Groundwater Directive); S.I. No. 106 of 2007: European Communities (Drinking Water) Regulations 2007 and S.I. No. 122 of 2014: European Communities (Drinking Water) Regulations 2014, arising from EU Directive 98/83/EC on the quality of water intended for human consumption (the Drinking Water Directive) and EU Directive 2000/60/EC; and

- S.I. No. 9 of 2010: European Communities Environmental Objectives (Groundwater) Regulations 2010 (as amended by S.I. No. 389/2011; S.I. No. 149/2012; S.I. No. 366/2016; the Radiological Protection (Miscellaneous Provisions) Act 2014; and S.I. No. 366/2016)

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); and
- 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. Of the 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 can be viewed online⁹⁰.

11.2.1 Guidance

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:

- Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (National Roads Authority, 2009)⁹¹;
- Guidelines for the Preparation of Soils, Geology and Hydrogeology chapters of Environmental Impact Statements (Institute of Geologists of Ireland, 2013)⁹²;
- Guidelines on the Management of Contaminated Land and Groundwater at EPA Licensed Sites (Environmental Protection Agency, 2013)⁹³; and
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (Environmental Protection Agency, 2022)⁹⁴.

The EPA guidance for assessing land contamination, includes the development of a conceptual model of the site to identify sources, pathways and receptors that are reasonably anticipated to be present and together create contaminant linkages. Where a linkage is present, an environmental risk is considered to exist.

⁹⁰<https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=b245c2bd11a64162a1632ad6bccf8e34&scale=0>

⁹¹ National Roads Authority. (2009). Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

⁹² Institute of Geologists of Ireland. (2013, 04). Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements. Retrieved from <https://igi.ie/publications/guidelines/>: https://eurogeologists.eu/wp-content/uploads/2017/07/Cullen_EFG-Guidelines_for_the_Preparation_of_Soils_Geology-Final.pdf

⁹³ Environmental Protection Agency (2013). Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites

⁹⁴ Environmental Protection Agency (2022). Guidance on the Information to be contained in Environmental Impact Assessment Reports

11.3 Methodology

11.3.1 Study Area

The study area comprises the land required to construct the proposed OCGT at Poolbeg, including any construction compounds and temporary access routes and a 500m buffer around these.

The 500m buffer has been informed by the design of the proposed development, noting that the potential effects on ground conditions will be limited to the Poolbeg OCGT development footprint, and not the wider Peninsula. However, the immediately surrounding land is also considered in terms of any potential for contamination to migrate onto or off site via groundwater. The Poolbeg OCGT development site is close to the coast and shallow groundwater will 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 Poolbeg OCGT site to Dublin Bay/River Liffey estuary.

11.3.2 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 11.1, constraints and likely sensitive receptors have been identified.

Table 11.1: Data Sources used to inform the Land, Soils and Hydrogeology chapter of this EIAR

Data source	Date	Data contents
AECOM 2020 ESB Proposed BESS and FlexGen Sites, Poolbeg Baseline Assessment, Report Reference PR-446384-ACM-EN-RP-PB-001;	2020	Site Investigation data, summary and analysis
AECOM 2020 ESB Poolbeg BESS and FlexGen SI and GQRA, Report Reference PR-446384-ACM-EN-RP-PB-006;	2020	Site Investigation data, summary and analysis
AECOM 2020 Proposed BESS Site, South Wall BESS & Ringsend FlexGen – SI and GQRA Final Report. Report Reference PR-44384-ACM-EN-RP-RG-007;	2020	Site Investigation data, summary and analysis
AECOM 2020 ESB Poolbeg FlexGen Hotspot Remedial Excavation and Validation Report Reference PR-44384-EN-RP-PB-010.	2020	Site Investigation data, summary and analysis
Geological Survey Ireland	2022	Geological maps including: • Quaternary Sediments 1:50,000; • Bedrock 1:100,000; • Karst Landforms; • Karst Traced Underground Connections; • Geological Heritage Audited Sites; • Bedrock Aquifers 1:100,000; • Sand and Gravel Aquifers 1:40,000; • Groundwater Vulnerability 1:40,000; • Public Source Protection Areas (SPAs) • Subsoil Permeability 1:40,000 • Groundwater Wells and Springs • Landslide Susceptibility • Landslide Extent Locations
Corine Land Use	2018	Land Use Data

Data source	Date	Data contents
EPA	2022	Irish Soil Information System • OSI Rivers and Lakes (2020) • WFD Groundwater Bodies – Cycle 3 (2021) • WFD River Water Bodies – Cycle 3 (2021) • Water Framework Ireland Map viewer databases

A site walkover survey of the Poolbeg Generating Station Complex was undertaken in February 2020. Site specific ground investigation data within the development boundary were not available for this assessment. Site investigation data from the BESS and FlexGen Sites (located within the Poolbeg Generating station complex, see AECOM reports in Table 11.1) have been used to inform understanding of the likely geological and hydrogeological conditions and the potential for land contamination within the study area. These sites are outside the proposed development boundary but are within the Poolbeg Generating Station Complex.

11.3.3 Approach to Impact Assessment

The impact assessment methodology is based on the guidance presented in Section 11.2.2 and tailored accordingly based on professional judgement and experience. The assessment approach is discussed in detail in the sections below.

11.3.3.1 Identification of Receptors

The scope used to identify the various baseline receptors in proximity to the cable route are summarised in Table 11.2.

Table 11.2: Scope for Identification of Baseline Receptors

Receiving Environment	Scope
Land and land use	• Land use types and potential contaminant profiles
Soils and geology	• Soils, subsoils, bedrock geology and other geological features, further to a review of GSI data. • Mapped karst landforms including boreholes, caves, dry valleys, enclosed depressions, estavelles, springs, superficial solution features, swallow holes and turloughs. • Traced underground connections of known water dye trace studies • Geological heritage sites • Geohazards: recorded events, primarily landslides, karst features
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. • 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: – LI – 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

Receiving Environment	Scope
	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)

11.3.3.2 Sensitivity

The importance / sensitivity of the identified receptors across land and land use, soils and geology, and hydrogeology, were assessed on completion of the baseline assessment.

Specific guidance regarding the importance / sensitivity of land and land use is not available within the NRA (2009) guidance. As such, professional judgement has been used to assign receptor values based on the perceived ecological, economic and societal value of land use types.

Using the (National Roads Authority, 2009). Guidance, an estimation of the importance / sensitivity of the geological and hydrogeological environments within the study area is set out in Table 11.3.

Table 11.3: Sensitivity of Receptors

Sensitivity (receptor environmental value)	Receiving Environment	Description	Example
Extremely High	Geology, Soil, Contamination	Not provided	Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation, e.g., SAC or SPA status.
	Hydrogeology	Attribute has a high quality or value on an international scale	
Very High	Geology	Attribute has a high quality, significance, or value on a regional or national scale	- Geological feature rare on a regional or national scale (NHA) - Large existing quarry or pit - Proven economically extractable mineral resource - Regionally important potable water source supplying >2500 homes - Inner source protection area for regionally important water source. - Groundwater supports river, wetland or surface water body ecosystem protected by EU or national legislation - Regionally Important Aquifer with multiple wellfields.
	Soil	Volume of peat and/or soft organic soil underlying route is significant on a national or regional scale	
	Contamination	Degree or extent of soil contamination is significant on a national or regional scale	
	Hydrogeology	Attribute has a high quality or value on a regional or national scale	
High	Geology	Attribute has a high quality, significance, or value on a local scale	- Geological feature of high value on a local scale (County Geological Site) - 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 - Large recent landfill site for mixed wastes. - Well drained and/or high fertility soils. - Moderately sized existing quarry or pit - Marginally economic extractable mineral resource Contaminated soil on site with previous heavy industrial usage
	Soils	Volume of peat and/or soft organic soil underlying route is significant on a local scale	
	Contamination	Degree or extent of soil contamination is significant on a local scale	
	Hydrogeology	Attribute has a high quality or value on a local scale	
Medium	Geology	Attribute has a medium quality, significance, or value on a local scale,	- Locally Important Aquifer - Potable water source supplying >50 homes - Outer source protection area for locally important water source
	Soils	Volume of peat and/or soft organic soil underlying route is moderate on a local scale	

Sensitivity (receptor environmental value)	Receiving Environment	Description	Example
Low	Contamination	Degree or extent of soil contamination is moderate on a local scale	- Small recent landfill site for mixed wastes - Moderately drained and/or moderate fertility soils
	Hydrogeology	Attribute has a medium quality or value on a local scale	- Small existing quarry or pit - Sub-economic extractable mineral resource Contaminated soil on site with previous light industrial usage
	Geology	Attribute has a low quality, significance, or value on a local scale	- Poor Bedrock Aquifer. - Potable water source supplying <50 homes.
	Soils	Volume of peat and/or soft organic soil underlying route is small on a local scale	- Poorly drained and/or low fertility soils - Uneconomically extractable mineral resource
	Contamination	Degree or extent of soil contamination is minor on a local scale	Large historical and/or recent site for construction and demolition wastes
	Hydrogeology	Attribute has a low quality or value on a local scale	Small historical and/or recent landfill site for construction and demolition wastes

Source: Adapted from Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.

11.3.3.3 Assessment of Magnitude of Impact

The terms used to define magnitude of impact, sensitivity of receptors and significance of effect are in accordance with National Roads Authority guidelines (National Roads Authority, 2009) for soils, geological and hydrogeological receptors. A definition of the terms is given in Table 11.4.

The National Roads Authority (National Roads Authority, 2009) guidelines state that minor, moderate or major beneficial impacts are “positive” impacts. Minor, moderate or major adverse impacts are considered “negative” impacts. Negligible impacts are considered “neutral” impacts. 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”.

Additionally, the EPA (Environmental Protection Agency, 2022). further considers “positive”, negative” and “neutral” quality indicators, and “direct” and “indirect” type indicators, as significance of effect descriptors.

The assessment of the impact of the proposed development on identified receptors will also include the duration of effect: temporary, short-term, medium-term, long-term and permanent.

Table 11.4: Magnitude of Impact

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	- 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

Magnitude of Impact	Criteria	Typical Examples Hydrogeology	Typical Examples Soils and Geology
		Calculated risk of serious pollution incident >1% annually	- 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 - Potential low risk of pollution to groundwater from routine run-off - Calculated risk of serious pollution incident >0.5% annually	- 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 - 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

Magnitude of Impact	Criteria	Typical Examples Hydrogeology	Typical Examples Soils and Geology
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: Adapted from National Roads Authority (2009)

11.3.3.4 Assessment of Significance of Effect

The sensitivity of the receptor (Table 11.3) and the magnitude of impact (Table 11.4) determine the significance of an effect (Table 11.5).

Table 11.5: Significance Matrix

		Magnitude of Impact			
Sensitivity of Receptor		Negligible	Small	Moderate	Large
	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 Roads Authority, 2009)

11.3.3.5 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.

11.4 Receiving Environment

11.4.1 Land and Land Use

The location and extent of land use can be found in Figure 11.1. Current land use (Corine, 2018)⁹⁵ within the site is industrial or commercial units. This land use type is considered to have a Low sensitivity.

Within the wider study area, land use includes Estuaries, Sea and ocean, Intertidal flats and Sport and Leisure facilities. These land use types are considered to have Medium sensitivity.

The wider area is a heavily industrialised city port with a mixture of power generation, wastewater treatment and other commercial enterprises associated with the docks. The peninsula supports several large industrial/municipal installations including Dublin Bay Power, Hammond Lane Metal Company Limited, National Oil Reserve Agency (NORA) Tank farm,

⁹⁵ Corine. (2018). Corine Land Cover 2018. Retrieved from <https://land.copernicus.eu/pan-european/corine-land-cover/clc2018>

Dublin Waste to Energy and Ringsend Wastewater Treatment Works (Environmental Protection Agency, 2022).

The site comprises a generally flat area of made ground and impermeable stone surfaces. The existing ground profile of the development site ranges from approximately 3.8 metres above Malin Head ordnance datum (mOD) in the north of the site to approximately 2.37mOD around the existing NORA tanks in the south east corner (Topographical levels provided by ESB).

The site is comprised entirely of hardstanding ground with adjacent buildings and structures. There are a number of amenity grassland areas to the south of the site including the Poolbeg compensatory grassland and the Irishtown Nature Park are located ca. 400m south west of the site. The coastal areas immediately north and south of the Poolbeg peninsula are also designated as European sites (SAC/ SPA).

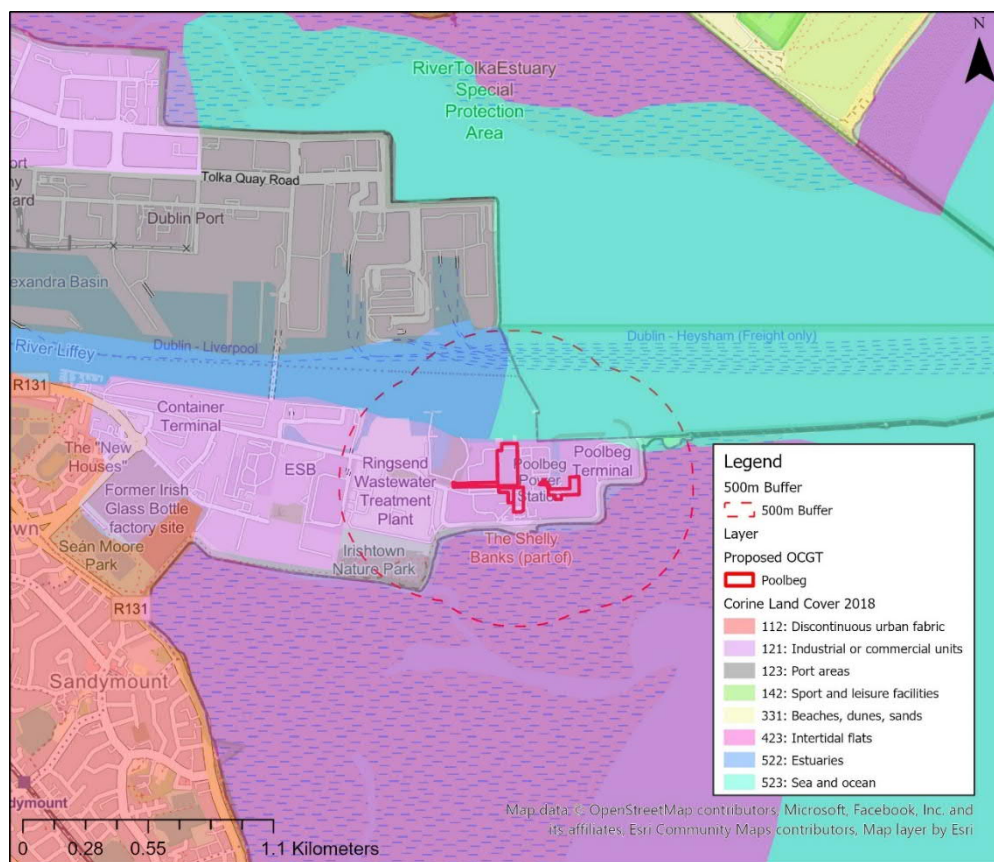
Existing site survey and archive drawing information^{99 100} reveals various underground live and redundant services present within the development footprint.

In both the extant Dublin City Development Plan (CDP) and CDP 2022-2028, the existing site at which the proposed development will be located, is categorised as Zone Z7 *“Employment (Heavy), To provide for the protection and creation of industrial uses and facilitate opportunities for employment creation including Port Related Activities”*⁹⁶.

Land designated as Zone Z9 *“To preserve, provide and improve recreational amenity and open space and green networks”* lies south of the Poolbeg OCGT site with the study area (associated with the sports and leisure facilities land use type in Figure 11.1).

⁹⁶ Mott MacDonald (2022) Poolbeg 229MW Open Cycle Gas Turbine (OCGT) Planning Report

Figure 11.1: Corine Land Use Cover 2018



11.4.2 Soils and Geology

Soil receptors were identified using the Teagasc database (Environmental Protection Agency, Teagasc, Cranfield University, 2014)⁹⁷. Quaternary subsoils and bedrock were identified using the Geological Survey of Ireland database (Geological Survey of Ireland, 2022)⁹⁸ in combination with AECOM reports (see Section 11.3.1).

11.4.2.1 Soils

There are limited soils present in the area to be developed. Made ground was the primary soil receptor identified within the study area, as demonstrated in Figure 11.2.

According to historical maps and aerial photography, the land that the proposed OCGT is to be built upon was reclaimed by 1970^{99 100}.

The solid geology is overlain by intertidal sands. The peninsula has been developed through raising the elevation of the land, which was originally intertidal, through the placement of granular waste materials from the 1960s onwards.

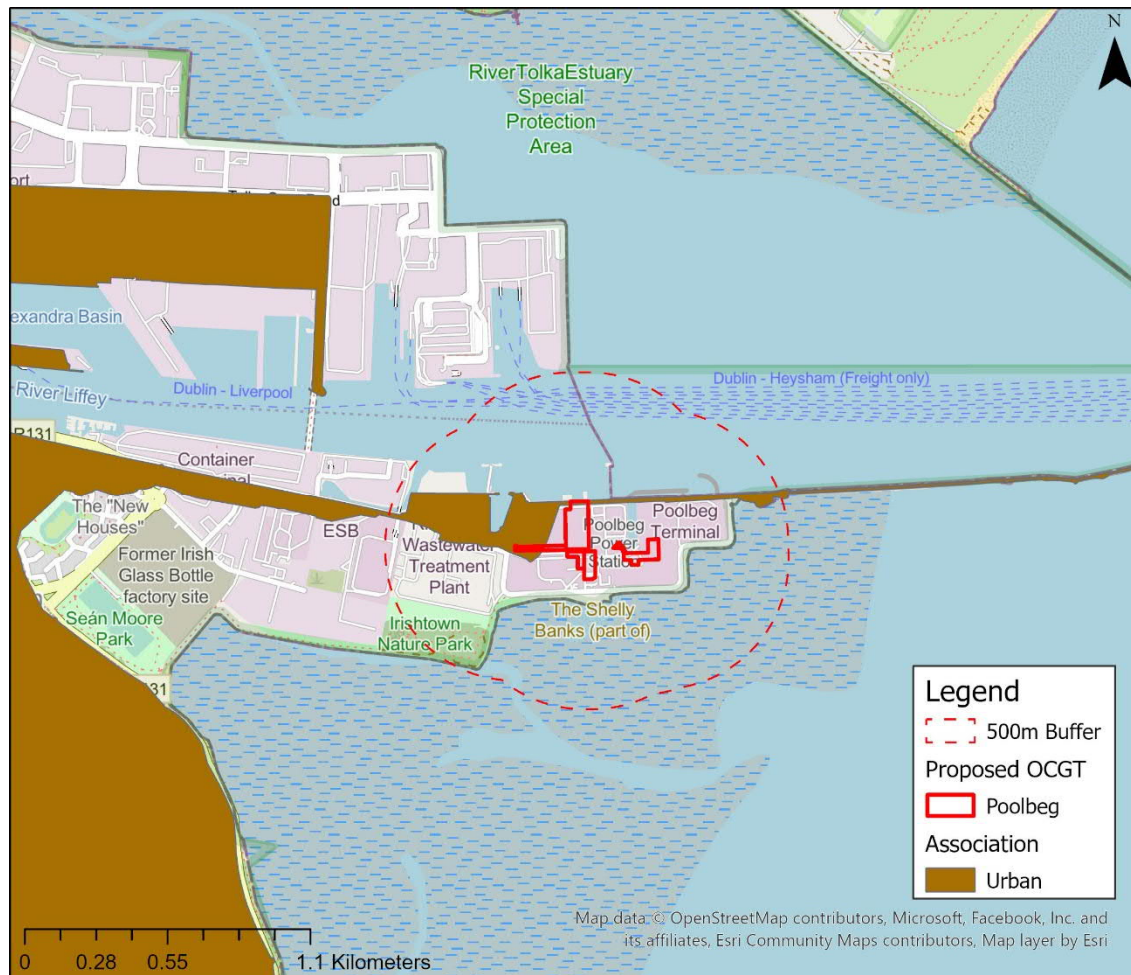
The classification of receptor values for soil type was based on Table 11.3. Soils identified as well drained and/or highly fertile classified as high importance value, with the poorly drained and/or low fertility soils classified as low importance value (National Roads Authority, 2009). Soil was also identified as a high importance receptor value where soil was expected to be

⁹⁷ Environmental Protection Agency, Teagasc, Cranfield University. (2014). Retrieved from Irish Soil Information System: <http://gis.teagasc.ie/soils/map.php>

⁹⁸ Geological Survey of Ireland (2022) GSI Web Map Viewer. Retrieved from Geological Survey Ireland: <https://dcenr.maps.arcgis.com/apps/webappviewer/index.html?id=de7012a99d2748ea9106e7ee1b6ab8d5&scale=0>

contaminated significantly at the local scale. Man Made soil type was the only receptor identified as being significantly contaminated within the scope of this EIA.

Figure 11.2: SIS National Soil



11.4.2.2 Geology and Subsoil

The Geological Survey Ireland mapping indicates the site is underlain by dark limestone and calcareous mudstone of the Lucan Formation. The sensitivity of the bedrock aquifer is considered in Section 11.4.3.

According to ESB reports, the subsoils extend to a significant depth below ground surface. Glacial drift and Port Clay are classified as Low sensitivity, and Upper and Lower Gravels are considered to have a High sensitivity.

The location and extent of subsoil and bedrock geology can be found in Figure 11.3 and Figure 11.4.

Figure 11.3: Subsoil

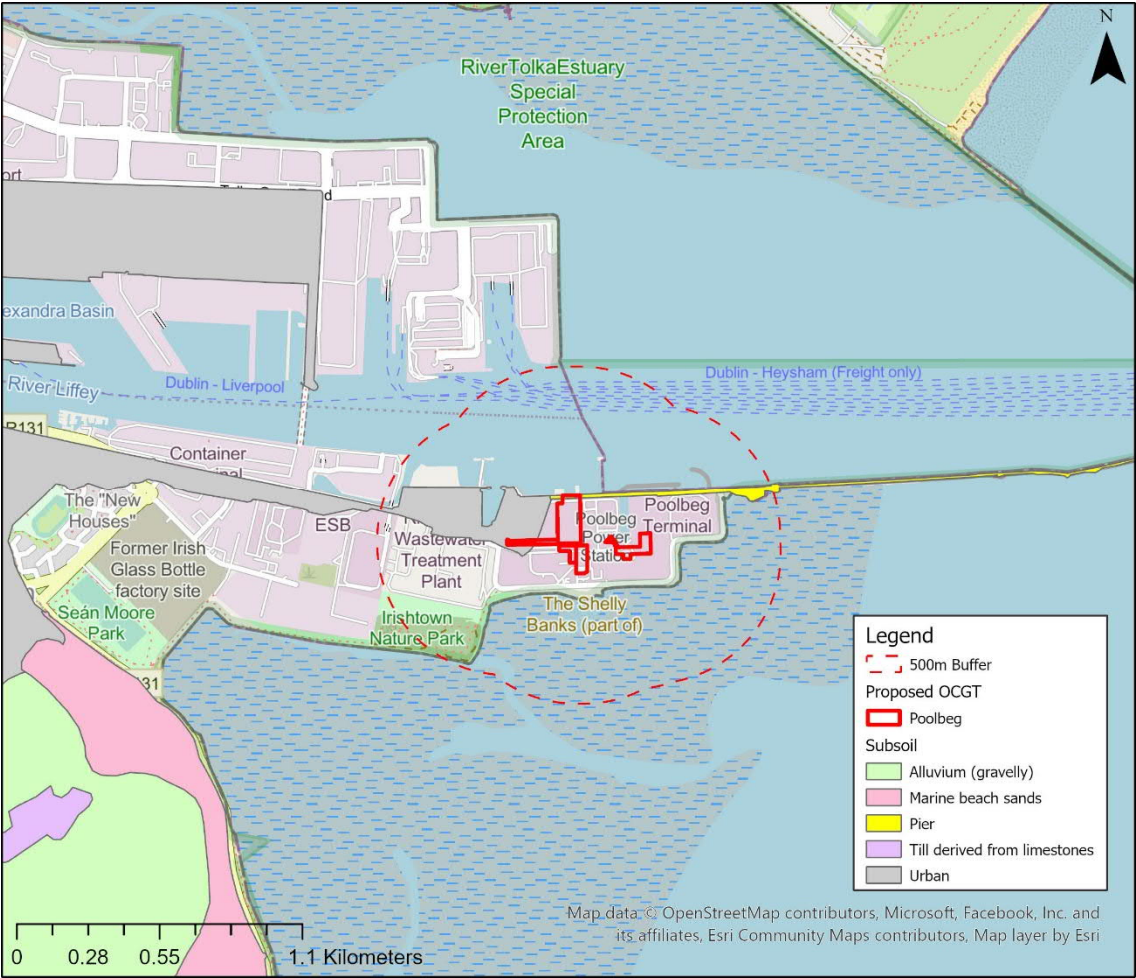
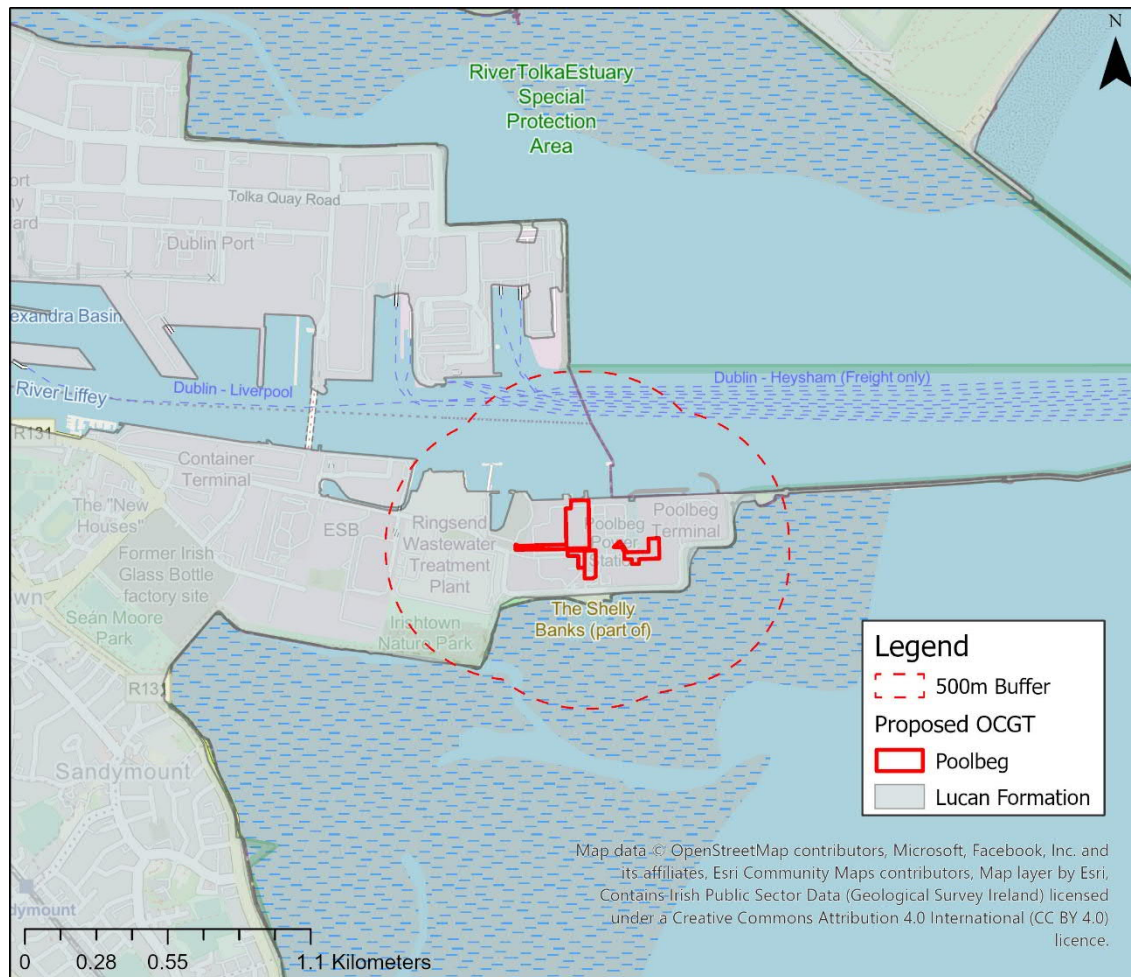


Figure 11.4: Bedrock geology



The Geological Survey Ireland Spatial Resources website shows that the Poolbeg peninsula is not located in or near to a designated County Geological Site. The nearest Geological Heritage Site, located north-east of the proposed development, is North Bull Island and is considered to have a Very high sensitivity. As North Bull Island is located 1.4km from the 500m buffer, the development will have no effect on this designation.

The site location is within an area where aggregates could potentially be extracted.

No historical landslide events, landslide susceptibility risk or karst features are identified within the study area.

ESB and AECOM have undertaken ground investigations on the Peninsula ^{99, 100}. As mentioned in Section 11.3.1, these investigations were outside the Poolbeg OCGT footprint boundary but give an indication of the likely geological conditions at the site. These investigations are summarised in Table 11.6 and Table 11.7.

⁹⁹ AECOM 2020 ESB Proposed BESS and FlexGen Sites ESB Poolbeg BESS and FlexGen SI and GQRA

¹⁰⁰ AECOM 2020 ESB Proposed BESS Site Ringsend SI and GQRA Final Report

Table 11.6: Summary of Geology

Stratum	Typical Depth Range (m below ground level)
Made ground	0-6
Upper and Lower Gravels (comprising medium dense to dense sand, gravel with some cobbles and boulders. The upper and lower gravels are separated by occasional silt horizons)	6-14
Port Clay (comprising firm to stiff silty clay with thin laminations of fine sand or silt)	14-33
GLACIAL DRIFT (comprising very dense sand and gravel with some cobbles and traces of clay)	33-40
BEDROCK (hard argillaceous Limestone)	40+

Source: AECOM Reports ^{99,100}

Table 11.7: Summary of Ground Conditions

Ground conditions	
Topsoil	Parts of the site were covered with topsoil extending to depths between 0.1m and 0.2m bgl. The topsoil was soft, brown, slightly sandy, silty clay with plant rootlets and other organic plant matter.
Made Ground (Hardstanding)	Compacted gravel sub-base extending to depths of between 0.2m and 0.4m bgl. Very dense, grey, sandy, of fine to coarse grained gravel. Buried gravel material was occasionally found beneath the topsoil and other made ground soils to depths up to 0.7m bgl.
Made Ground (Soil)	Occurring beneath the topsoil and gravel sub-base to depths between 0.3m and 5.0m bgl. Consisted of greyish brown, sandy, gravelly clays with occasional low to high cobble content and low boulder content or as greyish brown sandy, silty, clayey gravel with occasional low to high cobble content and low boulder content. Made ground material included fragments of wood, glass, ceramics, red brick, yellow brick, plastic, concrete and metal.
Gravelly Sand / Sandy Gravel	Reclaimed soils typically occurring beneath made ground soils at depths of between 0.3m and 3.8m bgl. Natural soils consisted of brown rounded to sub-rounded gravelly sand or sandy gravels with shells and occasional low to medium cobble content.
Silt	Soft, grey, fine, sandy silt occurring beneath the natural sand and gravels.

Source: AECOM Reports ^{99,100}

Hence, according to the previous site investigations ^{99 100} within the Poolbeg Generating station complex the following typical stratification from ground level (G.L.) is expected:

- Made Ground (G.L. to 6-7m);
- Granular & Cohesive Fluvioglacial deposits (7m – 20m);
- Dublin Port Clay (15m – 30m);
- Granular & Cohesive Glacial Till (18m – 40m); and
- Weathered / non-intact Limestone (encountered between depths of 28m and 33m).

11.4.3 Hydrogeology

Hydrogeological receptors including aquifers, source protection zones, boreholes/abstractions and karst features, have been identified using the Geological Survey Ireland Spatial Resources Data Viewer (Geological Survey of Ireland, 2019).

Groundwater was recorded at shallow depths within the Made Ground during the recent AECOM ground investigations and is tidally influenced, indicating a connection with seawater in Dublin Bay. Previous groundwater monitoring (AECOM 2020) has indicated that groundwater elevations can vary by 0.7m between high and low tides which indicates limited connectivity

between groundwater and Dublin Bay, the tidal Range in Dublin Bay is much larger at approximately 3m.

The general direction of groundwater flow is expected to flow towards the Liffey Estuary in the north and towards Dublin Bay in the south and east, with a watershed running along the centre of the Peninsula, although this is likely to be influenced by underground structures modifying groundwater migration pathways and surface developments intercepting rainfall and diverting this into drainage systems.

AECOM¹⁰¹ report that the Lucan Formation is classified as LI – locally important aquifer, which is moderately productive in local zones. The Lucan Formation is classified as Medium sensitivity. However, the bedrock beneath the site is not mapped as an aquifer, given the depth to bedrock and coastal setting it is expected that groundwater in the bedrock would be brackish. As the aquifer designations within the study area is impacted by proximity to the coastline and influence of saline intrusion, the bedrock aquifer is considered Low sensitivity. The reclaimed sediments are also not classified as a gravel aquifer; groundwater in the reclaimed sediments is also expected to be brackish. In previous groundwater monitoring rounds (within the Poolbeg Generating station complex) electrical conductivity readings above 3,999 μ S/cm were frequently recorded, indicating brackish groundwater conditions¹⁰¹.

