MOTT MACDONALD

Environmental Impact Assessment Report

North Wall Emergency Power Generation Plant

June 2022

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Abbreviation	Full Title
AA	Appropriate Assessment
AADT	Annual Average Daily Traffic
ABP	An Bord Pleanála
AGI	Above Ground Installation
AOD	Above Ordnance Datum
AQS	Air Quality Standards
CDP	County Development Plan
CEMP	Construction Environmental Management Plan
CRU	Commission for Regulation of Utilities
DAU	Development Applications Unit
DCCAE	Department of Communications, Climate Action and Environment
DEHLG	Department of the Environment Heritage and Local Government
DECC	Department of the Environment, Climate and Communications
DHLGH	Department of Housing, Local Government and Heritage
DECLG	Department of the Environment, Community and Local Government
EC	European Council
EU	European Union
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environment Protection Agency
HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
IEMA	Institute of Environmental Management and Assessment
LAP	Local Area Plan
LCA	Landscape Character Area
LGV	Light Goods Vehicle
MWe	Megawatt electric refers to the electricity output capability of the plant
MWth	Megawatt thermal refers to the input energy required
NIAH	National Inventory of Architectural Heritage
NIS	Natura Impact Statement
NPWS	National Parks and Wildlife Service
pNHA	Proposed Natural Heritage Area
PS	Protected Structure
RMP	Recorded Archaeological Monument
SAC	Special Area of Conservation
SPA	Special Protection Area
TAO	Transmission Asset Owner
TSO	Transmission System Operator
UBH	Unregistered Built Heritage site
UNFCCC	United Nations Framework Convention on Climate Change

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 line with Section 181(2)(a) of the Planning and Development Act 2000, as amended. Further detail is provided in Section 1.5 *Legislative Framework*.

The proposed development relates to the EirGrid intention to procure up to 200MW of Temporary Emergency Generation (ENQEIR778) in response to the national emergency relating to security of electricity supply.

The Electricity Supply Board (ESB) has entered into an agreement with EirGrid to progress certain time-sensitive works at North Wall Generating Station in advance of the conclusion of the procurement stage for Emergency Generation Plant. The preparation of planning documents is an agreed part of advanced services under this agreement.

The proposed development relates to the construction and operation of a Temporary Emergency Generating Plant, comprising the installation of six turbines. The emergency generating plant will be installed for up to five years from early 2023 to late 2027. Demolition of existing equipment and structures will be required to facilitate the works.

Six 35MWe nominal capacity gas turbine generators (General Electric LM2500Xpress units) are proposed.

The location of the proposed gas turbine generators is within the existing North Wall Generating Station. Figure 1.1 presents an image of the proposed Temporary Emergency Generation Plant. Figure 1.2 illustrates the proposed development's geographical location within its wider industrial setting in Dublin Port. Figure 1.3 presents a 2019 drone imagery of the site, facing south towards the River Liffey Estuary.

The emergency generating plant will operate up to 500 hours per annum on natural gas only, typically four hours per day when called on to run.

Natural gas will be provided by the existing gas compound on site. The Gas Networks Ireland Above Ground Installation (AGI) is located in the north-west corner of the site. Onsite gas compression will be provided to meet the inlet pressures required by the gas turbines.

Each emergency generating unit will be connected to the existing on site 220kV transformer by means of cables running on elevated pipe/cable racks. The 220kV transformer is connected to the national grid through the existing onsite 220kV substation. No changes to the gas and electricity transmission infrastructure will be required to facilitate the proposed development.

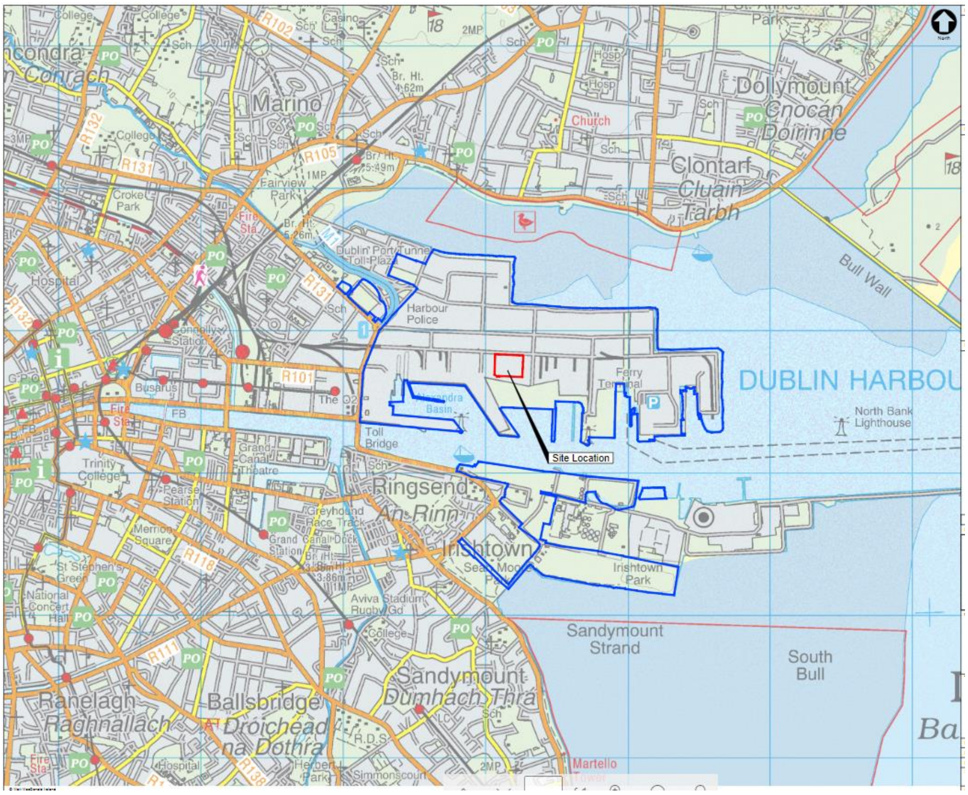
The North Wall Generating Station site operates, and will continue to operate, under the existing Industrial Emissions licence (Registration Number: P0579), regulated by the Environmental Protection Agency (EPA).

Further details on the proposed development are provided in Chapter 3 *Description of the Proposed Development*.

Figure 1.1: LM2500Xpress Gas Turbine Generator

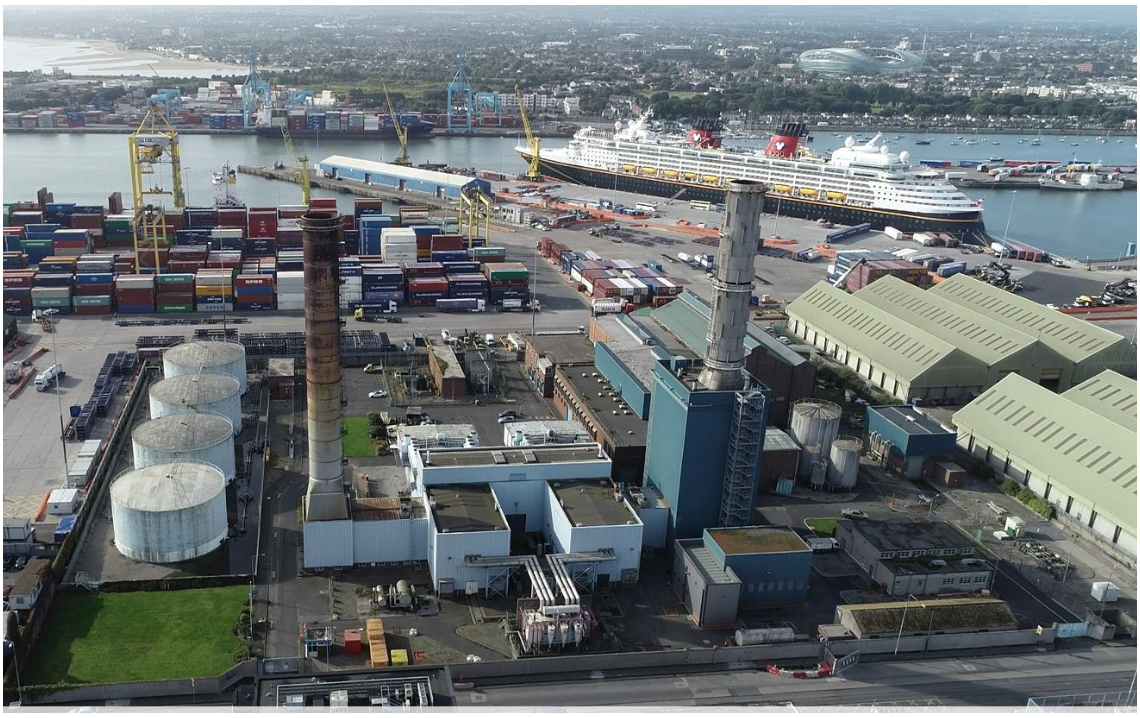
Source: GE

Figure 1.2: Site Location



Source: Mott MacDonald (©Ordnance Survey Ireland/Government of Ireland. Ordnance Survey Ireland Licence No. EN0034520)

Figure 1.3: Existing North Wall Generating Station (looking south towards the River Liffey Estuary)



Source: ESB Drone image 2019

1.2 About the ESB

The Electricity Supply Board (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.

ESB will procure and oversee the engineering, design, installation and commissioning of the equipment and ensure that the Temporary Emergency Power Generation Plant meets all the legislations, regulations, licences, standards and codes applicable to allow for flexible, safe and reliable operation.

1.3 About EirGrid

EirGrid is the state-owned independent Transmission System Operator (TSO) and developer of Ireland's national high voltage electricity grid (also called the "Transmission System"). The

European Communities (Internal Market in Electricity) Regulations 2000 (SI 445 of 2000) sets out the role and responsibilities of the TSO in particular Article 8(1) (a) gives EirGrid, as TSO, the exclusive function:

"To operate and ensure the maintenance of and, if necessary, develop a safe, secure, reliable, economical, and efficient electricity transmission system, and to explore and develop opportunities for interconnection of its system with other systems, in all cases with a view to ensuring that all reasonable demands for electricity are met *having due regard for the environment*."

EirGrid has invited ESB to submit a proposal to install Temporary Emergency Generating Plant at North Wall Generating Station to meet an expected shortfall in generation capacity (Ref: EirGrid ENQEIR778).

1.4 Land Ownership

Dublin Port Company (DPC) is the freehold owner of the North Wall Generating Station site; ESB has operated a power station at North Wall since the late 1940's from which time ESB has been the leaseholder of the site. ESB and DPC are in the process of negotiating a new long-term lease, which will commence directly following the expiry of the current lease at the end 2023.

The continuing use of the site for electricity generation is reflected in its inclusion in the Dublin Port 2040 Masterplan which allocates the site as a power generating site.

1.5 Legislative Framework

Given the emergency nature of the Temporary Emergency Generation Plant, the most expedient approach to project preliminaries and development is a key requirement. Potential delays in the standard planning processes under the Planning and Development Act 2000 (as amended) (PDA) could result in a real risk that critical timelines may not being achieved.

Therefore, for the successful delivery of the emergency generation in the timeframe required and in the context of the critical and urgent nature of these services, it is envisaged that the provisions of Section 181(2)(a) of the PDA will be employed, subject to the approval of the Board. The PDA may be disapplied by Ministerial Order under Section 181(2)(a) of same in the case of development required 'by reason of accident or emergency'.

ESB has entered into an agreement with EirGrid to progress certain time-sensitive works which includes the preparation of planning documents for EirGrid to make these available to the Minister to accompany the application for approval under Section 181(2)(a).

Details of the need for the plant are provided in Section 2.2 *Need for the Development*.

1.6 Consultation and Engagement

A summary of ESB's engagement with principal statutory stakeholders on this project is set out in Table 1.1. ESB also contacted neighbouring businesses via email in March 2022 to inform them of the proposed development. The communication with neighbouring businesses took the following form: the need for the emergency generation over the next three to five years at North Wall was described, a short description of the proposed generating units and details of the proposed location on the station site was provided. It was stated that a planning submission will be made to An Bord Pleanála for the project in the coming weeks which will consist of a set of planning drawings, an Environmental Impact Assessment Report and supporting studies and forms. An indication was given that dismantling and demolition works could begin mid-year followed by equipment installation later in 2022.

Table 1.1: Summary of Stakeholder Engagement

Stakeholder name	Summary of Issues
An Bord Pleanala	In July 2021 a meeting was attended by An Bord Pleanala (ABP), Department of Environment, Climate and Communications (DECC), Commission for Regulated Utilities (CRU), EirGrid and ESB. The prospective application parties set out the background to the emergency generation project and described the respective roles of the individual parties. The applicants advised an intention to use Section 181(2A) of the Planning & Development Act for the purposes of authorising the development. ESB provided a presentation on a proposal to develop a 200 MW emergency generation plant at North Wall Generating Station. ESB noted that preparation of planning documents for the development had commenced. ABP provided general guidance on Section 181 and on the content of the planning documents. The need for the development in respect of security of supply is to be emphasises in the planning documents.
Dublin City Council	ESB contacted Dublin City Council by email in March 2022 to advise of the proposal to install temporary emergency generation development on the North Wall Generating Station. ESB provided information on the background to the emergency generation project and noted this was required for between 3 and 5 years at North Wall. The intention to use Section 181(2A) of the Planning & Development Act for the purposes of authorising the development was advised. A short description of the proposed emergency generating units was provided and the proposed location on the station site was identified. An indication was given that dismantling and demolition works could begin mid-year followed by equipment installation later in 2022.
Environmental Protection Agency	ESB and EPA held meetings on three occasions in June, July and August 2021. The purpose of the meetings was to examine the approach to review the current IE licence for North Wall Generating Station in order to incorporate changes arising from the installation and operation of the proposed emergency generation plant. Procedures and timelines were discussed in general terms for the application, consultation and determination process.
Dublin Port Company	ESB and Dublin Port Company (DPC) held a meeting in November 2021, a short presentation of the emergency generation proposal at North Wall was presented and the proposed plant arrangement on the station site was described in outline. Questions relating to technical issues such as water consumption (potable and firefighting uses only) were answered to satisfaction of DPC.
Health and Safety Authority	ESB contacted Health and Safety Authority (HAS) by email in March 2022 with regard to the proposal to install temporary emergency generation development on the North Wall Generating Station. ESB provided information on the background to the emergency generation project and noted this it be required for between 3 and 5 years at North Wall. A short description of the proposed generating units was provided and the proposed location on the station site was identified. An indication was given that dismantling and demolition works could begin mid-year followed by equipment installation later in 2022.

1.7 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 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 1.2 below:

Table 1.2: Structure of this EIAR

Chapter No.	Chapter Title
1	Introduction
2	Need for the Development and Alternatives Considered
3	Description of the Development
4	Planning Policy
5	EIAR Methodology
6	Population and Human Health
7	Noise and Vibration
8	Air and Climate
9	Land and Soils and Hydrogeology
10	Surface Water and Flood Risk
11	Biodiversity
12	Archaeology and Cultural Heritage
13	Roads and Traffic
14	The Landscape
15	Material Assets
16	Major Accidents and/or Disasters
17	Interaction Between the Topics
18	Summary of Mitigation
19	References

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

Details of the competencies of the respective EIAR contributors is provided in Appendix 1 *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.

2 Need for the Development and Alternatives Considered

2.1 Introduction

This chapter sets out the need for the development.

EIA legislation requires that EIA Reports consider 'reasonable alternatives' for projects. Within the European Commission's Preparation of EIAR guidance documents for the implementation of EIAR 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 Sites;
- Alternative Technologies; and
- Alternative Fuel.

2.2 Need for the Development

The Commission for Regulation of Utilities (CRU) has a statutory responsibility, under the European Communities (Internal Market in Electricity) Regulations (SI 60 of 2005) (the "Regulations") to have regard to the security of supply of electricity and under Regulation 28(5), to take such measures as it considers necessary to protect security of supply.

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

Issues around security and continuity of supply have recently arisen because of unexpected generator outages and delays in delivery of new gas fired generation capacity. EirGrid's identification of a potential capacity shortfall, is set out in its *All Island Generation Capacity Statement 2021.*

The CRU, working with System Operators, has therefore progressed several measures to support both medium-term and short-term electricity supply and demand balance. On 9 August 2021, the CRU published a number of letters which assist in providing context to the current considered risk and security of supply. These letters relate to directions to EirGrid and Gas Networks Ireland (GNI), in respect of progressing some of the measures being undertaken, to protect and address the security of energy supply. The letters are summarised hereunder and copies of the letters and supporting documentation are provided in Appendix 2.1:

- 4 June 2021: Letter from Gas Networks Ireland (GNI) to CRU – Ref. CRU21089
  - GNI highlighted the significant volume of connection enquiries from gas fired generators and their extensive engagement with potential electricity generation plant developers. GNI also noted that despite "*the high number of enquiries and successful completion of the T-4 capacity auction by EirGrid, all but one connection offer remains outstanding*" - and expressed concern that the security of electricity supply may be impacted as a result; i.e. in the event of delays to new generation capacity supply. GNI put forward a proposal to the CRU in respect of detailed design work, deep reinforcement and material procurement to mitigate the risk of delay in connecting gas fired generators.
- 15 June 2021: Letter to the CRU from EirGrid – Ref. CRU21085
  - EirGrid set out the existence of "*an emergency situation whereby there is a clear and likely threat to security of supply this winter...given in particular the significant and unexpected failure of equipment at both Huntstown and Whitegate generating stations and the associated timeframes and risk in relation to their return to service*. EirGrid consequently identified the need for *delivery of c.200MW of emergency additional generation by Winter 2021"*, of a mobile and temporary nature. This letter was accompanied by a report prepared by EirGrid entitled *Security of Supply Winter 2021/22*"
- 16 June 2021: Letter from CRU to Minister Ryan, Department of the Environment, Climate and Communications (DECC) - Ref. CRU21086
  - Outlined the security of supply and consequent '*emergency situation*' as provided by EirGrid. EirGrid's letter and supporting report are also provided for context. The letter further outlined that the situation has led to a number of conclusions, including (inter alia) that "*This will require regulatory and government support relating to funding mechanisms; statutory licensing, consents and other requirements…".* The CRU also noted that temporary, mobile, emergency generation can only be deployed in the timeframe required "*if the necessary statutory licensing and consents etc. can be dis-applied or fast tracked".*
  - The CRU also noted that due to the immediacy of Winter 2021/22, EirGrid had commenced a process of engagement with generation developers that could potentially provide the necessary system services in a generation context, with an existing North Inner City Dublin site being identified as being suitable to proceed from a technical perspective.
  - The letter requested consent from the Minister to allow the CRU to direct EirGrid to *secure the delivery of 200MW temporary urgent emergency generation units for the purposes of the provision of system services, including reserve*.
  - In closing, the CRU highlighted that should consent be issued, the CRU would work with DECC, EirGrid and relevant key stakeholder as appropriate, "*on the practical steps to secure the additional emergency generation, including the dis-application and/ or fast-tracking of environmental and other consents and requirements*".
- 23 June 2021: Letter from Minister Ryan (DECC) to CRU – Ref. CRU21087
  - This letter refered to the contents of the CRU's letter dated 16 June, specifically in respect of a substantial risk to security of supply in Winter 2021/22 and highlights the provisions of Regulation 28(10), "*that where the CRU has identified a likely and substantial risk to security of supply, and it is not practicable in the time available to otherwise ensure security of supply, and is not practicable in the time available to otherwise ensure security of supply, the CRU, with Ministerial consent, may direct the transmission system operator, the public electricity supplier or any licensed undertakings, as appropriate, to undertake all or any such arrangements as the CRU considers*

necessary, including financial arrangements, relating to security of supply in a manner approved by the CRU."

  – The letter indicated the Minister's consent to the CRU to direct EirGrid to secure the delivery of approximately 200MW of emergency additional generation as identified in the CRU's letter, subject to this being carried out in compliance with State Aid rules.
  – In concluding, the Minister asked that the CRU consider "why the current electricity market structure and the regulatory measures in place are not delivering the required level of new generation capacity necessary to ensure security of supply in Ireland and thus support the Government's emission reduction targets."
- 1 July 2021: Letter from CRU to GNI – Ref. CRU21090
  – The CRU noted GNI proposal and directed GNI to implement the proposals outlined in their letter (of 4 June 2021) under Section 19A of the Gas (Interim)(Regulation) Act 2002 and monitor their effectiveness.
- 02 July 2021: Letter from CRU to EirGrid – Ref. CRU21088
  – In response to EirGrid's letter to the CRU dated 15 June 2021, the CRU confirmed that it had applied to the Minister of DECC and received consent, to direct EirGrid to secure the delivery of emergency additional generation. The letter proceeds to provide such direction.

Further to the above, on 29 September 2021, the CRU published an Information Note – "*Security of Electricity Supply – Programme of Actions*". This note provided an update on the short-term security of supply risks for winter 2021/22, whilst also noting a planned return to operation of the Huntstown 2 and Whitegate generators in October and November 2021, respectively, which assisted in reducing the short-term supply risk.

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

Subsequently, in November 2021, EirGrid published a 'Roadmap', "*Shaping Our Energy Future".* Whilst this document seeks to outline key development from a networks, engagement, operations and market perspective that will be needed to support a secure transition to at least 70% renewables on the electricity grid by 2030, it also highlights the fact that in the short-term, there is an urgency to address the risks to security of supply. In this regard, it identifies there is a "*need to develop mitigating solutions that are outside of the current market construct",* and that *"where such solutions are approved, they will be proportionate and informed by clearly stated positions on the immediate short-term supply deficits and associated risks".*

In addition, on 30 November 2021, the Minister for the Environment, Climate and Communications, published a new Government Policy Statement to ensure security of electricity supply. The Policy Statement indicates that the development of new conventional generation (including gas-fired and gasoil/ distillate-fired generation) is a national priority and should be permitted and supported, in order to ensure security of electricity supply[1] and facilitate the target of up to 80% renewable electricity generation by 2030. The "*Policy Statement supports the Commission for Regulation of Utilities (CRU) and EirGrid as they carry out their statutory roles to ensure security of electricity supply in Ireland. It provides clarity to investors and planning*

[1] In 2020 the gas network powered 51% of the country's electricity requirements (System and Renewable Data Summary Report – EirGrid) – Gas Networks Ireland: Ireland's Gas Network "Delivering for Ireland", November 2021 (https://www.gasnetworks.ie/corporate/company/our-network/irish-gas-market-overview/Irelands-Gas-Network_Delivering-for-Ireland_FINAL-file-as-published-11-11-2021.pdf)

authorities that the Government fully supports the actions being taken by the CRU and EirGrid, including the need to develop new gas-fired generation capacity".

2.3 Alternatives Considered

If the proposed development does not proceed, it is possible that power outages could occur in the absence of the proposed development unless emergency generation is provided at some other location due to the forecasted system demand. This would have a significant adverse effect in terms of energy requirements and supply at home, at work, for commercial developments and industry. The following sections provide discussion on alternative sites, technologies and fuels.

2.3.1 Alternative Sites

In 2021 EirGrid sought Candidate(s) that can provide up to 200 MW of emergency generation to the transmission network by a target date of Q3 2022, on a generating site in the Greater Dublin area with adequate space and existing gas and electrical grid connections to enable connection of emergency generation due to potential shortfall in available generation..

North Wall Generating Station, the site of the proposed development, was identified as meeting the necessary criteria. EirGrid identified North Wall as a preferred location at which to progress the provision of emergency generation.

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

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

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

2.3.2 Alternative Technologies

EirGrid sought generation technologies that could be installed quickly, could generate significant amounts of electricity and comply with environmental emission controls and legislation.

The GE LM2500Xpress generating units are specifically designed to meet the requirements for temporary large scale electricity generation. Enquiries to GE confirmed that the required six generating units could be supplied to satisfy the timeline set down by EirGrid.

3 Description of the Development

3.1 Overview

ESB proposes to develop six 35MWe nominal capacity modular gas turbine generators (LM2500Xpress units) within the existing North Wall Generating Station.

The North Wall Generating station is located to the east of Dublin City Centre, on the southern side of Alexandra Road within Dublin Port.

The surrounding area is largely industrial in nature and is dominated by Port activities. Dublin Port container stacking areas are situated to the south and west, Doyle Shipping Group is located to the east and Irish Tar and Bitumen is located on the northern boundary of Alexandra Road. The nearest residential property is located approximately 760m to the south.

Figure 3.1 illustrates the location of the proposed development within Dublin Port.

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. The generators will operate using existing connections to natural gas and electricity transmission.

Excluding site specific preliminary works and civil works, the modularised nature of the proposals means that the units can be installed and commissioned in approximately eleven months. This compares to approximately two years for the installation and commissioning phases for a conventional power plant configuration.

Demolition of existing structures and buildings will be required to facilitate the installation of the proposed gas turbines. Details of the demolition works required are provided in Section 3.3.2. Modifications will also be required to the existing site drainage system, details of which are provided in Section 3.2.7.

The emergency power plant is designed to start quickly and will run when electricity demand is high and generation capacity from other sources available on the system is at risk of not meeting demand.

The temporary emergency generating plant will be installed for up to five years from early 2023 to late 2027 and will operate for up to 500 hours per annum on natural gas only, typically four hours per day when called on to operate.

Natural gas will be provided via the existing gas compound on site. The existing Gas Networks Ireland (GNI) Above Ground Installation (AGI) is located in the north-west corner of the site. On-site gas compression will be provided to meet the inlet pressures required by the gas turbines. Gas pipes from the AGI to the gas compressors and to the emergency generation units will be run on elevated pipe/cable racks. Each emergency generating unit will be connected to the existing on-site 220kV transformer by means of cables running on elevated pipe/cable racks. The bunded 220kV transformer is connected to the national grid through the existing on-site 220kV Substation. The bund is inspected annually and tested in accordance with the existing Industrial Emissions licence, regulated by the EPA, (Registration Number: P0579-03).

No changes to the gas and electricity transmission supply infrastructure will be required to facilitate the proposed development.

Each generating unit will include one 11m high exhaust stack i.e, six stacks in total are proposed.

Figure 3.1: Site Location

Source: Drawing No. 229101053-MMD-00-XX-DR-C-0001

3.2 Key Plant, Processes and Operating Procedures

The following sections provide a description of the principal elements of plant, processes and operating procedures, as detailed in Table 3.1. A site layout drawing is provided in Drawing Reference No 229101053-MMD-00-XX-DR-C-0011.