Groundwater quality monitoring was carried out at boreholes installed in the Poolbeg FlexGen and BESS sites (located within the Poolbeg Generating station complex) in March 2020. Groundwater was generally encountered at depths of 3.5m and 4.5m below ground level (bgl). Conductivity measurements of between 522 μ S/cm and >70,900 μ S/cm confirm the presence of brackish water quality. Generally, there was no evidence of contamination during groundwater purging for well development. In well BSA01 in the Poolbeg BESS site, there was a slight hydrocarbon sheen visible during well development (19 March 2020), reducing to a trace sheen during sampling (23 March 2020). There was also a trace sheen observed on groundwater from BH102 in the Poolbeg FlexGen site during sampling. No hydrocarbon odour was observed during sampling.

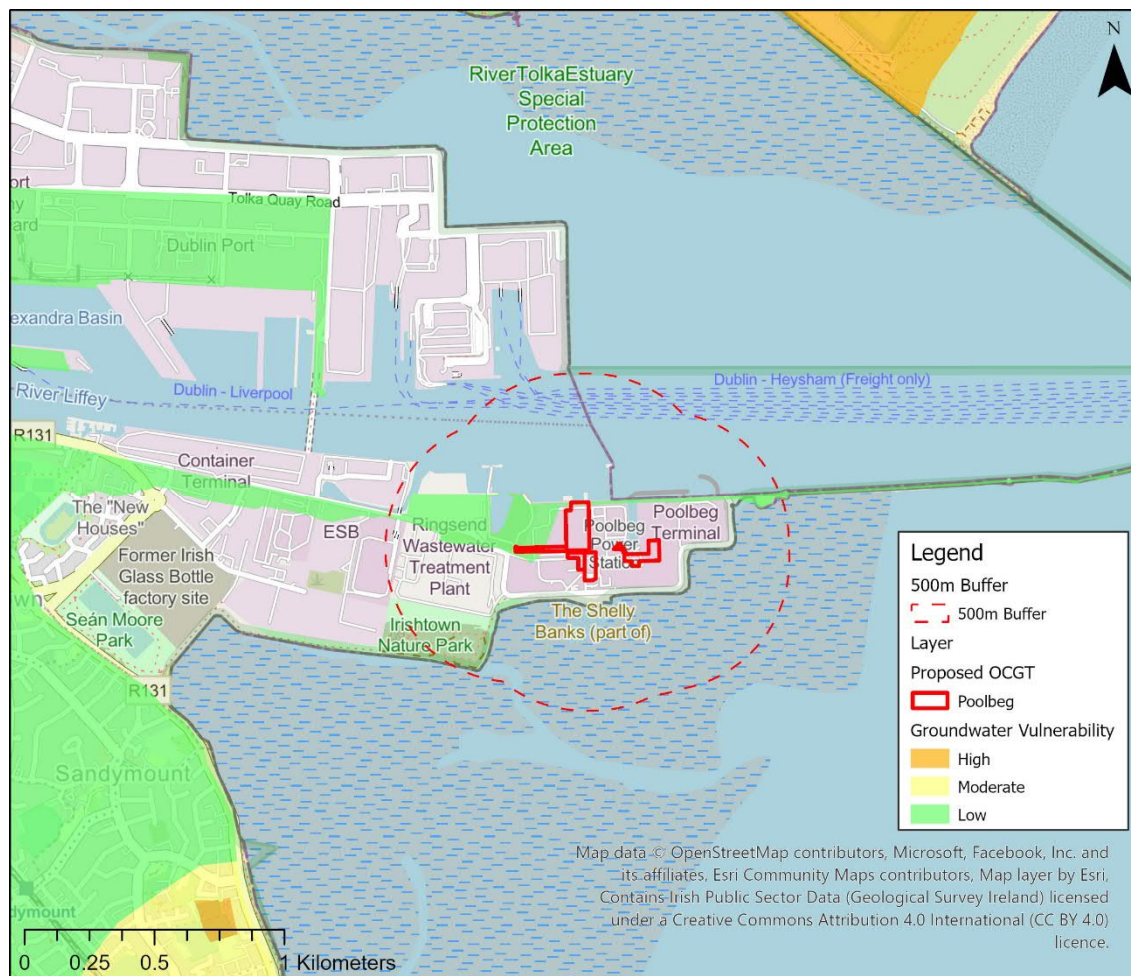
Groundwater vulnerability has been identified using GSI Groundwater Data Viewer (Geological Survey of Ireland, 2022). Groundwater vulnerability indicates how rapidly contaminants on the ground might reach the aquifer and is a function of soil and sub-soil thickness and permeability. Areas where there is no soil or subsoil protection above an aquifer (i.e., outcrops) are considered highly vulnerable. Groundwater vulnerability is considered Low in areas of made ground, as demonstrated in Figure 11.5.

No karst features, groundwater wells and springs, and source protection zones have been identified within the study area.

Shallow groundwater beneath the site is considered to be a possible pathway for migration of residual contaminants to Dublin Bay, a sensitive receptor. Hence, it is classified as medium sensitivity.

¹⁰¹ AECOM 2020 ESB Proposed BESS and FlexGen Sites ESB Poolbeg Baseline Assessment

Figure 11.5: Groundwater vulnerability



11.4.3.1 Radon

According to the EPA Radon Map accessed via the EPA website¹⁰², the Poolbeg Generating station complex is not within an area where more than one percent of the homes are estimated to be above the Reference Level of 200 becquerel per cubic metre and is, therefore, not classified as a high radon area.

11.4.3.2 Contaminated land

Site investigation data are not available for the Poolbeg OCGT footprint. The AECOM 2020^{99,100} ground investigations (outside the Poolbeg study area - see section 11.3.1) noted hydrocarbon contamination within the Made Ground comprising of residues of tar. Potential contaminants associated with the land-use type include metal/metalloids and inorganic and organic chemicals. As a result of this potential risk, in combination with the noted hydrocarbon contamination reported from ground investigations, there is the potential for contamination to be encountered during construction on this artificial peninsula.

11.4.3.3 Water Framework Directive

Dublin groundwater body (IE_EA_G_008) is the only WFD groundwater body within the study area. The flow regime of the Dublin groundwater body (GWB) is designated as poorly

¹⁰² Environmental Protection Agency Radon Map, accessed: [EPA Maps](#)

productive bedrock. The overall groundwater status, quantitative groundwater body status and chemical groundwater status for the Dublin GWB is reported as Good. Dublin GWB has been identified as Drinking Water Protected Areas due to the potential for qualifying for abstractions of water for human consumption as defined under Article 7 of the WFD (WFD, 2000).

11.5 Likely Significant Impacts

Construction and operational phase effects considered include those which have the potential to impact the following receiving environments:

- Land and land use;
- Soils and Geology; and
- Hydrogeology.

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 land, soil, and hydrogeology. The existing Poolbeg Generating station complex is an Industrial Emissions (IEL) site and will continue to comply with the conditions on the IE licence.

11.5.2 Construction Phase

The construction phase for the proposed development comprises pre-construction (demolition and enabling works), the main OCGT development works, and plant construction works, as described in Chapter 3 in this EIAR.

It is anticipated that advanced geo-environmental site investigations will also be undertaken by the Demolition and Enabling Works Contractor on behalf of the Main EPC Contractor. This will confirm the underlying ground conditions in the area, including under the proposed gas turbine and exhaust stack locations. The results of these surveys will be used to inform the final foundation design and piling arrangements.

Current estimates of exported and imported material are summarised in Table 11.8.

Table 11.8: Estimated Cut and Fill Quantities

Description	Cut / Export - Recovered (waste) (tons)	Cut / Export - Recycled (tons)	Fill / Import (tons)
Bituminous Mixtures	507		
Soil and stones	16097.25		12187.5
Concrete	2281.5		5492.5
Bricks/Blockwork	633.75		130
Iron and Steel		211.25	9675.25

Source: ESB

The construction phase assessment of effects for land, soils and hydrogeology are summarised in Table 11.9.

Table 11.9: Construction Phase Assessment of Effects

Receiving Environment	Construction Phase Impacts	Avoidance and mitigation measures included in design	Magnitude and Quality of remaining impact and Significance of Effect	Duration of effect
Land Use	No land use changes anticipated during construction phase from proposed scheme.	None required	<u>Magnitude and Quality of Impact:</u> Negligible / Neutral <u>Significance of Effect:</u> Imperceptible	Construction (temporary and permanent)
Land and Soils	Levelling and grading of the site is to include soil strip in preparation for the main development works, in addition to achieve the required finished levels between buildings and equipment. This is likely to require existing stone surfaces to be re-graded within the station complex. Minor vegetation and fence clearance around the building envelopes will be undertaken where required to facilitate access ahead of the main demolition works.	Bund areas will be backfilled using imported and compacted engineered graded material to make up the required levels for the site. An area of replacement carparking for the Poolbeg CCGT Generation Station staff will be established.	<u>Magnitude and Quality of Impact:</u> Negligible / Neutral <u>Significance of Effect:</u> Imperceptible	Construction (permanent)
	Removal of material from site as waste (see Table 11.8) is proposed. The bulk of the material to be excavated is soil and stones. Only excavated Iron and Steel will be recycled. The removal of material is large relative to the size of the site.		<u>Magnitude and Quality of Impact:</u> Moderate Adverse (Negative) Direct <u>Significance of Effect:</u> Slight	Construction (permanent)
Geology and Soils	Potential to encounter contaminated soils when excavating the Made Ground for foundations and service runs.	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 will be worn	<u>Magnitude and Quality of Impact:</u> Moderate Adverse (Negative) - Direct	Construction (temporary)

Receiving Environment	Construction Phase Impacts	Avoidance and mitigation measures included in design	Magnitude and Quality of remaining impact and Significance of Effect	Duration of effect
		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.	<u>Significance of Effect:</u> Moderate	
	Existing site survey and archive drawing information ^{99 100} reveals various underground live and redundant services present within the development footprint. The diversion of any existing live underground services will be required to suit the proposed development including a fire ring main, foul and surface water drainage, which may cause minor impacts to the soils or geology.	A geophysical survey will be undertaken to identify existing below ground services including electrical cables and other services such as water pipes and drains. Physical intrusive surveys using careful hand digging techniques will be used to physically verify this desktop information. Any disruption is likely to be temporary and affecting a small number of users. There is not anticipated to be a significant change in the nature of the geological resource.	<u>Magnitude and Quality of Impact:</u> Negligible / Neutral <u>Significance of Effect:</u> Imperceptible	Construction (temporary and permanent)
	There is a potential for the creation of residual contaminated soils during demolition if: - Contaminated water causes runoff during the decommissioning, or leaking of the water tanks. - Asbestos Containing Materials (ACM) from plant and buildings are identified.	Processes are in place for any ACM to be removed by an approved Specialist Asbestos Contractor and air-testing completed, prior to demolition. All water runoff shall be collected and disposed of off-site at an appropriate environmentally licenced facility.	<u>Magnitude and Quality of Impact:</u> Moderate Adverse (Negative) - Direct <u>Significance of Effect:</u> Significant	Construction (temporary and permanent)
	A maximum volume of 2100m ³ of material will be required for local site-raising purposes. The material will be imported to site for direct infilling with some short-term stockpiling undertaken to facilitate construction operations.	No change in the nature of the geological resource is anticipated.	<u>Magnitude and Quality of Impact:</u> Negligible / Neutral <u>Significance of Effect:</u> Imperceptible	Construction (temporary)

Receiving Environment	Construction Phase Impacts	Avoidance and mitigation measures included in design	Magnitude and Quality of remaining impact and Significance of Effect	Duration of effect
Hydrogeology	Potential to encounter residual contaminants that could become remobilised.		<u>Magnitude and Quality of Impact:</u> Moderate Adverse (Negative) - Direct <u>Significance of Effect:</u> Moderate	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. Shallow groundwater provides a pathway to Dublin Bay.	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. Chapter 5 of the D&CEMP (Appendix C) outlines the Environmental Incident Response Plan which will be followed and regularly reviewed throughout construction.	<u>Magnitude and Quality of Impact:</u> Moderate Adverse (Negative) - Direct <u>Significance of Effect:</u> Significant	Construction (permanent and temporary)
	The diversion of any existing live underground services will be required to suit the proposed development including a fire ring main, foul and surface water drainage, which may result in a new pollution pathway if not mitigated appropriately.	The shallow subsurface is granular and likely to be permeable. Additional pathways are not anticipated.	<u>Magnitude and Quality of Impact:</u> Moderate Adverse (Negative) - Direct <u>Significance of Effect:</u> Slight	Construction (temporary and permanent)
	Piling may temporarily mobilise contamination during installation	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-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 with a rock socket achieved at depth within the limestone bedrock at an approximate depth of 35 to 40m.	<u>Magnitude and Quality of Impact:</u> Negligible / Neutral <u>Significance of Effect:</u> Imperceptible	Construction (permanent and temporary)

Receiving Environment	Construction Phase Impacts	Avoidance and mitigation measures included in design	Magnitude and Quality of remaining impact and Significance of Effect	Duration of effect
		Rotary boring minimises soils drag down and lateral displacement of soil.		
	The water table is expected at a depth of 2.5m to 4m below ground level (bgl) and likely to be influenced by the tidal range 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. Shallow groundwater provides a pathway to Dublin Bay.	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. To mitigate the impact on groundwater, the bores for piles will likely need to be cased down to the Dublin Port clays or rockhead during concrete placement in order to limit the egress of concrete from the bore and into the soil substrate. The casing will minimise the potential for contaminant migration. 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. Chapter 5 of the D&CEMP (Appendix C) outlines the Environmental Incident Response Plan which will be follow and regularly reviewed throughout construction.	<u>Magnitude and Quality of Impact:</u> Negligible / Neutral <u>Significance of Effect:</u> Imperceptible	Construction (permanent)
	A maximum volume of 2100m ³ of material will be required for local site-raising purposes. The material will be imported to site for direct infilling with some short-term stockpiling undertaken to facilitate construction operations. Contamination risk to receptors if run off enters groundwater flow pathway e.g. from turbidity/silt run-off.		<u>Magnitude and Quality of Impact:</u> Negligible / Neutral <u>Significance of Effect:</u> Imperceptible	Construction (temporary)

11.5.3 Operational 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; and
- Hydrogeology.

Operational phase activities, outlined in Section 3.9 *Operational Phase Activities*, are summarized in Table 11.10.

Table 11.10: Operational Phase Assessment of Effects

Receiving Environment	Operational Phase Impacts	Avoidance and mitigation measures included in design	Magnitude and Quality of remaining impact and Significance of Effect	Duration of effect
Land and Land Use	No land use changes anticipated during operational phase from proposed scheme.	None required	<u>Magnitude and Quality of Impact:</u> Negligible / Neutral <u>Significance of Effect:</u> Imperceptible	Operational (long-term)
Geology and Soils	Potential leakage or spillage of wastewater generated by the gas turbine during compressor wash cycles. Wastewater poses risk of contamination to soil and subsoil. Contamination risk from spillage or leakage of wastewater containing hydrocarbons, generated by the fuel gas scrubber which will be stored in the fuel gas condensate tank located within the Gas Compressor and Auxiliaries building.	Treated wastewater will be discharged to the proposed new surface water discharge point (Easting – 711553, Northing – 758931) into the existing cooling water outfall channel that discharges to the Liffey Estuary Lower Waterbody (IE_EA_090_0300). This new surface water discharge point will be regulated under the IE Licence. Alternative arrangement for the management of this wastewater will be made if advised by the Environmental Protection Agency and/or IE Licence requirements. In case of emergency, a shutdown valve will be provided at the discharge point from the treatment plant before entering the proposed drainage network.	<u>Magnitude and Quality of Impact:</u> Negligible / Neutral <u>Significance of Effect:</u> Imperceptible	Operational (long-term)
	Spillage of hazardous chemicals that are required for water	All chemicals stored on the proposed Poolbeg OCGT site will be regulated under the IE licence. All fuels and chemicals stored on site will be subject to a COSHH	<u>Magnitude and Quality of Impact:</u>	Operational (long-term)

Receiving Environment	Operational Phase Impacts	Avoidance and mitigation measures included in design	Magnitude and Quality of remaining impact and Significance of Effect	Duration of effect
	treatment have the potential to contaminate soil and subsoil.	(Control of Substances Hazardous to Health) assessment and compliance with the requirements of REACH.	Negligible / Neutral <u>Significance of Effect:</u> Imperceptible	
Hydrogeology	Wastewater arising from operation (water treatment and process wastewater) has the potential to cause pollution if not appropriately managed, discharged or disposed of.	See above.	<u>Magnitude and Quality of Impact:</u> Negligible / Neutral <u>Significance of Effect:</u> Imperceptible	Operational (long-term)
	Contaminated runoff from roads, parking, concrete or bunded areas has the potential to cause contamination to ground or pollute shallow groundwater.	All runoff will be collected in a new underground drainage network which has measures (including hydrocarbon separators and an oil alarm) to minimise pollution risks. Run off will be managed and monitored in accordance with Industrial Emissions Licence (IEL).	<u>Magnitude and Quality of Impact:</u> Negligible / Neutral <u>Significance of Effect:</u> Imperceptible	Operational (long-term)
	Site water discharges, e.g., firewater discharge, may contain contaminants that have the potential to pollute groundwater.	Study area is essentially a low-permeability cap on the limestone, which prevents the underlying limestone from receiving recharge. 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. The facilities themselves will store potentially contaminative substances in secure bunded areas which are further secured by the site drainage system.	<u>Magnitude and Quality of Impact:</u> Negligible / Neutral <u>Significance of Effect:</u> Imperceptible	Operational (long-term)

11.5.4 WFD Groundwater Status

The groundwater screening assessment is summarised in Table 11.11. The small scale of the proposed development relative to the magnitude of the WFD waterbody is deemed to pose very low risk to the delivery of long term WFD no deterioration and status objectives, such that no further (additional) assessment is required.

Table 11.11: WFD Groundwater Assessment

Test	Impact Assessment
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.
Impact 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 Dublin Bay. 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 Dependant Terrestrial Ecosystem (GWDTE) quantitative status	Dublin WFD Groundwater body has been designated in entirety as protected areas for Groundwater in SPA/SAC habitats. However, the closest SPA/SCA areas to the scheme are estuarine/marine related habitats, which are not considered GWDTEs.
Water balance	No predicted impact to water balance of the WFD groundwater body. As the study area is essentially a low-permeability cap on the limestone, the underlying limestone receives limited recharge. The proposed development will not change surface permeability and therefore the recharge regime is not expected to change. The significant superficial cover and depth of the WFD groundwater body (as reflected by the low aquifer vulnerability) further reduces recharge in the area.
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.
Impact of groundwater on surface water ecological/chemical status	No predicted impact to water balance of the WFD groundwater body. Study area is essentially a low-permeability cap on the limestone, which prevents the underlying limestone from receiving recharge. Measures are in place to minimise the risk of contamination migration during piling. The proposed development will not change surface permeability.
GWDTE chemical status	No predicted impact to GWDTE chemical status. Embedded design and additional mitigation measures will ensure contamination arising from the construction or operational activities does not impact the waterbody.
Drinking water protected areas	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 (accidents and disasters), such as hydrocarbons, will be minimised by the embedded and additional mitigation measures implemented during construction and operation. The impact to the chemical status of the Dublin WFD groundwater body is considered negligible.

11.5.5 Decommissioning Phase

The proposed development is expected to be operational for at least 20 years or as long as is required by grid infrastructure. 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.

On decommissioning the following steps will be implemented:

- All plant and equipment will be dismantled and either sold, recycled or disposed of through licenced 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 ensuring that there will be no environmental pollution. The modular nature of the proposed development construction will assist any decommissioning in that modules can be disconnected and removed from site.

Decommissioning the plant will require the removal of existing infrastructure, including diesel tanks. Once these sources of potential contamination have been removed, it is anticipated that there will be 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.

11.6 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

Further to a review of planning applications undertaken in November 2022, a list of other known existing and/or approved and relevant developments and other known planned developments which have been considered when assessing cumulative effects, and are presented in Table 4.2. All developments 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 D&CEMP) of a similar standard detailed herein would be incorporated into the below developments.

The most significant adverse cumulative impacts are likely to be the cumulation of waste materials for export during site demolition and excavation and the cumulation of virgin imported materials for construction.

Requirements to identify and treat land contamination may improve ground conditions on the peninsula and lead to an overall slight beneficial effect.

Other cumulative impacts are considered minimal.

No intra-project interactions have been identified.

11.7 Mitigation Measures and Monitoring

11.7.1 Design and construction best practice mitigation measures

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 on a daily basis. In the event of unforeseen contaminated land being encountered, the Contractor will refer to Section 14.14 of the ESB publication *Employer's*

Minimum Environmental Requirements for Construction and Demolition Projects and Related Works and Activities (2022).

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 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 D&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), if encountered, will 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 the D&CEMP which will set out control measures and procedures to ensure potentially polluting activities are controlled and managed. These measures will include 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 wash water will be collected and disposed of in accordance with the Waste Management Act 1996, as amended
- 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 escaping and entering drains;
- Any spillages will be cleared immediately by excavating and disposing of affected soils in accordance with the Waste Management Act 1996, and associated regulations; and
- The base of temporary stockpiles (including excavated and imported material) will be protected by silt fencing. Regular visual monitoring of the silt fence will be undertaken (at least daily). The silt fence will be repaired, replaced or reinforced as necessary to prevent migration of silt.

The D&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.

Wastewater will be disposed offsite by road tanker in accordance with the Waste Management Act 1996, and associated regulations (see Section 3.8.4 for further details).

11.7.2 Operational phase mitigation measures

Operational risk mitigation measures have been designed into the Poolbeg OCGT plant design (see Section 3.9 for further details). These include:

- Residual wastewater produced in the demineralisation process will undergo suitable treatment prior to discharge. The type of water treatment technology to be used is not yet determined and will be finalised after awarding the contract, as outlined in Section 3.9.5. The discharge will be regulated in accordance with IEL. Alternative arrangements for wastewater management will be made if advised by the EPA and/or IE. In case of emergency, a shutdown valve will be provided at the discharge point from the treatment plant before entering the proposed drainage network.
- Following treatment, wastewater generated from the demineralisation waste treatment process will be discharged to the proposed new surface water discharge point (Easting – 711553, Northing – 758931) into the existing cooling water outfall channel that discharges to the Liffey Estuary Lower Waterbody (IE_EA_090_0300). This new surface water discharge point will be regulated under the IE Licence.
- The wastewater from the demineralisation waste treatment process will be collected in the bunded Gas Turbine (GT) Area Drain Tanks. The contents of each GT Area Drain Tank will be collected by a suitably licenced waste contractor in accordance with the Waste Management Act 1996, and associated regulations for disposal. Wastewaters generated during this process will not be discharged to environment.
- Wastewater will also be generated during the fuel gas scrubber process. The wastewater associated with this process will be stored in the bunded fuel gas condensate tank located within the Gas Compressor and Auxiliaries building. Water in this tank will contain hydrocarbons and will be disposed offsite by road tanker in accordance with the Waste Management Act 1996, and associated regulations. The volume of wastewater generated during this process will be negligible and will not be discharged to the environment.

No monitoring is proposed.

11.8 Residual Impacts

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 (were 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 phase:

- all impacts to land and land, soils, geology and hydrogeology will result in imperceptible effects which are not significant.

12 Archaeology, Architectural and Cultural Heritage

12.1 Introduction

This chapter presents an assessment of the likely and significant impacts arising from the proposed development on Archaeology, Architectural and Cultural Heritage. The assessment is based on the development as described in Chapter 3 of this EIAR.

This chapter of the EIAR, prepared by Enda O'Flaherty (BA, H-Dip, PhD) of Rubicon Heritage Services Ltd., details the archaeological, architectural and cultural heritage issues that need to be addressed in respect of the proposed (OCGT) at Poolbeg.

This study aims to assess the baseline archaeology and cultural heritage environment, to evaluate the likely significant impacts that the proposed development will have on this environment, and to provide mitigation measures to ameliorate these impacts in accordance with the policies of the Department of Housing, Local Government and Heritage (DHLGH), Dublin City Development Plan (2022-2028) the National Monuments Acts 1930-2004, and best practice guidelines.

12.2 Policy and Guidance

The Planning Report which accompanies this application (Ref: 229100184_3_A) 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 are set out in this section.

The following policy and guidance documents have been used to inform this chapter of the EIAR. The detailed legislative framework for Archaeology, Architectural and Cultural Heritage is provided in Section 1.2 in Appendix G.

12.2.1 Legislation and Policies

- Planning and Development Act 2000 (as amended);
- National Monuments Acts 1930-2004;
- Dublin City Development Plan 2016-2022; and
- Dublin City Development Plan 2022-2028.

12.2.2 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 Statements (Environmental Protection Agency, 2002);
- Advice notes on current practice (in the preparation of Environmental Impact Statements) (Environmental Protection Agency, 2003);
- 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);

- 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); and
- Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes (National Roads Authority, 2005).

12.3 Methodology

This section presents the methodology used in assessing the baseline cultural heritage environment.

12.3.1 Approach to Data Collection

12.3.1.1 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 here.

- Sites and Monuments Record (SMR) and Record of Monuments and Places (RMP) for County Dublin;
- Various editions of the Ordnance Survey of Ireland maps;
- The Sites and Monuments Record database;
- National Inventory of Architectural Heritage;
- Excavation Bulletins Database (www.excavations.ie);
- Dublin City Development Plan Chapter 11 (2022-2028) ;
- Various published sources for local history;
- Ordnance Survey Name books and Letters;
- Excavations Bulletin;
- Aerial Photographs; and
- Cartographic Sources.

12.3.1.2 Field Inspection

A field inspection of the proposed development site was undertaken by Rubicon Heritage Services Ltd on 15 September 2022 by Ivan Pawle.

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.

12.3.2 Approach to Impact Assessment

12.3.2.1 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 site of cultural heritage significance and / or potential 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 TII Guidelines (NRA 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 1930-2004 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) 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 12.1.

Table 12.1: 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	High
- Unregistered built heritage sites that comprise extant remains which are in poor condition - Unregistered cultural heritage sites (not including built heritage sites) that comprise extant remains - Townland boundaries that comprise extant remains - Marshy/wetland areas	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

Note: 'All other areas' collectively refers to the areas within the proposed development site that do not contain or comprise features of cultural heritage significance.

12.3.2.2 Type of Impact

Table 12.2 lists the type of impacts that a proposed development may have on the cultural heritage resource.

Table 12.2: 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.

12.3.2.3 Assessing Physical 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 Table 12.3.

Table 12.3: Criteria Used for Rating Magnitude of Impacts

Impact Magnitude	Criteria
Severe	- 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 development. Mitigation is unlikely to remove adverse effects.
Major	- 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 is 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

Impact Magnitude	Criteria
	be consistent with existing and emerging trends. Impacts are probably reversible and may be of relatively short duration. Appropriate mitigation is 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.
Minor	● 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 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.
Negligible	● 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. ● A beneficial or positive effect on architectural heritage of local importance that is capable of measurement but without noticeable consequences.

12.3.2.4 Assessing Impacts on Setting

The definition of setting follows the guidance set by English Heritage as they have developed a range of comprehensive guidance on this subject specific to heritage assets (English Heritage 2005; 2008). 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.

English Heritage 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 12.4.

Table 12.4: Factors to be Considered when Assessing Impacts upon Setting (Adapted from English Heritage, 2005)

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.

Factor	Discussion
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 landuse 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 landuse 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.

12.3.2.5 Methodology Used for Assessing Significance Level of Impacts

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 12.5 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.

Table 12.5: Criteria for Assessing Significance Level of Impacts

Magnitude of Impact	Baseline Value				
	Very High	High	Medium / High	Medium / Low	Low
Severe	Very significant	Very significant	Significant	Moderate	Slight
Major	Significant	Significant	Moderate	Slight	Slight
Moderate	Moderate	Moderate	Slight	Slight	Negligible
Minor	Moderate	Slight	Slight	Negligible	Negligible
Negligible	Slight	Slight	Negligible	Negligible	Negligible

12.3.2.6 Limitations

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.

12.3.3 Study Area

The study area 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 scheme may have on sites of cultural heritage significance.

Taking these factors into account the study area has been defined as follows:

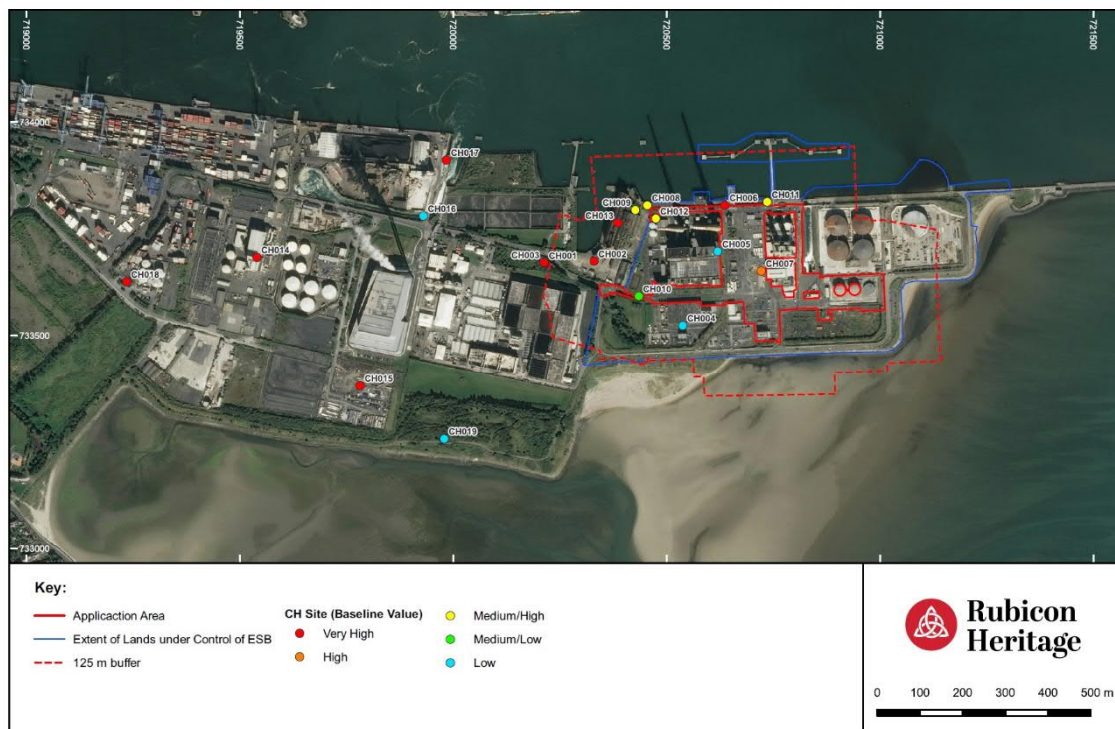
Table 12.6: Dimensions of the Study Area

Subject	Study Area
National Monuments and Recorded archaeological monuments (RMPs)	Within 250 m of the proposed development
Protected Structures and / or their curtilage	Within 250 m of the proposed development
Architectural Conservation Areas (ACAs)	Within 250 m of the proposed development
Structures recorded in the NIAH	Within 250 m of the proposed development
Unregistered features of cultural heritage	Within 125 m of the proposed development
Townland boundaries	Within or bounding the proposed development footprint
Areas of archaeological potential	Within or bounding the proposed development footprint
Previous Excavations	Within any townland traversed by the proposed development
Topographical files	Within any townland traversed by the proposed development

12.4 Receiving Environment

The distribution of Cultural Heritage (CH) sites in vicinity of the study area is shown in Figure 12.1.

Figure 12.1: Distribution of CH Sites



12.4.1 Topography, Route and Locational Detail

The proposed development site is on the southern banks of the River Liffey, part of the Poolbeg Peninsula and in the townland of Dublin South City as shown in Planning drawing P000442-01-CE21-101-001. The wider area is a heavily industrialised city port with a mixture of power generation and other commercial enterprises associated with the docks. The peninsula supports a number of large industrial/municipal installations including Dublin Bay Power and Dublin Waste to Energy. The proposed development is situated within the Dublin City Council administrative area.

The modern topography of the proposed development site comprises entirely land reclaimed from the tidal sands to the south of the River Liffey and the South Wall of Dublin Harbour. The South Wall of Dublin Harbour was completed c.1730 – prior to this the area comprised shifting sandbanks deposited by the River Liffey. The northern portions of the proposed development site formed part of an isolation hospital located to the south of South Wall at the turn of the 20th century, while the southern portion of the site was not reclaimed until the second half of the 20th century.

The entire site is underlain by infill dating to the reclamation of the land from 1958 onwards. However, the original foreshore sediments lie underneath this infill, and this area was a main shipping route for centuries. Therefore, only excavation beneath the infill (which is limited based on the nature of the development) into the foreshore sediments has the potential to impact on archaeological features or finds (for example, wrecks and associated finds, fish traps, kishes or ships timbers), should they exist.

12.4.2 Archaeological and Historic Context

Prior to modern land reclamation the area in which the proposed development is located was tidal and formed part of the estuary of the River Liffey (Cox & Gould 1998). While permanent occupation during the prehistoric and medieval periods is unlikely, the area may have been

used on a temporary basis exploiting local resources including fish and wild fowl. Archaeological material associated with this form of exploitation includes fish traps and other fishing structures and dug out boats. Movement through the estuarine landscape would have been assisted by the dumping of brushwood or the construction of hurdle panels or timber trackways (O'Sullivan 2001, 131).

Recent archaeological monitoring at North Wall Quay, to the north of the proposed development uncovered archaeological material associated with the use of the estuary during the prehistoric period (McQuade 2005, 6). This monitoring revealed a primary shoreline associated with the River Liffey which descended into silt deposits and which had accumulated to a depth of approximately 3m. The remains of at least two fish-traps, constructed of hazel, were revealed between 1.2m and 12m from that shoreline (McQuade 2005, 6). The fish-traps were dated to around 7000 BP placing them in the Mesolithic period (McQuade 2005, 6).

Archaeological evidence suggests that the earliest permanent settlements in the Dublin region were located on two dry patches of ground, one of which is located nearby the site of the proposed development. The most important settlement was well outside the study area, in the vicinity of Dublin Castle, and the other was situated on the low gravel ridge at Ringsend. The name Ringsend is thought to be a corruption of the Irish An Rinn, meaning 'the end of a point of land' where this community would have been located (Bennett 1994, 172). Besides this small peninsula of land, the area was largely riverine marsh until reclamation in the post medieval period.

From the Viking period onwards, Wood Quay to the west of the study area formed the focal point of trade moving along the River Liffey (de Courcy 1996, 128). It is known that in the 16th century vessels unloaded at Merchants Quay and Wood Quay. Prior to the 18th century large ships anchored in Dublin Bay and used lighter craft to move cargo into the city centre (Official Handbook 1927).

On the south side of the estuary, medieval settlements developed at Ringsend (DU018:053) and Irishtown (DU018:054). Settlement at the latter was founded in the mid-fifteenth century, when Dublin Corporation ordered the expulsion of all people of Irish blood from within the city gates (Bennett 1991). The pattern formed by Strand Street and Irishtown Road is likely to respect the line of an enclosure around the early foundation, the site of which is presently marked by St Matthew's Church.

After Dutch attacks on British vessels moored in the Thames in 1667, the Admiralty and Government were concerned about the safety of Dublin Port. In 1672 Bernard de Gomme was sent to ascertain what works would be necessary to protect Dublin. He produced a survey that was displayed to King Charles II in November 1673 (Haliday 1881, 230). In 1698 the Corporation of Dublin petitioned the House of Commons to allow the establishment of the Ballast Office. The aim of the organisation was to remove ballast from the banks on both sides of the Liffey below Ringsend and thereby free up the river and allow ships to dock and unload (ibid, 245-6). The first improvement was to straighten the channel from the city to Ringsend in 1711. This comprised a bank of timber and stones to the north and a masonry quay wall to the south (Purser Griffith 1915, 13-14). By 1717 the reclamation project had gone out as far as East Wall Road (identified as East Quay on Rocque's 1756 map) (McCullough 1989, 39).

Efforts to reclaim the estuary commenced with containment works undertaken by the Ballast Office in 1710 to the north of the proposed development (De Courcy 1996, 268-9). Woven baskets or 'kishes' filled with stones, gravel and shingle were laid along the line of the intended wall by small sailing vessels (University College Dublin School of Architecture 1996, 171). The newly made ground behind the kishes was surveyed and a number of new streets including Sheriff Street, Commons Street, Guild Street and Mayor Street were laid out (Clerkin 2001, 132) - the construction of a stone river wall, began soon after. Brooking's map of 1728 depicts the

new wall running east to a point opposite the Donneybrook River at Ringsend before turning north. Newly made ground to the north of this is 'Walled in but as yet overflow'd by ye tide'. Brooking's map is augmented by 'A Prospect of the City of Dublin from the North' which clearly shows the area behind the river wall inundated with water. The area had been fully reclaimed by the mid-18th century and is shown on Rocque's map of 1756.

In 1725 Gabriel Stokes produced a Survey of Dublin Bay and Harbour. This was followed by a further survey in 1728 by Captain John Perry and Thomas Burgh who went onto to produce a detailed map of the harbour. The beginnings of the breakwater on the south side of the channel are shown on the 1728 map. John Rocque's map of 1756 shows the section of the Great South Wall running from Ringsend into the centre of the Dublin Bay. A lighthouse was built at the furthest extent of the wall in 1760 (Daly n.d., 5-8).

During the period 1786-1867 a number of improvements were made to the port, including: Construction of quay wall of North Quay, South Quay and East Quay and the dredging of channel. By 1915 the Dublin Port and Docks Board were granted further powers, which allowed additional borrowing and provision made for raising revenue for the maintenance and improvement of the Port by rates on cargos. The powers provided by the 1902 Act included: Further improvement of the port through dredging.

The Pigeon House, roughly opposite the Clontarf oyster beds and earlier Clontarf Pool, is located where the Ballast Wall meets the earlier piled wall that combine to make up the South Wall. Although not indicated by Taylor, 'The Piles' reached their westernmost point on an area known as the Green Patch, which remained dry at high tide and was an early staging place for ships. The original Pigeon House or blockhouse (the first structure to be built in the Pigeon House precinct following the creation of the South Wall) at this point is said to have been built in 1760 (De Courcy 1996) and to be named after its resident caretaker, John Pigeon, and it is indicated as such by Taylor in 1816. The Pigeon House quickly became a resting-point for passengers landing at the Pigeon House Hole, part of the original Salmon Pool, and visitors to the Green Patch on excursion from the city. A harbour, to be called Pigeon House Harbour, was planned in 1791, following the establishment of the Ballast Board in 1786. At this stage, a new wall was constructed in the Liffey channel to form the new harbour's north side, as shown by Taylor. By c.1793, the need for additional accommodation for travellers led to the construction of the Pigeon House Hotel, indicated on Taylor's map as the 'Hotel Barracks.' In addition to the 'Hotel Barracks,' Taylor notes the existence of the 'Revenue Barrack', with a longitudinal structure between them and a number of smaller buildings west of the hotel.

Following temporary military arrangements after the 1798 Rebellion, the Pigeon House Fort was constructed and maintained by the Department of War from 1814-1897. It included gates with drawbridges, quarters for officers and men, a hospital and armoury, magazines and stores. Described in 1837 as *The Pigeon-house fort situated on the south wall, midway between Ringsend and the lighthouse*. The precinct remained occupied as a military fort until 1897, when it was sold to Dublin Corporation, which selected the site as a generating station to meet the rapidly increasing demands in the city for electricity. In 1897 the complex was sold to Dublin Corporation and absorbed into a complex of electricity generating stations and waste-water treatment works.

12.4.3 Toponymy of 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. Research into the names (toponymy) of these land units frequently provides information relating to the townland's archaeology, history, folklore, ownership, topography or land use. Most placenames (including townland names) were anglicised by the time the Ordnance Survey began in the 1830s. However, despite some inaccuracies in translation, the Gaelic, Viking, Anglo-Norman and

English origins of place names are generally recognisable. 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.

The proposed development extends through or impacts on one townland.

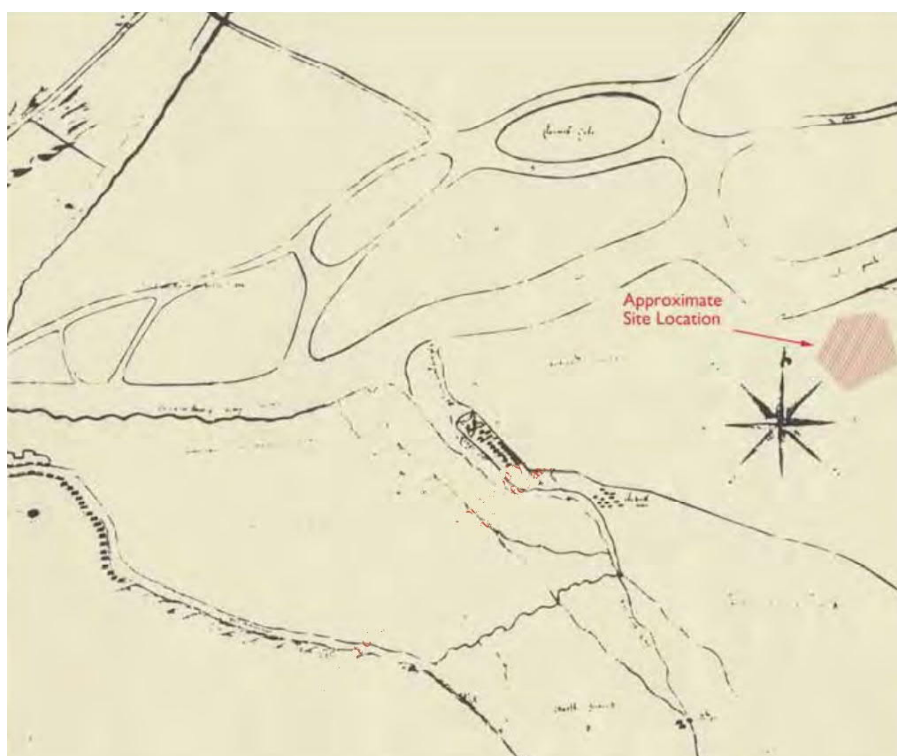
Table 12.7: Townlands Impacted by the Proposed Development

English Name	Irish Name	Glossary
Ringsend	<i>An Rinn</i> ¹⁰³	point, headland

12.4.4 Cartographic Record

The first map on record to show the mouth of the Liffey is a map of 1654 by William Farrand and William Starkes that was incorporated into Dr William Petty's Down Survey of forfeited land in 1655–56 (De Courcy 1996). The latter shows a single area of dry land, the Island of Clontarf, on an exposed sandbank that extends westward as far as the shoreline demarcated by 'The high road to Clontarf,' now broadly Amiens Street and North Strand Road. The island is envisaged as having served as a landing point for boats and men, along with the Clontarf shore, during the Battle of Clontarf between the Vikings and Irish under Brian Boru in 1014.

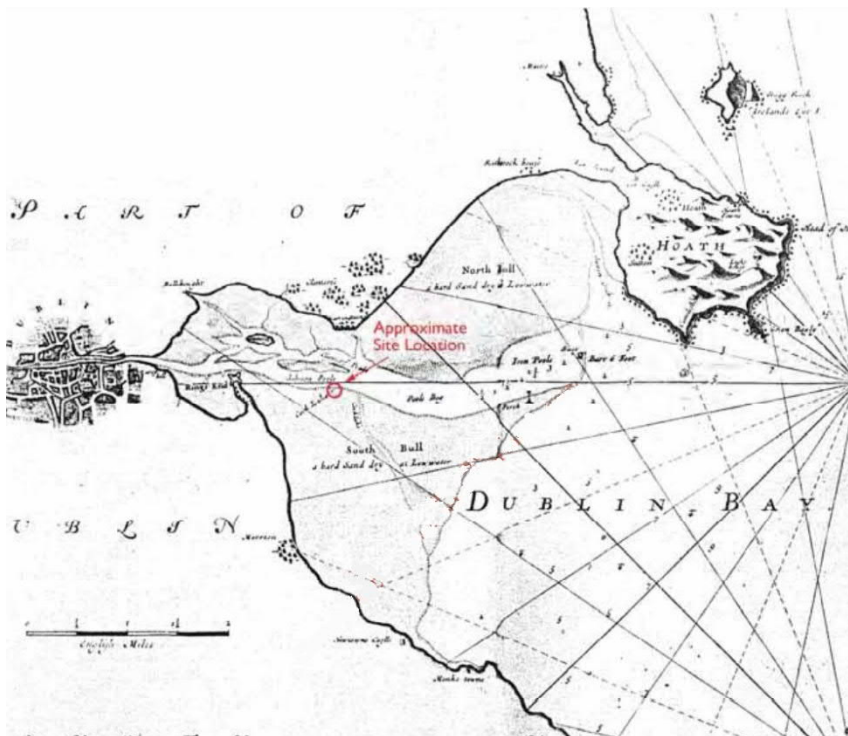
Figure 12.2: Detail from Bernard de Gomme's Map of the City and Estuary



De Gomme's 1673 map (Figure 12.2) of the harbour and bay at low tide shows the tortuous channels of the Liffey and Tolka estuaries at that time, demonstrating the inadequacy of the channels as shipping lanes (De Courcy 1996). Concerned primarily with harbour defences, following the outbreak of war between the English and the Dutch in 1672, de Gomme's survey also shows a large citadel, or star-fort, straddling the Ringsend peninsula.

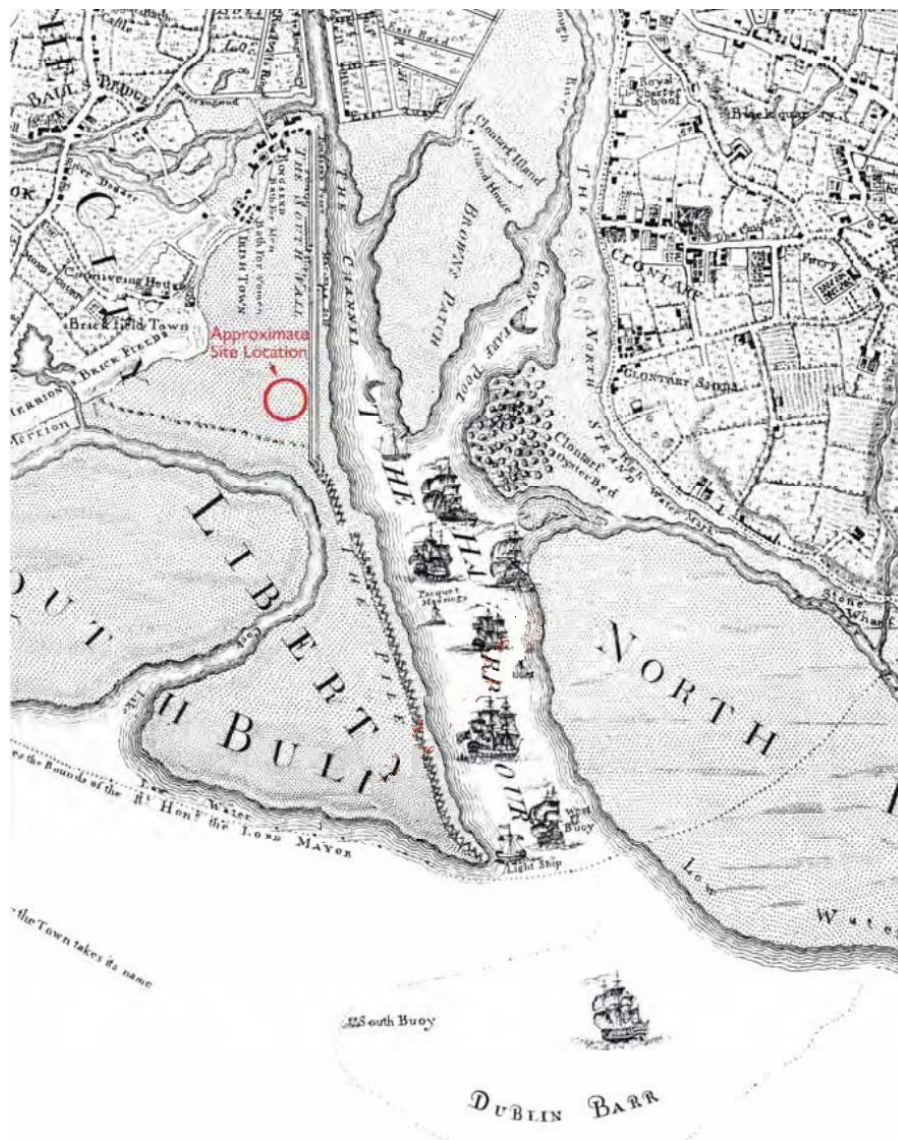
¹⁰³ <https://www.logainm.ie/57187.aspx>

Figure 12.3: Detail from Captain Greville Collins's Map of Dublin Bay dated 1686



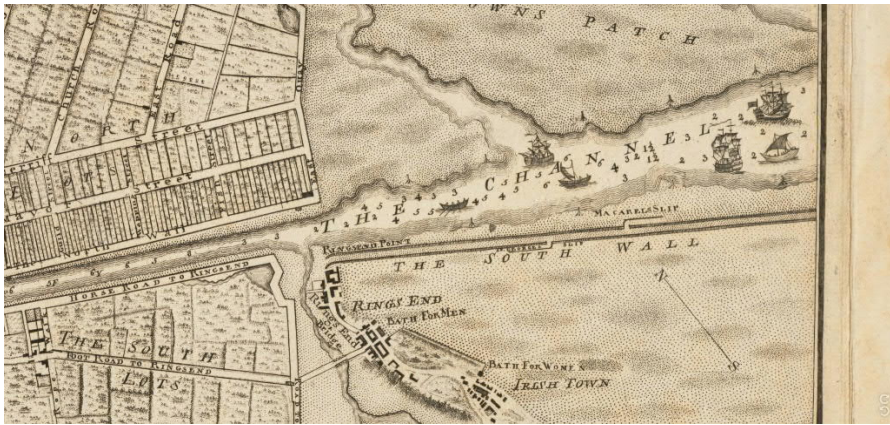
A small fort guarding Dublin Harbour is shown on two contemporary maps: a map of Dublin by Phillips dating to c.1685 and the chart of Dublin Bay by Captain Greenville Collins, which would have been surveyed after 1681 and produced in 1686 (Figure 12.3). The Greenville Collins chart shows a square bastioned fort at the end of the peninsula at Ringsend. Phillips's map shows the same structure with a more irregular outline and similar dimensions to the typical Cromwellian-period fort, with which it may well be contemporary. The fort is not shown on any eighteenth-century map (De Courcy 1996).

Figure 12.4: Detail from John Rocque's 'An Actual Survey of the County of Dublin'



Eighteenth century maps, including Rocque's 'An Actual Survey of the County of Dublin,' produced following the construction of the South Wall, in 1760 (Figure 12.4), show Cock Lake as a loop with two mouths (De Courcy 1996). Rocque also documents the eastern expansion of the city in the eighteenth century and the development of reclaimed land north and south of the new Liffey Quay walls, primarily to accommodate housing at the upper end of the market. On the south bank, Ringsend village appears as a somewhat prosperous place, a rival fishing village with Clontarf, which from the end of the sixteenth century functioned as the deep-water port for Dublin. The South Wall is shown partly as a stone wall with slips from Ringsend Point and partly as the earlier piled breakwater staked out in 1716 to the eastern tip of the South Bull sands.

Figure 12.5: William Duncan's Map of the County of Dublin



Duncan, on his later map of 1821 (Figure 12.5), provides additional information on water depths over the North and South Bull sands. Buoys delineate the approach to the harbour by denoting the extent of both Bull sands, and although the Bull Wall was only completed in 1824, Duncan indicates the position and extent of the wall on his 1821 map. Records of buoys in the harbour date to 1566, when Gerald Plunkett was authorised to set buoys or marks on Dublin Bar as a guide to shipping (Gilligan 1988, 11).

Figure 12.6: First Edition Ordnance Survey 6-inch Map (1843) with Development Footprint



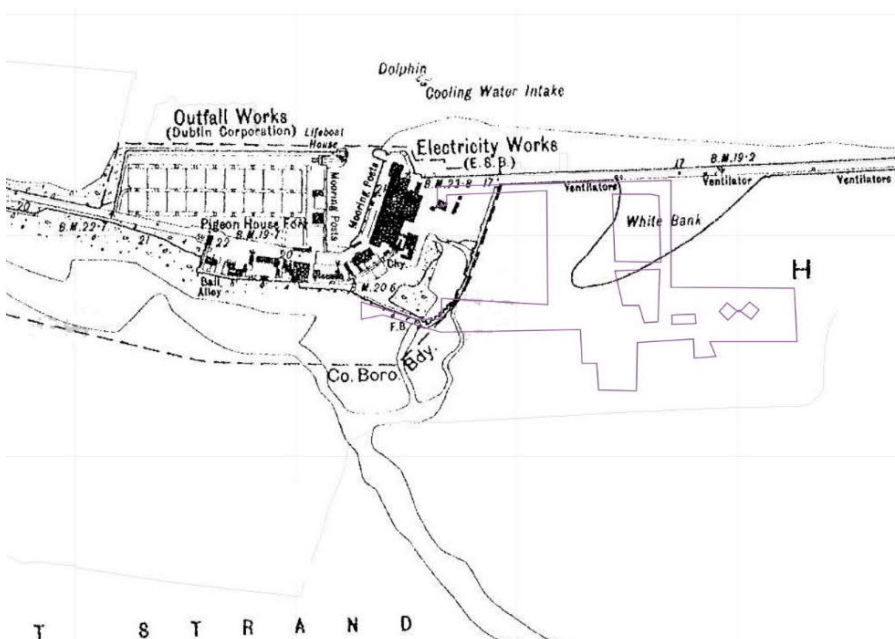
The development of the Pigeon House precinct, as a military fort in the nineteenth century and as an area of service for the city of Dublin under Dublin Corporation in the twentieth century, is shown in most detail on the various six-inch edition Ordnance Survey maps, the first of which was published in 1843. The First Edition Ordnance Survey 6-inch sheet (Figure 12.6) shows the development footprint being entirely located on the tidal foreshore of the estuary, to the south of the sea wall.

Figure 12.7: First Edition 25-inch Ordnance Survey (1912) with Development Footprint



By the mid-twentieth century the ESB proceeded with its plans to develop a new oil generating station at Ringsend, at the western edge of the Pigeon House precinct, south and west of the cholera isolation hospital shown on the 1912 edition Ordnance Survey 25-inch map (Figure 12.7 – by 1936 the hospital is shown as a 'Tuberculosis Hospital' (Figure 12.8), whose ground contained a convent and a Catholic Chapel. The Board reclaimed foreshore to the south of the Pigeon House Road (in an area indicated as a Rifle Range on the 1912 map) for the station, and constructed a 550-foot long wharf, with associated reclamation for storage of coal adjoining the wharf on the riverfront. The new station came into operation in 1955 (Gilligan 1988).

Figure 12.8: Cassini Edition Ordnance Survey (1936) with Development Footprint



12.4.5 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 2020. 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 townlands traversed by the proposed development. The database produced nine examples of licensed archaeological investigations undertaken within the townlands incorporated by the study area (see also Section 1.3 in Appendix G). Of these nine investigations, four sites did not identify any archaeological deposits. One record (08D085; a dive survey) had no report available for review. The remaining archaeological investigations comprised four excavations:

- 18th-and 19th-century artillery fort (09E0259) (CH002);
- Foreshore wreck (01E0402) (CH0013);
- 19th-century fortifications (13E0066) (CH014); and
- Post-medieval deposits (96E0269) (CH017).

The records from the excavations database show a number of locations in the vicinity of the proposed development have produced deposits associated with the early modern period:

(CH002)

In 2009, license was granted (09E 0259) for archaeological excavations at the site of the Pigeon House Fort. The excavations database does not provide a summary of these excavations beyond the historical background of the site.

(CH013)

In 2001, during the course of a foreshore assessment associated with the excavation of a pipeline trench in the intertidal zone from Ringsend to Sutton, an undated wreck was identified. A licence to test-excavate was obtained to determine the extent and nature of the wreck. Nine trenches were excavated around the potential wreck. Of these, six were excavated in the immediate vicinity of the site and three on the boundary of the buffer zone to determine whether the 40m exclusion zone was sufficient. The first six trenches determined that a wooden and metal shipwreck incorporating wooden dowels was present. The last three trenches testing the buffer zone proved archaeologically negative. It was, however, recommended that the buffer zone be increased to 60m in a western direction to preserve the wreck in situ. Two sump trenches were also excavated, one to the west and one to the north-west of the wreck site. No archaeological stratigraphy was identified but a number of spent bullets and musket balls were recovered.

(CH014)

In 2013, archaeological monitoring of site investigation trenches was undertaken at the site of the Dublin Waste to Energy Project, Poolbeg, Dublin 4. Site investigations were conducted over two phases in the area of the Dublin to Waste development site. In total 23 test trenches were excavated, ten in Phase 1, 13 in Phase 2. The majority of the trenches encountered significant modern fill deposits associated with estuarine land reclamation south of the modern Pigeon house Road. Test trenches excavated as part of Phase 2 (Test trenches 12 and 13) exhibited the partially truncated remains of a metallised surface and walling. These remains are considered to have formed part of the causeway which led to the 19th-century Pigeonhouse Fort. Both test trenches were only excavated to a depth where extant services could be identified. The archaeological remains exposed were covered with a protective layer of sand before backfilling. The site of a coffer dam associated with a pump station for the facility was excavated during October 2015. Significant reclamation deposits overlay navigation channel silts with modern debris inclusions. Nothing of archaeological significance was recovered.

(CH017)

In 1996, Archaeological assessment of the development site at the rear of Seapoint Terrace, Irishtown Road, Dublin 4, was carried out. Five long trenches were dug on the site by mechanical excavator. The site had been cleared of all standing buildings, and part of a partition wall, originally the rear boundary wall of the gardens to the rear of Seapoint Terrace, was standing on the site. The area of Ringsend was composed of tidal mudflats and sand-banks both in the medieval period and later. While several dwellings are listed in the Sandymount/Ringsend area in the Down Survey, the area was not extensively settled and reclaimed until the 18th century. Between 0.5m and 0.8m of garden soil containing 19th-century and later material overlay the sand and gravel subsoil on the site. Towards the centre of the site a localised grey soil and small oyster shell midden, c. 0.2m thick, yielded fragments of late 17th-century pottery. No structural features were associated with the 17th-century soil. Razor shell and limpet throughout the upper levels of the sand subsoil indicate that the area was open sand-banks until the widespread deposition of the recent garden soil. Editor's note: This excavation, though carried out in 1996, was not reported on in time for inclusion in the bulletin of that year..

12.4.6 Designated Archaeological and Architectural Sites

Record of Monuments and Places (RMPs)

Section 12(1) of the National Monuments Act 1994 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 two recorded archaeological monuments identified within the study area (see Section 1.1 in Appendix G)

- (CH001) in the townland of Dublin South City – a blockhouse; and
- (CH005) in the townland of Dublin South City – a Ballast Office.

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.

There are no National Monuments identified within the study area.

Sites with Preservation Orders

The National Monuments Act 1930-2004 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 Ministers' 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 identified within the study area.

Protected Structures

The Dublin City Development Plan (2022-2028) 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). 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.

There are two Protected Structures identified within the study area:

- (CH001) Pigeon House Hotel, is currently in use as office accommodation. The property is a three storey over basement building built in the 1790's. The property is of stone masonry block construction under a pitched, slated roof with two glass-dome roof windows.
- (CH012) Pigeon House Power Station; a coal fired power station dating to 1902 located on Pigeon House Road.

Architectural Conservation Areas

The Dublin City Development Plan (2022-2028) was consulted for records relating to Architectural Conservation Areas (hereinafter '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.

National Inventory of Architectural Heritage (NIAH)

The National Inventory of Architectural Heritage (hereinafter the 'NIAH') is a state initiative under the administration of the DHLGH and was established on a statutory basis under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 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 are no structures listed in the NIAH identified within the study area.

Dublin City Industrial Heritage Record (DCIHR)

The Dublin City Industrial Heritage Record was developed between 2006 and 2009 as an action of the Dublin City Heritage Plan in conjunction with the city archaeologist with grant support from the Heritage Council's County Heritage Plan grant scheme. The DCIHR represents a full survey of the industrial architectural heritage of Dublin City. The purpose of the record is to highlight structures requiring statutory protection, to make recommendations on conservation of streetscapes and to raise awareness of the industrial heritage of the city. Although these sites are not necessarily included within the RPS, they represent Industrial assets that are considered to be of value and may be recommended for inclusion within the RPS.

There are two structures from the DCIHR located immediately adjacent to the development site:

- (CH019) Poolbeg Generating Station Chimneys. The tall twin chimneys of the 20th century Poolbeg Generating Station are registered on the DCIHR and are considered to be of local value; DCIHR: 19-09-015
- (CH020) Electricity Works (Dublin Corporation). Multiple-bay three-storey red brick former coal-fired power station, built in 1902; No DCIHR number given

12.4.7 Undesignated Cultural Heritage Sites

This section deals with 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 1st edition 6-inch/25-inch OS maps. Aerial photography from the 1995, 2000, and 2005 fly-overs was inspected, as well as the latest OSI images, Google Earth and Bing Maps satellite imagery. In addition, publicly available LiDAR data published by TII and OPW was also consulted.

Undesignated cultural heritage sites that comprise extant remains

Undesignated cultural heritage sites which comprise extant remains are typically, though not always, post-1700 in date. The majority of these sites are represented on the 6" and/or 25" Ordnance Survey maps. Many constitute country houses and associated lodges, while others may be bridges or industrial features, hollow-ways, mass rocks etc.

There are two undesignated cultural heritage sites that potentially comprise extant remains present within the development site, all of which are situated in the townland of Dublin South City (see Section 1.1 in Appendix G).

- (CH007) Marked on the 1st Edition 6-inch sheet, a landing slip to the northern side of the sea wall, potentially lying within the development footprint; and
- (CH011) Marked on the Cassini Edition of the Ordnance Survey, a small square building.

Undesignated cultural heritage sites that do not comprise extant remains

Undesignated cultural heritage features which do comprise extant remains typically include features such as lime kilns, dwellings, outhouses, trackways, etc. which are identifiable on maps such as the 6" and / or 25" Ordnance Surveys but which no longer have an above-ground presence.

Three undesignated cultural heritage sites were identified within the study area from cartographic sources (see Section 1.1 in Appendix G).

- (CH008) Drawbridge - Marked on the 1st Edition 6-inch sheet, a draw bridge between Pigeon House Fort and the sea wall (White Bank Warf), potentially lying within the development footprint;
- (CH009) A footbridge marked on the Cassini Edition of the Ordnance Survey, with associated pathway leading from Pigeon House Fort complex to Electricity Works (ESB) - potentially underlying footprint of development; and
- (CH010) Marked on the Cassini Edition of the Ordnance Survey as 'ventilatore' - a feature within the seawall prior to land reclamation.

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 nineteenth century 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 proposed development does not impact on any townland boundaries.

12.4.8 Areas of Archaeological Potential

Areas of archaeological potential (AAPs) are areas or locations whose characteristics present a higher potential for unknown archaeological features to be present. The First Edition 6-inch Ordnance Survey map depicts the lands underlying the proposed development site as estuarine and tidal foreshore. Estuarine locations, such as this have been favoured for human occupation since prehistoric times due to their proximity to rich food sources and have additionally served as routeways, boundaries, defences and as a focus for ritual and votive offering. As a result, the entire area of the development site is considered to be an Area of Archaeological Potential (AAP) (CH006).

12.5 Characteristics of the Proposed Development

The characteristics of the proposed development are detailed in Chapter 3 of this report.

12.6 Likely Significant Impacts

12.6.1 Do Nothing

If the OCGT at Poolbeg were not to proceed, the site would continue to be managed as an existing industrial site. Direct and indirect impacts on Archaeological, Architectural and Cultural Heritage would not occur.

12.6.2 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. These are summarised in Table 12.8.

Table 12.8: Description of Impacts to CH Sites at Construction Phase

CH No.	Summary	Description of Impact	Magnitude of Impact prior to implementation of mitigation measures	Baseline Value	Significance of Impact prior to implementation of mitigation measures
CH006	AAP	Direct physical impact on Area of Archaeological Potential through groundworks during construction phase of development	N/A	Medium/ - High	N/A
CH019	DCIHR: 19-09-015	The proposed development site occurs directly adjacent to Poolbeg Chimneys. There is potential for vibrations caused by the surrounding development to impact on the integrity of the structures	Severe	High	Very Significant

Indirect Impacts; Indirect effects on archaeology, architectural and cultural heritage are considered to be those effects which happen away from 'the site'. This includes impacts on visual setting of any cultural heritage asset in the wider landscape. It is not proposed to consider any impacts on setting for any sites either within the development site or the wider study area during the construction phase, as construction works constitute a short-term alteration to an already developed industrial landscape.

12.6.3 Operation and Maintenance Phase

There will be some alteration to the immediate setting of Poolbeg chimneys (CH019). However, the proposed development represents a continuation of function and of the existing industrial character of the location, so the overall impact to setting will be negligible. There is no aspect of the proposed development that will alter or obscure the Poolbeg chimneys significance as a landmark. Subject to the implementation of the appropriate archaeological mitigation during the construction phase, there will be no change to the character of this already developed industrial environment during the operation phase.

12.6.4 Decommissioning Phase

Subject to the implementation of the appropriate archaeological mitigation during the construction phase, there will be no change to the character of this already developed industrial environment from the decommissioning phase.

12.7 Cumulative Effects

Cumulative effect is defined as 'The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects' (EPA 2022). 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 OCGT at Poolbeg 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 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 (for example, wrecks and associated finds, fish traps, kishes or ships timbers) occur within the development site, which will be impacted on during construction. 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.

12.8 Mitigation Measures and Monitoring

To mitigate the impact of the proposed development, the following mitigation strategy will be implemented during the construction phase of the development.

- Should groundworks exceed the depth of the post-1958 infill, then a suitably qualified archaeologist shall undertake archaeological monitoring of these works under license to the

National Monuments Service Section of the Department of Housing, Local Government and Heritage. Should any archaeological material be encountered mechanical excavation will cease and the City Archaeologist and National Monuments Service shall be notified. Further work will then only be carried out following consultations with the City Archaeologist and the National Monuments Service.

Although the predicted impact of vibration is below harmful levels, care will need to be taken to ensure that real world vibrations remain at safe levels. During the phases of piling that are closest to the Poolbeg Power Station towers, monitoring of sensitive structures will be undertaken to ensure that real world vibrations remain within safe levels. Cranes should preferably be sited where their operation will avoid the possibility of accidental damage to the Poolbeg Power Station Chimneys or the retained administration building within the Poolbeg Generation station complex. Operations will be planned and monitored accordingly to avoid any risk of impact to the buildings.