Table 3.1: Proposed Plant and Equipment

Proposed Plant and Equipment	No. of Units	Height (m)	Width (m)	Length (m)	Diameter (m)
LM2500Xpress generator	6	11	10.75	27.7	N/A
Gas compressor	3	3.14	2.43	16.1	N/A
Fin-fan cooler	3	1.44	2.31	13	N/A
LM2500Xpress control house	6	3.39	2.62	6.76	N/A
Power control module	3	5.5	3.1	12.2	N/A
Raw & Fire water tank	1	14.5	N/A	N/A	12

Proposed Plant and Equipment	No. of Units	Height (m)	Width (m)	Length (m)	Diameter (m)
Fire water pump skid	1	5.5	4.8	12.75	N/A
Firefighting stores building	1	5.5	4.8	12.75	N/A
Air compressor	2	2.5	2.5	2.5	N/A
Reactors* (single)	12	3.7	N/A	N/A	1.95
Reactors* (double)	6	6.56	N/A	N/A	1.95
Fuel gas scrubber	1	3.5	3	3	N/A
Pipe and Cable Rack (over road)	2	8.6	4	12.6	N/A
Pipe and Cable Rack (admin and central)	2	5.6	2.4	N/A	N/A
Pipe and Cable Rack (gas compressor corridor)	2	1.6	2.4	N/A	N/A
Water wash drain tank	6	N/A	N/A	2	1

3.2.1 Modular Gas Turbine Technology

The gas turbine technology proposed will be the LM2500Xpress aeroderivative modular gas turbine which delivers 35 MWe of power generation per unit (nominal) and is transportable to any location by land, air, or sea. This proposed modular gas turbine power plant can operate on natural gas or liquid fuel. The proposed plant that is the subject of this EIAR will operate on natural gas only.

The LM2500Xpress units have been developed specifically to respond to fast and mobile power needs. The units will be delivered in fully assembled modules and tested to allow for quick installation, reliable operation, and ease of maintenance in the field whilst saving valuable construction and lead time, allowing a quick response to the national electricity emergency.

The proposed technology comprises a turbine module and a generator module. The turbine module will be connected to the generator module on site. Landing legs will be provided to support and level the equipment.

A control house module will be inter-connected electrically to the turbine and generator modules on site.

3.2.1.1 Turbine Module

The main deck of the turbine module includes an inlet silencing system for the turbine and the turbine module. The auxiliary skid, which contains the TCP (Turbine Control Panel) along with various package support systems are included at one end of the turbine module.

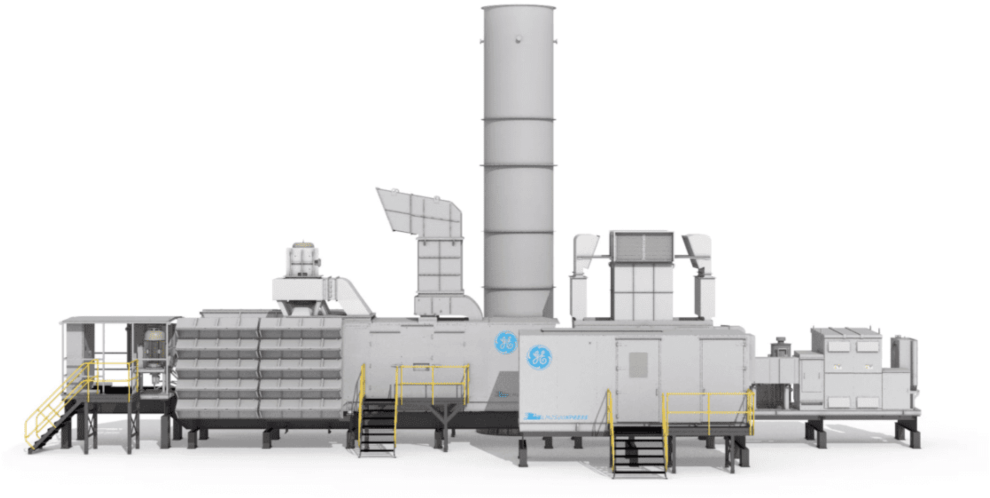
When the package is fully installed, the turbine module assembly will be fitted with the air filter modules, the turbine exhaust silencer, and the ventilation fan assembly for the turbine enclosure.

The following components and assemblies are included in the turbine module:

- Gas Turbine Engine w/ Turbine Enclosure
- Turbine Gauge Panel (TGP)
- Fire Protection Aerosol Canisters
- Auxiliary Skid - including the following:
  - Turbine Control Panel (TCP)
  - Hydraulic Start System
  - Turbine Lube Oil (TLO) System (shared)
  - Off-Line Water Wash System
- Air Inlet Silencer with enclosure
- Inlet Air Filter System
- Dual Fuel System (not in use)
- Turbine Exhaust
- High Speed Coupling Shaft
- Ventilation Fan Assembly skid
- Alignment System

An image of a typical LM2500Xpress Gas Turbine Generator is provided in Figure 3.2 below.

Figure 3.2: LM2500Xpress Gas Turbine Generator



Source: GE (Different Exhaust to that proposed for this project shown)

3.2.1.2 Generator Module

The main deck of the generator module contains the following components:

- Generator Module
- Generator Ventilation
- Generator
- Switchgear
- Generator Lube Oil Skid

The generator module will be connected to the turbine module on site. The alternating current (AC) generator will operate at a synchronous speed of 3,000 rpm for 50-Hz. The LM2500Xpress generator is an air-cooled Andritz generator (Model A03OP-T) or GEPC Generator with an air filter assembly and exhaust assembly.

3.2.1.3 Control House Module

The control house module will be inter-connected electrically to the turbine and generator modules on site. The control house module includes a lighted and insulated control house. The control house is equipped with an access door and air conditioner/heater.

The control house module consists of the following components:

- Human-Machine Interface (HMI)
- Motor Control Centre (MCC)
- Generator Control Panel (GCP)
- Batteries and Chargers

3.2.2 Above Ground Gas Installation

The site is currently connected the natural gas network supplied to the site by GNI.

The existing GNI AGI, located in the north-west of the site, will supply gas to the emergency generation units. Gas pipes from the AGI to the gas compressors and to the emergency generation units will be run on elevated pipe/cable racks.

3.2.3 Gas Compressors

It will be necessary to increase the gas pressure on site in order to provide gas at the required pressure to the LM2500Xpress gas turbines. Three gas compressors will be provided. One gas compressor will be sufficient to provide the required gas quantity and gas pressure to three LM2500Xpress gas turbines meaning that there will be a gas compressor in standby to ensure the reliability of the gas system.

Cooling of the gas compressors will be via a closed-circuit cooling water system utilising fin fan coolers. Anti-freeze (Ethylene Glycol) may be added if required, no other chemical dosing of cooling water is proposed. Make-up of closed-circuit cooling water or blow-down discharge of cooling wastewater will not be required.

Each gas compressor will include the following:

- Compressor
- Main Drive Motor (Air Cooled)
- Oil System
- Closed Loop Water-Air Cooling System (Fin-Fan Air Cooler)
- Discharge Filter
- Enclosure for Compressor
- Control System
- Appropriate instrumentation

In addition to the gas compressor the following equipment will also be provided to condition fuel gas on site prior to use:

- Gas Fuel Main Shut-Off Skid
- Gas Fuel Scrubber

- Gas Fuel Filter/Coalescing Skid
- Gas Condensate Tank

3.2.4 Electricity Transmission Connection

The six LM2500Xpress units will be connected to the existing on-site 220kV/10.5kV/10.5kV T2004-5 Generator Step-up Transformer (GSUT) which will export to the grid through the existing cable connection to bay D2 at the existing North Wall 220kV Substation which is co-located on the same site. ESB is not aware of any reinforcement works required on the transmission bay to facilitate this proposed electrical power export.

The T2004-5 Generator Step-up Transformer is a three-winding transformer (300 MVA on 220kV side, 150MVA for each 10.5kV winding) with on-load tap changer (OLTC) and it is proposed to connect three LM2500Xpress units to each LV winding of the transformer.

Each of the LM2500Xpress generators will export power at 10.5kV to coordinate with the voltage ratings of the existing Isolated Phase Busbars (IPB's) and the existing Transformer LV windings.

The Gas Turbine Generators will connect by means of cabling running on elevated pipe and cable racks to the existing IPB via current limiting reactors. The current limiting reactors will be used to limit the fault current or restricting the fault levels of plant auxiliary systems.

3.2.5 Emissions Monitoring System

The exhaust gases from each gas turbine will be discharged to atmosphere through an 11m high stack. The (six in total) stacks 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.

3.2.6 Water Demand

Water will be supplied to site via two existing Irish Water towns water connections. Water will be used by the following consumers:

- Potable water used for general purposes (drinking water, toilets etc.); and
- Water for fire-fighting purposes.

As the proposed gas turbines use Dry Low NOx technology, there will be no water consumed as part of the power generation process.

The number of construction workers required during the construction phase is expected to peak at approximately 100 persons. Up to five operational staff will be on site during the day time and up to two staff will be on site in the evening time seven days a week. Water demand will typically be limited to domestic water consumption for staff welfare and there is sufficient existing water supply on site to meet water demand associated with the emergency plant.

Towns water will be stored in a common firewater/ storage tank of approximately 1250m^3 in volume and will be used by the fire water system and for general domestic supplies.

3.2.7 Wastewater Drainage

3.2.7.1 Surface Water Drainage

Surface water runoff will be generated from all surfaces within the power plant site which are exposed to rainwater or to which water is applied in order to wash down. This includes all hardstanding surfaces, roofs, and other impermeable surfaces.

No change in run-off volume is proposed as the proposed plant area is on an area of existing hardstanding which drains to the existing surface water drainage system, in accordance with the existing EPA regulated IE licence. It will however be necessary to reconfigure the drainage network in the area of the main carpark where the Emergency Generation plant is to be located. This area currently drains, via the southern interceptor, to SW4 (IEL Monitoring/Discharge point SW4). The new surface water drainage network for the gas turbine area will continue to drain to SW4.

SW4 discharges to the River Liffey Estuary to the south of the site. Prior to the construction phase of this proposed development ESB will have installed an additional new Class 1 oil interceptor upstream of SW4, immediately upstream of the existing interceptor which will remain in-situ.

Surface water from the northern part of the North Wall site will also continue to be discharged to the Dublin Port rainwater collector drain on Alexandra Road which discharges to the Tolka Estuary (IE licence monitoring/discharge point SW3) via a Class 1 oil interceptor.

Water collected in the existing bunded 220kV transformer will be inspected prior to discharge to SW3 via the oil water interceptor in accordance with the existing IE licence.

Details of the drainage system are provided in Drawing Reference No 229101053-MMD-00-XX-DR-C-0031_P1.

3.2.7.2 Foul Wastewater Drainage

The existing foul wastewater drainage system will continue to be used. No new toilets or welfare facilities are proposed as existing facilities will be used.

There are two existing foul wastewater discharge points, one under the northern boundary (proximate to the 220 kV Substation) with the second at the southern boundary near the entrance to the control building. The existing foul wastewater system discharges to the main Dublin City sewer system.

The system has adequate capacity for both the construction and operational phase of his development.

3.2.7.3 Process Wastewaters

Wastewater will be generated by the fuel gas scrubber which will be stored in the fuel gas condensate tank. 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.

Wastewater will also be generated by gas turbines during a compressor wash cycles. Wastewater from each gas turbine will be collected in its own dedicated Gas Turbine (GT) Area Drain Tank. The content 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.

No process wastewaters will be discharged to drain.

3.2.8 Firefighting Systems and Controls

A fire water storage tank of approximately 1250m^3 will be installed on site. Water supply to this tank will be towns water via an existing Irish Water connection.

Firefighting on site will predominately be carried out by manual fire suppression using the fire water hydrant network on site. A new fire water hydrant network will be installed for the protection of the temporary equipment to be installed.

Fire water discharges will be collected in the surface drainage system and will be discharged from the site after passing through the drainage interceptors.

Specific items of equipment will have gaseous fire suppressions, for example, the gas turbine enclosure.

3.2.9 Chemical Storage

A number of chemicals and oils will be stored on site, including;

- Transformer Oil;
- Lubrication Oils (for each gas turbine, gas compressor, pumps etc);
- Carbon dioxide bottles (for fire suppression);
- Compressor cleaning detergent; and
- General oils and greases for rotating machinery.

All chemicals and oils will be stored in suitably bunded areas and with weather protection. Table 3.2 provides estimated quantities for each substance.

Table 3.2: Chemical Storage (Existing and Proposed)

Material/Substance	Nature	Amount Stored (estimate)	Storage Location	Location of Use	Notes
Gas Turbine Lubricating Oil (per GT)	Liquid	6m^3	Lube Oil Tank (of each Gas Turbine)	Gas Turbine Area	Tank will be bunded. Volume is on a per GT basis
Gas Turbine Aerosol Fire Protection (per GT)	Gas	500Nm^3	Part of the turbine module of each gas turbine	Gas Turbine Area	Stored in high pressure storage bottles. Volume is on a per GT basis
Natural Gas for use in all GT's	Gas	N/A	N/A	Gas Turbine Area, Gas Compressor area, central pipe rack	Gas is consumed as part of the generation process. No gas stored on site.
Water Wash Drain Tank (per GT)	Liquid	1.5m^3	Water Wash Drain Tank (of each Gas Turbine)	Gas Turbine Area	Tank will be bunded. Volume is on a per GT basis
Fuel Gas Condensate Tank	Liquid	8m^3	Adjacent to AGI	Adjacent to AGI	Tank will be bunded.
Raw and Fire Water Tank	Liquid	1250m^3	Water Tank	Overall Site	None
Fire Fighting Pump Diesel Tank	Liquid	100litres	Fire Fighting Pump House	Fire Fighting Pump House	None
Fire Fighting Pump Lube Oil	Liquid	9litres	Fire Fighting Pump House	Fire Fighting Pump House	None
Gas Compressors Lubricating Oil (per gas compressor)	Liquid	3m^3	Gas Compressor Area	Gas Compressor Area	Volume is on a per GT basis
Fin Fan Cooling Water with Corrosion Inhibitor [Water with Ethylene Glycol]	Liquid	10m^3	Gas Compressor Area	Gas Compressor Area	Volume is on a per gas compressor basis
Compressor Water Wash Chemicals	Liquid	m^3	Gas Turbine Area	Gas Turbine Area	None
Nitrogen	Gas	1500Nm^3	Gas Compressors Area	Gas Compressors Area	Stored in high pressure storage bottles.
Chemicals in the Control of ESB Networks (existing)					
SF6 Circuit Breakers	Gas	1,585kg	ESB Networks GIS	ESB Networks GIS	Existing equipment
220 kV Cable Oil Tank	Liquid	40m^3	Dublin Transmission Network	Cable Oil Storage Tank	Existing Equipment Tank will be installed in a bund
GIS generator diesel pump	Liquid	1m^3	ESB Networks GIS	ESB Networks GIS	Existing equipment

3.2.10 Lighting

Power supply to the existing site lighting network has been disconnected to allow for safe demolition work on site. 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. It is expected however that site lighting will remain dominated by the high intensity port lighting to the south of the site.

3.2.11 Security

There are no proposed changes to the existing site security measures or boundary walls. The site is secured by high walls with security gates. Gates are remotely operated by security. Notices at the gates inform visitors to site on contact methods for security to gain access. The gate will operate in line with the current arrangements for the existing gates. During times of high traffic volumes to and from the site the gate will be manned.

3.3 Construction Phase Activities

The following sections provide a description of the construction phase activities, which will be carried out in three phases, as detailed in Table 3.3.

3.3.1 Construction Phase Description and Duration

The total number of construction staff on-site will vary during the construction phase of the works but are expected to peak at approximately 100 persons.

Normal working hours for external site activities during the construction period are expected to be Monday to Friday 07:00 to 19:00 hours and 08.00 to 17.00 on Saturday. During certain stages of the construction phase, it is expected that some work will have to be carried out outside of normal working hours however this will be kept to a minimum.

Construction activities will gradually phase from pre-construction site preparation and removal of redundant structures to predominantly construction and modular assembly works followed by commissioning and testing of the proposed power plant and equipment.

The construction phase of the project is expected to commence in Q2 / Q3 2022 and last for approximately 15 months. Table 3.3 provides an outline schedule of the proposed activities.

Table 3.3: Construction Schedule

Phase	Timeline
1. Pre-construction works	Two months
2. Demolition works	Two months
3. Plant construction works	Eleven months (six months civil works and five months installation works)
Total	**15 months**

The demolition works and plant construction works will be carried out by separate contractors. This approach has been adopted to ensure that a contractor with the appropriate competency and experience is carrying out the relevant construction phase.

All waste arisings will be managed in accordance with the Waste Management Act 1996, and associated regulations.

3.3.2 Pre-construction Works

The pre-construction phase of development includes preparatory works and consultation with statutory bodies [Health and Safety Authority (HSA), EPA etc] and the public as required. Following this process, site clearance activities will commence. Typical activities will include preparation of the construction working area, laydown area and site clearance as required. During this period the structural assessments of any buildings proposed for demolition will be undertaken to determine demolition method and sequencing.

The site has been in use for electricity generation since the late 1940’s and its history of use is well known and documented. A number of areas of the site will require excavation for construction purposes. In addition to the previous studies carried out and the assessment presented in this EIAR, soil in these areas will be tested in advance of or during the construction phase to identify the appropriate waste classification which will determine the appropriate route for disposal.

3.3.2.1 Demolition Works

The proposed foundations for the temporary generation plant will generally be constructed to finish above the existing ground levels on site. Where existing substructures or foundations are encountered, these will be removed where necessary. It is expected that the maximum depth of any new foundation inclusive of stone capping layers will be 800mm. Below ground services in conflict with the new foundations will also be removed as required.

Where openings are created in buildings by the removal of equipment or part of the building during the alterations works, recycled similar finish materials from the site will be used to close the openings where possible. This will help reduce the waste generated by the works while ensuring the finish to buildings matches with the current finishes. Where recycled material cannot be used new materials will be sourced to match the existing finishes.

The equipment and structures identified in Drawing No 229101053-MMD-00-XX-DR-C-0010 will be removed by a specialist contractor prior to the construction phase.

The general methodology of removal will be by mechanical dismantling that will bring all structures and equipment to ground level/grade in a progressive manner using a top-down approach. All buildings will go through a structural appraisal process prior to dismantling works commencing, to ensure the proposed demolition sequence maintains the stability of the remaining buildings and unplanned collapse is prevented. All open spaces/voids created as part of the removal process will be backfilled with suitable materials to the surrounding grade levels.

Prior to general removal works all hazardous materials will be identified and will be removed by specialist contractors in advance of the general dismantling and demolition works.

Services to the buildings and structures will be isolated and physically disconnected. Any remaining chemicals will be removed, and tanks/vessels will be decontaminated to reduce the residual risk to as low as reasonably practicable.

Further detail on specific equipment and structures is provided in Table 3.4 overleaf.

Table 3.4: Equipment and structures to be removed

Equipment / Structure to be Removed	Details
Gas Compressor Building	The building is constructed on a concrete foundation with an internal precast concrete frame and a mixture of brick and corrugated cladding for the lower and upper parts of each elevation. The lower part of the building is of cavity wall construction with a blockwork inner leaf. The roof consists of a steel frame with purlins and roof bracing. The roof is finished with profiled with steel cladding. The structure is roughly 204m^2 measuring approximately 17m long x 12m high x 12m wide. The building together with redundant plant, equipment and piping will be demolished to slab level. Existing foundations, ground slab and below ground services in conflict with the new foundations will also be demolished as required. There is a switch room to the North of the building, that will also be demolished to ground level. The switch room houses the electrical switch gear for the compressors and is constructed from brick with a block inner leaf and a concrete roof.
38kV Substation	The 38kV substation is located to the south of the main car park and must be removed in its entirety to facilitate the installation of the temporary gas turbines. The 38kV substation building is approximately 29m long x 6m wide x 5m high and covers approximately 174m^2. It is a free-standing single-story building of cavity wall construction (brick outer leaf with concrete block inner leaf) accessible from ground level The building contains a concrete slab (which is believed to be ground bearing) with the floor coated with an epoxy paint. All equipment internal to the 38kV building has previously been removed. The 38kV building will be demolished to a maximum of 800mm below existing ground level. The transformer bunds and fire walls will be demolished. Existing foundations and below ground services above 800mm below ground level, will also be demolished as required. This excavation will be backfilled where necessary with appropriate inert engineering fill and finished at ground level to facilitate the placement of the emergency generation equipment.
Fuel Oil Pump House	The Fuel oil Pump House is located on the south-eastern side of the site, adjacent to oil tanks 3 and 4 and the 38kV substation. The building will be demolished to ground level. Existing foundations and below ground services in conflict with the new foundations will also be demolished as required. The equipment floor area of the building is approximately 1.2m below ground level. This area will be backfilled with appropriate inert engineering fill and finished at ground level.
Air Inlet Filter House and Electrical Rooms	The air intake structures located at the southern ends of the turbine hall for CT4 and CT5, supplied combustion air to the now redundant gas turbines on site. Below each air intake is a decommissioned electrical room that contains high voltage switchgear and control and instrumentation panels for the redundant gas turbines. The intake structure is a steel skeletal frame and a mixture of brick and corrugated cladding. The air intake structure also supports a number of fin fan coolers which formed part of the gas turbine cooling water system The air intake structure, Speedtronic rooms and a number of fin fan coolers will be demolished and a new gable end to the building installed on the remaining portion of the turbine halls.
Gate Keeper's House	The existing gate house is a single store building of traditional block work construction. This building will be demolished to slab level.

3.3.2.2 Site Offices, workshop and storage building

The existing administration and workshop building will be used as site offices and a workshop and storage building during both the construction and operational phases. This work is likely to include the electrical rewiring of the building to electrically separate the building form any existing electrical circuits and allow for the safe completion of the demolition works identified in section 3.3.2.1.

During the construction phase temporary welfare facilities will be provided. These will be connected to a sealed holding tank to be emptied and disposed of off-site by a licensed contractor to an approved licenced facility, in accordance with the Waste Management Act 1996 and associated regulations.

3.3.2.3 Ground Works

The areas for the installation of new equipment will be levelled and new equipment foundations will be constructed. New equipment foundations are expected to extend over an area of approximately 3,500 m^2, have a thickness of 300 to 400mm, with up to 200mm of this depth above existing ground level. Beneath this proposed foundation will be a layer of new formation stone capping extending up to 800mm below existing ground level. Existing foundations or buried structures will be removed to a depth of 800mm. Existing below ground services (surface water drains) will be rerouted around areas where foundations are to be constructed.

It is anticipated that foundations will be raft type ground bearing foundations however some shallow piled foundations may be required.

In 2004 there was an incident on site that resulted in the loss of approximately 8,000 litres of diesel on site. Approximately 6,000 – 7,000 litres of diesel were recovered by ESB, however an oily plume remains under part of the site and is the subject on ongoing monitoring, further detail of which is provided in Chapter 9 *Land Soils and Hydrogeology*.

Foundations for the gas turbine generators will be adjacent and, in some cases, above the existing oil plume on site. Foundations will be constructed above the water table to avoid impacts on groundwater. A number of existing ground water monitoring wells will need to be relocated. New locations will be agreed with the EPA prior to construction but are expected to be located down gradient of the existing plume.

The minimum recorded depth below the surface to the plume in the affected part of the site is approximately 1.57m, although it has been recorded at depths to 2.3m. As the source of the contamination has lower density than water, it forms a narrow layer on the top of the groundwater.

To avoid interaction with the plume during construction the excavation depth over the plume will be minimised to avoid encountering groundwater and contaminated material.

The following measures will also be implemented:

- The majority of the civil works are planned to take place in summer months. Where heavy rainfall is forecast during the civil works, or if the civil works extend into the Winter season, the following measures will be put in place to restrict rainwater seepage into the ground:
  - Minimise extent and duration of exposed excavation surfaces.
  - Cover/protect excavations with use of water-tight membranes together with use of pump sumps or equivalent where required.
  - Excavations to be blinded with concrete immediately following excavation together with use of pump sumps or equivalent.

  - Surface water runoff will be treated in accordance with *Ciria C750 Groundwater Control – Design and Practice*.
- The requirements for excavation over the plume will be minimised. Site services (fuel gas, water supply, electrical cables, control and instrumentation cables will be positioned above ground level on pipe and cable racks.
- The main foundations supporting plant and equipment in the area of the plume will be designed so as to not extend below the ground water level. The level of the top of the foundations will extend above the current level of the existing site to minimise the depth of excavation required.
- A raft type / floating design of the main equipment foundations will avoid the requirement for piling in the area of the plume. Excavation depth will be limited to 800mm in this area. The surface water drainage network will be designed to be above the ground water level.
- Piling will be avoided in the area of the plume.
- Where piling is required outside the area of the plume, it will be undertaken in accordance with the parameters assessed in this EIAR and in the NIS and in the CEMP. A Source-Pathway-Receptor hazard risk assessment will be undertaken in consideration of the extensive monitoring regime present on site. The pile type will be selected and installed by a specialist contractor and be considerate of current guidance such as *Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention* published by the National Groundwater and Contaminated Land Centre Report No. NC/99/73 (UK Environment Agency). The following will be incorporated into the detailed design:
  - Low vibration piling techniques.
  - Piling techniques which avoid the creation of preferential pathways.
  - Piling techniques which avoid pushing contaminated soil into uncontaminated soil.
- On completion of construction, the site will comprise paved surfaces of similar area to existing, laid to falls. Surface rainwater will be collected at low points by a series of gulleys or equivalent and be conveyed by a network of underground drainage pipes laid to shallow falls in accordance with *Specification for Road Works Series 500 - Drainage and Service Ducts, CC-SPW-00500* March 2015, Transport Infrastructure Ireland, connecting into the existing site main drainage infrastructure, discussed in Section 3.2.7 *Wastewater Drainage*.

All works will be carried out within the parameters assessed in this EIAR and the parameters assessed in the NIS supporting the application and the measures detailed in the Construction and Environmental Management Plan (CEMP), refer to Section 3.3.6 of this EIAR.

The Contractor will comply with the *Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites* and with the conditions detailed in the existing IE licence.

Excavated soil, and piling arisings if any, will be tested on site prior to disposal off site or reuse on site.

Excavation will be supervised by a qualified and experienced hydrogeologist/soil contamination expert and the Environmental Clerk of Works (EnCoW) throughout the period of such works, refer to Section 3.3.7.