13 Landscape and Visual

13.1 Introduction

This chapter presents an assessment of the likely and significant impacts arising from the proposed development on landscape and visual. The assessment is based on the development as described in Chapter 3 of this EIAR.

This Landscape & Visual Impact Assessment (LVIA) describes the landscape context of the proposed development and assesses the likely landscape and visual impacts of each on the receiving environment. Although closely linked, landscape and visual impacts are assessed separately for each proposed development.

Landscape Impact Assessment (LIA) 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 (VIA) 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).

13.2 Assessment Methodology

Production of this LVIA involved:

A desktop study to establish an appropriate study area, relevant landscape and visual designations in the Dublin City Development Plan (CDP) 2016-2022 and the Dublin City Development Plan 2022-2028, as well as other sensitive visual receptors. This stage culminates in the selection of a set of potential viewpoints from which to study the effects of each 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 each development as a function of landscape sensitivity weighed against the magnitude of the landscape impact;
- Assessment of the significance of the visual impact of each 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, presented in Appendix H2.

For more detailed information on the Landscape and Visual Impact Assessment criteria and methodology is set out Appendix H1.

13.3 Definition of Study Area

Owing to the highly industrialised land use to all sides of the site, which entails multiple large, capacious buildings and structures associated with Dublin Port, it is anticipated that the proposed development is not likely to give rise to significant landscape or visual impacts beyond

approximately 1km. However, in the interests of a comprehensive appraisal, a 3km radius study area is used in this instance (see Figure 13.1).

Figure 13.1: Study Area – Landscape & Visual Impact Assessment



13.4 Policy and Guidance

The Planning Report which accompanies this application (Ref: 229100184_3_A) describes the wider policy and legislative context applicable to the proposed development. Policies and guidance documents of potential relevance to the Landscape and Visual chapter are set out in this section.

13.4.1 Dublin City Development Plan (CDP) 2016-2022

According to the CDP, and representative of much of the Dublin Port locale, the site is located within Zone Z7, whose zoning objective is, *“To provide for the protection and creation of industrial uses and facilitate opportunities for employment creation.”* In addition, the proposed development site is designated as being of “low” sensitivity.

However, outside the site, a recreational ‘corridor’ runs along the southern side and eastern end of the peninsula, which includes Irishtown Nature Park. Most of this corridor takes the form of a public pathway and green network that also facilitates walkers and runners accessing not just the nature park but also the Great South Wall/South Bull Wall and Poolbeg Lighthouse. Unlike most of the peninsula, this ‘corridor’ is designated as Zone Z9, whose objective is, *“To preserve, provide and improve recreational open space lands, and entails: public open space; private*

open space and sports facilities in private amenity and open space and green networks.”
However, it is worth reiterating that this is outside the site.

With regards to Chapter 10 ('Green Infrastructure, Open Space and Recreation') and Chapter 11 ('Built Heritage and Culture') of the Dublin CDP 2016-2022, there are no policies or objectives that are relevant to the proposed OCGT site. Furthermore, there are no designated/protected routes, views or prospects within the study area.

13.4.2 Dublin City Development Plan (CDP) 2022-2028

In terms of zoning for the proposed development site, there is no reference or no known map relating to the Poolbeg peninsula (and, therefore, the site) in the 'Draft Plan Proposed Material Alterations Volume 3' (July 2022), which entails the zoning maps for the CDP. As the Poolbeg peninsula would appear not to be subject to any such zoning amendment, it can be concluded that the site's zoning will remain consistent with the 2016-2022 CDP.

With regards to Chapter 10 ('Green Infrastructure, Open Space and Recreation') and Chapter 11 ('Built Heritage and Culture') of the Dublin CDP 2022-2028, there are no policies or objectives that are relevant to the proposed development site.

13.4.3 National Parks & Wildlife Service (NPWS)

In terms of NPWS sensitive designations, the only land-based designation on the peninsula is part of the South Dublin Bay and River Tolka Estuary Special Protection Area (SPA) (site code 004024). This entails an approx. 70m-wide strip between Irishtown Nature Park and the Ringsend wastewater plant. South of the Liffey, the South Dublin Bay and River Tolka Estuary SPA (site code 004024) and the South Dublin Bay Special Area of Conservation (SAC) and Proposed Natural Heritage Area (pNHA) (site code 000210) align the southern and eastern perimeter of the peninsula. These are exclusively marine/riverine designations that are adjacent to, rather than within, the Poolbeg peninsula. North of the River Liffey, Bull Island is a SPA, while the North Dublin Bay (i.e. north of North Bull Wall) is a designated SAC, with the north inner bay being a pNHA.

Outside such NPWS designations, it should be noted that there are two National Special Amenity Areas within North Dublin Bay, being Bull Island and Howth Head; the former of which enters the study area, while the latter remains outside. In addition, the proposed Special Amenity Area for South Dublin Bay and the 'core zone' of the Dublin Bay UNESCO Biosphere is also present within the study; a designation that aligns the southern and eastern perimeter of the peninsula.

13.4.4 Guidance

This LVIA uses methodology as prescribed in the following guidance documents:

- Environmental Protection Agency (EPA) publication Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022) and the accompanying Draft Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (2015); and
- Landscape Institute and the Institute of Environmental Management and Assessment publication entitled Guidelines for Landscape and Visual Impact Assessment (2013).

13.5 Receiving Environment

13.5.1 Landscape Baseline of Study Area

The landscape baseline represents the existing landscape context and is the scenario against which any changes to the landscape brought about by the developments will be assessed. It is worth noting, however, that many of the landscape elements identified in the landscape baseline also relate to visual receptors i.e. places and transport routes from which viewers can potentially see the proposed developments.

Poolbeg Peninsula

The Poolbeg Peninsula is an entirely manmade construction that has evolved out of Dublin Bay in recent centuries, with the site, like most of the present Poolbeg Peninsula, still being part of Dublin Bay within the last century. This flat, low-lying, reclaimed land now contains some of the tallest industrial structures and largest industrial buildings in the country (see Figure 13.2). Being an entirely anthropocentric creation, the only “natural” watercourses within approx. 1km of the site is the River Liffey estuary, situated within 50m to the north, as well as Dublin Bay, which lies within 30m to the south and within 50m to the east of the site (see Figure 13.3).

Figure 13.2: Historical OSI Cassini 6-inch map extract, demonstrating that the site, like most of the present Poolbeg Peninsula, was still part of Dublin Bay within the last century

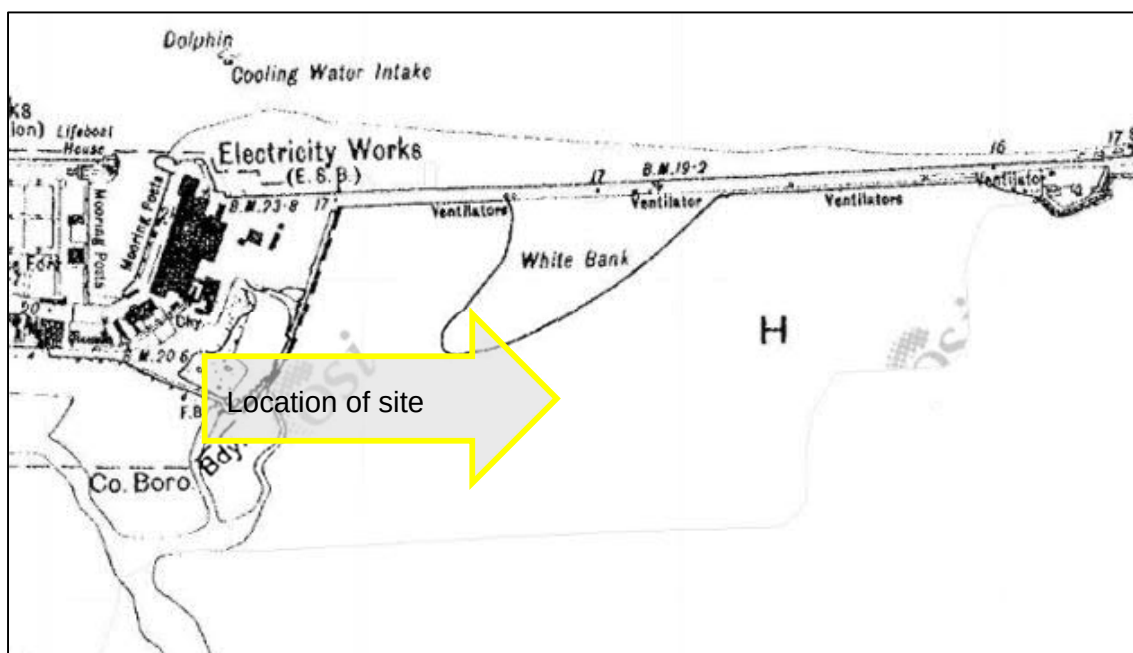
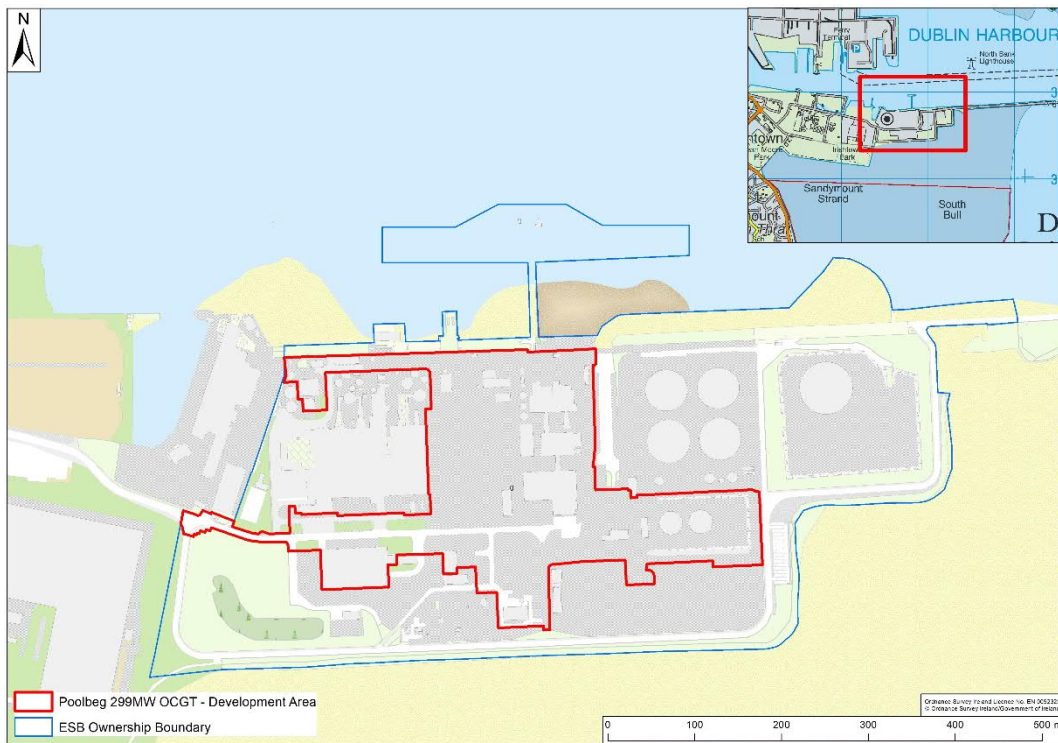


Figure 13.3: Location of Site within the context of River Liffey (north of site) and Dublin Bay (south of site)



To the southwest of the site is Poolbeg Beach, which includes a recreational walking/running trail that follows the unnamed road that is owned by ESB, adjoining sections of the site's southern boundaries. This pathway is mostly used by those accessing the Great South Wall/South Bull Wall for recreational purposes (i.e., walkers and runners). The road terminates soon after passing the site, where motorists typically park and then walk, fish or swim.

Figure 13.4: Vehicular Entrance to the South of the Site



The proposed development is wholly within ESB ownership, and is located within the overall ESB Poolbeg Generating station complex which dominates the Poolbeg peninsula. Existing

access to the complex is through a large, security-manned, palisade gateway off Pigeon House Road; a gateway that also serves Poolbeg Generating station complex. Palisade fencing secures the overall Poolbeg Generating station complex while a vegetated berm aligns its southern and eastern boundaries, along which relatively young trees and native scrub have established (i.e., outside the proposed development area).

Figure 13.5: View of the Poolbeg Peninsula from the Great South Wall/South Bull Wall



Towards the eastern (i.e., the seaward) half of the peninsula, notable developments include highly visible infrastructure reflective of its industrial zoning (see Figure 13.4). This includes the high brick and concrete chimneystacks (Poolbeg towers) to the immediate west of the site, which are listed in the Dublin City Industrial Heritage Record; the Poolbeg Generating station complex, a Combined Cycle Gas Turbine (CCGT) Station to the immediate east of the site, and the National Oil Reserve Agency (NORA) oil tanks. Closer to the River Liffey, within 300m northeast of the proposed development is a large and ostensibly intact stone building that was built in 1760 as a “blockhouse” (i.e., a detached fort occupied by a garrison), which is a protected structure. Consistent with such an industrial zone, there are no protected structures or cultural heritage features within the proposed OCGT boundary.

Figure 13.6: View of the Eastern End of the Site



In terms of land use upon the site at present, it includes a combination of used and unused hardstand areas that are indicative of the site's former industrial use. There is a minor degree of scrub vegetation in certain locations across the site, as well as less than five low trees, and some existing lighting and underground services. Rubble, general construction materials, plant operation materials, shipping containers and site cabins have also been observed within the site, which stretches approx. 650m east-west, and approx. 320m north-south.

Figure 13.7: To the Southwest of the Site is Poolbeg Beach, which includes a recreational walking/running trail



Figure 13.8: The main entrance to the site is also the public entrance to the ESB Poolbeg Generating Station complex



13.6 Characteristics of the Proposed Development

A detailed overview of the Poolbeg Generating station complex and neighbouring facilities is set out in Chapter 3 of this EIAR.

13.7 Likely Significant Effects

13.7.1 Landscape Impact Assessment

13.7.1.1 Landscape Value and Sensitivity

Landscape value and sensitivity are considered in relation to a number of factors highlighted in the Guidelines for Landscape and Visual Impact Assessment 2013 and in accordance with the criteria set out in Appendix H1.

The landscape quality/condition of the site reflects that of a former industrialised nature; one in which the vast majority of the site is now derelict in nature, and/or displays a considerable degree of degradation or obsolescence. Crucially, it is a brownfield site upon an area of land that is, itself, less than a century old, and which has always been of an industrial or post-industrial nature.

Separate to the overwhelming majority of landform elsewhere in the city, county and country, the site is on land reclaimed from Dublin Bay precisely for such industrial and/or port-related purposes. As a result, it is of low quality, condition and integrity, and has always been so within living memory. As with most industrialised, brownfield sites, there is a negligible degree of scenic quality, conservation value or recreation value associated with the site. Be that as it may, such qualities do exist within the vicinity of the site, for reasons set out in Chapter 13. Similarly, in the context of an industrialised, brownfield site set within a port peninsula, there is little, if any, rarity associated with the site. In summary, and in accordance with the site's location as designated in the aforementioned Dublin CDP, the site and its vicinity are of **Low** sensitivity.

13.7.2 Construction Phase

It is envisaged that two phase construction programme stage will be required to deliver the project:

- Pre-construction stage: this will involve the demolition of existing buildings and civil enabling works for the site, which will form the first stage of the works.
- Construction stage: the second and main stage of the project will involve detailed construction of the OCGT development.

It is expected that the pre-construction-stage work on site will involve site clearance and preparation, with existing concrete slabs, obsolete buildings and fence lines demolished and cleared along with rubble within the site. This is expected to take up to 8 months' work. The subsequent construction work will include the laying of foundations for plant and buildings, installation of plant and equipment, concrete works/hard surfacing and paving, as well as external lighting, landscaping and fencing. This is expected to take up to 22 months' work, which will see the gradual emergence of the proposed development, the key elements of which entail:

- The OCGT generating unit and associated plant and equipment;
- Ancillary extension to the existing gas Above Ground Installation;
- Secondary fuel storage tanks;
- An electricity connection to the national grid;
- Installation of palisade perimeter fencing, a new lighting arrangement and surface water drainage network.

The existing security-manned site access to the Poolbeg Generating Station Complex will be used for construction access, in addition to taking access from the existing road to the south of site, if permitted, during construction. In terms of physical landscape effects, the proposed

development will require a relatively minor degree of excavation, which would continue to evolve the entirely anthropocentric landform of the site. The proposed development will introduce a form of contemporary industrial construction upon a pre-existing hardcore base. In this regard, the proposed development is consistent with the nature and scale of prevailing land use on the peninsula.

There will be a higher intensity of site activity during the construction phase of the proposed development than there is at present on site. Construction activity will include the movement of construction machinery on-site, as well as an estimated 22 HGV deliveries to the site per working day during peak stages. It may also include temporary site lighting and the temporary storage of some stripped earth, or excavated hardcore, and construction materials. The construction phase is likely to take in the order of 30 months to complete. Construction-related impacts will only result in 'short term' landscape and visual effects (i.e., effects lasting one to seven years, according to aforementioned EPA Guidelines).

On the basis of the factors discussed above, it is considered that the magnitude of landscape impact during construction is **High** and with a **Negative** quality of effect.

With reference to the significance matrix (Table 1.3 in the Appendix H1), the Low landscape sensitivity judgement attributed to the study area coupled with a High magnitude of construction-stage landscape impact is considered to result in a **Moderate-slight** significance of landscape impact, with a short-term duration and a Negative quality of effect.

13.7.3 Operational Phase

Once construction is fully completed, any potential impacts the proposed development is capable of having will pertain solely to its likely impact upon the landscape/townscape character of the receiving environment. In that post-construction environment, while the use of the site will change as a result of the proposed development, any perceived change to landscape character is one that entails the intensification of a brownfield site of industrial character to that of a large mechanised development representing a notable increase in built intensity. Consequently, while the existing landscape character of the site will be somewhat evolved from its present state, it will become more consistent and compatible with the wider ESB Poolbeg Generating Station complex and that of the broader Poolbeg peninsula.

On balance, the former industrial use of the site, together with the customary character and built form of this industrial area, mitigates against any perceived irreconcilabilities between the proposed and existing land-uses. This point is particularly striking within the context of the highly transitional character of the Poolbeg Peninsula.

As the site is within the wider ESB Poolbeg Generating Station complex, a near-identical and compatible land use and character is in the immediate vicinity of the site. In that regard, the proposed development is a moderate expansion of the electricity generation/storage land use and landscape character adjacent to the site. Operational-related effects are expected to be permanent (i.e., effects lasting over 60 years) and are not readily reversible.

On the basis of the factors discussed above it is considered that the magnitude of operational landscape impact is **Low** and with a Neutral quality of effect.

With reference to the significance matrix (Table 1.3 in the Appendix H1), the Low landscape sensitivity judgement attributed to the study area coupled with a Low magnitude of operational-stage landscape impact is considered to result in a **Slight-Imperceptible** significance of landscape impact, with a permanent duration of effect and a neutral quality of effect.

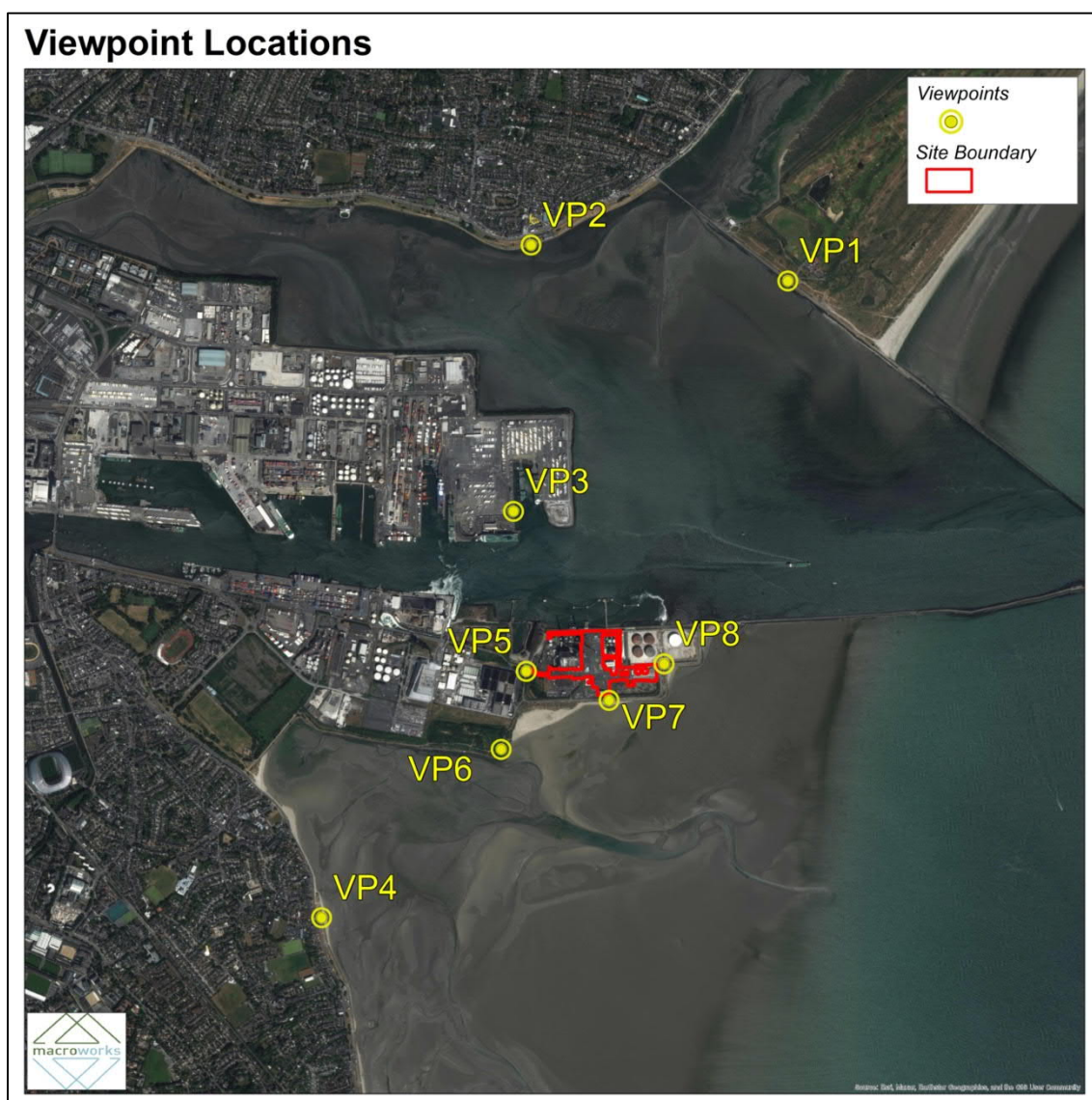
13.7.4 Visual Impact Assessment

13.7.4.1 Identification of Viewshed Reference Points as a Basis for Assessment

Viewshed Reference Points (VRPs) are the locations used to study the visual impacts of a proposal 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 receptors that are represented by a particular VRP are listed at the beginning of each viewpoint appraisal.

The Viewshed Reference Points selected in this instance are set out in Figure 13.9.

Figure 13.9: Viewpoint Location Map



13.7.4.2 Sensitivity of Visually Receptors

On the basis of the criteria set out in Appendix H1:

- Viewpoints 1, 2 and 4 are deemed to be of **High-medium** sensitivity;

- Viewpoint 6 is deemed to be of **Medium** sensitivity;
- Viewpoints 7 and 8 are deemed to be of **Medium-low** sensitivity.
- Viewpoints 3 and 5 are deemed to be of **Low** sensitivity.

13.7.4.3 Magnitude of Visual Effects

The assessment of visual impacts at each of the selected viewpoints is aided by photomontages of the Proposed Development. Photomontages are a 'photo-real' depiction of the proposed development 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 viewpoint, the following images have been produced:

1. Existing view;
2. Outline view (yellow outline showing the extent of the proposed buildings and structures, overlaid on the photograph);
3. Montage (proposed development upon completion of construction).

Please note, that in terms of duration of effects, all likely visual impact are deemed to be permanent.

Viewshed Reference Point		Viewing distance	Direction of View
VP1	Bull Wall, Bull Island	1.9km	SW

Representative of:

- Amenity & Heritage feature;
- Local Community Views.

Receptor Sensitivity High-medium

Existing View A very popular resource/route for walkers and runners, in particular, Bull Wall marks the south-western end of Bull Island, the 5km-long island containing numerous conservation designations. The island is a heavily used recreational resource for Dubliners, particularly local communities between Fairview and Sutton. Bull Wall extends almost 3km from Dollymount into Dublin Bay, where it terminates at a statue of *Realt na Mara* (Our Lady, Star of the Sea), and offers panoramic views of Dublin Bay with the Dublin Mountains to the south; the beach and dune system of Bull Island; the Howth peninsula; the Dollymount/Clontarf coastline, as well as Dublin Port.

Over a distance of approx. 1.9km of Dublin Bay, the industrial development of the Poolbeg peninsula, and the wider Dublin Port, is the most noticeable aspect of this particular scene. The tall profile of the Poolbeg chimneys draws the eye, as does the light tone of the Dublin Waste to Energy facility (i.e., incinerator). Elsewhere on the peninsula, large tanks, tall stacks and industrial-scale buildings can be made out. To the east of the peninsula, the long, low extent of the Great South Wall/South Bull Wall can be discerned extending into Dublin Bay, to a backdrop of the south Dublin suburbs, with the Dublin mountains beyond.

Visual Impact of proposed development

While partially visible, the proposed development is unlikely to be distinctly noticeable from receptors along the Bull Wall. This is largely owing to the distance to the site, in combination with the modest height of the proposed structures in comparison to the taller, more muscular and apparent industrial structures in the direct vicinity of the site, and across the Poolbeg peninsula. Furthermore, the competing panorama of Dublin Bay, as well as Bull Island and Howth, will be considerably more likely to draw the eye of the viewer. On balance, the visual presence of the proposed development is deemed to be in the region of sub-dominant to minimal.

If noticed, the most visible proposed elements will be the proposed stack and, to its immediate east, the proposed gas turbine enclosure; neither of which transcend the distant ridgeline of the Dublin Hills. Along with the proposed tanks partially visible further east within the site, these are likely to have the visual effect of 'in filling' the industrial scene within the peninsula, while not markedly detracting from the inherent visual amenity. In addition, there will be compelling overlaps and consistencies in form, scale, function and tone between the visual baseline and that presented by the proposed development. Indeed, the proposed development will be dwarfed by the muscular, industrial skyline, and so will be visually 'nestled' in the field of vision.

On balance, the magnitude of visual impact is considered to be **Low-negligible and neutral**.

Summary

Based on the assessment criteria and matrices outlined in Appendix H1, the significance of residual visual impact is summarised below.

Visual Impact Significance

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact/Quality of effect
High-medium	Low-negligible	Slight-imperceptible/ neutral

Viewshed Reference Point		Viewing distance	Direction of View
VP2	Clontarf promenade	1.9km	S

Representative of:

- Amenity & Heritage feature;
- Local Community Views.

Receptor Sensitivity High-medium

Existing View The waterside walkway along the promenade at Clontarf is a very popular resource for walkers and runners, in particular, and links East Wall and Fairview with Bull Wall. This location marks the jetty/slipway for Clontarf Yacht & Boat Club, but is also used by sea swimmers. A pleasing

maritime vista is apparent in the mid-ground, with Dublin Bay waters dotted with several berthed maritime craft. However, the backdrop to it is one that is heavily industrial by nature, owing to the industrial development of the Poolbeg peninsula, and the wider Dublin Port. The imposing profile of the Poolbeg chimneys is most apparent, followed by the Dublin Waste to Energy facility (i.e., incinerator). Elsewhere on the peninsula, large tanks, cranes, tall stacks and industrial-scale buildings can be made out, with the Dublin mountains beyond.

Visual Impact of proposed development

The only element of the proposed development that will be discernible from this location will be the tall stack, as well as the fainter roofline of the proposed Gas Turbine Enclosure, although neither element will be noticeable to the viewer. This is because of the modest height of the proposed structures when compared to the taller, more muscular industrial structures in the direct vicinity of the site, and across the Poolbeg peninsula. In addition, built form between the site and this location will obscure most of the proposed development, while those partially visible elements will remain almost 2km away. Thus, the visual presence of the proposed development is deemed to be minimal.

If noticed, the proposed development is likely to veritably 'infill' the industrial setting on the peninsula, but will not detract from the inherent visual amenity of this location. Rather, it will be compatible in form, scale, function and tone with the receiving environment. Although it will transcend the skyline, the proposed development will be dwarfed by the muscular, industrial skyline in its direct vicinity, which make up some of the tallest structures in the country.

On balance, the magnitude of visual impact is considered to be **Negligible** and neutral quality of effect.

Summary

Based on the assessment criteria and matrices outlined in Appendix H1, the significance of residual visual impact is summarised below.

Visual Impact Significance

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact/quality of effect
High-medium	Negligible	Imperceptible/ neutral

Viewshed Reference Point		Viewing distance	Direction of View
VP3	Irish Ferries Terminal, Dublin Port	624m	S/SE

Representative of: • Transport Infrastructure

Receptor Sensitivity Low

Existing View This location is at the busy Irish Ferries Terminal in Dublin Port, on northern side of the Liffey. As four different ferry routes depart/arrive here from across Britain and France, it is an intensely loud, busy and muscular industrial port settings, like that of numerous port cities across northern Europe. Accordingly, the visual amenity is relatively poor, with large-scale industrial infrastructure to most sides, as well as the mouth of the River Liffey.

In this scene, the large ferry docked at the terminal curtails most views to the south, while to the southeast, there are the harbour waters in the foreground, with the highly-developed, large, industrial structures of the ESB Generating station evident upon the south bank. These substantial structures are conspicuous at this distance, and are chiefly made up of the Poolbeg chimneys and power station, and the four stacks of the Poolbeg CCGT.

Visual Impact of proposed development The proposed development will be partially visible in the form of the tall, proposed stack, followed by the gas turbine enclosure building. In the context of such an intensively industrial setting, these partially visible elements are not distinctive, especially when they will be towered over by some of the largest structures found in the country. Thus, their visual presence is deemed to be subdominant.

Aesthetically, the proposed development is unlikely to have any marked effect upon the inherent visual amenity of the scene, but will read as being consistent and compatible with the receiving environment, in its overall form, function, scale and materiality. The proposed development is likely to have the visual effect of 'in filling' the industrial setting, while not markedly detracting from the inherent visual amenity.

For these reasons, the magnitude of visual impact is considered to be **Low** and neutral quality of effect.

Summary Based on the assessment criteria and matrices outlined in Appendix H1, the significance of residual visual impact is summarised below.

Visual Impact Significance

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact/quality of effect
Low	Low	Slight/neutral

Viewshed Reference Point		Viewing distance	Direction of View
VP4	Sandymount Strand	1.5km	NE

Representative of:

- Amenity & Heritage feature;
- Local Community Views.

Receptor Sensitivity High-medium

Existing View This location is from a footpath aligning Beach Road/R802, adjacent to Sandymount Strand Car Park 1, near the junction of Gilford Road. With Sandymount Strand aligning the foreground and mid-ground, this is a highly popular walking/jogging/cycling route, as well as a busy vehicular route linking Merrion Gates and Irishtown/Ringsend and on to Eastlink toll bridge. The tall, voluminous industrial buildings and structures located on the peninsula leave an unmistakable imprint upon the skyline, particularly the iconic Poolbeg chimneys and the Dublin Waste to Energy facility (i.e., Covanta incinerator). At the eastern end of the Peninsula, the low and faint outline of the Great South Wall/South Bull Wall and the Poolbeg Lighthouse can be faintly discerned, with the outline of the Howth peninsula apparent to its northwest

Visual Impact of proposed development Owing to intervening structures and landform, almost all of the proposed development will not be discernible from this location. The minute degree of partial visibility of some of the lower proposed structures will be highly unlikely to be noticed, and even if noticed, will have no material bearing upon the inherent visual amenity.

Thus, the magnitude of visual impact is considered to be **Negligible** and with a neutral quality of effect.

Summary Based on the assessment criteria and matrices outlined in Appendix H1, the significance of residual visual impact is summarised below.

Visual Impact Significance	Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact/quality of effect
	High-medium	Negligible	Slight-imperceptible/ neutral

Viewshed Reference Point		Viewing distance	Direction of View
VP5	Entrance to ESB Poolbeg Generating Station	0m	E

Representative of: • Transport Infrastructure

Receptor Sensitivity Low

Existing View This location marks the terminus of Pigeon House Road and the main entrance to the ESB Poolbeg Generating Station, and is directly adjacent to the Ringsend Wastewater Treatment Plant. And intensively industrial scene, this is a setting upon a brownfield peninsula, reclaimed from the sea over the last century for very such industrial and/or energy production/storage purposes. Owing to the large-scale build-up of infrastructure to all sides, views out beyond the peninsula (e.g. to Dublin Bay) are unobtainable from this location.

This scene is governed by the security entrance area, with a roadside security office in the foreground, and high walls to either side. The base of one of the Poolbeg chimneys is discernible to the northeast; chimneys that tower over all other development across the foreground site and the wider peninsula. An entrance gate and security barrier is also visible in the foreground, behind which industrial development can be perceived within the site.

Visual Impact of proposed development The only aspect of the proposed building that will be perceptible from this location will be the southern extents of the Gas Turbine Air Intake Building, set approx. 300m from this location. This is highly unlikely to draw attention to itself, in the wider context of such an intensely developed locale. On balance, its visual presence is deemed to be in the region of subdominant to minimal.

Aesthetically, the Gas Turbine Air Intake Building will appear as a light-coloured, 3-4 storey development that will be dwarfed by the vastly larger infrastructure in its vicinity, including the substantial Poolbeg chimneys. While it is largely in the direct line of sight of road users, it is in the context of a massively industrialised zone containing some of the largest infrastructure in the country. Thus, the proposed development will have no marked effect upon the inherent visual amenity of the setting.

On balance, the magnitude of visual impact is considered to be **Low** with a neutral quality of effect.

Summary Based on the assessment criteria and matrices outlined in Appendix H1, the significance of residual visual impact is summarised below.

Visual Impact Significance	Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact/quality of effect

Low	Low	Slight/ neutral

Viewshed Reference Point		Viewing distance	Direction of View
VP6	Irishtown Nature Park	390m	NE

Representative of: • Amenity & Heritage feature

Receptor Sensitivity Medium

Existing View Partly within the South Dublin Bay and River Tolka Estuary SPA designation, Irishtown Nature Park is a very popular recreational resource, particularly for residents in Ringsend, Irishtown and Sandymount. Reclaimed in the 1980s from a former waste/dumping ground, this small park is also dissected by the aforementioned, heavily used pathway that aligns the southern coast of the peninsula, linking Ringsend/Irishtown/Sandymount to Poolbeg Lighthouse. The park's elevated profile allows for valued views out east towards Dublin Bay, as well as south towards Dublin Mountains.

In the foreground of this scene, the vegetation and pathway within the park soon meets Poolbeg Beach and the waters of Dublin Bay. The tall, muscular and highly evident industrial buildings and structures (including several stacks) of the Poolbeg peninsula are particularly evident. Further east, the low profile of the Great South Wall/South Bull Wall can be made out extending into Dublin Bay, with the Howth peninsula serving as its backdrop.

Visual Impact of proposed development The proposed development will be a partially visible, yet relatively inconspicuous, industrial development infilling the eastern end of the Poolbeg peninsula. Most of the elements of the proposed development will not be visible from this elevated position, owing to intervening structures/built form upon the peninsula, and those elements will be considerably less noticeable than the larger, highly evident industrial buildings and structures further west along the Poolbeg peninsula. Thus, it's visual presence is deemed to be sub-dominant.

In terms of aesthetics, tonally and texturally, the proposed development will assimilate relatively well into the industrial setting of the peninsula. The proposed development will likely read as a modest extension to the industrial scale and activity patent on the peninsula, while representing a coherent and gradual 'tapering down' of scale from west-to-east (i.e., in this view, the eye gradually drops as it moves eastwards from the Poolbeg chimneys, until it lowers across the Great South Wall). While in many others settings, the scale of the proposed structures and buildings would

have a more marked visual impact, in the context of the Poolbeg Peninsula - a relatively contained zone holding some of the largest structures in the country - this is clearly not the case. Furthermore, the most pulsating sources of visual amenity at this setting (i.e., views out across the south of Dublin Bay, down the coastline to the Dublin Mountains) will remain unaffected by the proposed development.

On balance, the magnitude of visual impact is considered to be **Low-negligible** with a neutral quality of effect.

Summary

Based on the assessment criteria and matrices outlined in Appendix H1, the significance of residual visual impact is summarised below.

Visual Impact Significance

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact/ quality of effect
Medium	Low-negligible	Slight-Imperceptible/ neutral

Viewshed Reference Point		Viewing distance	Direction of View
VP7	Site entrance along southern site boundary	22m	N/NW/NE

Representative of:

- Amenity & Heritage feature;
- Local Community Views.

Receptor Sensitivity

Medium-low

Existing View

The context of this view is from a publicly accessible road and its attendant footpath, where it wraps around the site boundary. This viewpoint location is from an area of fractionally elevated, unmanaged open space between the road and waters of Dublin Bay. This location marks the southern entrance to the site, which is not accessible to the public. A splayed, palisade fenced site boundary and (open) gate is set before the large, muscular infrastructure of the Poolbeg Generating Station, where numerous tall stacks and large industrial buildings are set alongside the towering Poolbeg chimneys that are located approx. 320m to the northwest of this location. The large, light-coloured Gas Networks Ireland building is located closer to this viewpoint, to the immediate northwest. To either side of the entrance, vegetated berms tend to preclude wider views of the site.

Owing to the vegetated berm screening the site, there is a lack of legibility and coherence of how much of the site's space is internally divided, and how it relates to adjacent/neighbouring industrial land uses. However, it should be noted that the main sources of visual amenity along this road lie in the opposite direction to that of the site.

Visual Impact of proposed development

From this location, the proposed Gas Turbine Air Intake building, with a backdrop of the proposed stack, will be the most noticeable element of the proposed development. This will mostly take the form of a large, light-toned, industrial-scale building like several others across this peninsula, and similar to that of the Poolbeg Generating station and the more immediate Gas Networks Ireland building. However, the proposed structures will be unlikely to draw similar attention as that of pre-existing, larger structures within the generating station site, and the wider peninsula.

Aesthetically, the proposed Gas Turbine Air Intake building will be similar in tone, scale, function and materiality as the pre-existing buildings and structures within the site, and in its vicinity. The tallest element of the proposed development (i.e., the stack) will be dwarfed by pre-existing stacks and towers adjacent to the site. The proposal will serve to veritable 'infill' this brownfield, highly-modified site further, and within the context of an intensely industrialised zone containing some of the most substantial energy generating/storage infrastructure in the country. In addition, the proposal will not inhibit any source of visual amenity at this location.

On balance, the magnitude of visual impact is considered to be **Low** and with a neutral-negative quality of effect.

Summary

Based on the assessment criteria and matrices outlined in Appendix H1, the significance of residual visual impact is summarised below.

Visual Impact Significance

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact/quality of effect
Medium-low	Low	Slight/ neutral-negative

Viewshed Reference Point		Viewing distance	Direction of View
VP8	Public road by eastern site boundary	39m	W/NW

Representative of:

- Amenity & Heritage feature;
- Local Community Views.

Receptor Sensitivity Medium-low

Existing View

The context of this location is a road and footpath wrapping around the southern side of the eastern end of the peninsula; a trail used widely by walkers and runners, as well as those citizens driving to the vehicle terminus of the South Wall, where upon they walk from there out along the South Wall into Dublin Bay. It is important to note that, in order to get to this location, such receptors must first have passed by upwards of 2km of

a heavily industrialised, fenced off peninsula, whereby the inherent source of visual amenity is to the south and southeast.

In this scene, foreground tanks and poles associated with the Poolbeg Generating Station is evident in the foreground, through and behind a roadside palisade fence and gateway. To the northwest, the stacks of the Poolbeg CCGT, as well as the towering Poolbeg chimneys, can be perceived.

Visual Impact of proposed development

When viewed from this location, the proposed development will be mostly apparent in the form of three partially-visible large industrial tanks located at the eastern end of the site. These will appear largely consistent and compatible with the pre-existing tanks within the site. While they will represent a moderate increase in the rate of built intensity in the scene, they will not draw attention to themselves in the context of vastly largely infrastructure in the vicinity and, more so, the inherent visual amenity available to the south and southeast of this location.

Aesthetically, the proposal will read as a modest extension of the heavy industry across the eastern end of the peninsula. These proposed tanks will be very similar in scale, form, materiality and tone to that of the pre-existing tanks within the site, and will be largely screened by intervening vegetation and a petite, low roadside building. The proposal will be viewed by the receptor as being a consistent and compatible addition to the Poolbeg Generating station, which will serve to 'infill' this fenced-off, brownfield site in a manner that is legible and coherent to the site, it's vicinity and the wider peninsula, along which such receptors have passed. In addition, while the proposal is a readily noticeable element in the scene, it does not screen or obscure any appreciable source of visual amenity at this location.

On balance, the magnitude of visual impact is considered to be **Low** and with a neutral-negative quality of effect.

Summary

Based on the assessment criteria and matrices outlined in Appendix H1, the significance of residual visual impact is summarised below.

Visual Impact Significance

Visual Receptor Sensitivity	Visual Impact Magnitude	Significance of Visual Impact/ quality of effect
Medium-low	Low	Slight/ neutral-negative

13.8 Cumulative Effects

In relation to the potential cumulative impacts arising from the proposed development in conjunction with existing developments, the context of the site's location, upon the eastern edge of a port peninsula, is crucial.

As has been covered in Section 13.5, the Poolbeg peninsula contains some of the tallest industrial structures and largest industrial buildings in the country. Indeed, the peninsula was reclaimed from Dublin Bay specifically for such industrial and/or port-related purposes. For well over a century, and consistent with its current zoning (as per section 13.4), the peninsula has

been subject to further and consistent intensification of industrial development. The most visible and well-known example of this in the last decade has been the construction and operation of the Covanta Waste to Energy facility, though there are several existing, substantial industrial developments even closer to the site, which are also commensurately larger than the proposed development. In that context, it is not considered that the proposed development will have any material landscape or visual impacts in-combination with other existing developments in the vicinity of the site.

In relation to the potential cumulative impacts arising from the proposed development in conjunction with other proposed or permitted developments in the vicinity of the site, there are five such developments that are of potential relevance, owing to their relative scale and proximity, within the broader vicinity of the site.

The first instance (File No. 3669/19) was granted permission on 15/01/2020 and consists of:

1.) *“Construction of a single storey ESB Substation & Switchroom located adjacent to the existing terminal entrance/exit gate onto Shelly Banks Road.*

2.) *All associated site works. These works are sought as an addition to the parent planning permission ref 2656/16 previously granted on the site. These development works will result in the site being upgraded to Upper Tier under the SEVESO regulations.”*

The second instance (File No. 3625/20) was granted permission on 22/06/2021 and consists, in part, of:

“Planning permission for development on a c. 5.3 ha site located within the existing Poolbeg Generating Station, Pigeon House Road, Dublin 4 (Eircode D04 XD82), which is licenced by the Environmental Protection Agency (EPA) under an Industrial Emissions (IE) Licence [Ref. P0577-03]. The development will consist of: (a) The demolition of three existing disused modern buildings with a combined floor area of 3,240 sq.m.. (c) Construction and operation of a 75 MW capacity battery energy storage system (BESS) facility within a secured compound...”

The third instance (File No. 3624/20) was granted permission on 22/06/2021 and consists, in part, of:

“...planning permission for development on a c. 5.6 ha site located within the existing Poolbeg Generating Station, Pigeon House Road, Dublin 4 (Eircode D04 XD82), which is licenced by the Environmental Protection Agency (EPA) under an Industrial Emissions (IE) Licence [Ref. P0577-03]. The development will consist of a 75 MWe (electrical output) aero derivative gas fired turbine for the generation of electricity...”

The fourth instance (File No. 3646/20) was granted permission on 06/08/2021 and consists, in part, of:

“Planning permission for development on a c. 3.5 ha site bounded by Shellybanks Road to the east and by South Bank Road to the south; being also to the south of the existing Dublin Bay Power Station, Pigeon House Road, Dublin 4, D04 Y5N2. The development will consist of: A 30 MW capacity battery energy storage system (BESS) facility within a secured compound...”

The fifth instance (File No. 3647/20) was granted permission on 06/08/2021 and consists, in part, of:

“Planning permission for development on a c. 6.1 ha site to the south of the existing Dublin Bay Power Station, Pigeon House Road, Dublin 4, D04 Y5N2, and bounded by South Bank Road to the south. The development will consist of a 75 MWe (electrical output) aero derivative gas fired turbine for the generation of electricity...”

It should be noted that approx. 800-900m west of the proposed development is the site of the planned Ringsend 299 Megawatt (MW) Open Cycle Gas Turbine (OCGT) Generating Plant Development. This development will entail the proposed demolition of five tanks, before the proposed construction of the OCGT generating unit and associated plant and equipment (including fuel storage tanks).

In the context of these five, aforementioned instances, it is not considered that the proposed development will have any substantive landscape or visual impacts in-combination with other proposed/permitted developments in the vicinity of the site.

In summary, the likely cumulative effects of the proposed development are deemed to be Low-negligible on the basis of the proposed development contributing to minor and consistent intensification of industrial development in this industrial setting.

13.9 Summary of Impacts

13.9.1 Summary of Landscape Impacts

In terms of the landscape value and sensitivity of the receiving environment, it was deemed to be **Low**. This is because the vast majority of this brownfield industrial/post-industrial site is derelict in nature, and/or displays a considerable degree of degradation or obsolescence, with a negligible degree of scenic quality, conservation value or recreation value associated with it, and set within an intensely industrialised peninsula containing some of the largest structures and energy infrastructure in the country.

In terms of constructed-stage landscape impacts, this will involve both demolition within the site, as well as large scale construction of the proposal, over the course of approx. 22 months. Overall, it was considered that the magnitude of landscape impact during construction will be **High** and short-term, with a **Negative** quality of effect.

In terms of operational-stage impacts, any perceived change to landscape character that is brought about as a result of the proposed development is one that entails the intensification of a brownfield site to that of industrial development, typical in nature and generally smaller in scale to that which already defines the landscape character of this setting. Thus, while the existing landscape character of the site will be somewhat evolved from its present state, it will become more consistent and compatible with that of the broader, highly industrialised Poolbeg peninsula. Thus, operational-stage impacts were considered to result in a **Slight-Imperceptible** significance of landscape impact, with a permanent duration of effect and a neutral quality of effect.

13.9.2 Summary of Visual Impacts

Visual impacts were assessed at eight no. viewpoints representing a variety of distances, angles and viewing contexts. These viewpoints are considered to range in sensitivity from Low to High-medium.

Of those eight viewpoints, half (i.e., four) were considered to have a 'Slight' Significance of visual impact: the highest likely visual impact associated with the proposal. Of these four viewpoints, there was a neutral quality of effect for VP3 and VP5, and a neutral-negative quality of effect for VP7 & VP8. Three further viewpoints (i.e., VP1, VP4 and VP6) were deemed to have a "Slight-imperceptible/ neutral" significance of impact/ quality of effect, with the remaining viewpoint (i.e., VP2) having an 'Imperceptible/ neutral' significance of impact/ quality of effect.

Such low visual impact significance is primarily as a result of the proposed development having no material consequence for the nature of the already industrial visual setting or the visual

amenity of the viewer, despite the proposed development being a noticeable addition to the industrial profile of the Poolbeg peninsula in each instance.

13.10 Mitigation Measures and Monitoring

Based on the landscape and visual impact judgements provided throughout this LVIA, the proposed OCGT development that is located on Poolbeg peninsula, is not considered to give rise to any significant landscape or visual impacts and as such no mitigation is proposed.

13.11 Residual Impacts

Based on the landscape and visual impact assessment, the proposed development located in the existing Poolbeg Generating Station complex is not considered to give rise to any significant residual landscape or visual impacts.

14 Roads and Traffic

14.1 Introduction

This chapter of the EIAR presents an assessment of the likely Roads and Traffic effects on public roads impacted by the construction of the proposed OCGT at Poolbeg.

Cumulative effects associated with committed projects which are likely to generate traffic utilising the same public roads within the project Study Area at the same time as traffic generated by the project have also been assessed.

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 project assessing the effect upon the local, regional and national road network and identifies measures to reduce network disruption.

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 the low volume of traffic that will be generated by the development in operation and similarly potential roads and traffic related environmental impacts during the operational phase have been scoped out.

This EIAR chapter does assess the construction phase in a manner that takes accord of the TII Guidelines, 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 Demolition and Construction Traffic Management Plan (D&CTMP). Due to the relatively low number of construction phase workers (expected to peak at approximately 140 persons per day) to the area that the proposed development covers, and the distribution of those workers to worksites at several dispersed geographical locations, a Workplace Travel Plan is not considered necessary, based on professional judgement.

A detailed description of the development is provided in Chapter 3. Air quality and noise pertaining to traffic and transport are discussed in Chapter 6 and Chapter 8 respectively.

14.2 Policy and Guidance

The Planning Report which accompanies this application (Ref: 229100184_3_A) describes the wider policy and legislative context applicable to the proposed development. The purpose of this section is to set out transport policies that are relevant to the assessment of traffic and transport effects of the project at a national level as well as those produced regionally and locally by Dublin City Council. This section also sets out the assessment guidance that were considered.

Table 14.1 provides a summary of the policies relevant to traffic and transport.

Table 14.1: Policy Summary

Document Title	Source and Year	Policy Detail	Relevance to Assessment
Dublin City Development Plan (CDP) 2016-2022		This plan includes a strategy for Dublin's movement and transport with several policy objectives relevant to the project: - MTO1: "Encourage intensification and mixed-use development along existing and planned public transport corridors". - MT7: "To improve the city's environment for walking and cycling through the implementation of improvements to throughfares and junctions and also through the development of new and safe routes, including the provision of foot and cycle bridges". - MTO34: "Manage restrictions on the use of road space for road works or general construction in accordance with Dublin City Council's Directions for the Control and Management of Road Works". - MO44: "Tackle the adverse environmental and road safety impacts of traffic in the city".	All acknowledged and considered in as integral to the assessment process unless stated otherwise.
Dublin City Development Plan 2022-2028		This Plan contains an overview of the existing transport policy context and outlines areas where the existing CDP transport policies need to be reviewed or updated. Some of the key and relevant sustainable movement and transport policy objectives are as follows: - SMT01: "To achieve and monitor a transition to more sustainable travel modes including walking, cycling and public transport over the lifetime of the development plan, in line with the city mode share targets of 26% walking/cycling/micro mobility; 57% public transport (bus/rail/LUAS); and 17% private (car/van/HGV/motorcycle)". - SMT20: "To support the expeditious delivery of key sustainable transport projects including Metrolink, Bus Connects, DART+ and LUAS expansion programme so as to provide an integrated public transport network with efficient interchange between transport modes, serving the existing and future needs of the city and region". - SMT22: "To promote the use and expansion of shared mobility to all areas of the city and facilitate adaptive infrastructure for the changing modal transport environment, including other micro-mobility and shared mobility, as part of an integrated transport network in the city".	All acknowledged and considered in as integral to the assessment process unless stated otherwise.
Draft Transport Strategy for the Greater Dublin Area 2016 – 2035		This strategy provides transport planning policy and offers a framework for the delivery of transport infrastructure and services in the Greater Dublin Area (GDA). - The strategy infrastructure proposals for heavy rail infrastructure intend to "implement a programme of station upgrades and enhancement; and ensure an appropriate level of train fleet, of an appropriate standard, to operate on the rail network". - Other rail investments include "renewal, replacement, upgrading of ticketing systems; platform changes / additions at stations; additional track works to enhance service efficiency; rail safety systems; and passenger information systems". - It is further intended to develop the light rail in the GDA through projects such as the New Metro North,	

Document Title	Source and Year	Policy Detail	Relevance to Assessment
		Metro South, and the Luas Red Line extension to Poolbeg. - There is a vision to develop an efficient and integrated transport network specifically focusing on public transport which: provides appropriate coverage of the region; increases opportunities to transfer between modes and services; provides fast and convenient access to major travel destinations throughout the region; is easily understood to both local and visiting passengers; delivers reliable and predictable journey times; charge simple, affordable fares which enable transfers between services without unnecessary penalty; provides easy-to-use cashless payment systems, where feasible; be accompanied by comprehensive information, both during and prior to the journey; and provides comfortable and convenient journeys to the maximum number of passengers.	
Project Ireland 2040		The National Development Plan 2021-2030, which makes up part of Project Ireland 2040, includes the Irish Government's strategy for sustainable mobility.	

Source: Mott MacDonald

14.2.1 Guidance

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 (EPA) (2022);
- Traffic and Transport Assessment Guidelines, Transport Infrastructure Ireland (TII) (2014); and
- The Institute of Environmental Management and Assessment Guidelines for the Environmental Assessment of Road Traffic, The Institute of Environmental Management and Assessment (IEMA) (1993)

The IEMA Guidelines 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 phase of the proposed development.

Guidance supplementary to those tabulated below in Table 14.2 is made reference to as required in this chapter.

Table 14.2: Core Guidance Summary

Document Title	Source and Year	Guidance Detail
Guidelines on the Information to be Contained in Environmental Impact Reports	Environmental Protection Agency (EPA) (2022)	These guidelines provide advice of best practice, principles and practice of developing an EIAR. Specific reference to transport assessment includes: "Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes roads infrastructure." and "The provision of new access facilities (e.g. links to motorways) or the upgrading of existing facilities (e.g. road widths, bridges and junctions) carried out by other parties can give rise to significant environmental effects "

Document Title	Source and Year	Guidance Detail
		The importance of a Construction Management Plan is acknowledged in this document; Construction Management Plans are often provided to supplement the project description and to set out specific details of the construction plan. While inclusion of full details may not be practicable at pre-consent stage, it should set out the environmental envelope within which the project will be built, including working areas, hours of work, principal construction methods and phases, volumes of materials, traffic and environmental controls.
ADVICE NOTES ON CURRENT PRACTICE (in the preparation of Environmental Impact Statements)	Environmental Protection Agency (EPA) (2003)	These notes provide general guidance on assessment practice. Defined environmental topics; 'human beings' and material assets' have relevance to transport assessment.
Traffic and Transport Assessment Guidelines	Transport Infrastructure Ireland (TII) (2014)	The guidelines provide guidance for scoping and developing traffic and transport assessment requirements to support development proposals. The guidelines outline the need for assessment of public transport, walking and cycling networks, rather than singularly focussing on the road network. The focus of these guidelines relates to operational traffic aspects.
The Institute of Environmental Management and Assessment Guidelines for the Environmental Assessment of Road Traffic	The Institute of Environmental Management and Assessment (IEMA) (1993)	The guidelines provide internationally referable guidance specific to best practice in transport EIA process and practice.
The Design Manual for Roads and Bridges (DMRB)	The Design Manual for Roads and Bridges (DMRB)	The DMRB document set detailed requirements for appraisal, design, maintenance, operation and disposal of motorway and all-purpose trunk roads. DMRB may also be applied to other roads with local authority approval.

Source: Mott MacDonald

14.3 Methodology

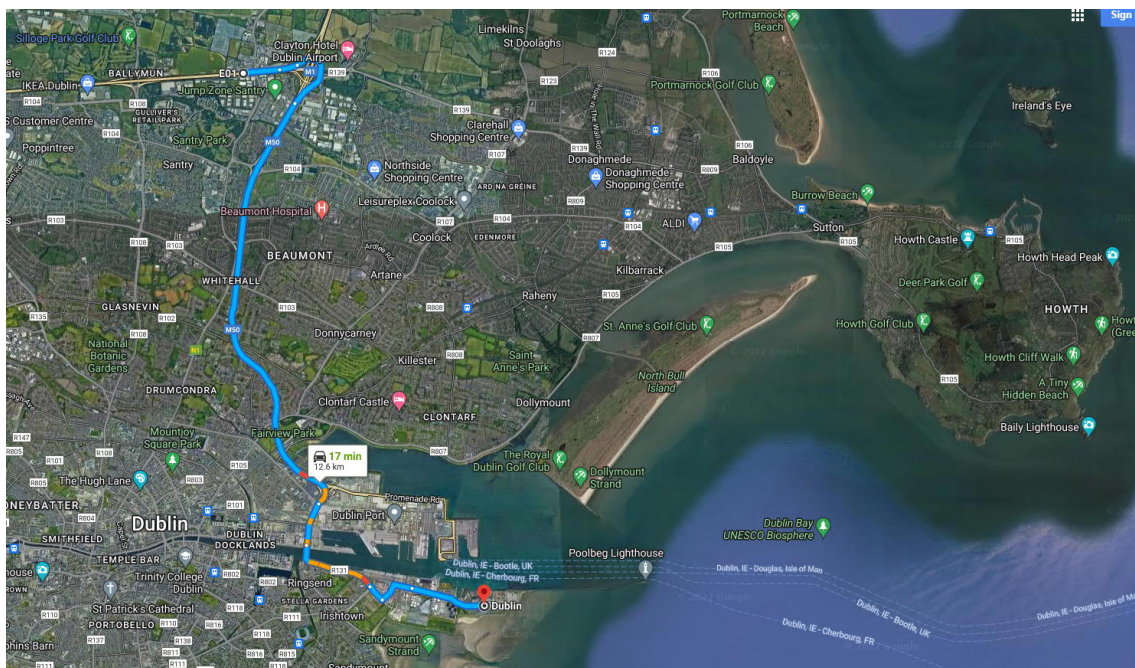
14.3.1 Study Area

The Study Area for the Roads and Traffic Chapter is effectively the public road network proposed to accommodate development generated construction traffic. This comprises two key routes, Route 1 accommodating vehicles transporting equipment and materials originating from the mainland, and Route 2 accommodating vehicles transporting equipment which will originate from factories in continental Europe:

- Route 1, which will be utilised by of HGVs, runs between the M50/M1 motorway interchange and the secured construction access point to Poolbeg Generation station complex on Pigeon House Road (See Figure 14.1);
- Route 2, which will only be utilised by a small number of abnormal loads, originates from Hammond Lane deep berthing facilities. From there, the equipment will be loaded onto the specially purposed tractor-trailer or truck-trailer transport solutions and delivered the short distance to site via Pigeon House Road See Figure 14.2);

The same HGV routes will be utilised for both access to and egress from the proposed development site.

Figure 14.1: Construction Traffic Access Route 1



Source: Construction Methodology Report (P000422-01-CE21-R003), ESB Generation and Trading, November 2022

Figure 14.2: Construction Traffic Access Route 2



Source: Construction Methodology Report (P000422-01-CE21-R003), ESB Generation and Trading, November 2022

Construction workers travelling to site (in car or Light Goods Vehicle) will originate from various locations and will enter the Study Area via the R131, from either the south or the west, and continue to follow route one to the construction site access point.

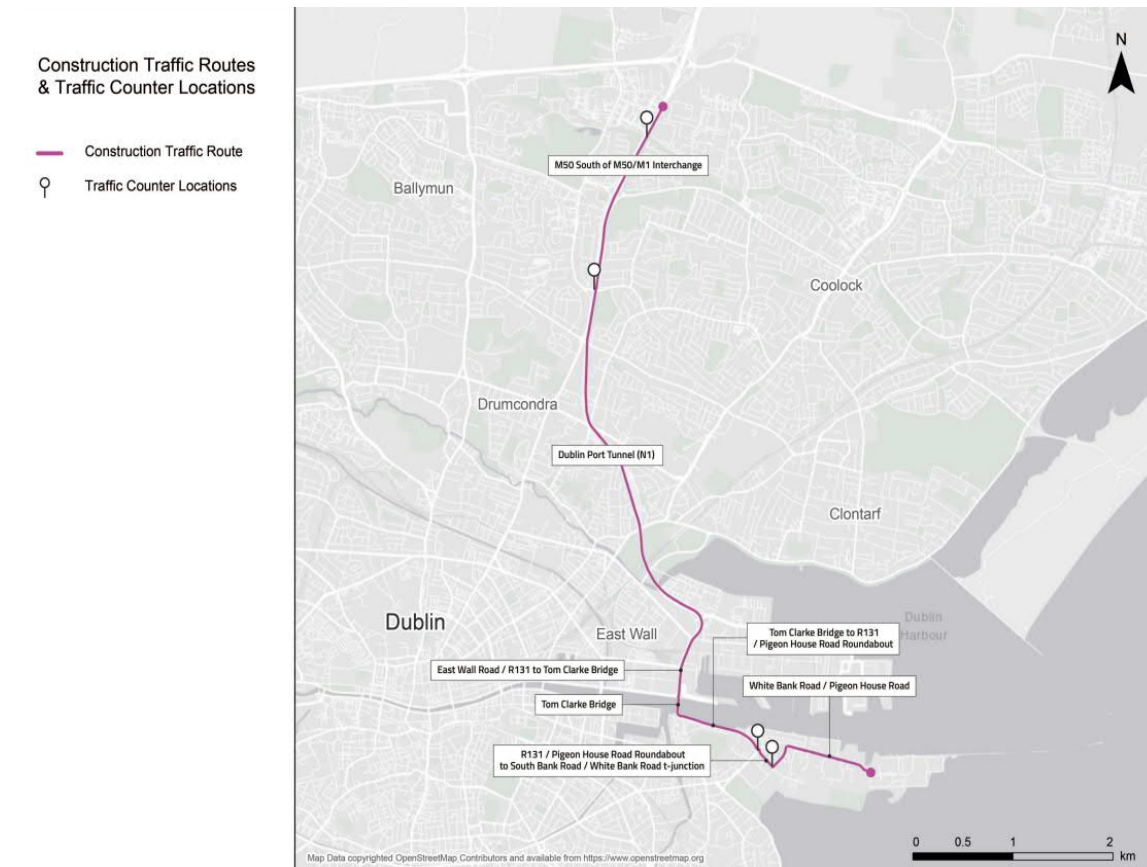
Public road sections included in the Study Area are listed below (numbers indicating sections in accompanying map):

- M50 South of M50/M1 Interchange;
- Dublin Port Tunnel (N1);
- East Wall Road / R131 to Tom Clarke Bridge ;
- Tom Clarke Bridge ;
- Tom Clarke Bridge to R131 / Pigeon House Road Roundabout;

- R131 / Pigeon House Road Roundabout to South Bank Road / White Bank Road t-junction; and
- White Bank Road

The Study Area is shown in Figure 14.3 and the D&CTMP (included as part of Appendix C).

Figure 14.3: Study Area



14.3.2 Approach to Data Collection

A desktop study was undertaken to review logical traffic access 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.

Information in relation to existing traffic volumes within the Study Area was obtained from:

- Transport Infrastructure Ireland (TII) Online Data Portal; and
- Commissioned survey undertaken by Irish Traffic Surveys Ltd.

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.

14.3.2.1 Existing Traffic Volumes

TII Online Data Portal Traffic Volumes

Traffic volume data regarding national primary roads was accessed via the TII online data portal. Relative to this assessment, this included the M50 with two counters situated on the M50 (for 2019 year) as described in Table 14.3 and these are also represented graphically in Figure 14.3.

Table 14.3: TII Existing Traffic Counters

Location Description	Counter Type	Year
M50 Between Junction 2 (Santry) and Junction 3 (M50/M1)	AADT	2019
N01 South of M50 Junction 2 (Santry), Whitehall	AADT	2019

Source: trafficdata.tii.ie

Commissioned Survey Data

A Junction Turning Count Survey, comprising two sites, was undertaken by Irish Traffic Surveys Ltd. from 21 May 2019 to 23 May 2019. This recorded the volumes of vehicles passing through the junctions every 15 minutes. The survey recorded Car, Light Goods Vehicle (LGV), Ordinary Goods Vehicle 1 (OGV1) ridged with up to 3 axels, Ordinary Goods Vehicle 2 (OGV2) ridged with 4 or more axles, Public Service Vehicles (PSV), Motorcycles (MCL), Pedal Cycles (PCL) and Pedestrians at each of the two junctions between the hours of 00:00 and 24:00.

Table 14.4 describes the locations of the traffic survey sites which are also represented shown in Figure 14.3 and also in the D&CTMP (included as part of Appendix C).

Table 14.4: Commissioned Traffic Survey Site Locations

Location	Junction Type	Date of Survey
R131 / Sean Moore Road/ South Bank Road/ Sean Moore Road/ Pigeon House Road	5-arm roundabout	21 May 2019 – 23 May 2019
South Bank Road / White Bank Road	T-junction	21 May 2019 – 23 May 2019

Source: Commissioned Survey, Irish Traffic Surveys Ltd.

14.3.2.2 Personal Injury Collisions (PICs)

No assessment of road safety was undertaken as recorded as Personal Injury Collision (PIC) data was unavailable at the time of assessment.

14.3.3 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 movement volumes have been compared to baseline traffic flows to identify if there are likely to be periods where the increase in traffic, 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, pedestrian amenity / fear and intimidation).

14.3.3.1 Significance

The IEMA Guidelines 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 would increase by more than 30% (or the number of Heavy Goods Vehicles (HGVs) would increase by more than 30%).
- Rule 2 - Include any other specifically sensitive areas where traffic flows would increase by 10% or more.

It is acknowledged by the IEMA guidelines 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 project. 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 (IEMA, 1993), 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 14.5. It should be noted that the assessment considers the effects of the % increase in general traffic HGV+ Light Goods Vehicles and cars (LGV) 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 urban industrial area; as such, all routes have been treated as not 'sensitive' and therefore the 30% significance threshold has been applied in view of Rule 2 of the IEMA Guidelines (IEMA, 1993), thereby facilitating a robust assessment.

It is to be noted that, during the operational phase of the project negligible volumes of traffic generation are anticipated. Considering this, the assessment primarily focuses on the construction phase traffic and transport impacts, with a qualitative summary of the traffic and transport impact during the operational phase and decommissioning phase.

The thresholds shown in Table 14.5 have been developed based upon the Rule 2 criteria above as well as the consideration that '**Major**' and '**Moderate**' effects are significant in the context of Environmental Protection Agency (EPA) Guidelines.

Table 14.5: 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: IEMA

The significance of all effects under consideration is linked to the volume of traffic generated by the Project, therefore it is deemed appropriate to link significance criteria with the scale of the forecast traffic increase. The IEMA Guidelines (IEMA, 1993), also state however that:

“For many effects there are no simple rules or formulae which define the thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, 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 caused by full or partial road closure and resultant traffic diversion, the assessment of community (pedestrian delay, pedestrian amenity / fear and intimidation) 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.