Existing ground water monitoring/treatment wells that may be affected by the works will be identified and amendments to the monitoring well network will be agreed with the EPA prior to commencement of works.

3.3.3 Plant Construction Works

The Main Contractor will be responsible to ESB for the design and installation of the emergency power generation plant. This will include the design, supply, and installation of all equipment and the installation of all equipment foundations.

Most of the new equipment will be skid mounted or containerised elements fabricated off site and delivered finished or for final assembly on site. The main exception to this is the pipe and cable corridor which will contain the plant pipework (natural gas, fire water etc) and cables (power cables, control cables etc) which will have to be fabricated on site.

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

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

As detailed in Section 3.2.7, in the area of the main carpark, where the gas turbines are to be installed, the existing surface water network will need to be modified and re-routed. Surface water drains will also be re-routed and/or sealed in advance of any concrete being cast.

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

As described above the maximum proposed excavation will not exceed a depth of 800mm for the raft foundations. If piled foundations are required, it is envisaged that these would require a similar depth of below ground excavation.

3.3.4 Construction Traffic

The majority of construction traffic will be generated during phase two and phase three (refer to Table 3.3), the demolition phase and the construction phase. The demolition phase which will see material being removed from site and being disposed of at various licenced waste disposal facilities, depending on the waste classification and quantity of material to be removed from site. As part of the demolition phase there will also be some inert material imported to site. This will generally be used to infill existing but redundant service trenches and basement structures.

For the demolition works it is estimated that up to 50 Heavy Good Vehicles (HGVs) loads from the site (100 HGV movements) will be required (maximum of 15 loads per day) to remove material over the period of asbestos removal and demolition which is expected to extend over a period of two months.

On completion of the demolition phase, the construction phase will commence. The construction phase will see the delivery of construction material such as packaged skids, piping, cabling, secondary steel support frames and bulk material like concrete for the construction of foundations.

Excavated material for the construction of foundations will also be disposed of offsite to suitably licenced waste facilities during the construction phase. It is expected that a peak of construction, approximately 15 HGV loads daily (30 HGV movements) will be required. An average of four HGV loads daily (8 HGV movements) is anticipated.

Much of the emergency generation plant and equipment, for example, LMXpress units, fin fan coolers, gas skids, pumps skids will be shipped to Ireland through Dublin Port and directly to site and will therefore not need to use the public road network. The proposed new equipment is set out in Table 3.5 below.

Two existing gates are currently used to access the site from Alexandra Road. The M50 Dublin Port Tunnel is located approximately 1.6km to the south-east of the site and is the major route in and out of the docklands for HGVs.

Table 3.5: Proposed New Equipment

Item	Description	Construction Method
1	LM2500Xpress Gas Turbines	Delivered to Site in Prefabricated Modules to be connected together on site
2	Water Wash Drain Tank	Delivered to Site Prefabricated
3	Fuel Gas Filter Skid	Delivered to Site Prefabricated
4	BOP PCM	Delivered to Site Prefabricated
5	N2 Storage Rack	Delivered to Site Prefabricated
6	Air Compressor for Gas Compressor	Delivered to Site Prefabricated
7	Fuel Gas Scrubber	Delivered to Site Prefabricated
8	Fuel Gas Condensate Tank	Delivered to Site Prefabricated
9	Raw & Fire Water Tank	Delivered to Site in Prefabricated Modules with final assembly on site
10	Fire Water Pump Skid	Delivered to Site Prefabricated
11	Current Limiting Rectors	Delivered to Site Prefabricated
12	Fuel Gas Emergency Shut-Off	Delivered to Site Prefabricated
13	MV Motor Starter Panel for Gas Compressor	Delivered to Site Prefabricated
14	Fuel Gas Compressor and Fin Fan Cooler	Delivered to Site Prefabricated
15	Water Storage Tank	Delivered to Site Prefabricated
16	Service and Potable Water Pressure Unit	Delivered to Site Prefabricated
17	Fuel Gas Skid	Delivered to Site Prefabricated
18	LM2500Xpress Control House	Delivered to Site Prefabricated
19	Pipe & Cable Corridor	Delivered to Site in Prefabricated Modules with final assembly on site
20	Crossover (Pedestrian)	Delivered to Site in Prefabricated Modules with final assembly on site
21	Stack (11.0m)	Delivered to Site in Prefabricated Modules with final assembly on site
22	Diesel Fire Fighting Pump	Delivered to Site in Prefabricated Modules with final assembly on site
23	Fuel Condensate Pump	Delivered to Site Prefabricated
24	Pipe & Cable Corridor (Pipebridge)	Delivered to Site in Prefabricated Modules with final assembly on site
25	GT Area Drain Tank	Delivered to Site Prefabricated

A number of abnormal load deliveries will be required during the construction phase of the project. These abnormal loads will be delivered to Dublin Port. From Dublin Port, abnormal loads will be transferred directly to the site via Dublin Port internal road network and will therefore not need to use the public road network. The expected abnormal loads are as follows;

- 6 x Turbine Module Units
- 6 x Control Module Units,
- 6 x Generator Module Units;
- 3 x Balance of Plant Power Control Modules;
- 1 x Fire Fighting Module.

The two existing entrances will be used to access the site during the construction and demolition phases. A traffic control person will be used to control traffic to and from the site, as required. Sufficient signage will be provided on both the western and eastern approaches to the site to provide warning to port traffic of the potential construction traffic entering and exiting the site.

The number of construction workers required during the construction phase is expected to peak at approximately 100 persons. It is assumed that staff will travel to site via a combination of public transport, cycling, carpooling, minibus and private passenger vehicles. The site has good public transport links given its proximity to the Luas Red Line and several bus stops.

It is anticipated that a mobile crane will be needed on site for part of the construction and demolition works on site. It is not anticipated that there will be a requirement to over-sail any adjacent sites.

3.3.5 Construction Compounds / Laydown Areas

Given the modular nature of the development, no designated construction compound / laydown area is proposed.

Equipment will be delivered to site in a phased manner and located in its final position on arrival. Small items of plant and materials such as pipework, cables, tools and installation equipment will be stored in the existing stores building.

3.3.6 Construction Environmental Management Plan

A Construction Environmental Management Plan (CEMP) is included as Appendix 3.1 of this EIAR. The CEMP will be implemented during the construction phase. The 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 CEMP is to safeguard the environment, site personnel and nearby sensitive receptors from site activity which may cause harm or nuisance. As such, the CEMP sets out a project framework to ensure that key mitigation measures and conditions set out in this EIAR are translated into measurable actions and are appropriately implemented during the construction phase of the proposed development. As part of this framework, transparent and effective monitoring of the receiving environment during construction will be used to inform and manage on-going activities on site and to demonstrate effectiveness of the measures outlined therein.

ESB will monitor the contractor(s) performance on a regular basis and will undertake various compliance checks throughout the duration of the construction period including:

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

3.3.6.1 Construction Resource Waste Management Plan

Prior to commencement of the development, the appointed Contractor will implement the Construction Resource Waste Management Plan (included as part of the CEMP in Appendix 3.1 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 has been prepared in accordance with waste management guidance and principles as outlined in *Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects* (EPA, 2021).

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 Plan will be available for inspection at the site office at all reasonable times for examination by the Consenting Authority.

3.3.7 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 to instruct the Contractor to stop works and to direct the carrying out of emergency mitigation / clean-up operations. The EnCoW will also manage consultation with key stakeholders as appropriate. The EnCoW will be responsible for carrying out regular monitoring of the Contractors CEMP and will report monitoring findings in writing to ESB on a regular basis (at least weekly, but immediately in the case of incidents or accidents).

3.4 Operational Phase Activities

3.4.1 Hours of Operation

The emergency plant will operate up to 500 hours per annum on natural gas only, typically four hours per day when called on to run.

The operating regime of the plant will be determined by EirGrid, which is the Transmission System Operator (TSO), subject to the 500 hours per annum limit.tr

3.4.2 Maintenance and Operation

The EPA grants and enforces Industrial Emissions (IE) licences for specified industrial and agricultural activities.

These IE licences contain strict conditions on how an activity must operate so as to protect the environment from pollution that might otherwise arise. The EPA Act, 1992 specifically prohibits the EPA from granting a licence if emissions from the activity would cause pollution.

The proposed temporary plant will continue to operate under the existing IE licence regulated by the EPA (Registration Number: P0579). ESB is in the process of preparing an application for review of IE licence P0579 to allow for the proposed development.

During the operational phase the emergency power generation plant will be attended by up to five operational staff (day-time) and two staff (night-time) seven days a week. Operational staff will be responsible for controlling the generation plant and responding to calls from the system operator to start and stop the plant.

Scheduled maintenance of the power generation units will be undertaken on a phased basis. Maintenance requirements will be dependent on the operating profile of the plant but are expected to occur annually and take approximately 14 days depending on the level of maintenance required.

Given the low number of operating hours per annum (500 hours), unscheduled maintenance due to plant breakdown will be minimal. For the purpose of this EIAR however it is assumed that unscheduled maintenance will lead to loss of operation of an individual generating unit for no more than 14 days per annum to repair and / or replace faulty equipment. A maintenance crew of approximately three persons will attend site in such instances.

Waste materials generated on site will be domestic such as paper and food waste from the personnel on site, non-hazardous such as clean metal and wood waste from delivery pallets and hazardous for waste oils and greases generated from the operation of the plant.

All waste will be appropriately segregated and will be collected by suitably licenced waste contractors for disposal and in accordance with the existing IE licence and the Waste Management Act 1996, as amended and associated Regulations.

3.5 Health and Safety Considerations

3.5.1 Alternative Fuel

A natural gas supply, adequate to supply the generating units, is connected to North Wall Generating Station.

Natural gas has negligible sulphur and particulate matter content when compared to liquid fuels. The LM2500Xpress generating units are designed to operate on natural gas producing lower emissions than if fired on liquid fuel.

There is no requirement to store gas oil as standby fuel for the emergency generation plant. The generating units will operate using natural gas only.

3.5.2 Project Supervisor Design Process / Project Supervisor Construction Stage

ESB has been appointed PSDP for the initial design phase of this project. A detailed project specific preliminary health and safety plan detailing the site constraints, work hazards and all other pertinent information has been prepared.

A specialist Demolition Contractor will be appointed to the role of PSDP and will take on the role of PSCS as the demolition works move to their execution phase.

Following completion of the demolition works on site, the Main Contractor will be appointed to the role of PSDP and PSCS for the installation, commissioning and testing of all equipment including the gas turbines.

3.5.3 COMAH Regulations

North Wall Generating Station was previously designated a lower tier site due to the quantity of liquid fuel stored on site. Currently there is no bulk distillate fuel oil stored on site in North Wall Generating Station. As of the 8 September 2021, following a site inspection by the HSA, the North Wall Generating Station site, the subject site of this application, has been De-Notified as a Seveso Site.

The proposed gas turbines will operate on natural gas only and therefore there will be no bulk storage of distillate fuel oil on site. A quantity of natural gas will be maintained in the gas system and a small quantity of diesel will be stored on site for use by the diesel fire pump.

A list of chemicals expected to be stored on site is provided in Section 3.2.9 *Chemical Storage*. The volumes of hazardous substances to be stored on site will be less than the requirements of the COMAH regulations.

3.6 Decommissioning

The operational life of the temporary power plant is expected to be up to five years. Thereafter, the emergency generation plant will be disconnected and removed from site. This equipment is likely to be shipped, via Dublin Port, from Ireland for use at another location.

Remaining equipment such as the water tank, gas compressors, pipework and cabling, will be made safe and retained on site for potential future uses at North Wall Generating Station. Equipment will be stored under appropriate conditions and the site and all associated buildings will be secured. All lubricating oils other potentially polluting consumables will be removed from site.

Waste materials generated during the decommissioning of the plant will be removed from site.

The activities associated with the decommissioning phase will be similar to those associated with the construction phase of the project.

4 Planning Policy

4.1 Introduction

This chapter presents a non-exhaustive analysis of the European, national, regional, local planning and sectoral energy policy considerations which are relevant to the proposed development.

4.2 European Union Policy Context

4.2.1 Large Combustion Plant Directive

The overall aim of Directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants, also known as the Large Combustion Plant (LCP) Directive, is to reduce emissions of acidifying pollutants, particles and ozone precursors. The following provisions are contained in the Directive:

- Plants licensed after 26 November 2002 have to comply with the (stricter) emission limit values for SO2, NOx and dust fixed in part B of the Annexes III to VII.
- Plants licensed on or after 1 July 1987 and before 27 November 2002 have to comply with the (less strict) emission limit values fixed in part A of the Annexes III to VII.
- Significant emission reductions from "existing plants" (licensed before 1 July 1987) are required to be achieved by 1 January 2008:
  - a) by individual compliance with the same emission limit values as established for the plants referred to in point 2 above or
  - b) through a national emission reduction plan (NERP) that achieves overall reductions calculated on the basis of those emission limit values.

4.2.2 Renewable Energy Directive (RED1)

The original Renewable Energy Directive 2009/28/EC (known as RED1) established a regulatory framework for the promotion of the use of energy from renewable sources which set binding national targets on the share of renewable energy in energy consumption and in the transport sector to be met by 2020. Its overall aim was to make renewable energy sources account by 2020 for 20% of EU energy and for 10% of energy specifically in the transport sector (both measured in terms of gross final energy consumption, i.e. total energy consumed from all sources, including renewables).

Ireland had a binding national overall target for renewable energy consumption of 16% in 2020. In order to achieve this target, the Irish Government decided that 40% of electricity consumed in 2020 would be generated using renewable energy sources with targets of 10% and 12% in transport and heat, respectively.

4.2.3 Recast Renewable Energy Directive (Revision of Directive (EU) 2018/2001 - REDII)

In 2014, the European Commissions '*A policy framework for climate and energy in the period from 2020 to 2030'*, established a framework for future European Union (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%.

That proposal was endorsed by the European Council which also advised that Member States should be able to set their own, more ambitious, national targets in order to deliver their planned contributions to the Union 2030 target and exceed them. Also in 2014, the European Parliaments publication '*A 2030 framework for climate and energy policies*' and 2016 publication '*The renewable energy progress report'*, went further than '*A policy framework for climate and energy in the period from 2020 to 2030',* stressing that, in light of the Paris Agreement and the recent renewable technology cost reductions, it was desirable to be significantly more ambitious.

The ambition set out in the Paris Agreement as well as technological developments, including cost reductions for investments in renewable energy, led to new objectives being set in 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. This target will be reviewed upwards in light of substantial cost reductions in the production of renewable energy, the EU's international commitments for decarbonisation, or in the case of a significant decrease in energy consumption in the EU. Member States are required to establish their contribution to the achievement of that target as part of their integrated national energy and climate plans. Also, in RED II, the Commission encouraged investments in new, flexible and clean technologies, and established an adequate strategy to manage the retirement of technologies which do not contribute to the reduction of emissions or deliver sufficient flexibility, based on transparent criteria and reliable market price signals. This Directive therefore has directly influenced the national policy context specifically relating to energy and renewable energy in Ireland, as discussed in the following section.

The proposed temporary emergency power generation development proposal will not hinder Ireland's efforts to meet its binding renewable energy targets. The need for the proposed development has arisen as a result of a national emergency relating to the security of power supply and the explicit direction from the CRU to EirGrid to secure the system. The proposed development will be in situ, only as a short-term (up to five years) measure to address immediate power supply and demand requirements.

4.2.4 Energy Roadmap 2050

The Energy Roadmap 2050 (hereafter referred to as 'the Roadmap') was published by the European Commission in 2011 and explores the transition of the energy system in ways that would be compatible with the greenhouse gas reductions targets set out in the Renewable Energy Directive while also increasing competitiveness and security of supply. To achieve these goals, the Roadmap states that significant investments need to be made in new low-carbon technologies, renewable energy, energy efficiency, and grid infrastructure. Four main routes are identified to achieving a more sustainable, competitive and secure energy system in 2050:

- Energy efficiency;
- Renewable energy,
- Nuclear energy; and
- Carbon capture and storage.

The Roadmap combined these routes in different ways to create and analyse seven possible scenarios for 2050. The analysis found that decarbonising the energy system is technically and economically feasible. Each of the scenarios in the analysis assumed that increasing the share of renewable energy and using energy more efficiently are crucial, irrespective of the particular energy mix chosen.

The Roadmap notes that "*Gas plays a key role in the transition*" towards renewables, and also highlights the fact that the use of gas in the short to medium term, by substitution (of coal and oil), "*could help to reduce emissions with existing technologies until at least 2030 or 2035*".

The proposed development will utilise gas as a power generating source. The Roadmap identifies gas as playing a key role in the transition towards renewables, and in this respect, the proposed development will not hinder Ireland's efforts to meet its binding renewable energy targets. The need for the proposed development has arisen as a result of a national emergency relating to the security of power supply and the explicit direction from the CRU to EirGrid to secure the system. The proposed development will be in situ, only as a temporary, short-term measure to address immediate power supply and demand requirements.

4.3 National Policy Context

4.3.1 Government White Paper – Ireland's Transition to a Low Carbon Energy Future 2015-2030

The Government White Paper entitled *Ireland's Transition to a Low Carbon Energy Future 2015-2030* sets out a framework to guide Ireland's energy policy development and actions that the Irish Government intends to take in the energy sector up to 2030 - also reaching out to 2050. The framework was developed in the context of the significant role played by European institutions in determining energy policy, markets and regulation. Similarly, it takes account of European and international climate change objectives.

The Energy Vision 2050 established in the White Paper describes a 'radical transformation' of Ireland's energy system which it is hoped will result in GHG emissions from the energy sector reducing by between 80% and 95%, compared to 1990 levels. This means that the diversification of energy supply during the national transition to a renewable energy system will need to shift away from carbon-intensive fuels such as peat and coal in favour of lower carbon fuels like natural gas.

The proposed temporary emergency power generation development proposal will utilise gas as a power generating source. The White Paper identifies gas as a lower carbon fuel which can assist in the diversification of energy supply towards renewables. In this respect, the proposed temporary emergency power generation plant will not hinder Ireland's efforts to meet its binding renewable energy targets. The need for the proposed development has arisen as a result of a national emergency relating to the security of power supply and the explicit direction from the CRU to EirGrid to secure the system. The proposed development will be in situ, only as a temporary, short-term measure to address immediate power supply and demand requirements.

4.3.2 Climate Action Plan 2021 – Securing Our Future

Ireland's Climate Action Plan 2021 (CAP 2021), is a sectoral roadmap for meeting Ireland's 2050 national climate objective, and is the Government's second action plan since the inaugural plan of 2019. It follows the Climate Act 2021, which commits Ireland to a legally binding target of net-zero greenhouse gas emissions no later than 2050, and a reduction of 51% by 2030.

Whilst CAP 2021 is largely focussed on commitments and approaches to reducing emissions and meeting up to 80% of electricity demand from renewable power by 2030, it acknowledges that accommodating this volume of renewable capacity on a small island system will require an unprecedented level of investment in transmission infrastructure.

CAP 2021 also recognises that in decarbonising electricity generation, the security of energy supply must be ensured throughout the transition and that further measures will be required. In this regard, CAP 2021 also identifies the need for 2GW of new gas-fired power for the flexible support of renewables.

4.3.3 National Planning Framework – Project Ireland 2040

Ireland 2040 - National Planning Framework, hereafter referred to as the NPF, published by the Government in February 2018, is a 20-year planning framework designed to guide public and private investment, to create and promote opportunities for Irish citizens, and to protect and enhance Ireland's built and natural environment.

The NPF notes that the population of Ireland is projected to increase by approximately 1 million people by 2040 which will place further demand on both the built and natural environment as well as the social and economic fabric of the country.

The main aim of the NPF is to provide a strategy for the growing population and support future growth and success of Ireland's leading global city of scale and its regional cities and towns, while improving citizen's quality of life. The National Strategic Outcomes (NSO) relating to supporting and strengthening the economy (NSO 3, 6 and 8), providing access to quality public services (NSO 4, 7 and 10) and achieving sustainable growth of settlements and management of environmental resources (NSO 1 and 9), are not achievable in the absence of a secure and reliable electricity supply.

The NPF states that Ireland's National Energy Policy is focused on three pillars:

- Sustainability
- Security of Supply
- Competitiveness

In line with these principles, the **National Strategic Outcome 8** (Transition to Sustainable Energy), notes that in creating Ireland's future energy landscape, new energy systems and transmission grids will be necessary to enable a more distributed energy generation which connects established and emerging energy sources, i.e. renewables, to the major sources of demand. To facilitate this, NPF acknowledges the need to:

'*Reinforce the distribution and transmission network to facilitate planned growth and distribution of a more renewables focused source of energy across the major demand centres*.'

Within Chapter 9 - Realising Our Sustainable Future, **National Policy Objective 55** relates to the provision of renewable energy as part of the transition to a low carbon energy future; *"Promote renewable energy use and generation at appropriate locations within the built and natural environment to meet national objectives towards achieving a low carbon economy by 2050."*

The proposed development is considered to support the National Strategic Outcomes of the NPF and is consistent with NPO 55 as it provides a temporary, emergency response to the supply-demand imbalance that is currently present as the electricity system moves increasingly to a low-carbon system.

4.3.4 National Development Plan 2021-2030

The National Development Plan 2021-2030, hereafter referred to as the NDP, sets out the investment priorities at national, regional and local planning levels that will facilitate the implementation of the NPF.

In the context of the energy sector, the NDP highlights that "*The long-term objective is to transition to a net-zero carbon, reliable, secure, flexible and resource-efficient energy services at the least possible cost for society by mid-century.*

In the above regard, the NDP reiterates the NPF centrality of NSO 8 (Transition to a Low Carbon and Climate-Resilient Society) to all elements of spatial policy and reducing fossil fuel use and commits to increasing the share of renewable electricity up to 80% by 2030, as well as investment in the electricity transmission and distribution grid to strengthen the reliability of electricity supplies.

The NDP highlights the fact that "*energy supply is vital for the proper functioning of society and the economy*", and that a national level priority is thus to ensure its continued supply within the overarching EU energy policy framework. The proposed development represents the type and nature of investment described within the NPD which is required to achieve the NPF's strategic outcomes and the continued safe and secure provision of energy.

The proposed development is consistent with the NDP and its aims to decarbonise energy generation. The proposed development is a temporary, emergency response to ensure a demand response is available when renewable energy cannot sustain supply.

4.4 Regional Policy Context

4.4.1 Regional Spatial and Economic Strategy (RSES) for the Eastern and Midland Region (2019-2031)

The Regional Spatial and Economic Strategy (RSES) for the Eastern and Midland Region was published in June 2019. The principal statutory purpose of the RSES for the Eastern and Midland Region (EMR) is to support the implementation of the National Planning Framework and National Development Plan; the RSES sets out a strategic plan and investment framework to shape the future development of the region to 2031 and beyond.

The RSES sets out a vision statement which is underpinned by three key cross-cutting principles which best reflect the challenges and opportunities of the EMR: healthy placemaking; climate action; and economic opportunity.

The RSES for the EMR states that Dublin and the Eastern Region is a major load centre on the Irish electricity transmission system; specifically, approximately one third of total electricity demand is located in these regions. Having regard to projected population and economic growth in the eastern region, the RSES notes that the increasing demand for electricity in the region must be addressed in a way which balances the need for a significant shift towards renewable energy and enabling resources to be harnessed in a manner consistent with the principles of proper planning and sustainable development.

- Facilitating the provision of appropriate renewable energy infrastructure and enabling technologies;
- Expansion and upgrading of the grid with the aim of increasing the share of variable renewable electricity;
- Moving from carbon intense fossil fuel generation to lower emissions fuels such as natural gas; and
- The need to ensure sufficient electricity to meet increased demand.

The following Regional Policy Objectives (RPO(s)) outlined below, seek to ensure that the development of the energy network is undertaken in a safe and secure way which meets the projected demand levels, Government Policy and the need to achieve a long-term, sustainable and competitive energy future for Ireland:

RPO 10.19: Support roll-out of the Smart Grids and Smart Cities Action Plan enabling new connections, grid balancing, energy management and micro grid development.

RPO 10.20: Support and facilitate the development of enhanced electricity and gas supplies, and associated networks, to serve the existing and future needs of the Region and facilitate new transmission infrastructure projects that might be brought forward in the lifetime of this Strategy;

RPO 10.22: Support the reinforcement and strengthening of the electricity transmission and distribution network to facilitate planned growth and transmission/distribution of a renewable energy focused generation across the major demand centres to support an island population of 8 million people; and

RPO 10.23: Support EirGrid's Implementation Plan 2017-2022 and Transmission Development Plan (TDP) 2016 and any subsequent plans prepared during the lifetime of the RSES that facilitate the timely delivery of major investment projects subject to appropriate environmental assessment and the outcome of the planning process.

The RSES supports the development of a safe, secure and reliable supply of electricity energy networks to meet projected demand levels; the proposed development is considered consistent with, and will provide both direct and indirect support, to the attainment of the above policy objectives.

4.4.1.1 Dublin Area Strategic Plan

As part of the preparation of the RSES there is a requirement for a Metropolitan Area Strategic Plan (MASP) for Dublin to be prepared. The MASP provides a 12-20 year strategic plan and investment framework for the Dublin metropolitan area. The MASP aligns with the outcomes of the RSES including the management of the sustainable growth and investment of Dublin as a global city region. In support of this the vision statement of the MASP sets out the following:

"Over the years to 2031 and with a 2040 horizon, the Dublin metropolitan area will; "build on our strengths to become a smart, climate resilient and global city region, expanding access to social and economic opportunities and improved housing choice, travel options and quality of life for people who live, work, study in or visit the metropolitan area"

The MASP identifies a number of guiding principles for the sustainable development of the Dublin Area Metropolitan Area which are broadly in line with the proposed development. These include:

- **Dublin as a Global Gateway** - In recognition of the international role of Dublin, to support and facilitate the continued growth of Dublin Airport and Dublin Port, to protect and improve existing access and support related access improvements; and
- **Alignment of growth with enabling infrastructure** - To promote quality infrastructure provision and capacity improvement, in tandem with new development and aligned with national projects and improvements in water and wastewater, sustainable energy, waste management and resource efficiency.

Energy infrastructure is listed under "Enabling Infrastructure" within the MASP, with energy aims based on those of the RSES. RPO 5.1 Enabling Infrastructure, seeks 'continued collaboration between infrastructure providers, state agencies and local authorities to inform spending plans and accelerate strategic development'.