Effects associated with works which might physically restrict usable road space, thus resulting in localised road or lane closure have also been assessed, considering requirements for diversion and/or journey time delay to traffic by road section.

The following effect classifications are considered;

- Driver delay;
- Accidents and safety; and
- Community effects (Pedestrian delay, severance, pedestrian and cyclist amenity; including fear and intimidation).

The IEMA Guidelines (1993) also necessitate the consideration of Noise, Visual Impact, Air Pollution and Dust and Dirt which 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 project, 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

14.3.3.2 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 for reference, the receptors of sensitivity have been defined in Table 14.6 for various roads links.

Table 14.6: 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: IEMA / Mott MacDonald

14.3.3.3 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 are provided in Table 14.7. This is of particular importance when considering community effects.

Table 14.7: 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 14.8 and are based on combining the magnitude of the effect with the receptor sensitivity.

Table 14.8: 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: IEMA

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.

14.3.3.4 Traffic Forecasting Assumptions

The restrictions placed by the COVID-19 pandemic has resulted in limitations on data collection, in particular site visits and traffic survey counts. As such, efforts have been made to build a profile using available desktop and historical data and 2019 has been used as the baseline year for existing traffic volumes.

In addition to the traffic data, road capacities relating to national, regional, and local roads have been determined using a combination of data sources.

For national and regional roads in the Study Area, professional judgement has been applied in determining vehicles per hour (vph) by reviewing road characteristics on a site visit (9th and 10th May 2022) alongside using Google Street View and referring to road classification descriptors provided in UK DMRB Guidance Volume 5, Part 3 TA 79/99. After assignment of a road classification the relevant road capacity (busiest directional flow in vehicles per hour) was noted.

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 work from home, travel on foot and bike, travel shorter distances and some shops and services had been closed. Whilst restrictions have been lifted and general trend are moving again it is become difficult to predict when 'normal' travel patterns will resume again and 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.

14.4 Receiving Environment

14.4.1 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 14.3.1. 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 Demolition and Construction Traffic Management Plan (D&CTMP) to be approved by Dublin City Council and adopted by appointed contractor(s).

With reference to the criteria specified in Section 14.3.3 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 14.9. Receptor sensitivity has been outlined using the criteria detailed in Table 14.6.

Table 14.9: Road Network and Route Profiles

Route Section	Speed Limit (km/h)	Description	Receptor Sensitivity
M50 South of M50/M1 Interchange	100	This is a dual carriageway motorway with three lanes in each direction and grass verges on either side of the carriageway.	Negligible
Dublin Port Tunnel (N1)	80	This is a dual carriageway with two lanes in each direction travelling through a tunnel of height 4.65m. The tunnel is well lit inside with speed camera signage along the route. This then exist into a continuation of two-lane dual carriageway outside the tunnel towards a toll station where vehicles are required to come to a complete stop. The final section of this road continues as before the toll station stop but with a 50km/h speed limit.	Negligible
E Wall Road / R131 to Tom Clarke Bridge	50	This is a dual carriageway with three lanes in each direction and numerous signalised traffic junctions. After three signalised junctions, the road becomes a single carriageway with two lanes in either direction. There is a shared used pedestrian/cycle path on the eastern side of the road and a pedestrian only footpath on the west.	Low
Tom Clarke Bridge	50	This is a single carriageway bridge with one lane in each direction and no observed weight restrictions.	Low
Tom Clarke Bridge to R131 / Pigeon House Road roundabout	50	After passing the Tom Clarke Bridge toll station, this section is a single carriageway road with one lane in each direction. There is a narrow pedestrian footway on the northern side of the carriageway and a grass bank on the southern side. There is street lighting along the route and a signalised pedestrian crossing.	Negligible
R131 / Pigeon House Road roundabout to South Bank Road / White Bank Road T Junction	50	This is a single carriageway road with one lane in each direction within an industrial area. There are minimal to no suitable pedestrian footways within this road section.	Negligible
Pigeon House Road / White Bank Road	50	This is a single carriageway road with one lane in each direction. There are minimal to no suitable pedestrian footways within this road section.	Negligible

Source: Mott MacDonald

14.4.2 Existing Traffic Flows

Typical capacities for a variety of road types have been determined through a review of the UK Design Manual for Roads and Bridges Guidance Volume 5, Part 3. These capacities are quoted as two-way flows in vehicles per hour (vph).

Where traffic flow data has not been obtained a reasonable assumption has been applied using professional judgement based on knowledge of traffic volumes on adjacent roads.

Table 14.10 details the existing baseline traffic flows and capacities on the routes within the Study Area considered in the assessment.

Table 14.10: Route Capacities and Existing Baseline Traffic Count Data

Route Section	Road Capacity (vph in Busiest Direction)	Existing AADT (two-way) from 2019	% HGV
M50 South of M50/M1 Interchange	5,600	86,729	9.20%
Dublin Port Tunnel (N1)	4,000	44,765	1.4%
E Wall Road / R131 to Tom Clarke Bridge	2,010	44,765	1.4%
Tom Clarke Bridge	1,590	21,210	12%
Tom Clarke Bridge to R131 / Pigeon House Road Roundabout	1,320	21,210	12%
R131 / Pigeon House Road Roundabout to South Bank Road / White Bank Road T Junction	1,860	3,819	44%
Pigeon House Road	2,550	3,346	42%

Source: Mott MacDonald, Design Manual for Roads and Bridges (DMRB), Transport Infrastructure Ireland (TII), Commissioned traffic surveys

14.4.3 Tourism and Leisure

Located within proximity of the Study Area for the Roads and Traffic Chapter there are two local communities: Irishtown and Lansdowne village.

The Poolbeg lighthouse is a popular tourist attraction within the region. The Poolbeg lighthouse walk, officially known as the Great South Wall Walk, attracts many tourists and walkers all year round. The Irishtown nature park is another tourist destination that offers walking trails that extend from Ringsend along towards the Poolbeg Peninsula. Shellybanks beach, Sandymount beach, Pembroke cove, Dublin Bay, Sean More Park and Ringsend Park are further examples of destinations used for tourism or leisure purposes situated South of the proposed construction vehicle travel route near the Study Area.

14.4.4 Walking and Cycling

The Study Area adjoins multiple locations for both tourism and leisure activities, including a small section of recreational routing for cycling and walking. The desktop study revealed that cycling and walking infrastructure was identified on two of the route sections on the specific HGV construction vehicle routes. These have been highlighted in Table 14.10 as having 'low' receptor sensitivity. Given that any cycling infrastructure on these route sections is segregated from traffic, and pedestrian and cyclist crossings are signalised, no discernible effect on pedestrians or cyclists is expected as a result of increased traffic flow on these route sections. Using professional judgement, the magnitude of the effects is therefore deemed as not significant.

These route sections which may be potentially affected by the construction access routes and associated traffic volume increase are detailed in Table 14.11.

Table 14.11: Impact on Local Walking / Cycling Routes

Route Section	Walking / Cycling Facilities on Route	Magnitude of Impact
East Wall Road / R131 to Tom Clarke Bridge	This route passes a small number of office and leisure facilities on the west of the carriageway which may attract active travel users. There is a shared used pedestrian/cycle path on the eastern side of the road and a footway on the west. Signalised crossings for pedestrians and cyclists are available along this section of road. Impact may include an increase in traffic along this section of road.	Low / Minor (Not Significant)

Route Section	Walking / Cycling Facilities on Route	Magnitude of Impact
Tom Clarke Bridge	There is a narrow pedestrian footway on either side of the bridge with a signalised crossing point on the bridge. Impact may include an increase in traffic along this section of road.	Low / Minor (Not Significant)

Source: Mott MacDonald

14.4.5 Public Transport

Several bus services utilise the road network local to the proposed development. Table 14.12 summarises the local services and their associated frequencies. There are no bus routes operating along the projected vehicle construction route beyond East Link/Tom Clarke Bridge.

Public transport access to popular tourist destinations and beaches, as outlined previously in this chapter, is relatively limited; walking is required to access most of the destinations. The closest bus stops in the area are located along Irishtown Road; bus services include the C1, C2 and 47 and details of these routes are included in Table 14.12. There are no local rail routes. The closest train stations being the Grand Canal Dock and Lansdowne Road.

Table 14.12: Local Bus Routes

Route	Route Summary	Weekday Frequency	Weekend Frequency
C1	Saint John's Church - Outside Train Station	Every 15 - 60 minutes	Every 30 - 60 minutes
C2	Saint John's Church - Outside Train Station	Every 20 - 40 minutes	Every 30 minutes
47	Poolbeg Street - Castlethorn Estate	Every 30 - 75 minutes	Every 60 minutes

Source: bustimes.org

14.5 Likely Significant Effects

14.5.1 Do Nothing

The 'do-nothing' scenario will have no discernible impact on Roads and Traffic, as it is assumed that traffic volumes locally will rise only in line with national traffic growth estimates.

14.5.2 Construction Phase

The construction phase is due to commence in Q2 of 2024 and is anticipated to last approximately 30 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 need for diversions. The indicative construction programme is outlined in Table 3.2 in Chapter 3 of the EIAR.

14.5.2.1 Working Hours

Normal working hours during the construction period are expected to be Monday to Friday 7am to 7pm and Saturday from 8am to 2pm. No construction works will take place outside these hours unless such work is required under exceptional circumstances or is carried out with the prior written approval of the Local Authority.

14.5.2.2 Construction Personnel

A maximum daily workforce of approximately 140 people are expected during the peak period for construction works on site. However, typical daily workforce requirements will be less than this.

A vehicle occupancy rate of 1.25 is assumed and in the worst-case scenario this would result in a peak daily requirement of 112 vehicles (approximately 224 two-way movements per day). This

would mean a requirement for up to 112 temporary car parking spaces in a robust case scenario.

Average daily construction personnel movements to site are summarised in Table 14.13.

Table 14.13: Daily Average Construction Personnel Movements

Phase	During Average Construction Operations				During Peak Construction Operations			
	Average Personnel on Site / Day	Vehicle Occupancy	Average Vehicle Req.* / Day	Average Movements / Day	Peak Personnel on Site / Day	Vehicle Occupancy	Peak Vehicle Req. / Day	Peak Movements / Day
Demolition & Enabling Works	20	1.25	16	32	35	1.25	28	56
Main OCGT Development Works	100	1.25	80	160	140	1.25	112	224

Source: Mott MacDonald

*Req. - Requirement

14.5.2.3 Heavy Goods Vehicle (HGV) Volumes

It is estimated that the maximum number of daily HGV movements generated by the project will be 24 trips (48 HGV movements) and that these will occur during peak construction stages which will take place during the main OCGT development works. However notable volumes of traffic will also be generated during the Demolition and Enabling phase.

For the purpose of a robust assessment the following assumptions have been made:

- There will be a maximum of six HGVs serving the site during any given daytime hour (12 HGV movements)
- HGVs will arrive and depart from the site within a given hour

Details of total HGV movements during the demolition and enabling works phase are shown in Table 14.14.

Table 14.14: HGV traffic activity during Demolition & Enabling Works Phase

Year	Month	Description	HGVs (≈)	Movements (≈)	Duration	Average Daily Frequency
					(months)	(HGVs)
2024	1	Site Setup	100	200	1	5
	2 - 8	Demolition & Enabling Works	1,500	3,000	7	10
	Months 1 - 8		1,600	3,200	8	9

Source: Construction Methodology Report, November 2022.

Details of total HGV movements during the main OCGT development works phase are shown in Table 14.15.

Table 14.15: HGV traffic activity during the Main OCGT Development works phase

Year	Month	Description	HGV/MGV Vehicles (≈)	Movements (≈)	Duration (months)	Average Daily Frequency (HGVs)
2024 to 2026	9	Site setup	100	200	1	5
	10 - 27	Inf & Building Const, and Eq. Install	9,500	19,000	18	24
	28 - 30	Commissioning & Handover	1,200	2,400	3	18
Months 9 - 30			10,800	21,600	22	22

Source: Construction Methodology Report, November 2022

Traffic likely to be generated by the proposed development (using public roads within the Study Area) throughout the entire construction phase is summarised in Table 14.16.

Table 14.16: Construction Traffic Generation Summary

	HGVs (Peak Daily Average)									Construction Worker Vehicles (Peak Daily Average)										
	2024			2025			2026			2024			2025			2026				
Route Section	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
M50 South of M50/M1 Interchange	10	10	10	24	24	24	24	24	24	24	0	0	0	0	0	0	0	0	0	0
Dublin Port Tunnel (N1)	10	10	10	24	24	24	24	24	24	24	0	0	0	0	0	0	0	0	0	0
E Wall Road / R131 to Tom Clarke Bridge	10	10	10	24	24	24	24	24	24	24	0	0	0	0	0	0	0	0	0	0
Tom Clarke Bridge	10	10	10	24	24	24	24	24	24	24	0	0	0	0	0	0	0	0	0	0
Tom Clarke Bridge to R131 / Pigeon House Road Roundabout	10	10	10	24	24	24	24	24	24	24	28	28	28	112	112	112	112	112	112	112
R131 / Pigeon House Road Roundabout to South Bank Road / White Bank Road T Junction	10	10	10	24	24	24	24	24	24	24	28	28	28	112	112	112	112	112	112	112
Pigeon House Road / White Bank Road	10	10	10	24	24	24	24	24	24	24	28	28	28	112	112	112	112	112	112	112

Source: Mott MacDonald

The peak period for construction traffic generation will occur during the period between Q1 2025 and Q3 2026.

14.5.2.4 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.

Most abnormal loads will be transported by marine vessel to Hammond Lane Port, then transported by specialist vehicle a short distance to the construction site access. Where practical abnormal loads will be transported overnight, and it is therefore, in conjunction with the low number of movements, probable that associated disruption to road network operation will be minimal. Table 14.17 summarises the abnormal load deliveries travelling to the proposed development site.

Table 14.17: Abnormal Load Deliveries

Transport item	Number of items	Abnormal loads	Movements (note: for return movement the transporter vehicle can retract to be classified as a standard HGV)
Gas Turbine	1	1	2
Gas Turbine Parts	2	2	4
Generator	1	1	2
Generator Parts	2	2	4
Main Transformer	1	1	2
Auxiliary Transformer	1	1	2
Stack	1	4	8
Diesel Generator	1	1	2
Gas Compressor	1	1	2
Tanks	4	10	20
Prefabricated Electrical Containers	3	3	6
Demineralised plant containers	1	2	4
Electrical switchgear equipment	4	4	8
Prefabricated administration buildings	2	4	8
HV/MV Cable Drum	1	1	2
Total	26	38	76

Source: Mott MacDonald

14.5.2.5 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 14.18 summarises future year traffic growth scenarios without the project.

Table 14.18: Future Year Scenario Growth Rates

Future Year Scenario	Growth Rate from 2019
2024	0.52%
2025	0.62%
2026	0.73%

Source: TII Publications, Project Appraisal Guidelines for National Roads Unit 5.3 – Travel Demand Projections, Table 6.1, October 2021

Table 14.19 lists forecast future baseline traffic flows factored upwards in accordance with the rates indicated in Table 14.18.

Table 14.19: Future Baseline Traffic Flow Data

Route Section	2024 Average Daily Traffic Flow		2025 Average Daily Traffic Flow		2026 Average Daily Traffic Flow	
	Total Two-Way Flow	HGV Only	Total Two-Way Flow	HGV Only	Total Two-Way Flow	HGV Only
M50 South of M50/M1 Interchange	87180	8021	87270	8029	87360	8037
Dublin Port Tunnel (N1)	44998	630	45044	631	45091	631
E Wall Road / R131 to Tom Clarke Bridge	44998	630	45044	631	45091	631
Tom Clarke Bridge	21320	2508	21342	2511	21364	2513
Tom Clarke Bridge to R131 / Pigeon House Road Roundabout	21320	2508	21342	2511	21364	2513
R131 / Pigeon House Road Roundabout to South Bank Road / White Bank Road T Junction	3839	1684	3843	1686	3847	1688
Pigeon House Road / White Bank Road	3363	1407	3367	1408	3370	1410

Source: Mott MacDonald

Given the greatest movement of construction vehicles is within the period from Q1 2025 to Q3 2026, and baseline traffic is forecast to be lower in 2025 than in 2026, it is anticipated that the greatest impact on the public road network will be in 2025.

Possible effects associated with the construction works are:

- Driver delay;
- Accidents and Safety; and
- Community effects (Pedestrian delay, severance, pedestrian and cyclist amenity; including 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 temporary effects, given the construction period is less than one year.

Table 14.20 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 14.3.

Table 14.20: IEMA Threshold Assessment Summary

Route Section	Capacity	Baseline 2025 Two- Way Flow AADT - All Vehicles	Baseline 2025 Two- Way Flow AADT - HGV Only	Peak Daily Additional HGV Movements	% Increase - HGVs	Total Peak Daily Additional Vehicle Movements	% Increase - All Vehicles	Effect Significance of HGV increase	Effect Significance of total vehicle increase
M50 South of M50/M1 Interchange	5600	87270	8029	48	0.6%	48	0.1%	None (Not Significant)	None (Not Significant)
Dublin Port Tunnel (N1)	4000	45044	631	48	7.6%	48	0.1%	Minor (Not Significant)	None (Not Significant)
E Wall Road / R131 to Tom Clarke Bridge	2010	45044	631	48	7.6%	48	0.1%	Minor (Not Significant)	None (Not Significant)
Tom Clarke Bridge	1590	21342	2511	48	1.9%	48	0.2%	None (Not Significant)	None (Not Significant)
Tom Clarke Bridge to R131 / Pigeon House Road Roundabout	1320	21342	2511	48	1.9%	272	1.3%	None (Not Significant)	None (Not Significant)
R131 / Pigeon House Road Roundabout to South Bank Road / White Bank Road T Junction	1860	3843	1686	48	2.8%	272	7.1%	None (Not Significant)	Minor (Not Significant)
Pigeon House Road / White Bank Road	2550	3367	1408	48	3.4%	272	8.1%	None (Not Significant)	Minor (Not Significant)

Source: Mott MacDonald

14.5.2.6 Driver Delay

There were no road sections which highlighted an increase in traffic volumes which, according to IEMA guidelines, trigger the threshold as potentially significant (increase exceeding than 30% for all traffic).

All abnormal loads will be transported overnight, 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.

Therefore, implementing professional judgement, effects associated with driver delay are therefore not considered to be significant in terms of the EPA 2022 EIAR Guidelines.

14.5.2.7 Accidents and Safety

Implementing professional judgement, given there is no significant traffic increase associated with the development, accidents and safety are therefore not considered to be significant in terms of the EPA 2022 EIAR Guidelines.

14.5.2.8 Community Effects (Pedestrian delay, severance, pedestrian and cyclist amenity; including fear and intimidation)

There are two road sections where the baseline studies identified a notable pedestrian and cyclist presence and these road sections are:

- East Wall Road / R131 to Tom Clarke Bridge; and
- Tom Clarke Bridge.

The increase in total traffic due to construction vehicle movements in these two areas during the peak construction period are 0.1% and 0.2% respectively and accordingly the addition of construction traffic on these road sections is not assessed to result in significant community effects.

Therefore, implementing professional judgement, the community related effects are therefore not considered to be significant in terms of the EPA 2022 EIAR Guidelines.

14.5.3 Operation and Maintenance Phase

During operation, the proposed Poolbeg OCGT will operate unmanned, controlled remotely from another ESB site. There will be personnel on site carrying out routine inspections and maintenance on the proposed facility. It is to be noted that, during the operational phase of the proposed development negligible volumes of traffic generation are anticipated therefore, no mitigation is deemed necessary.

14.5.4 Decommissioning Phase

It is anticipated that should future decommissioning occur in part or whole that it is probable that the associated traffic generation will be similar to those generated during the construction phase.

14.6 Cumulative Effects

A number of developments, most of which are committed in terms of planning, are proposed close to the proposed development. These developments are listed in Table 14.21 with comment on their inclusion in the cumulative assessment. Known development proposals which are not yet committed in planning terms (but are known to be emanate) are also considered. A summary of the project details is provided in Chapter 3 of the EIAR.

Table 14.21: Adjacent Development Proposals

Development	Reference (planning/ other)	Location	Potential for Cumulative Effect	Scoped out (Y/N) Justification
Production Units	2771/19	Irish Tar & Bitumen Suppliers, Alexandra Road, Dublin 1	NO POTENTIAL CUMULATIVE EFFECT	Y – Traffic data not available in application submission therefore effects on this project cannot be deduced.
Dublin Port Company MP2 Project https://dublinportmp2.ie/	An Bord Pleanála Ref: 304888 Related Foreshore Application see below – FS006893	Dublin Port	NO POTENTIAL CUMULATIVE EFFECT	Y – Insufficient information to determine effects that are available on the website
Foreshore Application Dublin Port Capital Dredging Project https://www.gov.ie/en/foreshore-notice/e7d34-dublin-port-capital-dredging/	FS007164	Dublin Port	NO POTENTIAL CUMULATIVE EFFECT	Y - No discernible traffic impact on road network as only occasional service vehicles required and private car use limited to approximately 10 staff. The project will be undertaken by vessels arriving and departing by sea.
Dublin Port Maintenance Dredging https://www.gov.ie/en/foreshore-notice/60147-dublin-port-maintenance-dredging/	FS007132	Dublin Port	NO POTENTIAL CUMULATIVE EFFECT	Y – Insufficient information to determine effects that are available on the website
Brexit Infrastructure	ABP Ref: SA29N.307352	Dublin Port	NO POTENTIAL CUMULATIVE EFFECT	Y - No discernible traffic impact on road network
Liffey-Tolka Project	Dublin City Council Ref: 3084/16	Dublin Port	NO POTENTIAL CUMULATIVE EFFECT	Y – Whilst roads overlap (one section of Dublin Port Tunnel into East Wall Road), there is insufficient traffic data to determine impacts

Dublin City Development Plan 2022-2028 <u>Development Plan 2022 - 2028 Dublin City Council</u>	Dublin City Council	Dublin City	NO POTENTIAL CUMULATIVE EFFECT	Y – Port area not a part of the plan
Phase 2 - Mixed use development in Poolbeg West SDZ (refer to https://glassbottle.ie/public-information/)	PWSDZ4058/22	Poolbeg - Dublin City	NO POTENTIAL CUMULATIVE EFFECT	Y – Construction period finished in 2023, and therefore does not overlap with project construction period
Phase A - Mixed use development in Poolbeg West SDZ	PWSDZ4380/22	Poolbeg - Dublin City	NO POTENTIAL CUMULATIVE EFFECT	Y – Construction period finished in 2023, and therefore does not overlap with project construction period
Phase 1B - Mixed use development in Poolbeg West SDZ	PWSDZ3406/22	Poolbeg - Dublin City	NO POTENTIAL CUMULATIVE EFFECT	Y – Construction period finished in 2023, and therefore does not overlap with project construction period
Phase 1 - Mixed use development in Poolbeg West SDZ	PWSDZ3207/21	Poolbeg - Dublin City	NO POTENTIAL CUMULATIVE EFFECT	Y – Construction period finished in 2023, and therefore does not overlap with project construction period
Infrastructural works - Mixed use development in Poolbeg West SDZ	PWSDZ3270/19	Poolbeg - Dublin City	NO POTENTIAL CUMULATIVE EFFECT	Y – Construction period finished in 2021, and therefore does not overlap with project construction period

Dublin Waste to Energy Facility - capacity increase (LA Foreshore Application)	ABP-309812-21	Poolbeg – Dublin City	NO POTENTIAL CUMULATIVE EFFECT	Y – Construction period finished in 2021, and therefore does not overlap with project construction period
Ringsend FlexGen	3647/20	Poolbeg – Dublin City	NO POTENTIAL CUMULATIVE EFFECT	Y – Construction period due to finish in 2022, and therefore does not overlap with project construction period
South Wall BESS	3646/20	Poolbeg – Dublin City	NO POTENTIAL CUMULATIVE EFFECT	Y – Construction period due to finish in 2022, and therefore does not overlap with project construction period
Poolbeg BESS	3625/20	Poolbeg – Dublin City	NO POTENTIAL CUMULATIVE EFFECT	Y – Construction period due to finish in 2022, and therefore does not overlap with project construction period
Poolbeg FlexGen	3624/20	Poolbeg – Dublin City	NO POTENTIAL CUMULATIVE EFFECT	Y – Construction period due to finish in 2022, and therefore does not overlap with project construction period
Continuation of concrete batching	PWSDZ3469/22	Poolbeg – Dublin City	NO POTENTIAL CUMULATIVE EFFECT	Y – Insufficient information to determine effects that are available on the planning portal
Grand Canal Storm Water Outfall Extension LA Foreshore Development Application	ABP-313738-22	Grand Canal	NO POTENTIAL CUMULATIVE EFFECT	Y – Construction traffic routes do not overlap

North Wall Power Plant – Temporary Emergency Generation Plant	ABP – TBC application to made in the immediate future under Section 181(1)(a)	Alexandra Road Dublin Port	NO POTENTIAL CUMULATIVE EFFECT	Y – Construction phase scheduled to be completed by 2023 and therefore does not overlap with project construction period.
North Wall Power Plant	2697/20	Alexandra Road Dublin Port	NO POTENTIAL CUMULATIVE EFFECT	Y – Whilst roads overlap slightly (one short section of East Wall Road), construction traffic movements for North Wall Power Plant were scheduled to be completed by Q4 2020 and therefore does not overlap with project construction period.
Ringsend WWTP upgrades https://www.water.ie/projects/local-projects/ringsend/	ABP ref: PA29S.301798	Ringsend – Dublin City	NO POTENTIAL CUMULATIVE EFFECT	Y – Project works now completed
Dublin Ports 3FM project	Not committed in planning terms		NO POTENTIAL CUMULATIVE EFFECT	Y – Not committed in planning terms
Ringsend OCGT	Not committed in planning terms	Ringsend Power Generation Station	POTENTIAL CUMULATIVE EFFECT	N – Overlap in time period and road sections used during the construction period

Source: Varies by development

The proposed Ringsend OCGT project will also generate construction traffic that will utilise some of the road sections in the Study Area and therefore has the potential to result in a cumulative effect in conjunction with the proposed development.

The Ringsend OCGT project is not yet committed in planning terms and has not lodged details of proposed traffic movements with the Planning Authority and accordingly these cannot be considered in detail at this time. However, the preliminary data has been reviewed and is summarised in Table 14.22.

It has been identified that HGV traffic generated by Ringsend OCGT¹⁰⁴ are anticipated to use the roads listed in Table 14.22 between 2024 Q2 and 2026 Q3, inclusive. From the quantitative assessment it demonstrates that traffic increase results in 'major (significant)' effects on two route sections.

Whilst construction traffic on three public road sections is assessed to exceed the 30% significance threshold, based upon professional judgement and knowledge of the receiving environment which has notable residual capacity it is envisaged that there are unlikely to be significant effects that cannot be managed through coordinated traffic management type interventions and will therefore be at worst 'minor' and therefore 'not significant' in terms of the EPA 2022 EIAR Guidelines.

Committed developments with known information have been considered within the assessment, however, some developments do not have full information per traffic generation or construction information available. Based on a review of the information available and applied professional judgement, aside from the planned Ringsend OCGT, there are assessed to be no other developments which have potential to combine cumulatively (and significantly) with the proposed development. Accordingly, it has been assumed that such traffic generation will be accounted for in the National Transport Model and therefore accounted for in the baseline traffic volumes derived, see Section 14.5.2.

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.

Provided this and other appropriate mitigation measures are implemented, such as those outlined in Section 14.8, the cumulative Roads and Traffic impacts associated with the construction phase, based on assessment, will not be 'significant'.

¹⁰⁴ P000422-02-CE21-R003 - Ringsend CMR

Table 14.22: The Proposed Development and Ringsend OCGT Cumulative Effects

Route Section	Ringsend OCGT Additional HGVs During Peak Construction Period	% Increase	Ringsend OCGT Additional Vehicles During Peak Construction Period	% Increase	Poolbeg OCGT + Ringsend OCGT Additional HGVs During Peak Construction Period	% Increase	Poolbeg PCGT + Ringsend OCGT Additional Vechiles During Peak Construction Period	% Increase	Effect Significance of HGV increase (quantitative assessment)	Effect Significance of total vehicle increase (quantitative assessment)	Effect Significance of HGV increase (professional assessment)	Effect Significance of total vehicle increase (professional assessment)
M50 South of M50/M1 Interchange	46	0.57%	46	0.05%	70	0.87%	94	0.11%	None (Not Significant)	None (Not Significant)	None (Not Significant)	None (Not Significant)
Dublin Port Tunnel (N1)	46	7.29%	46	0.10%	70	11.10%	94	0.21%	Moderate (Significant)	None (Not Significant)	Minor (Not Significant)	None (Not Significant)
E Wall Road / R131 to Tom Clarke Bridge	46	7.29%	46	0.10%	70	11.10%	94	0.21%	Moderate (Significant)	None (Not Significant)	Minor (Not Significant)	None (Not Significant)
Tom Clarke Bridge	46	1.83%	46	0.22%	70	2.79%	94	0.44%	None (Not Significant)	None (Not Significant)	None (Not Significant)	None (Not Significant)
Tom Clarke Bridge to R131 / Pigeon House Road Roundabout	46	1.83%	270	1.27%	70	2.79%	542	2.54%	None (Not Significant)	None (Not Significant)	None (Not Significant)	None (Not Significant)
R131 / Pigeon House Road Roundabout to South Bank Road / White Bank Road T Junction	46	2.73%	270	7.03%	70	4.15%	542	14.10%	None (Not Significant)	Moderate (Significant)	None (Not Significant)	Minor (Not Significant)
Pigeon House Road / White Bank Road	46	3.27%	270	8.02%	70	4.97%	542	16.10%	None (Not Significant)	Moderate (Significant)	None (Not Significant)	Minor (Not Significant)

Source: Mott MacDonald

14.7 Mitigation Measures and Monitoring

14.7.1 Demolition and Construction Traffic Management Plan

A summary of key Demolition and Construction Traffic Management Plan (D&CTMP) monitoring elements follow; the Plan is included as part of the D&CEMP comprising Appendix C of this EIAR.

The assessment of post-mitigation effects has been undertaken on the assumption that key measures set out in the D&CTMP 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 Dublin City 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.

The D&CTMP has been developed for the purposes of this assessment and will be further developed as necessary in consultation with Dublin City Council and the Gardai prior to construction commencing. The D&CTMP 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 D&CTMP 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.

Furthermore, only vehicles essentially required to facilitate construction will be allowed to attend worksites. 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, the appointed contractor will ensure that all concrete truck wash watering / cleaning is undertaken offsite where practical 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 D&CTMP 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 D&CTMP 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 during the construction process (Liaison Officer). This person will liaise with the local community so that the community has a direct point of contact within the developer organisation who they could contact for information purposes or to discuss matters pertaining to traffic management or site operation.

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.

14.8 Residual Impacts

There are 'no significant' residual traffic and road impacts predicted during the construction and operational phases and this will be assured through the incorporation of measures described in the D&TMP, included as part of the D&CEMP comprising Appendix C of this EIAR.

15 Material Assets including Waste

15.1 Introduction

This chapter presents an assessment of the likely and significant impacts arising from the proposed development on material assets including built services, infrastructure, utility use and waste management. The assessment is based on the development as described in Chapter 3 of this EIAR.

15.2 Policy and Guidance

The Planning Report which accompanies this application (Ref: 229100184_3_A) describes the wider policy and legislative context applicable to the proposed development. Policies and guidance documents of potential relevance to the Material Assets are set out in this section.

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

15.2.1 Legislation and Policies

- 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);
- Waste Management Act 1996 (as amended);
- A Waste Action Plan for a Circular Economy 2020-2025 (DECC 2020);
- National Hazardous Waste Management Plan 2021-2027 (EPA, 2021);
- Eastern Midlands Region Waste Management Plan 2015-2021 (Dublin City Council, 2015); and
- Waste Management Plan for the Dublin Region: Annual Progress Report (RPS 2011).

15.2.2 Guidelines

- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022)¹⁰⁵;
- Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects (EPA, 2021);
- Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-hazardous (EPA, 2019); and
- Design Out Waste: A Design Team Guide to Waste Reduction in Construction and Demolition Projects (EPA, 2015).

15.3 Methodology

15.3.1 Approach to Data Collection

The following information and data sources (Table 15.1) have been considered during the production of this EIAR.

¹⁰⁵ Hereafter "EPA Guidelines 2022".

Table 15.1: Data Sources used to inform the Material Assets (Waste) chapter of this EIAR

Data source	Date	Data contents
Project Description	2022	Existing utilities within the study area Materials required for construction Materials required for operation Waste arising from the project Materials and waste that will be recovered from off-site sources for use on the project Materials from the cut and fill balance On-site storage details and stockpiling arrangements for materials and waste
EPA	2022	Licensed waste facilities
ESB Proposed BESS and FlexGen Sites: ESB Poolbeg Baseline Assessment (AECOM)	2020	Ground conditions Contaminated land

15.3.2 Approach to Impact Assessment

The existing built infrastructure assets and utility services within the study area and in proximity to the proposed development are identified. The potential impacts of construction, operation and maintenance, and decommissioning on the built assets and services are assessed.

The construction, operation and maintenance, and decommissioning of any infrastructure can result in environmental effects associated with the consumption and use of materials, and the disposal / recovery of waste. Environmental impact assessments must, 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.

This assessment of materials and waste includes:

- The consumption of materials and products (from primary, recycled or secondary, and renewable sources, the use of materials offering sustainability benefits, and the use of excavated and other arisings that fall within the scope of waste exemption criteria); and
- The production and disposal of waste.