The proposed development is an important economic and social infrastructure project which shall help ensure that the MASP vision can be built towards in the coming years to 2031. It will assist in ensuring a reliable electricity source is available during required periods of demand over the immediate short-term period.

4.5 Local Policy

4.5.1 Dublin City County Development Plan 2016-2022

The proposed development is located within the functional area of Dublin City Council and is subject to the planning policies and objectives of the Dublin City Development Plan 2016-2022 (DCDP).

The DCDP contains a number of policies which are considered relevant to the proposed modifications to the existing North Wall Generating Station:

Renewable Energy

Objective CC03 which is to support the implementation of the national level 'Strategy for Renewable Energy 2012-2020' and the related National Renewable Energy Action Plan (NREAP) and National Energy Efficiency Action Plan (NEEAP);

Objective CC04 which is to support the implementation of the 'Dublin City Sustainable Energy Action Plan 2010-2020' and any replacement plan made during the term of this development plan; and

Objective CC09 to encourage the production of energy from renewable sources, such as from bioenergy, solar energy, hydro energy, wave/tidal energy, geothermal, wind energy, combined heat and power (CHP), heat energy distribution such as district heating/ cooling systems, and any other renewable energy sources, subject to normal planning considerations, including in particular, the potential impact on areas of environmental sensitivity including Natura 2000 sites.

Electricity

Objective CC014 to support the government's target of having 40% of electricity consumption generated from renewable energy sources by the year 2020.

The DCDP specifically outlines the background to electricity usage and the approach of the Council in relation to electricity generation and meeting the overarching sustainability and renewable energy objectives outlined above. In the supporting text it is also acknowledged that:

"The demand for electricity in the east region is expected to increase by over 80% by 2025. ESB Networks is the key provider of electricity infrastructure in Ireland and works closely with EirGrid, which is responsible for the operation and the development of the transmission system. EirGrid's grid development strategy, GRID25, is designed to ensure that the transmission network has the capacity to provide for growth in electricity demand between now and 2025 (although it is noted that this strategy is being updated and will be replaced by a new grid/transmission strategy plan)."

Land Use Zoning

The DCDP sets out the general land use zoning policies and objectives of Dublin City Council. Land use zoning within the City is based on a number of principles, with a total of 15no. land use zones designed to guide development within the city. As shown by Figure 4.1, the existing site, where the proposed development will be sited, is zoned under objective Z7 (Employment [Heavy]) – *"To provide for the protection and creation of industrial uses and facilitate opportunities for employment creation".*

Permissible uses within zoning objective Zone Z7 include "public service installation", the definition of this land use class is stated within Appendix 21 of the DCDP as;

"A building, or part thereof, a roadway or land used for the provision of public services. Public services include all service installations necessary for electricity, gas, telephone, radio,

telecommunications, television, data transmission, drainage, including wastewater treatment plants and other statutory undertakers: bring centres, green waste composting centres, public libraries, public lavatories, public telephone boxes, bus shelters, etc. but does not include incinerators/waste to energy plants. The offices of such undertakers and companies involved in service installations are not included in this definition".

The proposed development is consistent with the above definition. It also reflects the current land use, as well as historical planning permissions for all previous planning applications on the site of the ESBN North Wall Generating Station. Such planning permissions and the associated planners' reports have all acknowledged that the station's land use characterisation is consistent with the zoning policy of the area. It should furthermore be noted that the existing power station has been in situ at this location, since the 1940s.

4.5.2 Dublin Port Masterplan 2040 [Reviewed 2018]

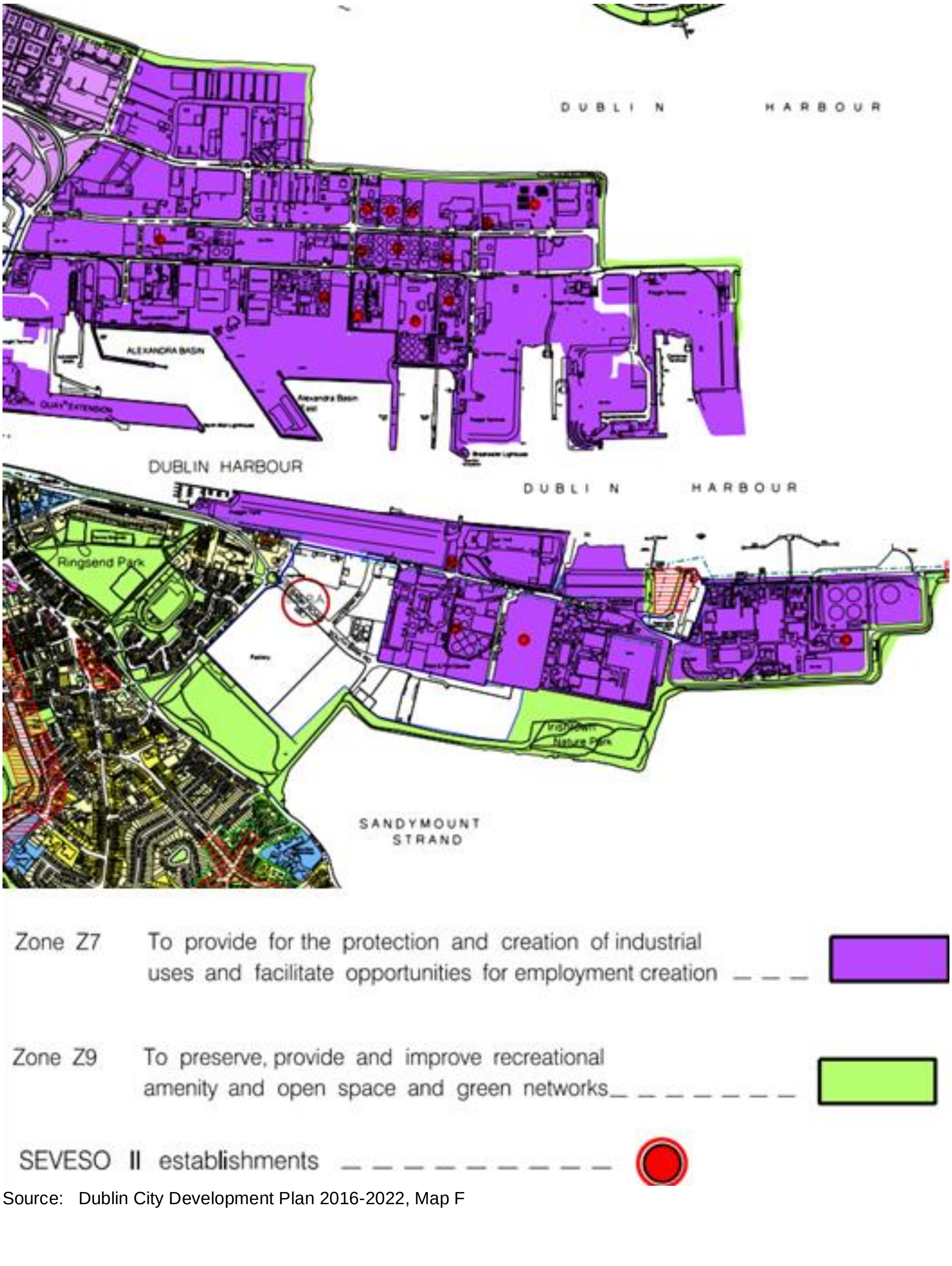
Dublin Port Company (DPC) adopted its Masterplan for the future development of the Port on 26 January 2012. The Masterplan, although not a statutory document provides the necessary framework to enable the DPC to plan for the sustainable development of the Port. The Masterplan also allows DPC to inform the Port's stakeholders, such as ESB, of how it is envisaged that the Port will/ could be developed in the years ahead.

The North Wall Generating Station site is identified in the Masterplan as a 'Power' land use (refer to Figure 4.2, North Wall Generating Station is annotated as 'P'). Under the commentary for the development potential for each site, the following is noted for the North Wall site (Ref: P);

'It is unclear if ESB's North Wall Power Station will be required long term by ESB. If not, the site could be redeveloped to provide additional lands for the transit storage of cargo".

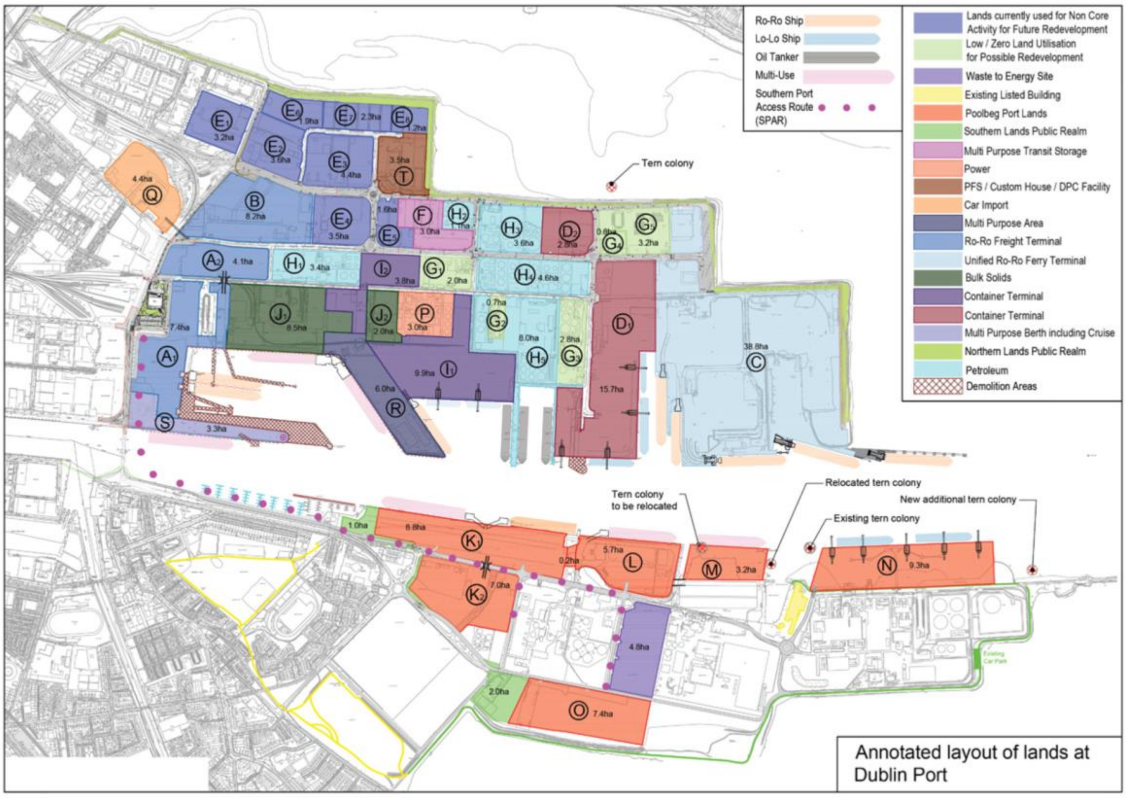
Notwithstanding the long-term future for this site, North Wall Generating Station and associated power generating use, has been in-situ in Dublin Port since the 1940s. it is an established land use, and is consistent with the zoning objectives of the Dublin City Development Plan 2016.

Figure 4.1: Land Use Zoning at Dublin Port



Source: Dublin City Development Plan 2016-2022, Map F

Figure 4.2: Land Uses within Dublin Port



Source: Dublin Port Masterplan 2040 [Reviewed 2018]

4.6 Sectoral Energy Policy

The emergency power generation plant is required to address security of supply issues, further detail on related policies is provided below.

4.6.1 Shaping our Electricity Future

In November 2021, EirGrid published a 'Roadmap', "*Shaping Our Energy Future".* Whilst this document seeks to outline key development from a networks, engagement, operations and market perspective that will be needed to support a secure transition to at least 70% renewables on the electricity grid by 2030, it also highlights the fact that in the short-term, there is an urgency to address the risks to security of supply. In this regard, it identifies there is a "*need to develop mitigating solutions that are outside of the current market construct",* and that *"where such solutions are approved, they will be proportionate and informed by clearly stated positions on the immediate short-term supply deficits and associated risks".*

4.6.2 Policy Statement on Security of Electricity Supply (DECC, November 2021)

On 30 November 2021, the Minister for the Environment, Climate and Communications, published a new Government Policy Statement to ensure security of electricity supply. The Policy Statement indicates that the development of new conventional generation (including gas-fired and gasoil/ distillate-fired generation) is a national priority and should be permitted and supported, in order to ensure security of electricity supply[2] and facilitate the target of up to 80%

[2] In 2020 the gas network powered 51% of the country's electricity requirements (System and Renewable Data Summary Report – EirGrid) – Gas Networks Ireland: Ireland's Gas Network "Delivering for Ireland", November 2021 (https://www.gasnetworks.ie/corporate/company/our-network/irish-gas-market-overview/Irelands-Gas-Network_Delivering-for-Ireland_FINAL-file-as-published-11-11-2021.pdf)

renewable electricity generation by 2030. The “*Policy Statement supports the Commission for Regulation of Utilities (CRU) and EirGrid as they carry out their statutory roles to ensure security of electricity supply in Ireland. It provides clarity to investors and planning authorities that the Government fully supports the actions being taken by the CRU and EirGrid, including the need to develop new gas-fired generation capacity”.*

4.6.3 Delivering a Secure, Sustainable Electricity System – DS3 Programme (EirGrid)

In response to the binding European and national total energy consumption targets EirGrid began a multi-year programme, “Delivering a Secure, Sustainable Electricity System” known as the DS3 Programme. To date the DS3 Programme has enabled increased instantaneous penetration levels of renewable generation on the system from 50% to 65%, with the aim to increase levels to 75% gradually over the coming years and ultimately achieve 95% instantaneous renewable generation penetration by 2030.

The DS3 Programme is designed to ensure that the increasing amount of renewable energy required on the Irish power system can operate in an efficient, secure and safe manner. The national power system operates as a synchronous system, whereby electricity is generated at a single synchronised AC frequency. Ireland and Northern Ireland form such a system – all of the conventional generators on the island run in synchronism, producing electricity at 50Hz. The growth of renewable energy generation, which is a non-synchronous form of power generation, presents a range of operational challenges for the power system as it displaces traditional synchronous generation on the system. This non-synchronous technology poses challenges in maintaining power system stability (maintaining system frequency within desired limits) and security due to both its non-synchronous characteristics and the inherent variability of renewable energy which is dependent upon climatic conditions. This variability must be managed to ensure demand for electricity is met at all times. A suite of system services has been developed as part of the DS3 Programme. These system services have been designed to aid the system operator in maintaining system stability and security as the level of renewable generation on the system increases. The proposed emergency generation plant will provide a response where an identified need for short-term grid support is required.

The CRU recently approved an additional allocation of DS3 revenue streams for the Dublin region only, to cover supply shortages. This package focuses on incentivising the TOR2 ramping products and local voltage control support.

4.6.4 ESB’s Brighter Future Strategy

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 and its continued decarbonisation will be provided by more gas generation plants from various gas technologies. Gas peak plants and gas CCGT are the most required technology in the years to 2030. However, these combined technologies will reduce their percentage of electricity generation overtime, they are predicted to decrease from 42.2% in 2015 to 5% in 2050. CCGT will continue to be required beyond 2050, with carbon capture and storage (CCS) technology increasing to fill the void from fossil fuels. Gas CCGT with CSS is predicted to increase from 10% in 2030 to 26% of electricity generation in 2050.

5 EIAR Methodology

5.1 Introduction

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

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

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

The 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 approach[3] has been applied whereby maximum design parameters based on realistic worst-case dimensions, orientations and components have been assessed. This approach ensures that the assessment will consider the greatest environmental impact (i.e. largest footprint, longest exposure, or highest dimensions depending on the topic). This approach is a resilient method where it may not be possible to identify the exact design parameters at this stage within the final design, thereby accommodating flexibility in design and construction whilst ensuring maximum extents and ranges are assessed in this EIAR.

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

5.2 EIA Directive

The amended EIA Directive requires that the EIAR provides:

"A description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as

[3] 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".

5.3 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 North Wall Emergency Power Generation Plant, the most relevant project type in Schedule 5 of the *Planning and Development Regulation 2001*, as amended, is identified in Part 1 Paragraph 2(a) which relates to:

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

Each generator will have a nominal capacity of 35MWe (33.3 MWe gross) and will have a net electrical efficiency of approximately 35% equating to approximately 91 MWth input. For six units the total thermal rating will be 546 MW with a net thermal rating of 346 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.

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, the urgent need for this emergency power generation plant has meant that formal scoping of this EIAR has not been undertaken. Further detail on the EIAR methodology applied in this EIAR is provided below.

5.4 EIAR Methodology

5.4.1 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.

5.4.2 Baseline 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 4.5.9 *Do-Nothing Effects*:

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

5.4.3 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.

5.4.4 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.

5.4.5 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 5.1 *Description of Effects* and as referenced in the EPA Guidelines 2022.

Table 5.1: Description of Effects

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

Category	Description of 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
	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

Category	Description 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 SOx and NOx to produce smog).

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

5.4.6 Mitigation and Monitoring

Mitigation by design / avoidance is incorporated into the design of the proposals, as described in Section 2.3 *Alternatives Considered* and Chapter 3 *Description of the Development*.

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

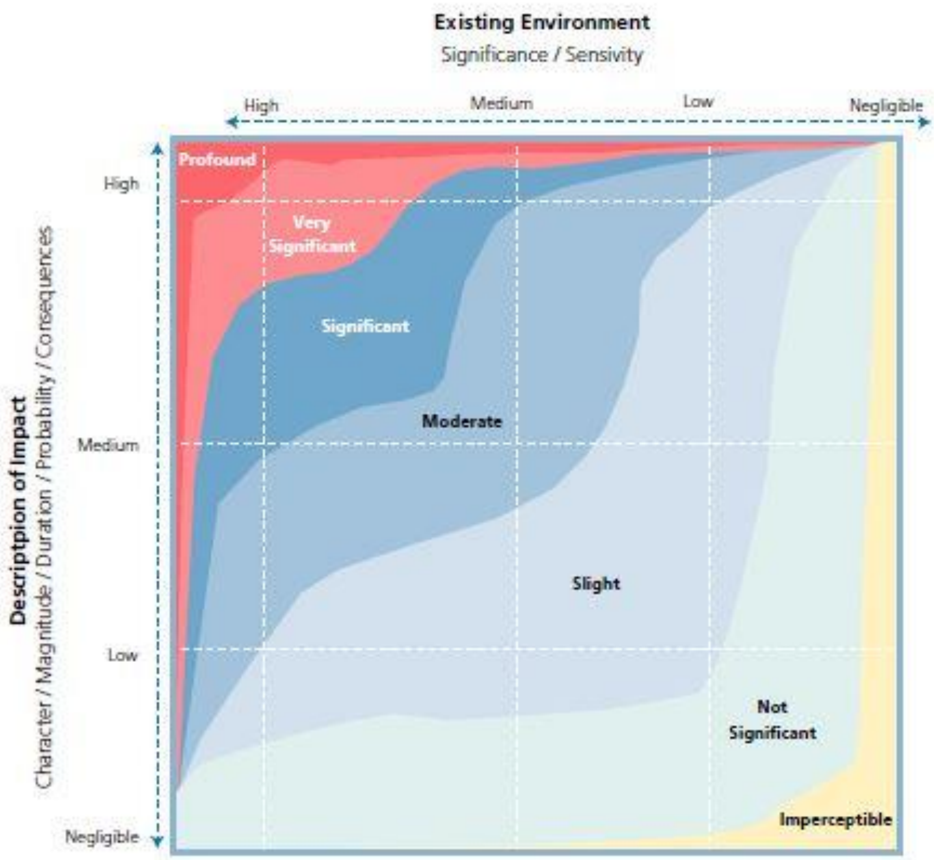
5.4.7 Residual Impacts

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

5.4.8 Decommissioning

The operational life of the equipment and apparatus of the emergency power generation plant will be limited to up to five 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 P0579-03 and decommissioning of the proposed emergency power generation plant will continue to comply with the conditions of this IE licence (Registration Number: P0579-03). Decommissioning impacts are however assessed for each technical chapter of this EIAR.

Figure 5.1: Impact Assessment Methodology



Source: EPA Guidelines 2022

5.4.9 Cumulative Effects

Cumulative effects take account of the addition of many minor or significant effects to create larger, more significant effects. As outlined in the EPA Guidelines 2022, while a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or significant), result in a cumulative impact that is collectively significant. A single effect which may, on its own, have a significant effect, may also have a reduced and insignificant impact when combined with other effects. Subject to consent being granted, it is anticipated that the construction phase of the project will commence in Q2/Q3 2022, with construction complete in Q1/Q2 2023.

Further to a review of planning applications undertaken on 20 March 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 5.2.

Table 5.2: 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 Masterplan 2040 (Alexandra Basin Development)	An Bord Pleanála Ref: 304888	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.	Granted 1 July 2020
MP2 SID Project	ABP Ref; 29N.PA0034	Dublin Port	The MP2 Project is a Strategic Infrastructure Development at Dublin Port which will include the construction of a new Ro-Ro jetty, construction of new quay walls, works to existing berths, new berth 53, dredging works and amendments to consented developments with planning reference numbers 3084/16 & 3638/18, and the ABR Project (ABP Ref. 29N.PA0034). An Environmental Impact Assessment Report (EIAR) of the project was undertaken by RPS on behalf of Dublin Port Company (RPS, 2019).	Granted 25/6/2020
Brexit Infrastructure	ABP Ref: 29N.PA0034	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
Dublin City Development Plan 2016 – 2022	Dublin City Council	Dublin City	The proposed development is located within the Dublin City administrative area. The Dublin City Development Plan 2016-2022 include objectives and policies which are associated with the protection of the natural environment.	N/A

For each technical topic, the nature and scale of the other development has been evaluated and the potential for temporal overlap within the topic-specific zone of influence (ZoI) has been assessed, having regard to the potential for significant cumulative effects.

It should be noted that it is not intended to proceed with the development permitted under 2697/20 (alterations to the existing North Wall Generating station) and no works have been carried out under the permission. The existing power station is no longer operational and will not be running at the same time as the emergency power plant. There is therefore no potential for cumulative effects to arise as a result of the development permitted under 2697/20.

5.4.10 Transboundary Effects

Certain environmental effects of a proposed development have the potential to cross state boundaries and have a 'transboundary effect'.

The need to consider transboundary impacts has been enshrined in the United Nations Economic Commission for Europe (UNECE) Convention on Environmental Impact Assessment in a Transboundary Context, adopted in 1991 (the Espoo Convention). The Espoo Convention has been ratified by the European Union, Ireland and the United Kingdom of Great Britain and Northern Ireland. Under the amended EIA Directive, the likely significant transboundary effects of a proposed development must be described.

All elements of the proposed development are found in Dublin City, Ireland and no international boundaries are crossed by the works. Given the nature and scale of the proposed development, significant transboundary effects as a result of the proposals are not likely to occur. Consequently, transboundary effects are not considered further in this EIAR.

5.4.11 Interactions between Environmental Factors

Interactions between effects may arise from the reaction between effects of the proposed development on different aspects of the environment which may exacerbate the magnitude of those effects. These are presented in Chapter 17 *Interactions Between the Topics* of this EIAR.

5.5 Limitations of this EIAR

There were no limitations encountered in compiling the information required to carry out this assessment of likely significant impacts as a result of the proposed development.

6 Population and Human Health

6.1 Introduction

This chapter presents an assessment of the likely and significant impacts arising from the proposed development on population and human health. The assessment is based on the 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:

- Noise and Vibration (Chapter 7);
- Air Quality and Climate (Chapter 8);
- Land, Soils and Hydrogeology (Chapter 9);
- Surface Water and Flood Risk (Chapter 10);
- Biodiversity (Chapter 11);
- Archaeology and Cultural Heritage (Chapter 12);
- Roads and Traffic (Chapter 13); and
- The Landscape (Chapter 14).

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

6.2 Methodology

A baseline condition was established by means of a desktop study which reviewed national guidance documents, publicly available datasets and resources to assess the likelihood of significant impacts associated with the proposed development and to provide mitigation and monitoring measures where required.

A desk study of the proposed development location and surrounding environs was carried out to collate all relevant and available data in relation to population and human health and for the study area using the following sources:

- Dublin City Development Plan 2016- 2022;
- Dublin Port Masterplan 2040 - MP2 Project;
- Regional Spatial and Economic Strategy for Eastern and Midland Region;
- Dublin Port Company Sustainability Report 2015;
- Fáilte Ireland Draft Docklands Visitor Experience Development Plan (2020);
- Labour Force Survey, Central Statistics Office www.cso.ie ;
- Census 2016, Central Statistics Office www.cso.ie;

- MP2 Project EIAR, Environmental Impact Assessment Report - Dublin Port MP2 Foreshore Consent; and
- Dublin Port Master Plan 2012-2040.

6.3 Study Area

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 study area has been defined by the Electoral Division(s), EDs, in which the proposed development site is located. EDs are the smallest legally defined administrative areas in the State for which Small Area Population Statistics (SAPS) are published from the Census. The North Wall Generating Station site is located within the ED of North Dock B. Pembroke East A ED is located adjacent to the North Dock B opposite the River Liffey. For the purpose of this EIAR it has been included in the study area as it contains the closest residential area located to the site. Census data for the wider area of Dublin City and suburbs were also considered in the desk-based assessment.

6.4 Baseline Environment

The proposed development is located within the site of an established power station in Dublin Port. The North Wall Generating Station is on the southern side of Alexandra Road within Dublin Port which is to the east of Dublin City Centre. Alexandra Road branches off the East Wall Road which is used by commuters during peak hours.

The immediate environment is dominated by Dublin Port and industrial use. The site is adjacent to container stacking areas to the south and west and the Irish Tar and Bitumen site is located across the road to the north of the site. Doyle Shipping group is located to the east and south. The nearest residential property is located approximately 760m to the south of the proposed development on Pigeon House Road.

The Point Square is located approximately 900m west of the proposed development, and includes; The 3 Arena, Red Luas Line, Gibson Hotel and the EXO Building, the tallest office building in Ireland.

6.4.1 Demographic Profile

Demographics are used to study the characteristics of a population at a specific point in time. In this assessment, demographics such as population and housing have been examined.