The regional capacity to accept waste materials and the ability of the regional infrastructure to cope with the demands placed on it by the proposed development is also taken into consideration. This includes an assessment of:

- Regional (or other relevant geographic scale) presence of landfill facilities to be utilised by the project;
- Regional (or other relevant geographic scale) presence of material recovery / recycling facilities to be utilised by the project; and
- Location of mineral resources in relation to the project.

The assessment and subsequent management of waste shall apply the following waste management hierarchy from the Waste Directive, in descending order of preference:

1. Prevention (no waste produced);
2. Preparing for re-use;
3. Recycling;
4. Other recovery, e.g. energy recovery; and
5. Disposal.

The assessment of effects on built assets, utilities, material use, and waste follows the criteria and guidance provided in the EPA Guidelines 2022.

15.3.3 Study Area

The study area is defined as the construction footprint of the proposed development. This is the area in which any wastes will be generated during construction, operation and maintenance, and decommissioning.

15.4 Receiving Environment

15.4.1 Built Assets and Utilities

The proposed development is located within the Poolbeg Generating Station complex in the Poolbeg Peninsula. The Poolbeg Peninsula is located south of Dublin Harbour and east of Dublin City Centre.

The complex is characterised by the presence of a regionally significant electricity generation facility, and significant grid infrastructure, accommodating the following uses

- Operating combined cycle gas turbine (CCGT) station;
- National Oil Reserve Agency (NORA) Poolbeg Oil Storage Terminal to the eastern extent of the site (this area has been leased to NORA);
- The Gas Networks Ireland (GNI) Above Ground Installation and ESB Networks Substation to the south
- The western part of the site is occupied by buildings associated with the original power station which have been decommissioned.
- The brick and concrete stacks (Poolbeg Towers), associated with the decommissioned gas fired units, are located in the northern portion of the existing complex.
- Multiple existing office facilities, many of which are no longer occupied.
- A combination of hardstand and grassed areas.

The proposed OCGT will connect to the existing 220kV substation via a 220kV underground cable. There is currently a Gas Networks Ireland (GNI) dedicated Above Ground Installation (AGI) gas compound within the Poolbeg Generating station complex. While gas and electrical grid connection works are integral to the operation of the proposed development they will be subject to separate consent process and as such they do not form part of this planning submission.

There is currently no water connection with the proposed development site boundary. A water supply will be required for the proposed welfare facilities within the workshop/admin building area.

The Poolbeg Peninsula can be accessed by Pigeon House Road. The road network in proximity to the Poolbeg Generating Station complex is described in Chapter 14 Roads & Traffic.

The current IE licence will be reviewed to accommodate the works proposed. The utilities map provided as part of the IE licence will also be updated as part of the review.

15.4.1.1 Proposed Works

Construction of the development infrastructure will involve excavation and installation of all below ground services including drainage systems, connections to existing water supplies and power, along with the routing of all cable ducting throughout the site within the specified terminal points. Services will be surrounded with imported suitable engineered fill and backfilled with either imported fill or with excavated material if this proves suitable.

In centre of the Main OCGT development area the following works will be required:

- Removal and backfilling of existing redundant underground services. This will include disused foul, gas and surface water drainage along with electrical services to lighting.
- Diversion of existing live underground services will be required to suit the proposed development. This will include a fire ring main, foul and surface water drainage.

In the Southern area the following works will be required:

- Removal and backfilling of existing redundant underground services. This will include disused surface water drainage along with electrical services to lighting.
- Relocation of an Electric Vehicle (EV) charging point.
- Diversion of existing live underground services will be required including a surface water drainage.

15.4.2 Regional Waste Management

EPA record the composition of C&D waste arising in Ireland. The EPA waste data release¹⁰⁶ published in October 2022 shows that the quantity of C&D waste generated and collected in Ireland increased to 8.2 million tonnes in 2020. The C&D waste comprised the following proportions:

- Soil, stones and dredging spoil – 84.4%
- Concrete, brick, tile and gypsum – 6.4%
- Mixed C&D waste – 4.6%
- Metal – 2.4%
- Bituminous mixtures – 1.6%
- Segregated wood, glass and plastic – 0.6%

The EPA notes that most of the C&D waste finally treated in Ireland was reused as backfill (82%) in 2020, while 10% 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 Waste Framework Directive requires each Member State to achieve 70% material recovery of non-hazardous C&D waste (excluding soil and stones) by 2020. EPA determined that Ireland achieved 78% material recovery of such waste in 2020, and therefore surpassed the 70% target¹⁰⁷.

C&D waste is recovered at EPA licensed landfills and Local Authority permitted sites. The latest available progress report for the Dublin region (2011)¹⁰⁸ indicates that 98% of C&D waste is recovered which indicates that there is infrastructure locally to process C&D waste. The Eastern Midlands Region Waste Management Plan 2015-2021 states the following with regards to the treatment capacity of this region:

“The Eastern-Midlands Region has over 7 million tonnes of active EPA-authorised treatment capacity and 4.4 million tonnes of local authority authorised treatment capacity. The latest EPA data shows a further pending capacity of 5.5 million tonnes.”

¹⁰⁶ <https://www.epa.ie/our-services/monitoring--assessment/waste/national-waste-statistics/construction--demolition/>

¹⁰⁷ *ibid.*

¹⁰⁸ Waste Management Plan for the Dublin Region: Annual Progress Report (RPS 2011)

The Plan also states that the treatment capacity appears to be in plentiful supply for waste streams like “*land improvement recovery of C&D wastes.*”

There are 39 EPA licenced waste facilities in County Dublin. These are listed in Table 15.2.

Table 15.2: EPA Waste Licenced Facilities

Active Licence No.	Facility Type	Name of the Facility	Location
W0035-01	Hazardous waste facility	Sita Environmental Limited	Sheriff Street Upper, Dublin 1, Dublin
W0036-02*	Hazardous waste facility	Indaver Ireland Limited	Tolka Quay Road, Dublin Port, Dublin Port, Dublin 1, Dublin
W0040-01	Hazardous waste facility	Sorundon Limited T/A Irish Environmental Services	520 Beech Road, Western Industrial Estate, Naas Road, Dublin 12, Dublin
W0054-02*	Hazardous waste facility	SRCL Limited	SRCL Limited (Kylemore Road) trading as Eco-Safe Systems Ltd, Allied Industrial Estate, Kylemore Road, Dublin 10, Unit 1 A, Allied Industrial Estate, Kylemore Road, Ballyfermot, Dublin 10, Dublin
W0055-02*	Hazardous waste facility	SRCL Limited	420-430 Beech Road, Western Industrial Estate, Naas Road, Dublin 12, Dublin
W0083-01	Hazardous waste facility	Sita Environmental Limited	Lower Oriel Street, North Wall, Dublin 1, Dublin
W0099-01*	Hazardous waste facility	Safety Kleen Ireland Limited	Unit 5, Airtown Road, Tallaght, Dublin 24, Dublin
W0112-01	Hazardous waste facility	National Recycling & Environmental Protection Limited	John F Kennedy Drive, JFK Industrial Estate, Naas Rd, Dublin 12, Dublin
W0185-01*	Hazardous waste facility	Rilta Environmental Limited	Block 14A1, Grant's Road, Greenogue Business Park, Rathcoole, Dublin
W0196-01*	Hazardous waste facility	JFK Environmental Limited	John F. Kennedy Industrial Estate, John F. Kennedy Road, Naas Road, Dublin
W0039-02*	Integrated waste management facility	Starrus Eco Holdings Limited	Ballymount Cross, Tallaght, Dublin 24, Dublin
W0208-01*	Integrated waste management facility	Oxigen Environmental	Merrywell Industrial Estate, Ballymount Road Lower, Clondalkin, Dublin 22, Dublin
W0232-01*	Integrated waste management facility	Dublin Waste to Energy Limited	Pigeon House Road, Poolbeg Peninsula, Dublin 4, Dublin
W0239-01	Integrated waste management facility	Tonge Industries Limited	Unit 7, First Avenue, Cookstown Industrial Estate, Tallaght, Dublin 24, Dublin
W0009-03*	Landfill	Fingal County Council	Balleally Landfill, Balleally, Lusk, Dublin
W0015-01	Landfill	Dun Laoghaire Rathdown County Council	Ballyogan Landfill Facility Ballyogan Recycling Park, Ballyogan Road, Jamestown Townland, Carrickmines, Dublin 18, Dublin
W0097-01	Landfill	Swalcliffe Limited	116 Sheriff Street Upper, Dublin 1, Dublin
W0127-01	Landfill	Fingal County Council	Dunsink Landfill aka Dunsink Civic Amenity, Dunsink Lane, Finglas, Dublin
W0129-02	Landfill	Integrated Materials Solutions Limited Partnership	Hollywood Great, Nags Head, The Naul, Dublin
W0181-01	Landfill	Swalcliffe Limited	116 Sheriff Street Upper, Dublin 1, Dublin
W0231-01*	Landfill	Fingal County Council	Fingal Landfill, Nevitt, Lusk, Dublin

Active Licence No.	Facility Type	Name of the Facility	Location
W0205-01*	Materials recovery facility	Green Circular Economy Unlimited Company	Crag Avenue, Clondalkin Industrial Estate, Clondalkin, Dublin 22, Dublin
W0238-01*	Materials recovery facility	Starrus Eco Holdings Limited	Merrywell Industrial Estate, Ballymount Road Lower, Ballymount, Dublin 12, Dublin
W0261-02*	Materials recovery facility	Starrus Eco Holdings Limited	Cappagh Road, Finglas, Dublin 11, Dublin
W0003-03*	Waste transfer station	South Dublin County Council	Ballymount Baling Station, Ballymount Road, Walkinstown, Dublin 12, Dublin
W0042-01	Waste transfer station	Dean Waste Co. Limited	Upper Sheriff Street, Dublin 1, Dublin
W0044-02*	Waste transfer station	Padraig Thornton Waste Disposal Limited	Thorntons Recycling Centre (Ballyfermot), Killeen Road, Ballyfermot, Dublin 10, Dublin
W0045-01	Waste transfer station	Key Waste Management Limited	Greenview, Greenhills Rd., Walkinstown, Dublin 12, Dublin
W0079-01	Waste transfer station	Starrus Eco Holdings Limited	Unit 41, Cookstown Industrial Estate, Tallaght, Dublin 24, Dublin
W0095-01	Waste transfer station	Green Circular Economy Unlimited Company	Waste Management Centre, Knockmitten Lane, Western Industrial Estate, Dublin 12, Dublin
W0152-03*	Waste transfer station	Oxigen Environmental	Robinhood Industrial Estate, Robinhood Road, Ballymount, Dublin 22, Dublin
W0183-01*	Waste transfer station	Starrus Eco Holdings Limited	Millennium Business Park, Grange, Ballycoolin, Dublin 11, Dublin
W0188-01*	Waste transfer station	Starrus Eco Holdings Limited	14B Phase 3, Road 3A, Greenogue Industrial Estate, Rathcoole, Dublin
W0192-03*	Waste transfer station	Rilta Environmental Limited	Block 402, Grant Drive, Greenogue Business Park, Rathcoole, Dublin
W0222-01*	Waste transfer station	Bord Na Móna Recycling Limited	Coldwinters, Blakescross, Lusk, Dublin
W0227-01*	Waste transfer station	Padraig Thornton Waste Disposal Limited	Unit 28, John F Kennedy Road, JFK Industrial Estate, Naas Road, Dublin 12, Dublin
W0263-01*	Waste transfer station	Irish Packaging Recycling	Ballymount Road, Walkinstown, Dublin 12, Dublin
W0272-01	Soil recovery facility	Roadstone Limited	Milverton Waste Recovery Facility, Milverton, Skerries, County Dublin, Dublin
W0277-03	Soil recovery facility	Roadstone Limited	Huntstown Inert Waste Recovery Facility, Huntstown Quarry, Huntstown, Kilshane and Johnstown Townlands, Finglas, Dublin 11, Dublin

*Waste Licence now deemed Industrial Emissions Licence

Source: [EPA Licence portal](#) (accessed 15th November 2022)

15.4.3 Waste and Materials associated with Proposed Development

The principal waste stream produced during construction will be construction and demolition waste (C&D waste). C&D waste will be generated through construction works associated with the OCGT generating unit and demolition/ dismantling of existing legacy ancillary structures in the Contractor's laydown area, temporary control building, stores building, existing reinforced concrete ground slab and existing foundation structures.

ESB have estimated a total of approximately 50,278 tonnes cut and fill material for the proposed development. Table 15.3 and Table 15.4 provide an overview of the volumes of materials for the proposed development. Approximately 19,682 tonnes C&D waste is likely to be generated from the proposed development.

The anticipated tonnage of C&D waste to be generated by the proposed project is 0.23% of the total C&D waste generated in Ireland (in 2020, as described in Section 15.4.2).

A Demolition and Construction Environmental Management Plan (D&CEMP) is provided as Appendix C of this EIAR. A Construction Resource and Waste Management Plan (CRWMP) has been prepared for the proposed development (included as part of the D&CEMP comprising Appendix C of this EIAR) 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 waste classification, reuse / disposal will be undertaken in accordance with the Demolition and Construction Environmental Management Plan and Construction Resource and Waste Management Plan with approval from Dublin City Council.

A Construction Methodology Report has been prepared by ESB (2022), submitted as part of the planning application, which includes details on material use during construction stage as summarised below.

15.4.3.1 Proposed Demolition Works

The following demolition works will be required prior to the construction of the proposed development:

- Existing legacy ancillary structures including blockwork walls and fencing in Contractor's laydown area to south and east of former thermal generating station building;
- Temporary Control Building to the north;
- Babcock Store building to the south east;
- Existing reinforced concrete ground slab to the east;
- Existing foundation structures to the north east; and
- Water tank with water capacity of 3,200m³ to the east.

All waste will be recorded on daily waste logs and brought to a licenced facility. All records will be available on request.

15.4.3.2 Types and Quantities of Materials

For the ground level raising, material geotechnically and chemically suitable for use on site will be sourced from a licenced quarry or from a suitable third-party site. It is anticipated that approximately 2,100m³ of material will be required for these purposes. Foundations will be concrete with ground levels made up with aggregates and floors cast from concrete. Where possible, prefabricated building units will be utilised to minimise on-site building works. If the use of prefabricated buildings is not proposed by the Contractor, a suitable designed traditional masonry block, flat roof, single storey building may be constructed. Cladding and insulation will be fixed, and the buildings will be made weather tight. It is expected the modular electrical containers and the transformers are to be partially completed off-site and potentially delivered as an abnormal load during the construction phase. The modular and factory-built nature of the equipment has been selected to increase resource efficiency by reducing waste generated during the construction process.

During operation, the proposed development will consume gas fuel, lubricating oil and water. Lubricating oils are not replaced frequently, and all waste oil will be recycled through established processes.

In the event that the proposed development needs to be run on the secondary fuel, demineralised water will be required for water injection into the gas turbine to reduce nitrogen oxide (NOx) emissions. The demineralised water will be produced in an on-site water treatment plant using industry-standard technology. The demineralised water will be stored in the proposed demineralised water tank. The treatment plant removes dissolved solids and chlorine from the potable water with a residual effluent. The residual effluent will undergo suitable treatment before it is discharged to the Poolbeg OCGT development surface water drainage system. The existing Poolbeg Generating Station complex currently discharges to the River Liffey Estuary. Further information is provided in Chapter 3 Description of the Proposed Development.

Should the facility be decommissioned there will be waste produced. The plant itself is modular and will be dismantled as a reversal of the construction process. It is anticipated that the majority of materials will be capable of reuse or recycling.

Details of material use for proposed works are provided in Table 15.3, Table 15.4 and Table 15.5.

Table 15.3: Bulk Material during Construction Works

Material – Demolition & Enabling Works	Export (tonnes)	Import (tonnes)
Tarmacadam/Blacktop	390	0
Topsoil	3,120	0
Subsoil: Roads & Foundations	0	0
Subsoil: Services Trenches	1,137.5	0
Stone	0	6,857.5
Concrete	1,755	0
Blockwork	487.5	0
Totals with bulking* applied at 1.3x	8,957	8,914.75
Material – Main OCGT Development Works	Export (tonnes)	Import (tonnes)
Tarmacadam/Blacktop	0	0
Topsoil	0	0
Subsoil: Roads	5,980	162.5
Subsoil: Services Trenches	2,145	0
Stone	0	5,167.5
Concrete	0	5,492.5
Blockwork	0	130
Totals with bulking* applied at 1.3x	10,562.5	14,238.25

*A bulking factor of 1.3x has been conservatively allowed for voiding during the bulk loading of the HGVs.

Source: ESB 2022

Table 15.4: Metal Material during Construction Works

Material – Demolition & Enabling Works	Export (tonnes)	Import (tonnes)
Structural Steelwork	125	0
Totals with bulking* applied at 1.3x	162.5	0
Material – Main OCGT Development Works	Export (tonnes)	Import (tonnes)
Steelwork, plant, cladding, reinforcement	0	5,725

Material – Demolition & Enabling Works	Export (tonnes)	Import (tonnes)
Totals with bulking* applied at 1.3x	0	7,442.5

*A bulking factor of 1.3x has been conservatively allowed for voiding during the bulk loading of the HGVs.

Source: ESB 2022

Table 15.5: Other Materials to be used during Construction, Commissioning and Testing Stages

Material	Site Preparation	Construction	Commissioning and Testing
Fuel	Yes	Yes	Yes
Granular and lightweight fill material	N/A	Yes	N/A
Concrete	N/A	Yes	N/A
Reinforcement steel	N/A	Yes	N/A
Blockwork	N/A	Yes	N/A
Structural steel	N/A	Yes	N/A
Timber	N/A	Yes	N/A
Metal (studwork and finishing elements)	N/A	Yes	N/A
Cladding	N/A	Yes	N/A
Curtain walling	N/A	Yes	N/A
Drainage and service media	N/A	Yes	N/A
Tarmac	N/A	Yes	N/A
Terram (geotextile membrane)	N/A	Yes	N/A
Plasterboard	N/A	Yes	N/A
Pre-cast concrete paving	N/A	Yes	N/A
Waterproof membranes	N/A	Yes	N/A
Plastic ducting	N/A	Yes	Yes
Cabling and service media	N/A	Yes	Yes
Paint and finishing products	N/A	Yes	Yes
Water treatment chemicals	N/A	Yes	Yes
Prefabricated plant	N/A	Yes	Yes
Plastic and Metallic Piping	N/A	N/A	Yes
Inert and Shielding Welding Gases	N/A	N/A	Yes
Nitrogen	N/A	N/A	Yes
CO ₂	N/A	N/A	Yes

Source: ESB 2022

15.4.3.3 Cut and Fill Balance

A summary of expected volume of materials is presented in Table 15.6 and the breakdown of materials is provided in Section 15.4.3.2. These calculations include 2,100m³ of material site raising purposes. The total C&D material to be exported from the site is 19,682 tonnes. It is anticipated that most of the material will be recovered off-site with minimal waste going to landfills.

Table 15.6: Summary of Cut/ Fill Balance (including Bulk Material and Metal Material)

Item	Quantities (tonnes)
Total Cut/ Export (including bulking* applied at 1.3x)	
Demolition & Enabling Works	9,119.5
Main OCGT Development	10,562.5
Total	19,682
Total Fill/ Import (including bulking* applied at 1.3x)	
Demolition & Enabling Works	8,914.75
Main OCGT Development	21,680.75
Total	30,595.5

*A bulking factor of 1.3x has been conservatively allowed for voiding during the bulk loading of the HGVs.

Source: ESB 2022

15.4.3.4 Mineral Resources

As discussed in Chapter 11 Land, Soils and Hydrogeology there are no strategic mineral resources beneath the proposed development site.

Whereas the ideal solution for sourcing the required aggregates for construction of proposed development is to use recycled C&D waste it is likely that some virgin mineral resources will be used. Ireland currently produces 35Mt of aggregates a year¹⁰⁹. It is considered that there are sufficient mineral resources available to allow construction of the proposed project.

Following site clearance, ground level raising is to be undertaken to achieve the required finished levels between buildings and equipment. Material will be locally sourced from a licenced quarry or from a suitable third-party site. 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.

It is anticipated that a maximum volume of 2,100m³ of material will be required for site raising purposes. The material will be imported to site for direct infilling with some short-term stockpiling undertaken to facilitate construction operations where necessary.

15.4.3.5 Hazardous Waste

Details on contaminated land are presented in Chapter 11 Land, Soils and Hydrogeology. The removal and disposal of hazardous substances, if any, from plant and buildings will be undertaken by approved Specialist Contractor in accordance with the IE Licence, the Waste Management Act 1996 and associated regulations.

As detailed in ESB's Construction Methodology Report 2022 (submitted as part of the planning application), any Asbestos Containing Materials (ACM) from plant and buildings will be safely identified and removed by an approved Specialist Asbestos Contractor.

It is anticipated that hazardous wastes like oil, paint etc. will be produced during proposed construction works and during the operation and maintenance phase. These will be disposed of appropriately in accordance with the IE Licence, the Waste Management Act 1996 and associated regulations. The operation and maintenance phase will require replenishment of lubricating oils periodically. These will be classified as hazardous waste if they are disposed of, however it is industry practice to recycle such materials. All hazardous waste will be treated in accordance with the IE Licence, the Waste Management Act 1996 and associated regulations.

¹⁰⁹ Irish Concrete Federation Essential Aggregates Providing for Ireland's needs to 2040.

All fuels and chemicals stored on site will be regulated under the IE licence and will be subject to a COSHH (Control of Substances Hazardous to Health) assessment.

Should the facility be decommissioned there may be minor quantities of hazardous waste produced, however it is anticipated that most materials will be recycled.

15.4.3.6 Municipal Waste

During construction works, domestic type waste (packaging, wood, paper etc.) will be produced at the project site. Should the OCGT ever be decommissioned, similar type of domestic waste is expected during the decommissioning stage.

During operation domestic type waste will be generated from infrequent use of the welfare facilities at the project site, however, this will be limited as the facility is not occupied permanently.

The foul water from the new workshop/admin building area on the southern side of the site is proposed to be discharged into the existing foul water manhole to the southern region across the internal Station Road from the building.

15.4.3.7 On-site Storage and Stockpiling

Any surplus materials created during construction will be stockpiled prior to offsite recycling. Lay down areas have been defined which will be used for storing materials temporarily during construction.

Any separation and storage of materials during operation and maintenance phase will adhere to the conditions of the IE licence. The existing IE licence will be reviewed having regard to the new development.

During decommissioning phase, similar approach to construction phase will be adopted.

15.4.3.8 Waste Arisings and Recovery

The main waste stream arisings (including surplus materials) which are likely to be generated during the construction phase are presented in Table 15.7. The List of Waste (LoW) codes are identified using the EPA publication Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-hazardous (2019). A breakdown of these quantities is provided in Table 15.3 and Table 15.4.

Table 15.7: Waste Types and Associated LoW Codes

LoW Code	LoW Description	Material	Quantities (tonnes) with bulking applied at 1.3x*
17 03 02	Bituminous Mixtures	Tarmacadam/Blacktop	507
17 05 04	Soil and stones other 17 05 03	Topsoil	4,056
17 05 04	Soil and stones other 17 05 03	Subsoil: Roads & Foundations	7,774
17 05 04	Soil and stones other 17 05 03	Subsoil: Services trenches	4,267.25
17 01 01	Concrete	Concrete	2,281.5
17 01 02	Bricks	Blockwork	633.75
17 04 05	Iron and Steel	Structural Steel	162.5
Total			19,682

*A bulking factor of 1.3x has been conservatively allowed for voiding during the bulk loading of the HGVs.

Source: ESB 2022

The estimated quantities for recovery, recycling and disposal are listed in Table 15.8.

Table 15.8: Estimated Quantities for Waste Management

Category	Quantities (tonnes)	Percentage of Total Export
Recycle	162.5	<1%
Recovery	19,012.5	97%
Disposal	507	3%

Source: ESB 2022

It is envisaged that majority of C&D material will be taken for recovery to a licenced facility as shown in Table 15.8. Only minimal quantities will be taken to landfill for disposal. Wastes generated during construction have been minimised by adopting a modular construction system with most construction occurring offsite. Wastes generated during construction and demolition will be segregated, classified and disposed of off-site in line with the existing Industrial Emissions licence for Poolbeg Station, EPA Licence Reg. No. P0577-04.

All waste arising from the site will be managed in a way that ensures the provisions of the Waste Management Act 1996 and associated amendments and regulations are applied and fully complied with. The appointed Contractor will develop a detailed Construction Resource and Waste Management Plan in accordance with the principles prescribed in the D&CEMP.

All waste generated during the operation and maintenance 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 IE licence, the Waste Management Act 1996 and associated regulations.

Waste generated during decommissioning phase will follow a similar approach as the construction phase. All waste arising from the site will be managed in a way that ensures the provisions of the Waste Management Act 1996 and associated amendments and regulations are applied and fully complied with.

15.5 Likely Significant Impacts

15.5.1 Do-Nothing

If the proposed development does not proceed, the existing infrastructure will remain as is. The proposed gas turbine technology facilitates fast plant start-up durations and can provide response capabilities in a timely fashion to support sudden fluctuations in electricity demand on the electricity grid.

15.5.2 Construction Phase

For the provision of the underground cable, trenching will be required during construction phase. There is potential for disruption to services during construction works, however these will be localised and brief in duration. All reasonable measures will be taken to avoid unplanned disruptions to any services during the proposed works. Service disruptions impacting the surrounding properties will be kept to a minimum, only occurring where unavoidable. Prior notification of disruptions will be given to all impacted properties. This will include information on when disruptions are scheduled to occur and the duration of the disruption. Consultation with relevant neighbouring parties will be undertaken prior to any proposed disruptions. The impacts associated with the road network are discussed in Chapter 14 Roads and Traffic. Therefore, the proposed development will result in temporary imperceptible effects on built assets and services.

The modular and factory-built nature of the equipment ensures resource efficiency by reducing waste generated during the construction process. The anticipated tonnage of C&D waste to be generated by the proposed project is 0.23% of the total C&D waste generated in Ireland. It is expected that majority of waste generated will be recycled or recovered off site in accordance with the Demolition and Construction Environmental Management Plan, Construction Resource and Waste Management Plan and regulatory requirements. The steel arising from the demolition works will be loaded into skips on-site and removed to a pre-agreed recovery facility. All waste will be managed in line with requirements of the IE Licence, the Waste Management Act 1996 and associated regulations. Therefore, waste associated with construction activities will result in short-term slight effects.

15.5.3 Operation and Maintenance Phase

During operation and maintenance phase, water supply will be required for welfare facilities. This supply will come from the designated metered connection currently supplying the Poolbeg OCGT. The proposed development will not impact on any other utilities during the operation and maintenance phase. The impacts associated with road network during operation and maintenance are presented in Section 14 Roads and Traffic. The proposed development will have temporary imperceptible effects on built assets and services during operation and maintenance phase.

The residual effluent released during production of demineralised water, in the event that the plant is required to operate on backup fuel, will be managed by undergoing suitable treatment before it is discharged to the Poolbeg OCGT development surface water drainage system. This discharge will be regulated under the IE Licence. Alternative arrangement for the management of this wastewater will be made if advised by the Environmental Protection Agency and/or IE Licence requirements. In case of emergency, a shutdown valve will be provided at the discharge point from the treatment plant before entering the proposed drainage network.

Operation of the proposed development will not generate significant amounts of waste nor use significant amounts of materials, apart from gas fuel, lubricating oil and water. Lubricating oils are not replaced frequently, and all waste oil will be recycled through established processes in line with requirements of the IE Licence, the Waste Management Act 1996 and associated regulations. The welfare facilities will generate domestic type waste; however, this will be limited as the facility is not occupied permanently. Any such waste will be managed in line with requirements of the IE Licence, the Waste Management Act 1996 and associated regulations. Therefore, waste associated with operation and maintenance activities will result in temporary imperceptible effects.

Once the OCGT is operational, it will reduce the reliance on burning peat, coal and oil for power generation which will have a beneficial effect, reducing mineral extraction. This will result in a positive significant effect.

15.5.4 Decommissioning Phase

Should the OCGT ever be decommissioned, there will be waste generated. It is anticipated that most materials will be capable of reuse or recycling and there are established recycling markets in Ireland to process these materials. It is more likely that the facility will continue to operate and worn out components will be replaced as required. A Decommissioning Management Plan (DMP) will be prepared in accordance with the IE licence application and reviewed annually.

The waste arising during decommissioning phase is anticipated to be similar to construction waste. The equipment is modular and will be dismantled as a reversal of the construction process. It is anticipated that most materials will be capable of reuse or recycling. Any such waste will be managed in line with requirements of the IE Licence, the Waste Management Act 1996 and associated regulations.

The built assets, services and waste impacts associated with the decommissioning phase will be similar to the impacts associated with the construction phase.

15.6 Cumulative Effects

Estimates of the volumes of waste arising amount to some 0.23% of the total annual production of C&D waste in Ireland. There is a well-established recycling industry for these waste streams within Dublin and so it is considered that there are no significant cumulative effects on waste.

The OCGT plant will use demineralised water produced from potable water supplies. There is sufficient capacity within the established water supply network to provide this water and current EPA licensing of the discharge to River Liffey Estuary provides sufficient capacity to accommodate the additional discharges associated with Poolbeg. A revision of the existing licence for Poolbeg will be required which will set discharge limits which will have no significant effect on the environment. No cumulative effect is anticipated from the use of de-mineralised water. Therefore, it is considered that there are no significant cumulative effects on waste.

15.7 Mitigation Measures and Monitoring

Prior to commencement of the development, the appointed Contractor will implement the CRWMP (included as part of the D&CEMP comprising Appendix C of this EIAR).

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.

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 D&CEMP.

The D&CEMP will be available for inspection at all reasonable times for examination by the Local Authority.

15.8 Residual Impacts

The adoption of mitigation measures listed above will result in temporary imperceptible effects on material assets due to the proposed development.

Through the adoption of these technologies (OCGT plant) to support renewable power generation it will be possible to reduce the reliance on burning peat, coal and oil for power generation which will have a beneficial effect, reducing mineral extraction. This will result in a positive significant effect.

16 Major Accidents and Disasters

16.1 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.

16.2 Policy and Guidance

16.2.1 Legislation

EIA Directive 2014/52/EC 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 (13) and Council Directive 2009/71/Euratom (14), or through relevant assessments carried out pursuant to national legislation provided that the requirements of this Directive are met”.

16.2.2 Guidance

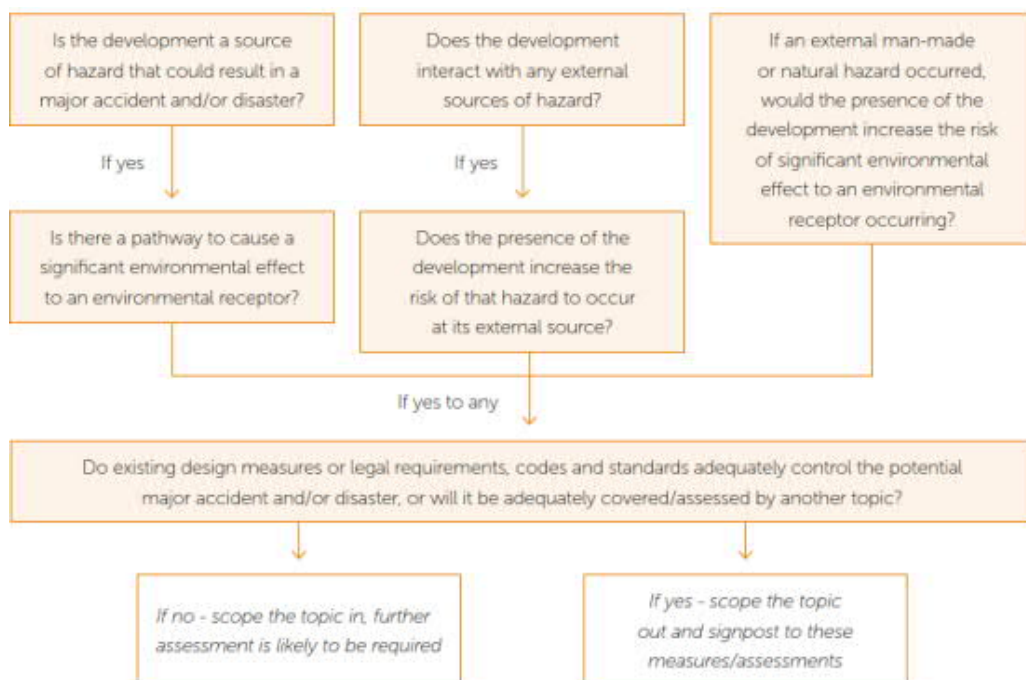
For the purpose of this assessment the following definitions, defined in the Institute of Environmental Management and Assessment (IEMA) document Major Accidents and Disasters in EIA: A Primer (September 2020), are used:

- 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.

16.3 Methodology

The methodology applied is based on the scoping decision process flow provided in Figure 16.1 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 16.1: Scoping Decision Process Flow



Source: Major Accidents and Disasters in EIA: A primer (IEMA, Sept 2020)

16.4 Receiving Environment

The Poolbeg Generating Station complex operates, and will continue to operate, under the existing Industrial Emissions licence (Registration Number: P0577-04), regulated by the EPA.

Should the application for planning consent be successful, an application to the EPA for a licence review of this existing licence will be progressed to incorporate Poolbeg OCGT within the IE licensed boundary of Poolbeg Generating Station.