6.4.1.1 Population

The proposed development is situated in the administrative boundary of Dublin City Council. According to Census 2016, population growth in The Republic of Ireland increased from 4,588,252 in 2011 to 4,757,976 in 2016 (3.7%). 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 proposed development site is located within the ED North Dock B. The population growth in North Dock B was significantly higher, c.11.6%, than the national average. This is likely associated with the significant level of residential development that has progressed in the western part of North Dock B ED and the addition of the Luas Red Line. Table 6.1 outlines the population in North Dock B and Pembroke East A which is the closest adjacent ED to the proposed development.

Table 6.1: Population of Electoral Districts (2016)

Electoral District	Population
North Dock B	7,695 persons comprised 3,521 females and 4,174 males
Pembroke East A	5,078 persons comprised 2,659 females and 2,419 males

Source: www.cso.ie

6.4.1.2 Housing

According to Census 2016, there are 3,067 private households within North Dock B ED with 55.5% of these comprising of flats and apartments. A review of publicly available mapping and the Dublin CDP show that all residential development in the North Dock B ED is located west of the docklands. The closest residential area to the proposed development is located approximately 760m south in the Pembroke East A ED on the Pigeon House Road. Table 6.2 shows the private housing within Pembroke East A ED and North Dock B ED.

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.

Table 6.2: Housing of Electoral Districts (2016)

Electoral District	Households
North Dock B	There are 3,067 private households 43.3% are houses/bungalows 55.5% are flats/apartments 0.1% are bed-sits 1.1% are not stated
Pembroke East A	There are 2,102 private households 51.5% are houses/bungalows 47.4 are flats/apartments 1.1% are not stated

Source: www.cso.ie

6.4.2 Land Use

Thermal power generation is the established land use at North Wall Generating Station. The site is 'Brownfield' in nature and the site / facility operates under the existing IE licence regulated by the EPA (Registration Number: P0579).

The site is located North of the River Liffey and south of Dublin Bay. According to Corine Data 2018, the site is situated on Level 1 'Artificial Surfaces' and Level 2 'Industrial, commercial and transport units'. Within the immediate vicinity of the proposed development the predominate land use is industrial in nature.

The site is accessed via the port-owned Alexandra Road which connects to the public East Wall Road, a busy commuter route at peak hours. The East Wall Road connects with the M50 Port Tunnel, which is used by Heavy Goods Vehicles (HGVs) to bypass the city traffic.

6.4.3 Community and Facilities

A search of publicly available mapping shows that there are no schools, hospitals or churches within a 1km radius of the proposed development. The closest community facility is located in Ringsend on the southern bank of the River Liffey. Poolbeg Yacht and Boat Club is located approximately 1km south east of the proposed site and is a popular local club with approximately 240 members using the marina all year round.

East Wall is located approximately 1km to the west of the site. There are numerous community groups and facilities located in East Wall which include a community centre and youth clubs.

6.4.4 Tourism and Recreation

As part of the Dublin Port Masterplan 2040, the MP2 Project supports growth in passenger services to the port and predicts that numbers are anticipated to increase from 1.85 million passengers in 2017 to 2.49 million passengers by 2029.

A Greenway is proposed under MP2 Project in Dublin Port and it is anticipated there will an increase in tourism to the area due to walkways, cycle routes, bird watching and wildlife viewing along the Northern shoreline overlooking the Tolka estuary. The Greenway will be located approximately 330m to the north of the site and extend along the northern and eastern border of the North Dock ED. According to the CDP, the objective of the Greenway is *'to preserve, provide and improve recreational amenity and open space and green networks'.*

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 will extend from the port area approximately 925m south west of 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.'

6.4.5 Economic Profile

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

Employment

The unemployment rate has been significantly influenced by the current Covid-19 pandemic. On a seasonally adjusted basis, the numbers unemployed in Ireland in February 2022 stood at 135,100 at 5.2%, reduced from 7.5% in February 2021.

As detailed in the Dublin Port Master Plan 2012-2040, Dublin Port is a significant focal point for employment in Dublin both directly in the Port Estate and on a regional basis as a consequence of trading activity carried on at the Port.

According to the Dublin Port Company (DPC), 153 people were employed by DPC in 2017.[4] East Point Business Park is also located within the North Dock B ED, approximately 1.2km north west of the site and is an important employment hub.

As stated in the Dublin CDP, the area is zoned for Employment (Industry) (Z7). The key employment within the area is industrial and port related.

[4] 20176_DPC_2017_Sustainability_Report_v6.indd (dublinport.ie)

Employment by industry in the North Dock B ED and Pembroke East A ED is set out in Table 6.3

Table 6.3: Employment by Industry of Electoral Districts (2016)

Area	Employment by Industry
North Dock B	0.04% Agriculture, forestry and fishing 2% Building and construction 4.1% Manufacturing industries 28.2% Commerce and trade 17.6% Transport and communications 4.6% Public administration 15.8% Professional services 27.6% Other
Pembroke East A	0% Agriculture, forestry and fishing 3.2% Building and construction 5% Manufacturing industries 33.6% Commerce and trade 15.2% Transport and communications 3.7% Public administration 19.8% Professional services 19.5% Other

Source: www.cso.ie

6.4.6 Human Health

6.4.6.1 Industrial Emissions Licence

The existing North Wall Generating Station operations are licensed by the Environmental Protection Agency under IE Licence P0579. 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.

6.4.6.2 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 400 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 North Dublin indicates 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/m^3.

6.4.6.3 COMAH

North Wall Generating Station was previously designated a lower tier site due to the quantity of liquid fuel stored on site. Currently there is no bulk distillate fuel oil stored on site in North Wall. As of the 8 September 2021, following a site inspection by the HSA, the North Wall site has been De-Notified as a Seveso Site.

The proposed gas turbines will operate on natural gas only and therefore there will be no bulk storage of distillate fuel oil on site. A quantity of natural gas will be maintained in the gas system and a small quantity of diesel will be stored on site for use by the diesel fire pump.

A list of chemicals expected to be stored on site is provided in Section 3.2.12 Chemical Storage. The volumes of hazardous substances to be stored on site will be less than the requirements of the COMAH regulations.

6.5 Likely Significant Impacts

6.5.1 Construction Phase

The likely significant impacts on population and human health associated with the construction phase due to air, noise and dust emissions and traffic are discussed in the specialist chapters below. This chapter considers likely significant construction phase impacts on:

- Demographic Profile;
- Land Use;
- Community and Amenities;
- Tourism and Recreation;
- Economic Profile; and
- Human Health.

6.5.1.1 Demographic Profile

Significant impacts on the demographic profile (population or housing) during the construction phase as a result of the proposals are unlikely due to the scale of the project and the fact that workers are expected to commute from the wider Dublin area. Neutral / imperceptible impacts on the demographic profile are predicted.

6.5.1.2 Land Use

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

6.5.1.3 Community and Amenities

Due to the location of the site, which is not in proximity to any community or amenity facilities, significant impacts on community and amenities during the construction phase of the proposed development are not likely. Neutral / imperceptible impacts on communities and amenities are predicted.

6.5.1.4 Tourism and Recreation

Temporary negative impacts on tourism and recreation as a result of the proposals are possible due to potential disruption to access, and general disturbance. Given the short duration and limited scale of the proposals, these impacts are not likely to be significant. Neutral / imperceptible impacts on tourism and recreation are predicted.

6.5.1.5 Economic Profile

There will 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.

6.5.1.6 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.

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

6.5.2 Operational Phase

6.5.2.1 Demographic Profile

During the operational phase the emergency power generation plant will be attended by up to five operational staff (day time) and two staff (night time) seven days a week Given the nature of the proposed development, the operational phase will not have a significant impact on the demographic profile of the area or population and housing. Neutral / imperceptible impacts on the demographic profile are predicted during the operational phase.

6.5.2.2 Land Use

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

6.5.2.3 Community and Amenities

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

6.5.2.4 Tourism and Recreation

Given the established site use, it is not expected that the proposed development will result in significant impacts on tourism in the area or the existing recreational facilities during the operational phase.

6.5.2.5 Economic Profile

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.

Human Health

The proposed development will continue to operate in accordance with the requirements of the existing IEL. Significant adverse impacts on human health are not likely.

6.5.3 Do Nothing

If the proposed development does not proceed, the existing infrastructure will remain as is. Due to demand pressure on the grid however there will be likely effects for industry, commercial and residential users if outages occur on the system, resulting in the likelihood of significant adverse effects on population.

6.5.4 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.

6.5.5 Cumulative Effects

A number of other developments are proposed within the immediate environs of the proposed development, as detailed in Section 5.4 of this EIAR.

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

6.6 Mitigation and Monitoring Measures

6.6.1 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 Construction Environmental Management Plan (CEMP) is included in Appendix 3.1 of this EIAR. The CEMP will be implemented during the construction phase to safeguard the environment, site personnel, and nearby receptors, i.e. occupiers of residential and commercial properties, from site activities which may cause harm or nuisance.

The appointed contractors (in collaboration with ESB) will be required to maintain close liaison with local community representatives and statutory consultees throughout the construction period. This is likely to include circulation of information about ongoing activities; particularly those that could potentially cause disturbance, including due to traffic. 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, including construction traffic, will be managed through the site CEMP.

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.

6.6.2 Operational Phase

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

6.7 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.

7 Noise and Vibration

7.1 Introduction

This chapter presents an assessment of noise and vibration impacts and effects due to the construction and operation associated with the proposed development. The assessment is based on the development as described in Chapter 3 of this EIAR.

7.2 Methodology

The proposed development is expected to give rise to both temporary (demolition and construction) and short-term (operational) noise and vibration impacts. The potential for these impacts to exceed relevant threshold and limit values has been considered. This section describes the approach to the assessment based on the various relevant requirements and criteria.

7.2.1 Licensing Requirements

The existing North Wall Generating Station holds an Industrial Emission Licence (P0579-03)[5]. Section B.4 of this licence includes limits on noise emissions as follows:

- Daytime 55 dB L_{Aeq} (30 minutes);
- Night-time 45 dB L_{Aeq} (30 minutes); and
- There will be no clearly audible tonal component or impulsive component in the noise emission from the activity at any noise sensitive receptor.

The above limits apply to operational noise.

With regards to monitoring to assess compliance with the requirements of the Licence, Condition 4 clause 4.4 states: "*Noise from the installation shall not give rise to sound pressure levels (Leq,T) measured at noise sensitive locations which exceed the limit value(s) by more than 2 dB(A).*"

7.2.2 Regulatory Controls

The Environmental Noise Regulations (ENR)[6] transposes the EU Directive 2002/49/EC[7] (commonly referred to as the Environmental Noise Directive (END)) for the strategic control of environmental noise. North Wall Generating Station is within the Dublin agglomeration[8] 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 Industrial Emissions Licensing regulations[9] give powers to the Environmental Protection Agency, as the competent authority, to place controls on noise from industrial sites.

Nuisance due to noise is dealt with by the Environmental Protection Agency Act and the Protection of the Environment Act 2003 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*

[5] https://epawebapp.epa.ie/terminalfour/ippc/ippc-view.jsp?regno=P0579-03 [Last accessed 29 September 2021]

[6] Environmental Noise Regulations, 2006 (S.I. No. 140 of 2006).

[7] 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.

[8] https://gis.epa.ie/EPAMaps/

[9] European Union (Industrial Emissions) Regulations 2013, S.I. 138 of 2013; Environmental Protection Agency (Industrial Emissions) (Licensing) Regulations 2013, S.I. 137 of 2013

environment, result in damage to material property, or impair or interfere with amenities and other legitimate uses of the environment". It clarifies that noise includes vibration.

7.2.3 Construction Noise

British Standard 5228 'Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise' (2009+A1:2014)[10] has been adopted for the assessment of temporary noise impacts due to demolition and construction. This standard provides comprehensive guidance including details of typical noise levels associated with items of plant and activities, prediction methods, and options for mitigation measures, and therefore has been considered appropriate for use in this assessment.

7.2.4 Construction Vibration

BS 5228 Part 2: Vibration[11] provides guidance on the assessment of vibration due to construction activity. The Standard considers levels of vibration from construction in terms of peak particle velocity (ppv) defined as the instantaneous maximum velocity reached by a vibrating element as it oscillates about its rest position and is expressed in millimetres per second (mm/s). Methods to calculate indicative levels of vibration at receptor distances are described, along with case history data for various types of activity. BS 5228–2:2009+A1:2014 includes guidance on the levels of vibration that correspond with reported disturbance of occupants of residential buildings and with cosmetic or structural damage to different types of buildings.

7.2.5 Operational Noise

The Environmental Protection Agency 'Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)' (2016)[12] 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 planning permission. The British Standard 5228 'Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1: Noise'[10] and 'Part 2: Vibration'[11] (2009+A1:2014) are referenced as relevant guidance.

The NG4 Guidance sets out a methodology for setting appropriate noise criteria on operational noise emissions with the potential to affect Noise Sensitive Locations (NSLs). NSLs are defined as "*Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other installation or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance levels*."

Firstly, sites are screened to determine whether they are Quiet Areas based on the proximity of the proposed development to urban areas and other major sources of environmental noise. The Quiet Area Noise Criteria for applicable sites is a limit defined as 10 dB below the average background noise level for the day (07:00 to 19:00), evening (19:00 to 23:00) and night-time (23:00 to 07:00) periods obtained by long-term noise monitoring.

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[10] British Standard 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 1: Noise'.

[11] British Standard 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration'.

[12] Environmental Protection Agency Office of Environmental Enforcement Guidance Note for Noise Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4). January 2016.

For NSLs that are not identified as being within Quiet Areas, the NSLs are first screened for low background noise defined as those where the average background noise levels (L_{AF90}) are less than or equal to:

- Daytime: 40 dB L_{AF90};
- Evening: 35 dB L_{AF90}; 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*"

7.2.6 Operational Vibration

Operational vibration due to the proposed development is considered to be negligible (as has been the case for the existing power station). No significant impact is likely in particular given the separation distance to the nearest NSLs. Operational vibration is not considered further.

7.2.7 Receptor Sensitivity

The effects of environmental noise take various forms including but not limited to annoyance, sleep disturbance, disturbance of tranquillity, ability to communicate or concentrate, or participate in social and community activities.

Noise-sensitive locations are defined within the Industrial Emissions Licence as "*Any dwelling house, hotel or hostel, health building, educational establishment, place of worship or entertainment, or any other installation or area of high amenity which for its proper enjoyment requires the absence of noise at nuisance level*s."

Table 7.1 sets out typical classes of sensitive receptors and classification of noise sensitivity respectively. Most receptors likely to be affected by the noise and vibration effects arising from the proposed development are dwellings and are therefore considered high sensitivity.

Table 7.1: Criteria of sensitivity

Sensitivity	Criteria
High	Receptors where occupants or activities are particularly susceptible to noise. Examples include: Residences, quiet outdoor areas used for recreation, conference facilities, auditoria/studios, schools in daytime, hospitals/residential care homes and religious institutions e.g. churches or mosques.
Medium	Receptors moderately sensitive to noise, where it may cause some distraction or disturbance. Examples include offices, restaurants and sports grounds where spectator noise is not a normal part of the event and where quiet conditions are necessary (e.g. golf or tennis).

Sensitivity	Criteria
Low	Receptors where distraction or disturbance from noise in minimal. Examples include residences and other buildings not occupied during working hours, factories and working environments with existing high noise levels and sports grounds where spectator noise is a normal part of the event.

Source: Mott MacDonald

7.2.8 Significance of Effect

7.2.8.1 Construction

British Standard 5228[10] has been adopted for the assessment of effects at noise sensitive receptors[13] during construction. Based on the BS 5228 Part 1 'Example method 2 – 5 dB(A) change' in BS 5228 Part 1 2009+A1:2014, noise levels generated by site activities are deemed to be potentially significant if the total noise (pre-construction ambient plus site noise) exceeds the pre-construction ambient noise by 5 dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB $L_{Aeq, T}$ from site noise alone, for the daytime, evening and night-time periods, respectively; and a duration of one month or more, unless works of a shorter duration are likely to result in significant effect.

British Standard 5228-2:2009+A1:2014 explains that even when vibration due to construction activity is very low in magnitude, this can be perceptible to the occupants of nearby buildings. Nuisance associated with vibration is frequently associated with the assumption that if vibration can be felt then building damage is inevitable. Considerably greater levels of vibration over the threshold of perception are however required before damage to buildings at either a cosmetic or structural level will occur. BS 5228-2:2009+A1:2014 presents the following guidance, measured in terms of peak particle velocity (ppv) (mm/s), on the effects of vibration with regard to human response:

- 0.14 mm/s: Vibration may just be perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies people are less sensitive to vibration.
- 0.3 mm/s: Vibration might just be perceptible in residential environments.
- 1.0 mm/s: It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior notification and explanation has been given to residents.
- 10 mm/s: Vibration is likely to be intolerable for any more than a brief exposure to this level in most building environments.

BS 5228-2:2009+A1:2014 states that low frequency vibration at a ppv of 15 mm/s may cause cosmetic damage in un-reinforced or light framed structures e.g. for residential/light commercial use, and 50 mm/s in heavy commercial buildings. These values apply to transient vibration which does not induce a resonant response in structures and low-rise buildings. A source of continuous low frequency vibration may induce a vibration response in buildings or structures at their resonant frequencies. The building would then be subject to additional dynamic forces arising from its own motion. Therefore, BS 5228–2:2009+A1:2014 recommends that the values given should be reduced by 50% to take into account for dynamic magnification due to resonances. Applying a reduction of 50% to the lowest values in BS 5228–2:2009+A1:2014 gives:

- 7.5 mm/s for residential and light commercial buildings; and
- 25 mm/s for industrial and commercial buildings.

[13] Residential buildings, hotels and hostels, buildings in religious use, buildings in educational use and buildings in health and/or community use.

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*."

7.2.8.2 Operation

The assessment identifies that there is potential for significant adverse effect to arise when the proposed development results in operational noise impacts at noise-sensitive receptors that exceed:

- 55 dB(A) L_{eq} during the daytime (07:00 to 19:00) free field;
- 50 dB(A) L_{eq} during the evening (19:00 to 23:00) free field; or
- 45 dB(A) L_{eq} during the night-time (23:00 to 07:00) free field for any thirty-minute period.

These correspond with the 'Typical limit values for noise for licenced sites' as given in the NG4 Guidance and would also indicate compliance with the limit values given in the Industrial Emissions Licence for the existing power plant.

Where the predicted noise impacts exceed these values, the final significance of effect shall be considered with regard to:

- Sensitivity of receptor;
- Whether the impact is temporary (construction-related) or short-term (operational);
- The magnitude by which the limit value is exceeded; and
- The change in ambient noise levels as a result of the contribution of the proposed development.

It is assumed that operational noise includes no significant tonal or impulsive features and therefore correction of daytime and evening noise levels to represent rating levels.

7.3 Baseline Environment

7.3.1 Site location

The location of the proposed development is within the major section of Dublin Port in Dublin Harbour. The closest noise-sensitive receptors are:

- A four-storey office building within the Lagan Bitumen site on Alexandra Road and directly adjacent to the site on the north side. The closest façade is ~15m from the northern site boundary wall.
- Dwellings in the area of Ringsend to the south (closest at approximately 760m), East Wall to the west, and Clontarf to the north.
- The Tolka Estuary at ~360m from the northern site boundary wall.
- The River Liffey at ~220m from the closest part of the southern boundary wall.

Surrounding industrial receptors are considered low sensitivity and due to the nature of their use are not expected to result in significant effects.

The assessment of impacts on the Tolka Estuary and River Liffey is considered within Chapter 11 *Biodiversity*.

7.3.2 Noise monitoring

Two baseline noise surveys were undertaken in 2006 and 2009, which acquired instantaneous noise levels at receptors in Ringsend, East Wall, and Clontarf. The measurements were carried out over thirty-minute intervals. The validity of these measurements must be considered in the context of any significant changes to the nature of commercial activity, highway layout etc. in the vicinity since the surveys were undertaken. There have been no significant changes in this regard and therefore the noise surveys are considered to be representative. The baseline noise survey results in Table 7.2 are taken from the Pilz Ireland 'ESB North Wall Power Station Environmental Noise Assessment' reports dated 2007[14] and 2009[15].

Table 7.2: Summary of baseline noise survey results

Location	Date	Daytime		Night-time	
		dB $L_{Aeq(30\ mins)}$	dB $L_{A90(30\ mins)}$	dB $L_{Aeq(30\ mins)}$	dB $L_{A90(30\ mins)}$
Ringsend	December 2006	61.7	56.9	55.0	50.4
	November 2009	66.3	62.3	54.0**	56.7**
East Wall	December 2006	57.1	51.6	50.3	42.3
	November 2009	n/a*	n/a*	49.6**	56.5**
Clontarf	December 2006	55.9	49.8	49.1	43.5
	November 2009	57.8	57.4	n/a*	n/a*

* Values not included as data was collected in non-representative conditions.

** L_{A90} value exceeds the L_{Aeq} which may indicate that the L_{Aeq} has been revised to exclude loud events but which were long enough in duration to also affect the continuous L_{A90} value.

The area surrounding the proposed development site is industrial in nature and is a characteristic of the baseline conditions of the nearest sensitive receptors. The dominant sources of noise affecting the baseline noise climate were identified as:

- Ringsend: heavy vehicles accessing the port and overhead cranes lifting shipping containers;
- East Wall: heavy vehicles accessing the port and general road traffic on East Wall Road; and
- Clontarf: road traffic.

The background noise levels expressed as L_{A90} dB given in Table 7.2 exceed the daytime and evening screening criteria for Areas of Low Background Noise given in the NG4 Guidance. This confirms that the NSLs are within areas that would not be identified as Quiet Areas.

Consequently, this also confirms that the General Noise Criteria defined in the NG4 Guidance are applicable rather than the Quiet Area Noise Criteria.

For the North Wall Generating Station, the EPA gave agreement in 2012 that routine baseline monitoring would not be necessary and would only be undertaken as required by the EPA[16]. This was due to the difficulty in obtaining credible readings of the operating plant at the nearest NSLs, which are in an area of relatively high noise levels or at relatively long distances from the site.

7.4 Likely Significant Impacts

Operational and construction noise levels due to the proposed development have been calculated at three receptors in Ringsend as shown at Figure 7.1 and Figure 7.6:

- Lagan Bitumen Ltd (office building), Alexandra Road at 15m;
- 76, Pigeon House Road at 760m; and

[14] Pilz Ireland (2007). 'ESB North Wall Power Station Environmental Noise Assessment'. Document number 1069.1-ESB-NW. Revision 5.

[15] Pilz Ireland (2009). 'ESB North Wall Power Station Environmental Noise Assessment'. Document number 1069.3-ESB-NW. Revision 3.

[16] https://epawebapp.epa.ie/licences/lic_eDMS/090151b280465a67.pdf [Last accessed 29 September 2021]

- 1, Pigeon House Road at 950m.

Noise sensitive receptors in Clontarf (approximately 1,100m away) and East Wall (approximately 1,200m away) are considered too far from the location of the proposed development to have potential adverse noise effects and were therefore not included in any calculations.

7.4.1 Construction Noise

An indicative list of plant is presented in Table 7.3 and has been derived from the inventories of similar projects and through consultation with the project team. Reference Sound Pressure Levels (SPL) for continuous operation are presented. The level of noise emission is corrected for utilisation based on the estimated percentage of time the plant is expected to be in use over a working day. The predicted noise levels at the NSLs in Ringsend due to demolition and the construction of the proposed development are below the daytime criterion of 65 dB L_{Aeq} and evening criterion of 55 dB L_{Aeq}. Therefore, it is concluded that significant adverse impacts due to construction noise are not likely.

Table 7.3: List of noise sources considered for the construction works for the proposed development

Phase	Item #	Description	SPL at 10m L_{Aeq}, dB	On time %	Specification data source
Pre-construction Works	A1	Clearing site	78.0	50	BS 5228 Table C.2 ref. no. 3
	A2	Distribution of materials	81.0	50	BS 5228 Table C.4 ref. no. 1
Demolition Works	B1	Breaking up concrete	93.0	25	BS 5228 Table C.1 ref. no. 7
	B2	Breaking up brick foundations	90.0	25	BS 5228 Table C.1 ref. no. 9
	B3	Dumping brick rubble	85.0	50	BS 5228 Table C.1 ref. no. 10
	B4	Breaking and spreading rubble	86.0	50	BS 5228 Table C.1 ref. no. 13
	B5	Breaking up/cutting steel	83.0	50	BS 5228 Table C.1 ref. no. 17
	B6	Breaking brickwork	89.0	25	BS 5228 Table D.2 ref. no. 13
	B7	Dropping ball demolition	93.0	25	BS 5228 Table D.2 ref. no. 1
	B8	Breaking concrete foundation	91.0	25	BS 5228 Table D.2 ref. no. 4
	B9	Distribution of materials	81.0	75	BS 5228 Table C.4 ref. no. 1
Ground Works	C1	Ground excavation/earthworks	71.0	25	BS 5228 Table C.2 ref. no. 21
	C2	Distribution of materials	81.0	75	BS 5228 Table C.4 ref. no. 1
	C3	Compacting fill	78.0	25	BS 5228 Table D.3 ref. no. 116
Piling	D1	Shallow Piling, Minicat, top-feed, electric vibrator	93.0	25	BS 5228 Table C.12 ref. no. 59
	D2	Shallow Piling, 360 Excavator	71.0	25	BS 5228 Table C.2 ref. no. 21
Plant Construction Works	E1	Ground excavation/earthworks	71.0	50	BS 5228 Table C.2 ref. no. 21
	E2	Distribution of materials	81.0	50	BS 5228 Table C.4 ref. no. 1
	E3	Mixing concrete	80.0	25	BS 5228 Table C.4 ref. no. 20
	E4	Pumping concrete	80.0	25	BS 5228 Table C.4 ref. no. 29
	E5	Concreting other	71.0	25	BS 5228 Table C.4 ref. no. 36

Phase	Item #	Description	SPL at 10m L_{Aeq}, dB	On time %	Specification data source
	E6	Lifting, Mobile telescopic crane	77.0	50	BS 5228 Table C.4 ref. no. 39
	E7	Lifting, Diesel scissor lift	78.0	50	BS 5228 Table C.4 ref. no. 59
	E8	Trenching	71.0	25	BS 5228 Table C.4 ref. no. 65
	E9	Power for site cabins	66.0	100	BS 5228 Table C.4 ref. no. 78
	E10	Pumping water	68.0	75	BS 5228 Table C.4 ref. no. 88

Source: Mott MacDonald

The source of noise is assumed to be evenly distributed across the site at locations adjacent to site components scheduled for demolition or construction. The calculation of construction noise has accounted for buildings providing screening. It is assumed that there will be no construction activity during the night-time. Normal working hours during the construction period are expected to be Monday to Friday 08:00 to 19:00 hours and 08.00 to 17.00 on Saturday. During certain stages of the construction phase, it is expected that some work will have to be carried out outside of normal working hours however this will be kept to a minimum.

Noise due to construction traffic is considered negligible within the context of the proposed site and the nature of the construction activity.

Neither of the example methods in BS 5228 specified in Annex E 'Significance of Noise Effects' align with requirements set by the Environmental Protection Agency and as a result have not been considered as methods for deriving the definition of a significant adverse effect. The definition of a significant adverse effect is specified in chapter 2 of this assessment.

Table 7.4 includes worst case noise levels at representative noise sensitive receptors (high sensitivity) in Ringsend due to the construction of the proposed development.

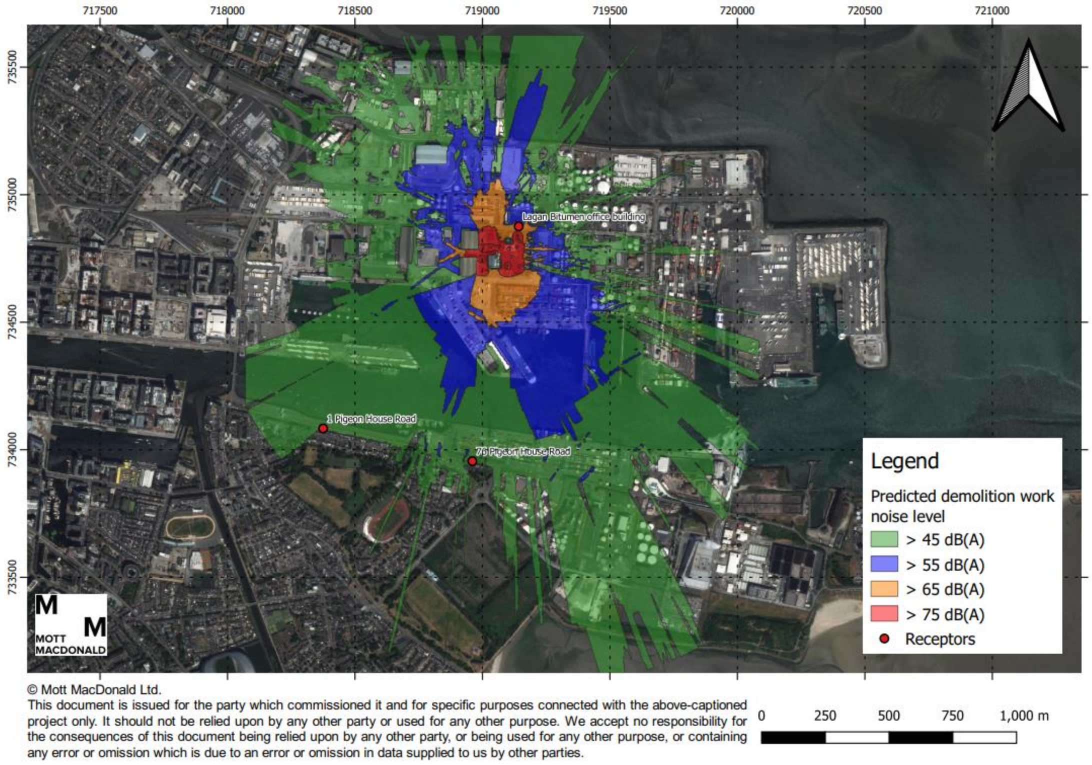
Table 7.4: Construction noise levels at sensitive receptors due to the proposed development

	Predicted noise level, dB L_{Aeq}					
Receptor	Pre-construction Works	Demolition Works	Ground Works	Piling	Plant Construction Works	Significant Adverse Effect
Lagan Bitumen office building, Alexandra Road	63	70	65	73	63	No [1]
1 Pigeon House Road	40	50	41	45	40	No
76 Pigeon House Road	36	51	37	39	39	No

Note: [1] This type of receptor is not considered by the BS 5228 'Example Method 2 - 5 dB(A) Change Method'. However, the most exposed façade is double-glazed and appears to be ventilated without the need to open windows. With an external noise level of 70 dB(A), the estimated internal noise level is ~40 dB(A) assuming the benefit of double glazing (4:(6-16)4mm. With reference to BS 8233:2014[17] Table 2, the design range for indoor ambient noise levels in an open plan office is 45 to 50 dB(A). Therefore estimated internal noise level within the Lagan Bitumen building due to demolition (worst case) does not exceed the design range for internal ambient noise level. It is concluded that this would not result in a significant adverse effect.

[17] British Standards Institution (2014). BS 8233 Guidance on sound insulation and noise reduction for buildings.

Figure 7.1: Contour plot of demolition work noise levels



Source: © Mott MacDonald Ltd. and © ESRI (UK) Limited

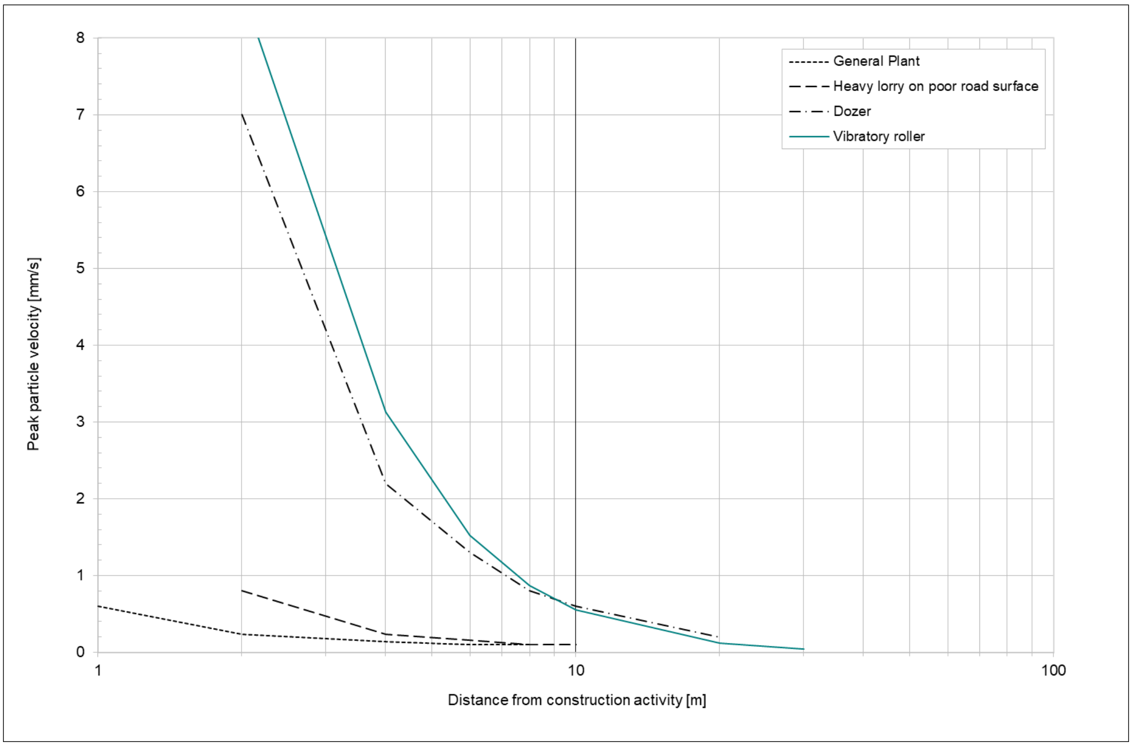
The predicted noise levels at the representative NSLs in Ringsend due to the construction of the proposed development are below the daytime criterion of 65 dB L_{Aeq} and evening criterion of 55 dB L_{Aeq}. The predicted level of noise at the Lagan Bitumen office building is 70 dB L_{Aeq} in the worst case and is due to 'Breaking up concrete'.

Therefore, it is concluded that significant adverse impacts due to construction noise are not likely.

7.4.2 Construction Vibration

Figure 7.2 presents levels of ground-borne vibration for various types of construction activities as a function of distance. This shows that vibration from general activity is not expected to result in perceptible levels of vibration beyond ~8m distance. The closest part of the site is ~15m from the closest NSL: the Lagan Bitumen office building.

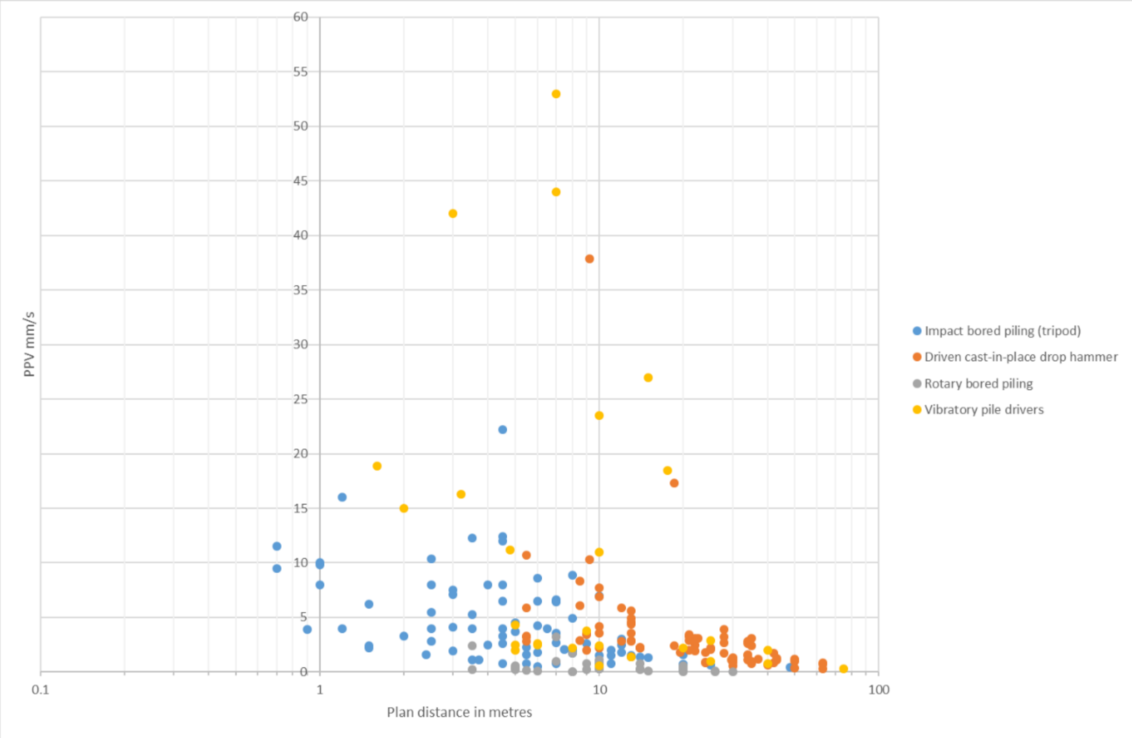
Figure 7.2: Empirical data on ground-borne vibration from general construction works



Source: Mott MacDonald

It is not known at this stage whether piling will be required or the preferred method. BS 5228-2:2009+A1:2014 presents case history data for the levels of vibration for various types of piling expressed as peak particle velocity. Figure 7.3 presents data for impact, driven, rotary and vibratory piling as a function of plan distance.

Figure 7.3: BS 5228-2:2009+A1:2014 case history data on vibration from piling



Source: Mott MacDonald

With reference to Figure 7.3, this shows that vibration due to most types of piling may exceed 1 mm/s if the works are undertaken at the closest part of the site to the Lagan Bitumen office. It would therefore be likely to be perceptible and may cause complaint. However, the likelihood of cosmetic or structural damage is very low. Vibration due to rotary bored piling is unlikely to be perceptible whereas driven, impact and vibratory types are likely to exceed 1 mm/s. Potential disturbance can be avoided by giving prior notification and careful timing of activities to avoid sensitive times of the day. However, as distance of the foundation of the gas turbines to the Lagan Bitumen office is approximately 110m, the significant effects due to the potential piling work is not likely.

It is concluded that vibration due to construction activity has a very low likelihood to cause complaint, cosmetic or structural damage. The significant effects of vibration due to construction activity and piling work are not likely as any piling will not occur at the part of the site closest (within 50m) to the Lagan Bitumen office. The impacts at all other NSLs are not predicted to exceed thresholds of perception.

7.4.3 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.

7.4.4 Decommissioning Phase

Specific details on decommissioning are not available at this stage of the project. Impacts during decommissioning from airborne noise and ground-borne vibration due to demolition activities are expected to be of a similar magnitude to those during construction but generally of shorter duration. Therefore, significant impacts are not likely to occur.

7.4.5 Cumulative Effects

Dublin Port Company was granted consent in 2020 for the MP2 project. This comprises:

- A new Ro-Ro jetty (Berth 53) for ferries up to 240m in length on an alignment north of the port's fairway;
- A reorientation of Berth 52 (already permitted);
- A lengthening of an existing river berth (50A) to provide the Container Freight Terminal with additional capacity to handle larger container ships. These works will include the infilling of the basin east of the now virtually redundant Oil Berth 4 on the Eastern Oil Jetty;
- The redevelopment and future-proofing of Oil Berth 3 as a future deep water container berth for the Container Freight Terminal. The future-proofing will facilitate the change of use of the berth from petroleum importation to container handling when the throughput of petroleum products through Dublin Port declines as a result of national policies to decarbonise the economy; and
- Consolidation of passenger terminal buildings, demolition of redundant structures and buildings, removal of connecting roads and reorganisation of access roads to increase the area of land for the transit storage of Ro-Ro freight units.

Figure 7.4 shows the extent of the MP2 project relative to the ESB North Wall Generating Station site indicated in green.

Figure 7.4: Extent of the proposed MP2 project area outline in red[18] and the ESB North Wall Generating Station site area indicated in green

Source: Extract of RPS (2019). MP2 Project Environmental Impact Assessment Report Main Document (Part 1) Volume 2.

The MP2 project has a 15-year construction period beginning Q2 / Q3 2022 It is expected that construction of the Emergency Generation Plant will commence in 2022 with design, construction, and commissioning activities lasting for approximately 18 months. The plant is expected to be fully operational in 2023. This indicates that there may be some simultaneous works in construction of the MP2 project, which this EIAR shows is expected to be the Berth 52 and Berth 53 elements. These are further east along the peninsula and more than 600m from

[18] RPS (2019).MP2 Project Environmental Impact Assessment Report Main Document (Part 1) Volume 2.

the North Wall Generating Station site. The EIA for the MP2 project concluded that noise due to construction (all phases) was not expected to result in prolonged nuisance to the local communities due to the distance from the construction works. Therefore, it is unlikely that cumulative construction impacts of the Temporary Emergency Generation Plant and MP2 projects would also result in prolonged nuisance due to separation of concurrent work phases.

The assessment of operational noise of the Emergency Generation Plant above predicts that this will be below baseline noise levels at the closest sensitive receptors. Therefore, the combination of operational noise impacts of the Emergency Generation Plant project with the construction or operational impacts of the MP2 would not modify the conclusions of the noise assessment of the EIA for the MP2 project which were generally neutral.

7.4.6 Operational Noise

The operational noise assessment implements the procedures of ISO 9613-2[19] using a three-dimensional acoustic model within DataKustik CadnaA software. The model includes:

- Noise source elements which represent operational activities;
- Screening elements such as buildings and plant enclosures; and
- Sensitive receptor elements at first floor level.

A list of operational noise sources is presented in Table 7.5 and the steady state sound power levels (SWL) that have been applied within the acoustic model. The item numbers correspond to the equipment layout in Figure 7.1. The noise emission data of plant items for the proposed development have been obtained for plant items specified within other similar projects and with similar specifications. It is assumed that all plant will operate continuously.

Table 7.5: List of noise sources considered within the acoustic model for the operation of the proposed development[20]

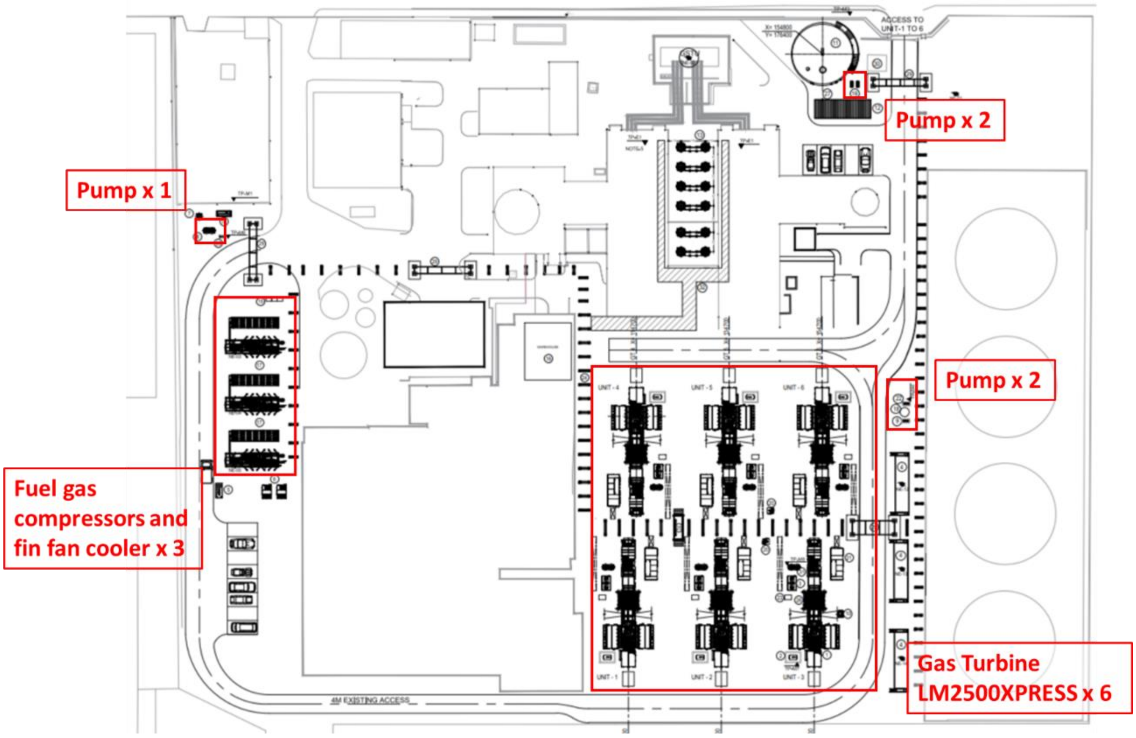
Item #	Description	Number of items	Sound power level dB(A)
ID_01	Gas turbine – LM2500Xpress	6	109.4
ID_02	Pump	5	93.1
ID_03	Fuel gas compressor and fin fan cooler	3	96.5

Source: Mott MacDonald

[19] ISO 9613 (1996) Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation'.

[20] Sound power levels obtained from the Mott MacDonald database for representative items of equipment.

Figure 7.5: Proposed Layout



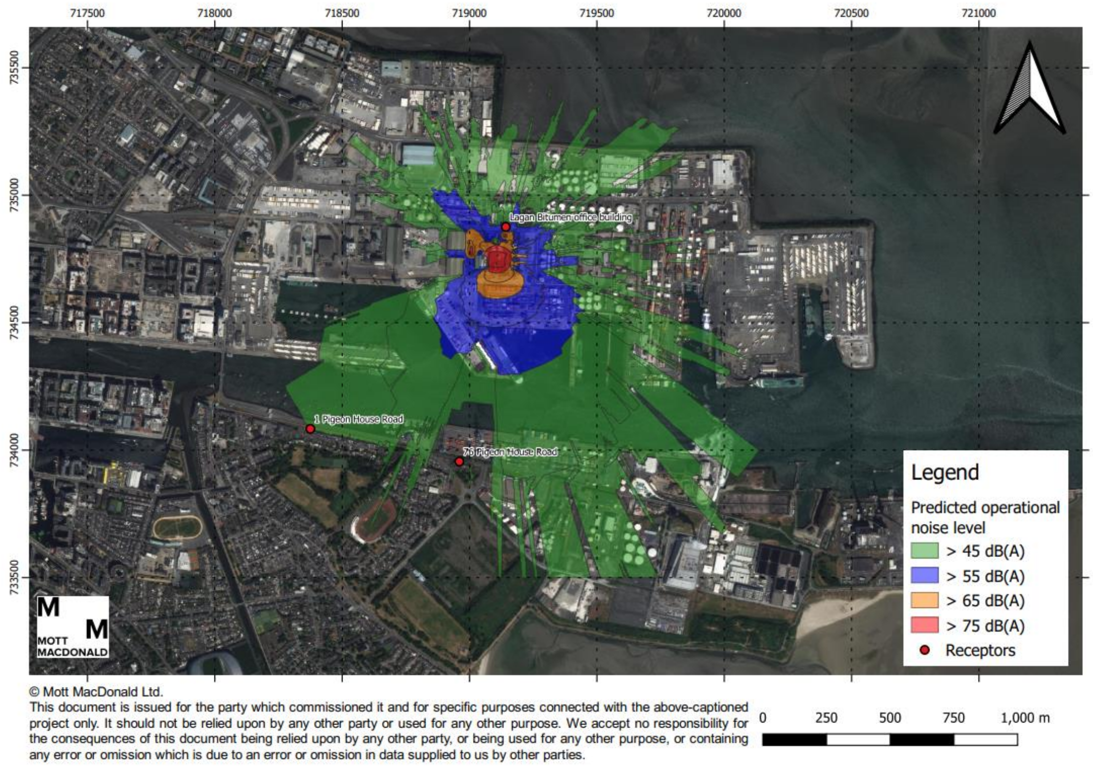
Source: Plant Layout, Temporary power generation, Drawing no. NOR/00/E/001b---003/GA/205, ESB GE Power Gas Power System

Table 7.6: Predicted operational noise levels at sensitive receptors due to the proposed development

Receptor	Noise Level dB L_{Aeq}	Significant Adverse Effect
Office building, Alexandra Road	61	No[1]
1 Pigeon House Road	46	No
76 Pigeon House Road	45	No

Note: [1] This type of receptor is not specifically considered by the NG4 Guidance. However, the most exposed façade is double-glazed and appears to be ventilated without the need to open windows. With an external noise level of 61 dB, the estimated internal noise level is ~30 dB assuming the benefit of double glazing (4:(6-16)4mm. With reference to BS 8233:2014 Table 2, the design range for indoor ambient noise levels in an open plan office is 45 to 50 dB. Therefore estimated internal noise level within the Lagan Bitumen building due to demolition (worst case) does not exceed the design range for internal ambient noise level. It is concluded that this would not result in a significant adverse effect.

Figure 7.6: Contour plot of operational noise levels



Source: © Mott MacDonald Ltd. and © ESRI (UK) Limited

The predicted noise levels at the representative receptors in Ringsend due to the proposed development are below the lowest criterion given in the NG4 guidance of 45 dB L_{Aeq} for the night-time. The noise levels are therefore also below the criteria for daytime and evening of 55 dB L_{Aeq} and 50 dB L_{Aeq} respectively. The predicted noise levels are below the baseline noise levels measured in 2006 and 2009. Therefore, it concluded that significant adverse impacts due to operational noise are not likely.

7.5 Mitigation and Monitoring Measures

No specific mitigation measures are proposed for the mitigation of construction or operational noise impacts at off-site sensitive receptors, noise emissions should be minimised at source, in accordance with best practice, to minimise the exposure site personnel to noise from construction and operational plant. The requirement for impact, drop hammer or vibratory piling methods close to the northern boundary of the site may generate perceptible vibration at the Lagan Bitumen office building and cause complaint, but is not expected to cause cosmetic or structural damage. If required, measures to limit exposure should be considered depending on the type of method selected.

7.6 Residual Impacts

The proposed redevelopment is expected generate noise during both the construction and operational stages, and vibration during construction.

The assessment has considered the likelihood of significant impacts based on predictions of noise where the noise emissions of construction and operational plant have been assumed.

The proposed development is located approximately 760m from the nearest dwellings in Ringsend. As a result, the distance between site and noise sensitive receptors is sufficiently high such that there will be no significant adverse effects due to construction or operational noise. There is potential for complaint due to vibration affecting the Lagan Bitumen office building, which is approximately 18m from the site boundary, if certain types of piling were required at the closest part of the site boundary. However, since the distance of the potential piling works to the Lagan Bitumen office is approximately 110m, significant impacts due to the potential piling work are not likely. If piling is required, measures to limit exposure should be considered depending on the type of method selected.

8 Air and Climate

8.1 Introduction

This chapter provides an assessment of the potential effects and likely significance of the proposed development on local air quality and climate and 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 national requirements including Environmental Protection Agency Air Dispersion Modelling from Industrial Installations Guidance Note (EPA AG4)[21] and addresses the construction and operational impacts resulting from emissions to air.

The proposed development will consist of six GE LM2500XPRESS open cycle gas turbines (OCGT), each with an approximate net output of 35 MWe. The proposed development will operate on natural gas only and will meet peak demand as required, with a maximum operation of 500 hours per year, to make up any short fall in grid electricity and prevent a national emergency. The proposed development will make use of an existing 220kV substation with Gas Insulated Switchgear (GIS) already present on the site. There will be no combustion of liquid fuels such as distillate oil. Further details regarding the project's description can be found in Chapter 3 Description of the Development.

The proposed development also requires the use of three gas compressors. The gas compressors will be electric motor driven and therefore have no direct emissions to air and have not therefore been considered further in this chapter.

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 Poolbeg Peninsula;
- 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.

[21] 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 [last accessed 09/09/2021]

8.1.1 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 (the proposed fuel for the proposed development), the primary pollutants of concern are:

- Oxides of nitrogen (NO_x); and
- Carbon Monoxide (CO)

8.1.1.1 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.

8.1.1.2 Carbon Monoxide

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

8.2 Legislation

8.2.1 Overview

This section summarises the relevant international and national legislation, policy and guidance in relation to air quality for the proposed development for emissions to air and ambient air quality.

8.2.2 Emissions to Air

The Industrial Emissions Directive[22] (IED) sets emissions limits for large combustion plant. For gas turbines adherence to emission limits for NO_x and CO are presented in Table 8.1. However, gas turbines for emergency use that operate less than 500 hours per year are not covered by the emissions limit values set out in IED. The operator of such plants, which includes the proposed development, must record the used operating hours. Nevertheless, the selected turbines will meet these requirements.