The proposed Poolbeg OCGT is located within consultation distance of the National Oil Reserves Agency Ltd. (NORA) fuel storage establishment located to the north which is notified to the Health and Safety Authority (HSA) as an Upper Tier Seveso site and is subject to the provisions of the Chemical Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S.I 209 of 2015).

The secondary fuel will be stored within the existing bunded Poolbeg fuel oil tank farm which owned by ESB but leased to NORA. The fuel oil tank currently has 2no oil tanks with a capacity of 16000m³ and a water storage tank. The existing water storage tank will be dismantled and planning permission is being sought of the construction of a third fuel storage tank with a capacity of 8000m³ located on the existing bund. Two smaller replacement water tanks with a total capacity of 3800m³ will also be constructed. The combined storage of the fuel tanks will provide the required diesel to operate the proposed OCGT on full load for 72 hours with spare capacity. The operational control of the oil tanks lies with NORA and excess capacity will be available to the National Oil Reserve Agency.

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

A list of chemicals expected to be stored on site is provided in Section 3.9.7.

16.5 Likely Significant Impacts

Table 16.1 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.

Table 16.1: 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 <i>directly adjacent to Dublin Bay</i> . 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 sea.	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 proposed levels of the development lie in the range of 3.5-4.56moD (Source ESB) 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 10.
Fire					
OCGT Plant	A generator fire resulting in emission of smoke and fumes	There will be a comprehensive fire detection and fire-fighting system on the site Heat, fire and gas detection systems will be incorporated as appropriate to the fire risk. Where required, flame detection will also be installed. Firefighting on site will predominately be carried out by manual fire suppression using the fire water hydrant network on site. Portable extinguishers appropriate to the fire risk will be sited at readily accessible fire points throughout the site. All	No	Yes	No 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
		switchgear rooms, relay rooms, communications rooms, cable basements, cable tunnels and the control room, will be provided with induced draught smoke/heat extraction fans as appropriate., A combined fire water and process water storage tank of approximately 2649m3 will be installed on site.			
The proposed transformer on site could fuel a fire	A transformer fire resulting in emission of smoke and fumes and rupture of the transformer tank with loss of oil into the bund below	The transformer has a containment bund which will retain any leakage oil. The likelihood of such an event is very rare. As the event is unlikely to occur for a long enough period of time to result in exceedances of the long or short-term averaging periods of the air quality standards, these events are not considered to be a significant source of emissions so have not been considered further	No	Ye	No likely significant adverse effects . Discussed separately in the Landuse Planning Report provided in Appendix D.
Extreme temperature (heat,wave, 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

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
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	All equipment to be designed in compliance with latest safety in design requirements. Access will be carefully controlled and allowed only for trained and competent persons	No	Yes	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	Road and Traffic are discussed in Chapter 14
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	None. Major accident / disaster unlikely	Not applicable	Not applicable	Not applicable	No 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
also does not generate interaction with animals. Construction phase activities will be carried out in accordance with Government guidelines					
Malicious attacks/cyberattack					
The proposed development will feed into Ireland's electrical transmission grid and could be subject to malicious physical or cyber attack	Damage would likely be limited to disruption of the generator's ability to operate until the damage was repaired	The site is secured by high fences with security gates, operated by security personal.	No	Yes	No likely significant adverse effects. Loss of functionality to the proposed development only, no environmental impacts
Contaminated land Groundwater					
Foundations for the gas turbine generators will be adjacent to the groundwater table.	Release of hydrocarbons to the receiving environment	Foundations will be constructed above the water table to avoid impacts on groundwater	No	Yes	Land, soils and hydrogeology is discussed in Chapter 11
Spillage or seepage of pollutants into watercourse/ground					
The proposed plant will operate mainly on natural gas. Secondary fuel is diesel oil. All chemicals and oils will be stored in suitably bunded areas and with weather protection	Oil seepage into the ground which could lead to contamination of the soil and waterways	The transformer bund and tank bunds are sized to collect the full volume of oil from the transformer. The bunds will be subject to annual integrity tests in line with the IE licence	No	Yes	Surface Water is discussed in Chapter 10 Land, Soils and Hydrogeology is discussed in detail in Chapter11
As the cables are solid insulation type there are no sources of pollution and	None. Major accident / disaster unlikely	Not applicable	Not applicable	Not applicable	Not applicable

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
they will not offer a pathway to any receptor					

16.6 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 Demolition and Construction Environmental Management Plan (D&CEMP) to ensure minimal impacts relating to Major Accidents and/or emergencies.

16.7 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.

17 Interaction of Effects

17.1 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.

17.2 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 17.2.

Table 17.1: Interaction of Effects

Interaction of Effects between the Factors	Interaction of Effects between the Factors											
	Population & Human Health	Air Quality	Climate	Noise & Vibration	Biodiversity	Surface Water & Flooding	Land, Soils & Hydrogeology	Architecture, Archaeology & Cultural Heritage	Landscape & Visual	Roads & Traffic	Material Assets including Waste	Major Accidents & Disasters
Population & Human Health												
Air Quality												
Climate												
Noise & Vibration												
Biodiversity												
Surface Water & Flooding												
Land, Soils & Hydrogeology												
Architecture, Archaeology & Cultural Heritage												
Landscape & Visual												
Roads & Traffic												
Material Assets including Waste												
Major Accidents & Disasters												

Table 17.2: Interaction of Effects – Description

Interaction or Indirect Effect	Description
Population and Human Health Interactions with: Air Quality, Climate, Noise and Vibration, Landscape and Visual, Roads & Traffic, Material Assets including Waste and Major Accident & 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 6 of the EIAR. The main potential impact relates to dust generation arising during construction activities. The potential impacts for dust soiling have been assessed in Chapter 6 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. The proposed development's process contribution (PC) is less than maximum allowable process contribution (MAPC) for the 1-hour NO₂, annual mean NO₂ and 8 hour rolling CO averaging periods. Baseline concentrations (BC) assumed for the assessment are relatively high, however the predicted environmental concentrations (PEC) do not exceed 70% of the AQS. Overall, the proposed development's maximum modelled PC and PEC for both the short-and long term averaging periods are not likely to cause a significant effect. 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. Should the application for planning consent be successful, an application to the EPA for a licence review of this existing licence will be progressed to incorporate the Poolbeg OCGT within the IE licensed boundary of Poolbeg Generating station complex. Climate: A Climate assessment was carried out, presented in Chapter 7 of the EIAR. . The proposed development's purpose is to provide additional generating capacity during periods of high demand or when renewable energy sources cannot meet demand. This development will facilitate the increased use of renewable energy technologies by providing energy to the national grid during periods when the energy available from the renewable technologies is insufficient. Therefore, the generation of electricity will be a positive effect for the population. The proposed development will use natural gas as a fuel with a back up of diesel which will result in significant annual GHG emissions which will not contribute to the set national targets and sectoral targets discussed in Chapter 7 Noise and Vibration: There is the potential for interactions between population and noise. This interaction has been discussed in Chapter 8 of this EIAR which concluded that significant adverse effects due to construction or operational noise are not likely due to the distance between the site and noise sensitive receptors. Landscape and Visual: There is the potential for interactions between population and human health and the landscape. This was assessed in Chapter 13 with the assessment concluding that the proposed development will not give rise to significant landscape and visual impacts Roads & Traffic: During construction, there will be a temporary increase in traffic levels and potential impacts on the local community. The number of vehicles on roads associated with the proposed development is likely to increase during the construction phase due to the movement of materials and workforce to the works areas. During construction traffic will be managed in accordance with the Traffic Management Plan to ensure minimal disruption to local receptors. During operation, the Poolbeg OCGT development will operate as required by the demands placed on the grid and the generating capacity available at any time. During operation, the facility will be unmanned with weekly site inspections, meetings and maintenance works. Disturbance will be minimal and will be limited to within the ESB Poolbeg Generating Station Complex. Surface Water & Flood Risk: Surface Water: The main interaction between Population & Human Health and Water Quality 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 the OCGT has been undertaken in Chapter 10. 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 Poolbeg OCGT site is located approximately 20m from the sea in Dublin Bay at its outermost boundary. 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 the OCGT is determined to be negligible therefore the risk to human health is considered low. Land, Soil 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 11, 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. 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 D&CEMP. In circumstances where the appropriate mitigations measures identified in Chapter 11 are fully implemented the impact of the proposed development will be imperceptible. Material Assets & Waste: The main interaction between Population & Human Health and Material Assets & Waste relates to the potential impact of the generation of C&D waste during construction activities (Demolition, Earthworks etc) and the removal of Construction and Demolition Waste from site. The peak period for construction traffic generation will occur during the period between Q1 2025 and Q3 2026. As outlined in Chapter 15, 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 D&CEMP. In circumstances where the appropriate mitigations measures identified in Chapter 11 are fully implemented the impact of the proposed development will be imperceptible. Major Accidents & Disasters: The proposed development is located within the consultation distance of the NORA fuel storage establishment which is notified to the HSA as an Upper Tier Seveso site and is subject to the provisions of the Chemical Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S.I 209 of 2015). The proposed development has been subject to a Land Use Planning Assessment in accordance with the HSA Guidance. The Land-Use Planning Assessment concluded that the NORA facility does not have an impact on the proposed development. Furthermore, it is not anticipated that the major accident scenarios at the proposed OCGT development will cause a major accident at the NORA facility. 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.
Air Quality interactions with: Roads and Traffic and Biodiversity	Roads & Traffic: An inter-relationship link between Roads and Air Quality exists. The main potential impact relates to dust generation arising during construction activities. The potential impacts for dust soiling have been assessed in Chapter 6 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. Biodiversity: There is potential for interactions between air quality and biodiversity. This interaction is discussed in Chapter 9 of the EIAR. It notes the potential impacts resulting from the generation of construction dust on sensitive receptors. However, the overall risk of dust soiling effects from the construction phase is deemed to be 'low' for demolition and trackout, and 'medium' for earthworks and construction, whilst for PM₁₀ health effects, the overall risk is deemed to be 'negligible' for demolition and 'low' for earthworks, construction and trackout. The

	proposed development will have no likely effects on winter birds due to dust. In summary, there is no potential for dust to result in significant negative effects on Key Ecological or other ecological receptors.
Noise & Vibrations Interactions with: Biodiversity and Archaeology, Architectural and Cultural Heritage	Biodiversity: There is the potential for interactions between Biodiversity and Noise and Vibration. The facility will generate noise during operation. The predicted operation noise for the Poolbeg OCGT indicates that slightly elevated noise levels will be highly localised and contained within the site. Thus, there is no potential for significance disturbance during the operation of the facility. As with any construction project, there is still however potential for adverse impacts associated with the natural environment and nuisance (such as noise emissions and traffic). The potential for these effects is discussed separately within the respective chapters of this EIAR. Construction noise has the potential to temporarily disturb birds; this is assessed in chapter 9 of this EIAR and it is concluded that proposed development is unlikely to impact significantly on biodiversity. No effects are likely to ecological receptors due to construction vibration. The mitigation measures outlined in the EIAR will be implemented to minimise disturbance to sensitive receptors. Archaeology, Architecture and Cultural Heritage: The proposed development site occurs directly adjacent to Poolbeg Chimneys. There is potential for vibrations caused by the surrounding development to impact on the integrity of the structures. Although the predicted impact of vibration is below harmful levels, care will need to be taken to ensure that real world vibrations remain at safe levels. During the phases of piling that are closest to the Poolbeg Power Station towers, monitoring of sensitive structures will be undertaken to ensure that real world vibrations remain within safe levels. Cranes should preferably be sited where their operation will avoid the possibility of accidental damage to the Poolbeg Power Station Chimneys or the retained administration building within the Poolbeg power Station. Operations will be planned and monitored accordingly to avoid any risk of impact to the buildings
Surface Water and Flooding Interactions with: Biodiversity and Climate	Biodiversity: There is the potential for interactions between Biodiversity and Surface Water resources. 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 run off which may enter unprotected drains. Polluting matter entering drains has the potential to discharge to either Dublin Bay to the south and the Liffey Estuary to the north. The magnitude of any such pollution incidents is likely to be small/ Moderate, presenting a significant profound adverse impact of temporary duration on Dublin Bay and the Liffey Estuary prior to implementation of mitigation measures. This interaction has been assessed in Chapter 9 and chapter 10 of this EIAR. 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. During Operation, there will be two new SW discharge points adjacent to each other. These discharge points will be operated and maintained in compliance with the Industrial Emissions Licence (IEL) with associated sampling requirements to be conditioned by the EPA. All chemicals and oils will be stored in suitably bunded areas and with weather protection. The effects of drainage on biodiversity are considered to be imperceptible. Climate: The impact of climate change on hydrology increases the potential for future flood risk, the latest climate change guidance was carried when considering the potential impact of the future climate change on flood risk and drainage design within the Poolbeg Generating Station Complex. A Flood Risk Assessment (FRA) report of the proposed development site has been prepared by ESB (ESB P000422-01-CE21-R004-00). 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 F1 of this EIAR. The FRA takes into account the potential impact of climate change under the CFRAM mid-range future scenario. Under the Mid Range future Scenario, 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).
Lands, Soils and Hydrogeology Interactions with: Material Assets including Waste	Material Assets including Waste: 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 10 Water and Flood Risk and Chapter 11 Land, Soils & Hydrogeology and the Demolition and Construction Environmental Management Plan of

	this EIAR. As outlined in Chapter 15, 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 D&CEMP. In circumstances where the appropriate mitigations measures identified in Chapter 11 are fully implemented the impact of the proposed development will be imperceptible.
Archaeology, Architecture and Cultural Heritage Interaction with: Material Assets including Waste	Material Assets including Waste: 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. The impacts of the proposed development on cultural heritage has been assess and mitigation measures recommended. Ie. Should groundworks exceed the depth of the post-1958 infill, then a suitably qualified archaeologist shall undertake archaeological monitoring of these works under license to the National Monuments Service Section of the Department of Housing, Local Government and Heritage. Should any archaeological material be encountered mechanical excavation will cease and the City Archaeologist and National Monuments Service shall be notified. Further work will then only be carried out following consultations with the City Archaeologist and the National Monuments Service. The implementation of these measures will ensure that such impacts are minimised.

18 Summary of Mitigation Measures

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 18.1 where following are provided:

- A unique reference number for each item;
- The section of the EIAR where the mitigation measure is referenced; 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 D&CEMP, and the methods, monitoring and mitigation included in this EIAR.

Table 18.1: Summary of Mitigation and Monitoring Measures

Reference	Mitigation and / or Monitoring Measure
Chapter 5 Population and Human Health	
5.1	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.
5.2	A Demolition and Construction Environmental Management Plan (D&CEMP) is included in Appendix C of this EIAR. The D&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.
5.3	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 D&CEMP and Demolition and Construction Traffic Management Plan (included as part of the D&CEMP comprising Appendix C of this EIAR). 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 6 Air Quality	
6.1	Communication and Site Management • Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. • Display the head or regional office contact information. • It is recommended that community engagement be undertaken before works commence on site explaining the nature and duration of the works. • Record all dust and air quality complaints, identify causes and take appropriate measures to reduce emissions in a timely manner and record the measures taken. • Make a complaint log available to the planning authority, when requested. • 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.
6.2	Monitoring • Carry out regular site inspections, record inspection results and make an inspection log available to the planning authority, when requested. • 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. • Preparing and maintaining the site. • Plan site layout so that machinery and dust causing activities are located away from receptors as far as possible. • Erect solid screens or barriers around dusty activities or the construction site boundary that are at least as high as any stockpiles. • Avoid site runoff of water or mud. • Keep site fencing, barriers and scaffolding clean using wet methods.

Reference	Mitigation and / or Monitoring Measure
	- 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 reused on site, cover as described below. - Cover, seed or fence stockpiles to prevent wind whipping. - Ensure all vehicles switch off engines when stationary - no idling vehicles. - Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment, where practicable.
6.3	Operations - Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction. - Ensure an adequate water supply on the site for 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 available. - 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. - No bonfires and burning of waste materials.
6.4	Measures specific to demolition - Ensure effective water suppression is used during demolition operations. - Avoid explosive blasting, using appropriate manual or mechanical alternatives. - Bag and remove any biological debris or damp down such material before demolition.
6.5	Measures specific to construction Ensure sand and other aggregates are stored in designated areas and ensure that appropriate control measures are in place.
6.6	Measures specific to trackout - Avoid dry sweeping of large areas. - Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport, where practicable. - Record all inspections of haul routes.
6.7	During its operation, 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.
Chapter 7 Climate	
7.1	GHG Emissions - Carefully evaluate plant design options and technology specification to ensure final plant design delivers in efficiency and performance, consequently reducing the amount of fuel consumed and GHG emissions released once the plant is in operation. - Where possible, specify electrical equipment without SF6 insulation gas. When not possible, ensure all SF6 containing equipment complies with or exceeds applicable European and national legislation to minimise leakage.

Reference	Mitigation and / or Monitoring Measure
	- Where possible, minimise the quantity of materials used, and aim to reuse and or repurpose local materials instead of procuring or importing new ones. For example, consider if some of the materials from the decommissioning of the existing site can be used in enabling works, rather than disposed of to landfill; - Where possible use low carbon materials. This is of particular importance for high embodied carbon materials such as steel, and materials used in large quantities like concrete. - Notwithstanding the above, it is important to consider the durability of materials or equipment and their maintenance, replace and refurbishment requirements over the project life. Selection should aim to reduce the overall project climate impact, not only the embodied carbon when constructed. - Where possible, minimise transport distances and select low carbon transport methods such as shipping or train transportation. - Select energy efficient construction materials and vehicles, ensure rational use to minimise emissions. - Ensure the climate mitigation measures within the D&CEMP are applied. - Minimise the use of diesel during plant operation. Diesel emissions per unit of energy output are greater than natural gas emissions, therefore this fuel should be avoided whenever possible. - Ensure maintenance and operation procedures are followed as per design and manufacturer specifications to ensure maximum efficiency of plant is achieved. This minimises the amount of fossil fuel required to achieve a defined power output. - Continuously monitor OCGT plant performance parameters to ensure operation in optimal efficient conditions. - Monitor stack emissions and report plant GHG emissions on a regular basis, continuously look for options to reduce emissions. - Review on a regular basis the availability and feasibility of deploying low carbon fuels and implement when feasible. For example, biomethane or green hydrogen might become available and feasible to implement in the medium to long term. - If high voltage switchgear with SF6 as insulation gas is installed, ensure monitoring and adequate maintenance to prevent leakage. - Include all monitoring and mitigation measures proposed above in the project Demolition and Construction Environmental Management Plan (D&CEMP). - The final disposal route for the decommissioned materials should be such that materials are wherever possible reused and repurposed, or recycled, with disposal to landfill only as a last alternative.
7.2	Climate Resilience - Reviews of the flood risk at the site will be carried out at the next design stage to consider whether further increases in allowances for climate change are required, including as part of a review of drainage and flood prevention system, and requirements for further mitigation. Mitigation may consider the use of nature-based solutions, such as vegetation planting to slow surface flows, where feasible. - If additional emergency access and egress routes are not viable, the next stage of design will consider implementation of wet weather management plans and provisioning of temporary flood defences and procedures and ensure staff training for dealing with hazardous weather conditions. - Flood risk reviews at the next design stage will consider upgrading site drainage to prevent water ingress into plant and tanks. - Mitigation during the operational phase will include periodic inspections and maintenance of storage tanks and transfer pipes. - Flood risk reviewed at the next design stage will consider runoff routes for rainfall to prevent scour of pipework and plant. - At the operational phase, periodic inspections and maintenance will be carried out of assets that may be potentially affected, to include monitoring of deterioration of equipment and structures. - Consideration of placing pipework below ground will be carried out during the next design stage.

Reference	Mitigation and / or Monitoring Measure
	- The next stage of design will consider climate changes to precipitation as part of the management of runoff, to prevent risks of further contamination due to increased rainfall intensity due to climate change. - Increase monitoring of the discharge water as the climate changes and consideration of methods to cool the water prior to discharge if frequent breaches occur. - The geotechnical assessments at the next stage of design will consider future ground conditions, temperature and rainfall when designing new foundations and specifications of foundation depth. - Monitoring during the operational phase will include ground movements and repair when necessary. - The next stage of design will consider plans for alternative (emergency) water sources available on a short term basis, and will also consider avoiding the inclusion of water-cooling system or replacement with an air cooling, a dry cooling, or a circulating system to improve equipment performance during droughts. - The next stage of design will consider the design of key or critical elements using materials with higher temperature threshold specification. - The operational phase will include monitoring deterioration of equipment and structures. - During the construction phase, monitoring and adjustment of the curing process of the concrete for new structures will be carried out to minimise risk of future high temperatures on the deterioration rate of the structure. - The operational phase will include monitoring deterioration of structures. - The next stage of design will include the appropriate design of offices and administration buildings to remain cool in high temperatures, including passive cooling to avoid the need for mechanical cooling (air conditioning). - New structures and machinery will be designed to a higher temperature threshold specification to avoid maintenance requirements at hottest parts of the day. - A review will be carried out at the next design stage to ensure changes to ambient air temperatures due to climate change will not affect acceptable emission concentrations. - Emission levels and air quality will be monitored and if levels become significant, an Air Pollution Plan will be implemented. - The next design stage will identify bedding/material that is suitably resistant to temperature fluctuations, such as gravel casing to around vulnerable pipes, plus pipes and cables with material resistant to freezing conditions. - The next stage of design will include design of structures to withstand wind loads that account for future climate changes. Additionally, where possible the design will include locating any sensitive new structures in sheltered areas to act as a barrier against high winds. - Lightning risk is typically considered within plant design and will utilise earthed shielded copper cabling - Use of an appropriate hazardous weather plan during construction and operation to ensure staff health and safety when working in or following hazardous conditions - The next stage of design will consider any additional mitigation needed to protect transmission infrastructure, or to allow for its ease of repair following storm events.
Chapter 8 Noise and Vibration	
8.1	Monitoring of vibration during piling with the potential to affect nearby buildings/structures should be based on ppv and may require time histories to be acquired. The measured levels should be compared with the threshold values given in Table 8.3 of the EIAR. The preferred positions to measure are low down on the structure with the transducers fixed at or within the outer wall of the foundation. In the case of horizontal vibration, amplification arises in buildings and tends to increase with building height. Vertical vibration will result in higher vibration levels in suspended floors/elements at mid-span positions. The measurement chain should be calibrated and traceable to national standards within an accredited calibration laboratory no more than two years before any valid measurement.

Reference	Mitigation and / or Monitoring Measure
Chapter 9 Biodiversity	
9.1	Environmental Clerk of Works (EnCoW) - An EnCoW will be appointed to ensure that the mitigation measures outlined in this document and any associated Method Statements are implemented in full. The EnCoW will have suitable environmental qualifications and experience. The EnCoW will be managed by the building contractor with oversight by the owners Engineer/ ESB. - The EnCoW will oversee monitoring during the construction phase of the project and will ensure that works are being carried out in accordance with the agreed Contractor's D&CEMP, method statements, safety procedures and any planning conditions associated with the consent etc. A Senior Resident Engineer will also be appointed by ESB to liaise with the landowners (if required) in the development works area. - The EnCoW with the Resident Engineer (as required) will ensure that the contractors on the site are informed and managed in relation to the following; - Installation of noise reducing hoarding is done correctly and to a sufficient standard (see measure 9.3 below). - Are informed and made aware of the ecological sensitivities of adjacent areas including; the coastal environment, nearby Peregrine nesting sites and the nearest (off site) Japanese Knotweed (Schedule 3 invasives) growing areas that will need to be avoided. - Ecological sensitivities will be communicated to contractors through an initial tool box talk and through ongoing communication/ site presence. - 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 be responsible for consultation with environmental bodies including the National Parks and Wildlife Services (NPWS). The EnCoW will be responsible for carrying out regular monitoring of the Contractor's D&CEMP. - If works do not start for at least two years following planning consent then a schedule 3 invasive survey will be required on the site to ensure no Japanese Knotweed in particular has established. Updated adaptive mitigation will be required if a survey records this species and this would be managed by the EnCoW.
9.2	Water Pollution Controls 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. - Providing impermeable mats (plastic sheeting) as covers to mounded excavated material and open excavations during periods of heavy rainfall. - 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.
9.3	Disturbance to Birds and Marine Mammals - To minimise disturbance, noise reducing hoarding will be erected around the northern edge of the proposed development sites if works are proposed during the wintering season (September-April inclusive). - Further to this it is proposed that following detailed design and geological investigation works on ground conditions, there will be clarity on locations where piling (and associated increased vibration/ noise) will arise. At these locations noise hoarding will be installed locally around the works area. The noise hoarding barrier material will have a mass per unit area exceeding 7kg/m² in accordance with the recommendations of BS 5228 Part 1:2009+A1:2014 Part B.4. There will be no gaps at the joints, for example, plywood panels with a minimum thickness of 13mm would achieve this. The length of a barrier is typically at least five times greater than its height. A shorter barrier is bent round the noise source. The minimum height of barriers will be such that no part of the noise source will be visible from the receiving point. The barrier is therefore likely to be at least 2m high.

Reference	Mitigation and / or Monitoring Measure
	The site engineer in consultation with the EnCoW will ensure that piling locations have noise hoarding set up correctly in advance of piling works commencing and this will be monitored by the site EnCoW to ensure it is effective, and for example no gaps exist in the hoarding that reduce their effectiveness.
9.4	Water Pollution Runoff - During the operational phase of the proposed development surface runoff collected from proposed roads, parking areas, concrete areas and bunded areas will be collected in a new underground drainage network and conveyed into a proposed Klargestor NSFA 200 Full Retention Separator and then to the proposed attenuation tank located in the northern region of the site. The clean rainwater runoff collected from the proposed buildings' roofs will connect to the attenuation tank, bypassing the oil separator. - In order to provide for treatment of surface water generated in the bunds, it is proposed to install an 'Entexol SCS001' or equivalent approved oil sensitive bund dewatering system with a 1 litre per second low shear vortex pump with oil separation detection within each bund. The bund dewatering system will be fitted with a high oil level alarm and will be connected back to the station control panel. - Should the application for planning consent be successful, an application to the EPA for a licence review of this existing licence will be progressed to incorporate Poolbeg OCGT within the IE licensed boundary of Poolbeg Generating Station.
Chapter 10 Surface Water Resources and Flooding	
10.1	An Environmental Clerk of Works (EnCoW) will be appointed prior to commencement of works.
10.2	Construction activities will be managed to prevent impacts to surface waters: concrete wash water will be retained on site and prevented from entering drains; 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 run-off and protecting drains.
10.3	All construction works will be carried out in accordance with the D&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.
10.4	Concrete will be brought to site by covered truck. Wet concrete operations adjacent to watercourses will be avoided where possible.
10.5	The Contractor will ensure that all concrete truck wash watering / cleaning is undertaken offsite where possible and remote from watercourses.
10.6	Silt fences (to Hy-Tex Premium specification or similar) and silt traps will be installed prior to commencement of works and will be inspected daily to inform adaptive management as required. The locations of same will be determined by the EnCoW.
10.7	Where works on other projects within the same study area 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.
10.8	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.
10.9	In order to reduce the risk of contamination arising as a result of spills or leakages, 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; - Fuels, chemicals, liquid and solid waste will be stored on impermeable surfaces;

Reference	Mitigation and / or Monitoring Measure
	- 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 underground cable installation works.
10.10	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.
10.11	The proposed development will be decommissioned in accordance with the Decommissioning Management Plan (DMP), under IE licence P0577. In accordance with IE licence P0577, the DMP will be reviewed on an annual basis and updated as necessary.
Chapter 11 Land, Soil and Hydrogeology	
11.1	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 on a daily basis. In the event of unforeseen contaminated land being encountered, the Contractor will refer to Section 14.14 of the ESB publication Employer's <i>Minimum Environmental Requirements for Construction and Demolition Projects and Related Works and Activities</i> (2022).
11.2	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 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 D&CEMP in Appendix C
11.3	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 areas where contaminants cannot leach into the underlying ground.
11.4	Asbestos Containing Materials (ACM), if encountered, will be stored separately from other contaminated material to prevent mixing of asbestos with other contaminated materials.
11.5	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.
11.6	During construction the contractor will implement the D&CEMP which will set out control measures and procedures to ensure potentially polluting activities are controlled and managed. These measures will include 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 wash water will be collected and disposed of in accordance with the Waste Management Act 1996, as amended - 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 escaping and entering drains; - Any spillages will be cleared immediately by excavating and disposing of affected soils in accordance with the Waste Management Act 1996, and associated regulations; and - The base of temporary stockpiles (including excavated and imported material) will be protected by silt fencing. Regular visual monitoring of the silt fence will be undertaken (at least daily). The silt fence will be repaired, replaced or reinforced as necessary to prevent migration of silt.

Reference	Mitigation and / or Monitoring Measure
11.7	The D&CEMP will include emergency procedures to prevent adverse impacts in the event of a pollution event arising from accidents and disasters.
11.8	Routine monitoring of the site to ensure potentially contaminating activities remain under control. Monitoring will include daily visual monitoring of any surface water outfalls.
11.9	Wastewater will be disposed offsite by road tanker in accordance with the Waste Management Act 1996, and associated regulations (see Section 3.8.4 for further details).
11.10	Residual wastewater produced in the demineralisation process will undergo suitable treatment prior to discharge. The type of water treatment technology to be used is not yet determined and will be finalised after awarding the contract, as outlined in Section 3.9.5. The discharge will be regulated in accordance with IEL. Alternative arrangements for wastewater management will be made if advised by the EPA and/or IE. In case of emergency, a shutdown valve will be provided at the discharge point from the treatment plant before entering the proposed drainage network.
11.11	Following treatment, wastewater generated from the demineralisation waste treatment process, will be discharged to the proposed new surface water discharge point (Easting – 711553, Northing – 758931) into the existing cooling water outfall channel that discharges to the Liffey Estuary Lower Waterbody (IE_EA_090_0300). This new surface water discharge point will be regulated under the IE Licence.
11.12	The wastewater from the demineralisation waste treatment process will be collected in the bunded Gas Turbine (GT) Area Drain Tanks . The contents of each GT Area Drain Tank will be collected by a suitably licenced waste contractor in accordance with the Waste Management Act 1996, and associated regulations for disposal. Wastewaters generated during this process will not be discharged to environment.
11.13	Wastewater will also be generated during the fuel gas scrubber process. The wastewater associated with this process will be stored in the bunded fuel gas condensate tank located within the Gas Compressor and Auxiliaries building. Water in this tank will contain hydrocarbons and will be disposed offsite by road tanker in accordance with the Waste Management Act 1996, and associated regulations. The volume of wastewater generated during this process will be negligible and will not be discharged to the environment.
Chapter 12 Archaeology, Architectural and Cultural Heritage	
12.1	Should groundworks exceed the depth of the post-1958 infill, then a suitably qualified archaeologist shall undertake archaeological monitoring of these works under license to the National Monuments Service Section of the Department of Housing, Local Government and Heritage. Should any archaeological material be encountered mechanical excavation will cease and the City Archaeologist and National Monuments Service shall be notified. Further work will then only be carried out following consultations with the City Archaeologist and the National Monuments Service.
12.2	Although the predicted impact of vibration is below harmful levels, care will need to be taken to ensure that real world vibrations remain at safe levels. During the phases of piling that are closest to the Poolbeg Power Station towers, monitoring of sensitive structures will be undertaken to ensure that real world vibrations remain within safe levels. Cranes should preferably be sited where their operation will avoid the possibility of accidental damage to the Poolbeg Power Station Chimneys or the retained administration building within the Poolbeg Generation station complex. Operations will be planned and monitored accordingly to avoid any risk of impact to the buildings.
Chapter 14 Roads and Traffic	
14.1	The appointed contractor will agree temporary traffic management measures then adopt and monitor an appropriate way of working in consultation with Dublin City 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.

Reference	Mitigation and / or Monitoring Measure
14.2	The D&CTMP has been developed for the purposes of this assessment and will be further developed as necessary in consultation with Dublin City Council and the Gardai prior to construction commencing. The D&CTMP 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 D&CTMP will be considered a 'live' document and will be developed accordingly, within the parameters assessed in this EIAR.
14.3	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.
14.4	Furthermore, only vehicles essentially required to facilitate construction will be allowed to attend worksites. Car sharing will be promoted to construction personnel by the contractor during the induction process.
14.5	In order to reduce the potential for mud and other debris being deposited onto the local road network in the vicinity of worksite accesses, the appointed contractor will ensure that all concrete truck wash watering / cleaning is undertaken offsite where practical 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.
14.6	The appointed contractor could employ a number of sub-contractors and all will fall under the umbrella of the D&CTMP 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.
14.7	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 D&CTMP and recording of any complaints. The appointed contractor will be required to stipulate that all contractors disseminate these rules to their sub-contractors.
14.8	The appointed contractor will nominate a person to be responsible for the co-ordination of all elements of Traffic and Transport during the construction process (Liaison Officer). This person will liaise with the local community so that the community has a direct point of contact within the developer organisation who they could contact for information purposes or to discuss matters pertaining to traffic management or site operation.
14.9	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.
Chapter 15 Material Assets including Waste	
15.1	Prior to commencement of the development, the appointed Contractor will implement the CRWMP (included as part of the D&CEMP comprising Appendix C of this EIAR).
15.2	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.
15.3	Waste arisings will be handled, stored, managed and re-used or recycled as close as practicable to the point of origin.
15.4	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 D&CEMP.
15.5	The D&CEMP will be available for inspection at all reasonable times for examination by the Local Authority.

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