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

Table 8.1: Emissions Limits Applicable to the Proposed development (mg/Nm³)

Pollutant	Emission Limit[(a)]
Nitrogen oxides (NOx as NO_2)	50[(b)]
Carbon monoxide (CO)	100

Notes: Concentrations referenced to 15% O_2, dry, 0°C, 1.013 kPa atm.
(a) For single cycle gas turbines having an efficiency greater than 35 % – determined at ISO base load conditions – the emission limit value for NO_x shall be 50xη/35 where η is the gas turbine efficiency at ISO base load conditions expressed as a percentage.
(b) For gas turbines (including combined cycle gas turbines), the NOx and CO emission limit values set out in this point apply only above 70 % load.

The Best Available Techniques (BAT) Reference Document for Large Combustion Plants[23] provide associated emission levels (BAT-AELs) for the combustion of gaseous fuels in new OCGTs. However, as the proposed development will operate for less than 500 hours per year, the BAT-AELs do not apply and have not been considered further.

8.2.3 Ambient Air Quality

Directive 2008/50/EC[24] on ambient air quality and cleaner air for Europe 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 Emission Limit Values (ELVs) for different pollutants, including NO_2 and CO, 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 Regulations[25] implement the EU Ambient Air Quality Directive (2008/50/EC) and define the air quality standards currently applicable in Republic of Ireland.

Table 8.2 presents the air quality standards and target values for the pollutants relevant to this assessment as prescribed by the EU and Irish legislation, hereafter referred to as air quality standards (AQS). Standards for the protection of vegetation and ecosystems are referred to as 'critical levels'.

Table 8.2: Statutory Ambient Air Quality Limit Values and Objectives for NO_x and NO_2

Pollutant	Averaging period	Limit value (µg/m³)	Allowance
For the protection of human health			
Nitrogen dioxide (NO_2)	1-hour	200	18 times pcy
	Annual	40	–
Carbon monoxide (CO)	8-hour running	10,000	-
For the protection of vegetation and ecosystems			
Nitrogen oxides (NO_X)	Annual	30	–

Source: Directive 2008/50/EC
Notes: pcy = per calendar year

Directive 2008/50/EC[24] sets out that the limit values apply everywhere with the exception of:

[23] Thierry Lecomte, José Félix Ferrería de la Fuente, Frederik Neuwahl, Michele Canova, Antoine Pinasseau, Ivan Jankov, Thomas Brinkmann, Serge Roudier, Luis Delgado Sancho; Best Available Techniques (BAT) Reference Document for Large Combustion Plants; EUR 28836 EN; doi:10.2760/949

[24] 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.

[25] Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011)

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

The areas where the AQS Regulations which implement EU annual limit values for the protection of vegetation applies are as follows:

a) More than 20 kilometres from an agglomeration (i.e. an area with a population of more than 250,000); and
b) 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)[26] (2020) they have been included within this assessment.

8.2.4 Greenhouse Gases

8.2.4.1 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°C. Ireland's contribution to the Paris Agreement will be determined by the EU to help achieve an EU-wide Greenhouse Gas (GHG) emissions reduction of at least 40% by 2030 compared to 1990 levels.

Under the EU Effort Sharing Decision, Ireland has a target of reducing GHG emissions not included in the EU Emissions Trading Scheme by 20% below 2005 levels by 2020. For the period 2021 to 2030, under the EU Effort Sharing Regulation, Ireland has a target of reducing GHG emissions by 30% compared to 2005 levels[27].

8.2.4.2 Climate Change Legislation and Policy

The National Policy Position indicates Ireland's national target of achieving a competitive, low carbon, climate-resilient and environmentally sustainable economy by 2050. The long-term vision is for an 80% reduction in CO_2 emissions compared to 1990 levels by 2050 in the electricity generation, built environment and transport sectors[28].

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[26] 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 [last accessed 20/07/2021]

[27] Department of Communications, Climate Action and Environment. Available at: https://www.dccae.gov.ie/en-ie/climate-action/topics/eu-and-international-climate-action/2020-eu-targets/Pages/default.aspx

[28] Department of Communications, Climate Action and Environment. Available at: https://www.dccae.gov.ie/en-ie/climate-action/topics/climate-action-at-a-national-level/Pages/default.aspx

In July 2021 the Government of Ireland approved the Climate Action and Low Carbon Development (Amendment) Act 2021[29] which set legally binding targets for net-zero emissions by 2050, with an interim target of 51% reduction on 2018 levels by 2030.

The Climate Action and Low Carbon Development (Amendment) Act 2021 provides the legal framework for the implementation of the aims outlined in the National Policy Position to support transition to Net Zero and a climate neutral economy by 2050. Under the act, the Minister for Communications, Climate Action and Environment must submit to Government a series of National Mitigation Plans and National Adaptation Frameworks.

8.2.4.3 European F-Gas Regulations 2015

Sulphur hexafluoride (SF_6) is an inorganic, odourless, non-toxic and non-flammable molecule which comprises six fluorine atoms attached to one sulphur atom. SF_6 is the universally used interrupting medium (dielectric) for high-voltage circuit breakers, replacing the older mediums of oil and air. The 220 kV GIS substation utilises SF_6 at a moderate pressure for phase-to-phase and phase-to-ground insulation.

SF_6 is listed under Section 3 of Annex 1 of the European F-Gas Regulations 2015. The regulations have been put in place to limit the total amount of regulated F-gases that can be sold in the EU from 2015 onwards and the phasing of them down in increments to one-fifth of 2014 sales in 2030. The regulation also sets out to ban the use of F-gases in many new types of equipment where less harmful alternatives are widely available. The Regulations set out to prevent emissions of F-gases from existing equipment by requiring checks, proper servicing, and recovery of the gases at the end of the equipment's life[30].

SF6 is also listed as a GHG and, according to the Intergovernmental Panel on Climate Change (IPPC), it is the most potent GHG that has been tested with a greenhouse gas potential several thousand times higher than that of carbon dioxide. This was calculated by working out a carbon dioxide equivalence factor (CO_2e).

Electrical switchgear containing SF_6 comply with the following conditions:

- It has a tested leakage rate of less than 0.1% per year as set out in the technical specification of the manufacturer and labelled accordingly;
- It is equipped with pressure or density monitoring devices; and
- It contains less than 6kg of fluorinated greenhouse gases

8.3 Methodology

8.3.1 Overview

This section outlines the assessment approach, data inputs and any assumptions made. Detailed dispersion modelling has been used to identify potentially significant effects on human health and ecological receptors. The construction phase has been undertaken in accordance with guidance from the Institute of Air Quality Management (IAQM) 'Guidance on the assessment of dust from demolition and construction'[31]. The operational air quality assessment has been undertaken in accordance with EPA AG4 guidance.

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[29] Climate Action and Low Carbon Development (Amendment) Bill 2021, available at gov.ie - Climate Action and Low Carbon Development (Amendment) Bill 2021 (www.gov.ie) [last accessed 24/02/2022]

[30] European Union (April 2014) Regulation (EU) No 517/2014 of the European Parliament and of the Council of 16 April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006

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

8.3.2 Construction Phase

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

For GHG, impacts arising from construction activities are likely to be extremely minimal for this proposed development. The main activities will be fuel use from plant and transport vehicles as well as the manufacture and supply of some raw materials, however when compared to the operational impacts over the lifetime of the proposed development these will not be significant. The GHG impacts from construction have therefore been scoped out of this assessment.

8.3.2.1 Dust Emissions

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 PM_{10}.

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 8.

The sensitivity of the surrounding area is determined for each activity using the matrices provided in Appendix 8. 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 PM_{10} 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 Appendix 8 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 8.7.2.

8.3.2.2 Construction Site Plant and Machinery Emissions

Construction requires the use of different equipment such as excavator, cranes and on-site generators. All construction plant have an energy demand with some resulting in direct emission to air from exhausts. Guidance from the IAQM notes that effects from exhausts will likely not be significant. Given the nature of the site plant, effects of plant emissions on local air quality are considered of negligible significance 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 8.10.

8.3.2.3 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’.[32] 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 IAQM[33] 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.

Given the type of development and its location within a port where there are already many vehicle movements, especially HDVs, the construction of the proposed development would not exceed any of 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.

[32] National Roads Authority (2011), ‘Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes’

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

for Air Quality’

8.3.3 Operational Phase

8.3.3.1 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 21112) 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 three separate components:

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

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.

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.

8.3.3.2 Model Inputs

Model Scenarios – Proposed development

The proposed development will operate to meet peak demand providing electricity to the grid as required for less than 500 hours per year to meet emergency requirements. This modelling assessment assumes continuous operation of six OCGTs each with an electrical output of 35MW, all operating on natural gas at full load.

In accordance with EPA AG4, long-term (annual mean) impacts have been factored to represent the number of operational hours in a calendar year. The factor has been derived by dividing the number of operational hours (500 for the purposes of this assessment) by the number of hours in a calendar year, i.e. 500/8760, to produce a factor of 0.057.

The modelling assessment has assumed continuous operation all year to capture the worst-case short-term (1 hour and 8 hour) impacts associated with all meteorological conditions.

Model Scenarios – Cumulative

EPA AG4 guidance provides a flowchart, presented in Appendix 8, for determining if a cumulative impact assessment of air quality is required and also 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.'

However, given the energy generation capacity of the proposed development and that of the existing and consented development on the Poolbeg Peninsula, a cumulative modelling scenario has been undertaken. This is a conservative assumption as it assumes all plant would operate simultaneously and would coincide with the worst meteorological conditions.

The cumulative scenario considers the proposed development in addition to:

- Poolbeg Power Station: including two Combined Cycle Gas Turbines (CCGT) and an auxiliary boiler;
- Consented Poolbeg FlexGen Plant: one OCGT;
- Dublin Bay Power Plant: one CCGT;
- Consented Ringsend FlexGen OCGT; and
- Dublin Waste to Energy (Covanta Plant): including two incineration lines.

Baseline concentrations are based on local ambient monitoring data, as summarised in Table 8.8. As the ambient monitoring station at Ringsend is likely to measure emissions from existing installations on the Poolbeg Peninsula, the inclusion of the plant is considered to represent a conservative worst-case assumption when discussing the cumulative effect of the predicted environmental concentrations.

Stack Emission Parameters

Table 8.3 summarises the stack emission parameters assumed for the proposed development. The relevant emissions data for firing on natural gas has been provided by the plant supplier on which the design is based. Modelled NOx and CO emissions concentrations are based on emissions limits provided by the plant supplier.

Table 8.3: Stack Emission Parameters

Parameter	Unit	OCGT Units 1-4	OCGT Units 5-6
Fuel	-	Natural gas	
Stack location	m[a]	4. 685613.1, 5914760.4 5. 685633.3, 5914760.6 6. 685653.1, 5914760.9 7. 685615.3, 5914792.4	8. 685635.2, 5914792.4 9. 685655.2, 5914791.7
Stack height[b]	m	11	11
Stack diameter	m	2.8	2.8
Exit temperature	°C	529	551
Volumetric flow rate (Actual)	Am^3/s	250	256
Exit velocity	m/s	40.6	41.6
Volumetric flow rate (Normal)	Nm^3 [c]	87.1	87.1
NOx emission concentration	mg/Nm^3 [c]	50	50
NOx emission rate	g/s	4.4	4.4
CO emission concentration	mg/Nm^3 [c]	31	31
CO emission rate	g/s	2.7	2.7

Notes: [a] Coordinate system – Universal Transverse Mercator (UTM) WGS84 Zone 29N
[b] This assessment considers the proposed development potential environmental impacts from a stack height of 11m 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.
[c] Reference conditions = 15% O_2, 0°C, dry, 1013 mbar

Table 8.4 presents the stack emission parameters that have been extracted from the air quality assessment[34] and AERMOD model[35] for the consented Poolbeg and Ringsend FlexGen plants and incorporated into the cumulative assessment for the proposed development.

Table 8.4: Stack Emission Parameters for Sources on Poolbeg Peninsula

Parameter	Unit	Ringsend Consented FlexGen OCGT	Dublin Bay Power Plant CCGT	Consented Poolbeg FlexGen OCGT	Poolbeg Power Station CCGT	Poolbeg Power Station Auxiliary Boiler	Dublin Waste to Energy
Stack location	m[(a)]	686079, 5913601	686069, 5913694	687385, 5913565	1: 687305, 5913752 2: 687328, 5913753	687337, 5913746	1: 686433, 5913696 2: 686427 5913697
Stack height	m	30	70	30	75	30	100
Stack diameter	m	3.7	6.5	3.7	5.2	0.5	2.4
Exit temperature	°C	446	114	425	1: 108 2: 122	233	55
Exit velocity	m/s	37.7	23	37.7	1: 31.0 2: 31.5	25.2	17.9
NOx emission rate	g/s	6.01	47.1	7.9	32.4	1	30.6

Notes: [(a)] Coordinate system – Universal Transverse Mercator (UTM) WGS84 Zone 29N

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. 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 listed in Appendix 8.2 and presented below in Figure 8.1.

[34] AWN Consulting (2019), 'Air Dispersion Modelling of Proposed 6.5Flexgen Plant at Poolbeg Generating Station Dublin 4'

[35] Obtained via direct consultation with AWNconsulting on 7th October 2020.

Figure 8.1: Modelled buildings for the proposed development

Buildings associated with emission sources on the Poolbeg Peninsula have been included in the cumulative assessment. These buildings have been extracted from the air quality assessment[36] and AERMOD model[37] for the consented Poolbeg and Ringsend FlexGen plants and incorporated into the cumulative assessment for the proposed development.

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 (2014 – 2018).

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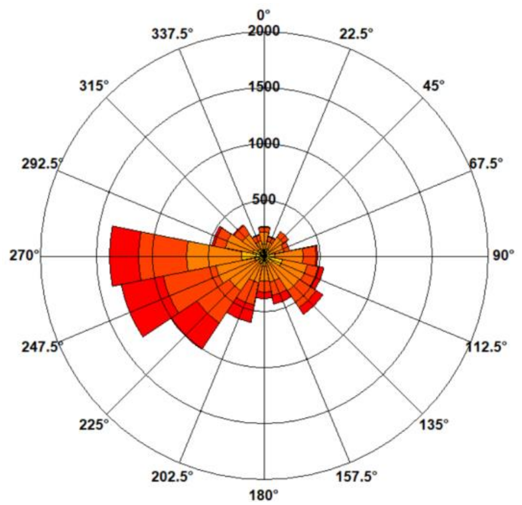
[36] Awn consulting (2019), 'Air Dispersion Modelling of Proposed 6.5Flexgen Plant at Poolbeg Generating Station Dublin 4'

[37] Obtained via direct consultation with AWN consulting on 7 October 2020.

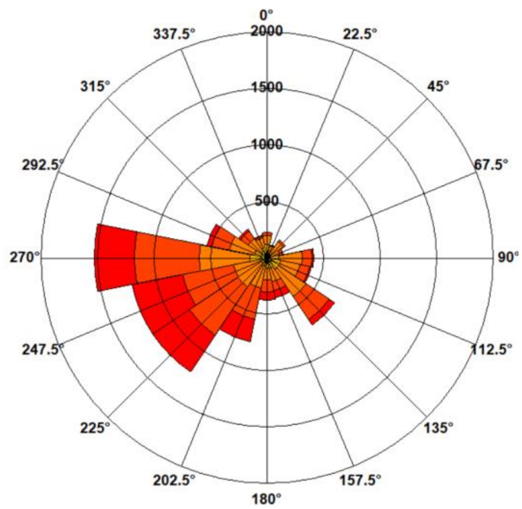
Meteorological data was sourced from Met Éireann and obtained from their monitoring site at Dublin Airport (approximately 8.5km north of the proposed development site) as this was the most representative and matches meteorological data used in the air quality assessments undertaken for plant on Poolbeg Peninsula considered in the cumulative assessment.

Wind roses have been constructed for each of the five years of meteorological data used in this assessment. The wind roses presented in Figure 8.2 illustrate that in all five meteorological years there is a dominance of strong winds from the west and south west.

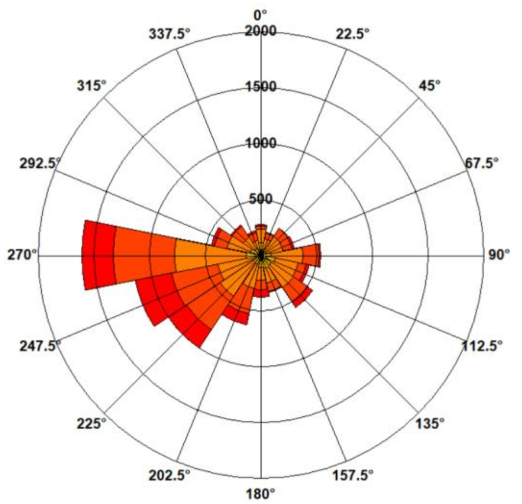
Figure 8.2: Wind Roses for Dublin Airport (2014 – 2018)



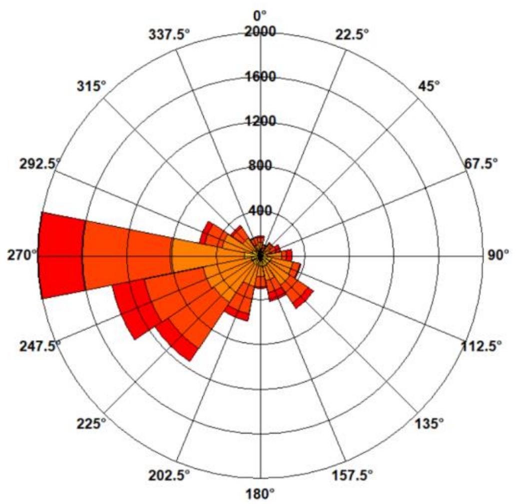
2014



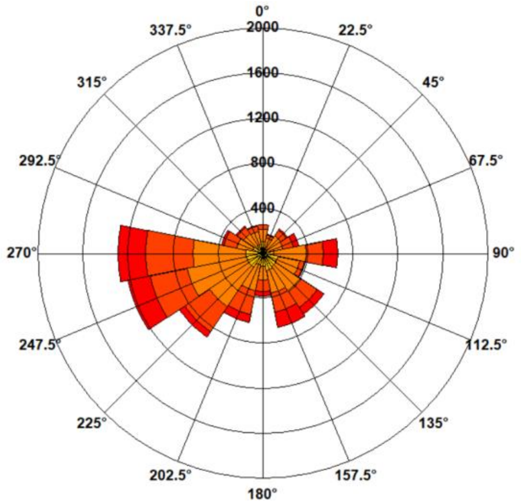
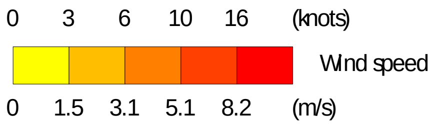
2015



2016



2017

	
2018	

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 within the study area has been calculated based on the land use ("Cultivated Land") within a 1km radius of the Dublin Airport meteorological station and calculated within the AERMET meteorological processor.

Receptors

The dispersion modelling has been used to predict ground level pollutant concentrations at regular intervals across an inner 4km^2 grid with a 50m horizontal resolution and an outer 12km^2 grid with a 100m horizontal resolution, both with a height of 0m, 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 well within the domain of the 4km^2 modelled grid and therefore meet the requirements of EPA AG4.

The dispersion modelling has also been used to predict ground level pollutant concentrations at sensitive human health and ecological receptors closest to the site. These locations are known as 'discrete receptors' and have been selected to represent the closest residential properties to the site and the closest boundaries of ecologically designated sites.

Six Natura 2000 sites and eight proposed Natural Heritage Areas (pNHAs) are within the gridded study area and have also been considered in the assessment. The maximum modelled gridded receptor point within each Natura 2000 and pNHA site has been presented in Section 8.5.3. The extents of some designated sites overlap and therefore for the purpose of this assessment, some of these sites have been grouped together to present the maximum impacts.

Human health discrete receptors included in the model are presented in Table 8.5 and Figure 8.3. Ecological designated sites considered are presented in Table 8.6 and Figure 8.4.

Table 8.5: Human Health Discrete Receptors Included in the Model

ID	Grid reference (UTM WGS84 Zone 29N)	
	X	Y
H1	684460	5914748
H2	684441	5914619
H3	684327	5914758
H4	684491	5914977
H5	684486	5915092
H6	684542	5915173
H7	685369	5913998
H8	685573	5913965
H9	685088	5914065
H10	684726	5914136
H11	684551	5914173
H12	686719	5915814
H13	686269	5915973
H14	685799	5915995
H15	685196	5916180

Note: Human health receptors modelled at a height of 1.5m
[a] Receptors 7,8 and 9 are representative of short term exposure only.
Grid references rounded to 0 decimal places.

Table 8.6: Ecological Discrete Receptors Considered within the Assessment

ID	Site Name	Site Code
E1	South Dublin Bay and River Tolka Estuary SPA	004024
E2	North Bull Island SPA	004006
E3	North Dublin Bay SAC	000206
E4	South Dublin Bay SAC	000210
E5	Baldoyle Bay SAC	000199
E6	Baldoyle Bay SPA	004016
E7	North Dublin Bay pNHA	000206
E8	South Dublin Bay pNHA	000210
E9	Baldoyle Bay pNHA	000199
E10	Royal Canal pNHA	002103
E11	Grand Canal pNHA	002104
E12	Santry Demesne pNHA	000178
E13	Dolphins, Dublin Docks pNHA	000201
E14	Booterstown pNHA	001205

Figure 8.3: Human Health Discrete Receptors

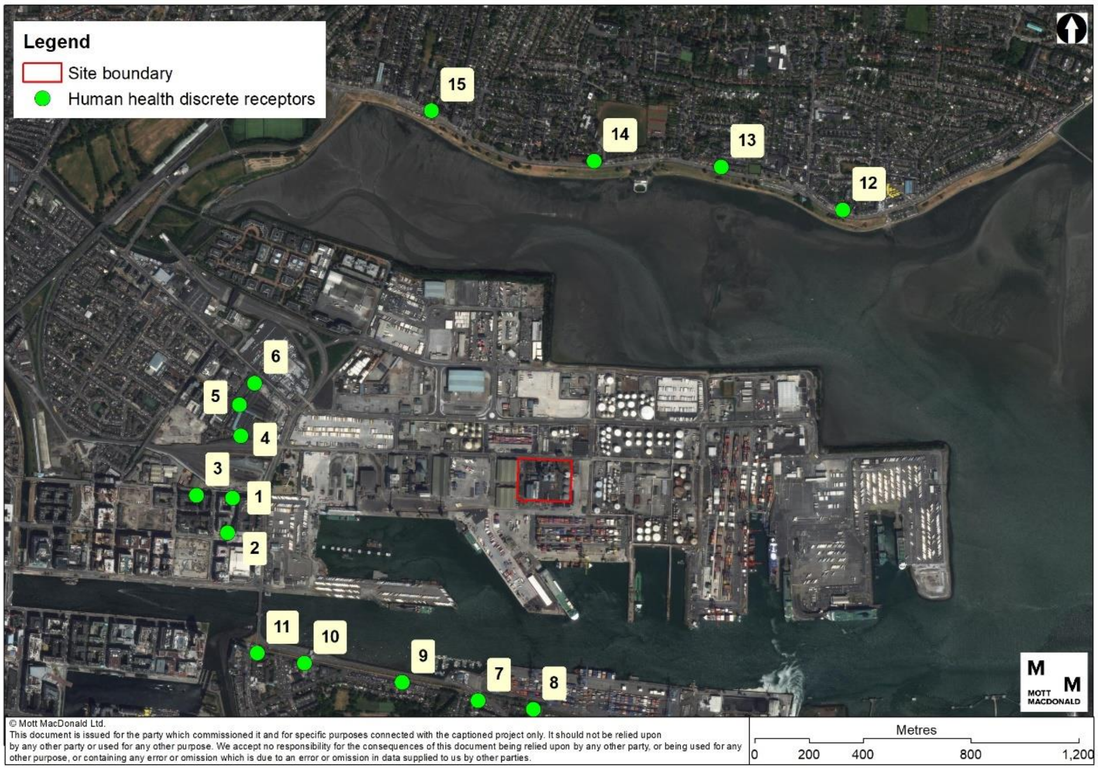
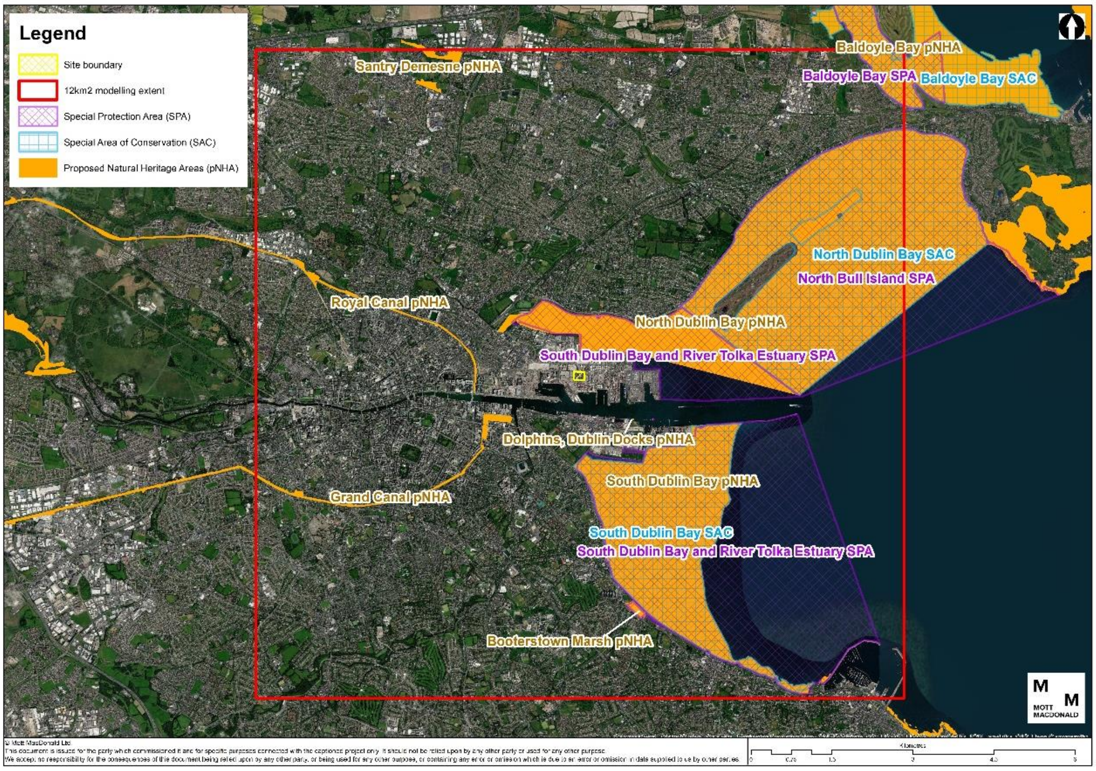


Figure 8.4: Ecological Receptors



NO_X to NO_2 Relationship

The NO_X emissions associated with combustion activities at the site will typically comprise approximately 90-95% nitrogen monoxide (NO) and 5-10% nitrogen dioxide (NO_2) at source. The NO oxidises in the atmosphere in the presence of sunlight, ozone and volatile organic compounds to form NO_2, which is the principal concern in terms of environmental health effects.

There are various techniques available for estimating the portion of the NO_X that is converted to NO_2, which increases with increasing distance from the source. EPA AG4 recommends that, where AERMOD has been used to predict ground level pollutant concentrations, detailed modelling of NO_2/NOx chemistry should also be undertaken.

AERMOD incorporates two options for modelling NO_2/NOx chemistry known as the Ozone Limiting Method (OLM) and the Plume Volume Molar Ratio Method (PVMRM). Both methods apply the same basic chemical mechanism for converting nitric oxide (NO) and Ozone (O_3) to NO_2 and oxygen (O_2). For dispersion modelling applications where there are isolated elevated point sources PVMRM represents a more refined approach as it accounts for entrained O_3 along the plume. However, where there are multiple plumes, the PVMRM method has not been thoroughly validated and may overestimate conversion of low lying plumes from multiple sources through overestimation of available O_3. Therefore, when modelling multiple emissions sources that are in close proximity, or for low level plumes that ground close to the source, the OLM is preferable.[38] On this basis, the OLM method has been adopted for this assessment.

This modelling assessment has used the following input data for OLM:

[38] United States Environmental Protection Agency (2011), 'Memorandum. Additional Clarification Regarding Application of Appendix W Modelling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard'.

- In-stack NO_2/NOx ratio
  – A ratio of 0.1 has been applied meaning that 10% of the NOx that leaves the stack is already in the form of NO_2.
- Final equilibrium NO_2/NOx ratio
  – A ratio of 0.9 has been applied meaning that the final balance between NO and NO_2 will be 10% NO and 90% NO_2.
- Background ozone (O_3) concentration
  – An ozone concentration of 54µg/m^3 has been used in this assessment based on the maximum measured annual average concentration at Zone A (Dublin conurbation) sites between 2017 and 2019[39]. The maximum measured concentration is a conservative assumption as the ratio of NO_2/NOx is dependent upon the number of moles of O_3 available for the reaction, i.e. the more O_3 available for reaction, the higher the conversion of NO to NO_2.

Operational Road Traffic Emissions

EPUK and IAQM[40] 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.

8.3.3.3 Assessment of effects on vegetation and ecosystems

Overview

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 12 kilometres square as presented in Table 8.6 and Figure 8.4. As critical levels and critical loads are based on long term (annual) averaging periods, concentrations at designated sites have been prorated as discussed in Section 8.3.3.2.

Critical Levels – Atmospheric NOx

Critical levels for the protection of vegetation and ecosystems are specified within relevant European air quality directives and corresponding Irish air quality standards. For both European and national sites, process contributions and predicted environmental concentrations of NO_x have been calculated for comparison against the critical level. Background NO_x concentrations applied to each designated site are identified in Section 8.4.2.

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

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[39] Data from 2020 was not available on the air quality monitoring data archive at the time of writing this report and, in any case, would not be representative due to COVID-19 restrictions.

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

for Air Quality'

been derived from dispersion modelling. Deposition rates were calculated using empirical methods within Habitats Directive Guidance (AQTAG.06)[41] as follows:

1. Calculate dry deposition flux from ground level NOx

Dry deposition flux	=	NOx ground level concentration	x	deposition velocity
($\mu g/m^2/s$)		($\mu g/m^3$)		(0.0015[42] m/s)

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

8.3.3.4 Operational Greenhouse Gas Emissions

The main source of operational greenhouse gas (GHG) with regard to the proposed development would be the combustion of natural gas followed by, to a lesser extent, potential leakages of SF_6 to the environment from the Gas Insulated Switchgear in the substation.

In 2019[43], Ireland estimated their total GHG emissions at 59,778 ktCO_2e (kilotonnes CO_2 equivalent). The contribution from the energy sector to Ireland's national emission inventory was 35,209 kTCO_2e, of which 8,985 ktCO_2e was from public electricity and heat production equating to 15% of Ireland's total emissions[44].

The total emissions of CO_2e have not been calculated for the proposed development as it is an emergency generating plant and would not operate for a consistent number of hours each year, but the carbon intensity[45] has been calculated and presented compared to EPA data for Ireland's grid average emission intensity from power generation. A "worst-case" estimate of maximum annual CO_2e emissions has also been calculated, assuming that the plant operates for its maximum permitted 500 hours at maximum output.

The 2019 contribution of SF_6 to Ireland's national emission inventory was 33.6 ktCO_2e. Of this, 7.2 kTCO_2e is associated with electrical equipment and this equates to a total of 0.01% of Irelands total emissions[44].

With regard to the existing substation, the main source of SF_6 emissions will be potential leakages from the GIS switchgear. It is assumed that this existing switchgear is equipped with a pressure or density monitoring device. Therefore, as per the F-Regulations (see section 8.2.4), there is no requirement for these to be assessed on a project basis.

[41] Air Quality Advisory Group, 2014, AQTAG06 Technical guidance on detailed modelling approach for an appropriate

assessment for emissions to air.

[42] Relevant for low lying features such as grassland

[43] Baseline GHG emissions for 2020 have not been considered due to uncertainties relating to COVID-19

[44] Irelands National Inventory report 2021 available at https://unfccc.int/documents/271533 [last accessed 24/02/2021] (emissions excluding land use (LULUCF))

[45] Emission intensity is the amount of CO_2 emissions per unit of electricity

8.3.4 Assessing Significance

8.3.4.1 Proposed development – Air Quality

A number of approaches can be used to determine whether the potential air quality effects of a development are significant. However, there remains no universally recognised definition of what constitutes 'significance'. Guidance is available from a range of regulatory authorities and advisory bodies on how best to determine and present the significance of effects within an air quality assessment. It is generally considered good practice that, where possible, an assessment should communicate effects both numerically and descriptively.

EPA AG4 does not define specific significance criteria for assessments of industrial emissions. However, where a facility is operated continuously at close to the maximum licenced mass emission rate the maximum allowable process contributions (MAPC) should be no more than 75% of the ambient air quality standard (AQS) and less than this where background concentrations (BC) account for a significant[46] proportion on the ambient air quality standard. The following formula from EPA AG4 has been used to assess significance of the proposed development:

- $\mathrm{MAPC} = 0.75 \text{ x } (\mathrm{AQS} - \mathrm{BC})$

Furthermore, whilst EPA AG4 does not provide maximum allowable Predicted Environmental Concentration (PEC), it is understood that it is preferable if it can be demonstrated that the PEC can be demonstrated to be below 70% of the AQS.

8.3.4.2 Cumulative – Air Quality

The EPA AG4 guidance states that, where both the nearby existing and proposed installations are predicted to have impacts greater than 5% of the short or long term AQS which overlap with nearby emission sources, a cumulative assessment should be undertaken. The guidance then asks the following questions:

- Does cumulative modelling indicate an exceedance of the AQS in the region of overlap between the proposed installation (i.e. the proposed development) and other existing or proposed installations? If so, is the AQS exceeded in the absence of the proposed installation?
- Does the proposed installation (i.e. the proposed development) exceed 25% of an AQS, known as the Prevention of Significant Deterioration (PSD) increment, in the region of overlap between the proposed installation and other existing or proposed installations?

8.3.4.3 Proposed development – Climate

When considering GHG, there is currently no nationally accepted threshold of GHG emissions, which if exceeded, can be defined as significant. However, consideration should be made as to the effect that the proposed development may have on Ireland meeting its reduction targets. The Institute of Environmental Management and Assessment (IEMA) Principles on Climate Change Mitigation & EIA states that "w*hen evaluating significance, all new GHG emissions contribute to a significant negative environmental effect*". In a further IEMA guidance document on evaluating significance of GHG emissions in EIA[47], Section 6.1 of the guidance entitled "*All GHG emissions are significant*" states *"in the absence of any significance criteria or a defined threshold, it might be considered that all GHG emissions are significant and an EIA should ensure the project addresses their occurrence by taking mitigating action"*. The IEMA guidance

[46] EPA AG4 does not define when a background concentration is significant.

[47] assessing-greenhouse-gas-emissions-and-evaluating-their-significance (iema.net)

suggests that the carbon footprint of a project should be contextualised with relevant budgets and mitigated against.

8.4 Baseline Environment

8.4.1 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 monitoring site, which is most representative of receptors within the model study area, is the urban monitor ‘Ringsend’. Ringsend is located approximately 1km south of the North Wall Generating Station site and monitors NOx, NO_2 and ozone. Although Ringsend is considered an ‘urban’ site it is considered the most representative of baseline conditions in the study area due to its close proximity to the site. The most representative CO monitoring site (as Ringsend does not monitor CO) is also an ‘urban’ site and is located approximately 4km west of the proposed development on Winetavern Street.

8.4.2 Baseline Data

Data for Ringsend and Winetavern Street has been obtained from the EPA data archive and is summarised in Table 8.7. Data from 2020 was not available on the data archive at the time of writing this report and, in any case, would not be representative due to COVID-19 restrictions.

Table 8.7: Ambient Monitored Pollutant Concentration

Site name	Location (WGS 1984 UTM Zone 29N)		Pollutant	Averaging period	Site type	Monitored concentrations (µg/m³, data capture rates presented in parentheses) [(a)]		
	X	Y				2017	2018	2019
Ringsend	685422	5913926	NOx	Annual mean	Urban	54.3 (61.6)	50.3 (94.4)	45 (96)
			NO_2			21.9 (61.6)	27.0 (94.4)	24 (96)
Winetavern Street	681577	5914039	CO	Rolling 8-hour maximum	Urban	3,100 (95.5)	2,900 (99.5)	2700 (94)
				Annual mean		140 (96)	200 (100)	300 (94)

Source: EPA Data Archive

Note: [(a)] Data presented to maximum number of decimal places available from EPA Data Archive.

8.4.3 Summary

Baseline concentrations used in the assessment have been determined for the entire modelled domain based on 2019 annual mean data from the Ringsend automatic monitor for NOx and NO_2. The baseline concentration for CO used in the assessment has been derived from the rolling 8-hour CO data from the Winetavern Street automatic monitor.

This is considered an appropriate approach as this monitoring site includes contributions from other emissions in the study area such as installations on the Poolbeg Peninsula.

Hourly maximum concentrations can be substantially higher than the 99.79^{th} 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 guidance[48] suggests that short term (1 hourly and 8 hourly) background concentrations can be estimated by doubling the annual mean background concentrations. This process has been applied to NO_2 concentrations as presented in Table 8.8.

However, the 2017 to 2019 average of the maximum rolling 8-hour CO concentrations has been used in this assessment as it represents a more conservative baseline concentration. This is appropriate as a rolling 8-hour average is less sensitive to an individual 1-hour periods of high concentration.

Baseline concentrations used in the assessment are summarised in Table 8.8.

Table 8.8: Baseline Concentrations used in the Assessment

Pollutant	Averaging period	Baseline concentration (µg/m^3)
NOx	Annual	45
NO_2	1-hour	48
	Annual	24
CO	8-hour	2,900

8.5 Likely Significant Impacts

8.5.1 Construction Phase

Table 8.9 presents a summary of the dust emission magnitude assigned to each construction activity based on these descriptors. The magnitude and sensitivity descriptors that have been applied to assess the overall effect of the construction phase are presented in Appendix 8.1.

Table 8.9: Dust Emission Magnitude

Activity	Dust emission magnitude	Justification
Demolition	Small	Total demolition volume less than 7,500 m^3
Earthworks	Medium	Total site area approximately 30,000 m^2. However, earthworks are being undertaken on less than 1/3 of the site (up to 10,000 m^2).
Construction	Small	Total building volume less than 10,000 m^3.
Trackout	Medium	It is not expected that there would be more than 50 HDV outbound movements per day.

Table 8.10 presents the sensitivity of the area to effects caused by construction activities and is based on the criteria presented in Appendix 8.1. Figure 8.5 and Figure 8.6. Figure 8.6 present the dust assessment buffers.

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

There are no ecological designated sites within 50m of the proposed development site boundary or the routes used by construction vehicles on the public highway.

Table 8.10: Area Sensitivity

Activity	Dust soiling		Health effects of PM_{10}	
	Sensitivity	**Comment**	**Sensitivity**	**Comment**
Demolition	Medium	More than one, medium sensitivity receptor within 20m of the site boundary (DSG office north of the site)	Low	Background PM_{10} concentration =19µg/m^3[49]. More than one, medium sensitivity receptor within 20m of the site boundary (DSG office north of the site)
Earthworks	Medium		Low	
Construction	Medium		Low	
Trackout	Low	More than one, medium sensitivity receptor within 20m of the trackout route, up to 200m from the site exit (DSG office north of the site)	Low	Background PM_{10} concentration =19µg/m^3. More than one, medium sensitivity receptor within 20m of the trackout route, up to 200m from the site exit (DSG office north of the site)

The overall risk of receptors to dust soiling effects and PM_{10} effects are presented in Table 8.11. Risk is based on the criteria presented in Appendix 8.1.

Table 8.11: Summary of the Risk of Construction Effects

Activity	Dust soiling effects	PM_{10} effects
Demolition	Low Risk	Negligible
Earthworks	Medium Risk	Low Risk
Construction	Low Risk	Negligible
Trackout	Low Risk	Low Risk

Dust soiling effects are 'Low to Medium Risk' and PM_{10} effects are 'Negligible to Low Risk' without mitigation. Mitigation measures appropriate for the proposed development have been presented in Section 8.6. These measures will be incorporated within the Construction Environmental Management Plan (CEMP) to further reduce the risk.

[49] The annual mean PM_{10} concentration of 19µg/m^3 was recorded at Blanchardstown, Ringsend and Davitt Road and is the maximum monitored annual mean concentration across all Zone A monitoring sites.

Figure 8.5: Construction Dust Assessment Buffers (Demolition, Earthworks and Construction)

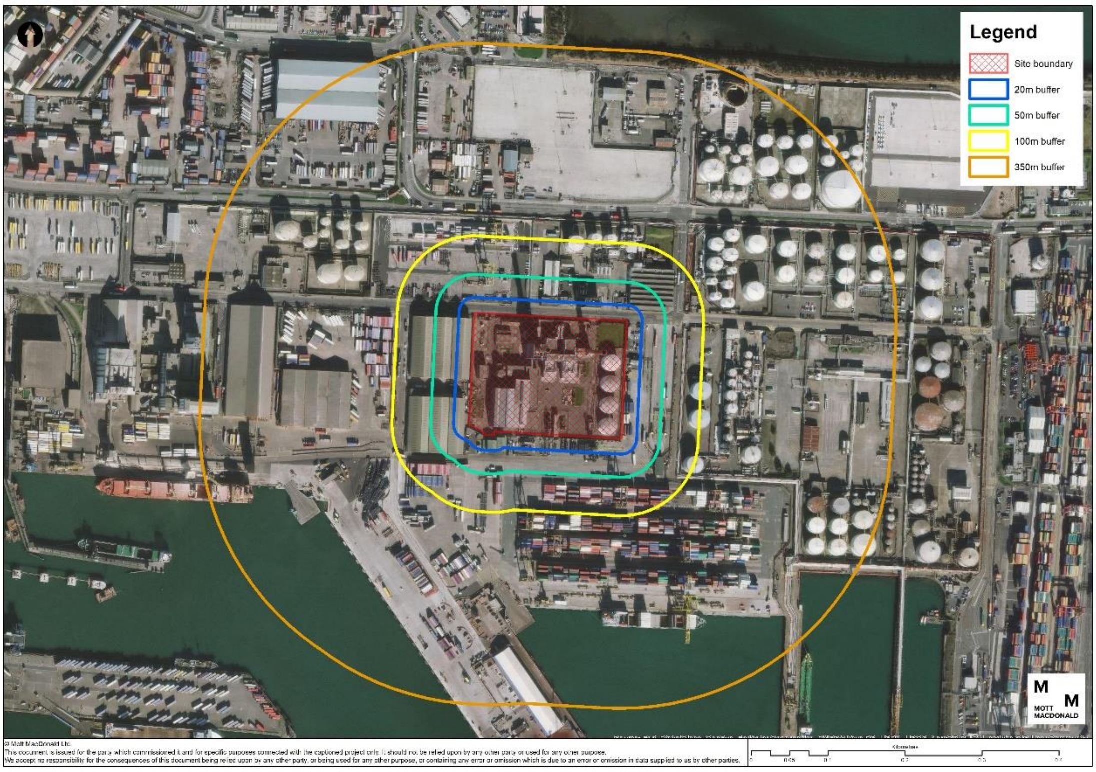
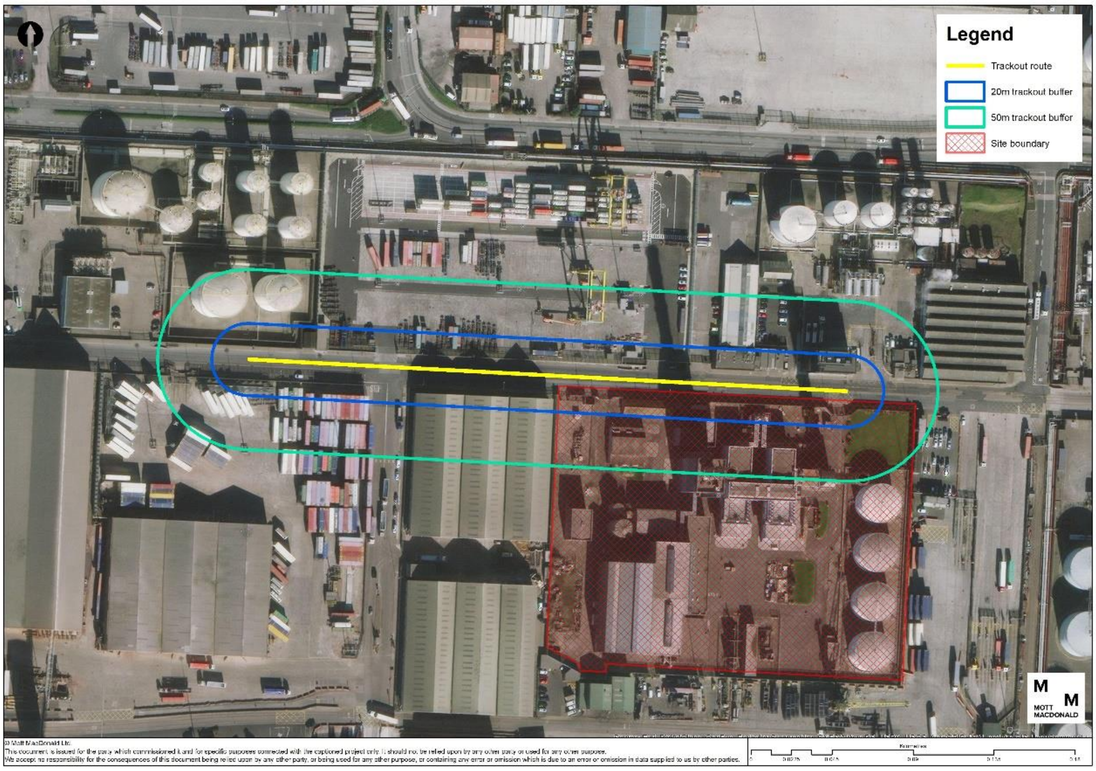


Figure 8.6: Construction Dust Assessment Buffers (Trackout)



8.5.2 Operational Phase

8.5.2.1 Overview

This section presents the operational effects identified from the dispersion modelling assessment and Greenhouse Gas emissions intensity.

8.5.2.2 Human Health Receptors

Table 8.12 presents the maximum predicted 1-hour and annual NO_2 and 8-hour running CO concentrations for comparison against the AQS from the proposed development. All predicted concentrations for these averaging periods are taken from the maximum offsite gridded receptor location[50].

Annual mean modelled NO_2 concentrations have been incorporated to represent 500 hours of operation. Baseline concentrations are based on local monitoring data, as summarised in Table 8.8.

The proposed development's process contribution (PC), presented in Table 8.12, is less than maximum allowable process contribution (MAPC), as discussed in section 8.3.4, for all pollutants assessed pollutants and averaging periods. Monitored baseline concentrations (BC) are low and the predicted environmental concentrations (PEC) do not exceed 70% of the AQS. Overall, the proposed development's modelled maximum PC and the PEC for both short and long terms averaging periods are not considered significant.

Modelled hourly concentrations at discrete receptor locations are presented in Table 8.13 which shows that, at all receptors, the process contributions are below 15% and the resultant predicted environmental concentrations are below 39% of the 1-hour AQS.

Modelled annual mean concentrations at discrete receptor locations are presented in Table 8.14 which shows that, at all receptors, the process contributions when prorated to 500 hours of operation are de minimis. On this basis, the resultant predicted environmental concentrations have not been presented for annual mean NO_2 at discrete receptor locations as they would not be distinguishable from the baseline concentration.

Figure 8.7 to Figure 8.9 presents contour plots for the 1-hour, annual mean and 8 hour predicted environmental concentrations for NO_2 and CO.

Table 8.12: Modelled Maximum Results (µg/m^3) – The Proposed development Firing on Natural Gas at Full Load

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 percentile	200	114	77.2	38.6	67.7	48	125.2	62.6
	Annual[(a)]	40	12	0.3	0.7	2.4	24	24.3	60.7
CO	8 hour running	10,000	5325	153.1	1.5	2.9	2900	3053.1	30.5

Notes: AQS: Air quality standard; MAPC: Maximum allowable process contribution (see section 8.3.4), e.g., for annual NO_2 the MAPC is calculated using the equation (40-24) x 0.75; PC: Process contribution; BC: Baseline concentration; PEC: Predicted environmental concentration

[50] 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 or the sea.

[(a)] Results prorated by a factor 500/8760 i.e. 500 hours out of 8760 in a calendar year.

Table 8.13: Hourly 99.79 %ile NO_2 Results at Human Health Discrete Receptors (µg/m^3) – Proposed development

Receptor	AQS	PC	PC as % of AQS	BC	PEC	PEC as % of AQS
1		21.0	10.5		69.0	34.5
2		29.7	14.8		77.7	38.8
3		18.6	9.3		66.6	33.3
4		12.2	6.1		60.2	30.1
5		9.9	4.9		57.9	28.9
6		12.1	6.0		60.1	30.0
7		12.0	6.0		60.0	30.0
8	200	9.0	4.5	48	57.0	28.5
9		11.8	5.9		59.8	29.9
10		10.9	5.4		58.9	29.4
11		10.6	5.3		58.6	29.3
12		22.7	11.3		70.7	35.3
13		23.0	11.5		71.0	35.5
14		13.1	6.6		61.1	30.6
15		11.5	5.8		59.5	29.8

Notes: PC: Process contribution; BC: Baseline concentration; PEC: Predicted environmental concentration
[(a)] Results prorated by a factor 500/8760 i.e. 500 hours out of 8760 in a calendar year.

Table 8.14: Annual Mean NO_2 Results at Human Health Discrete Receptors (µg/m^3) – Proposed development

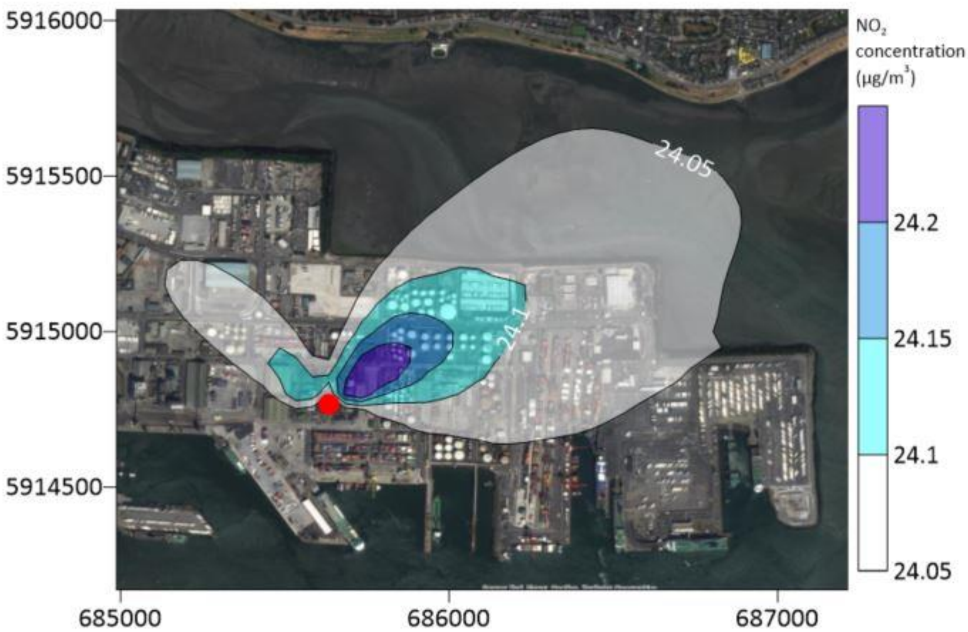
Receptor	AQS	PC	PC as % of AQS
1		0.02	0.05
2		0.02	0.06
3		0.02	0.04
4		0.01	0.03
5		0.01	0.03
6		0.02	0.04
7		0.01	0.02
8	40	0.01	0.01
9		0.01	0.03
10		0.01	0.03
11		0.01	0.03
12		0.04	0.11
13		0.03	0.08
14		0.01	0.03
15		0.01	0.03

Notes: PC: Process contribution; Results presented to 1 significant figure to show value is not 0. This is not an indication of model accuracy. Results prorated by a factor 500/8760 i.e. 500 hours out of 8760 in a calendar year.

Figure 8.7: 1-hour NO_2 99.79 percentile PEC – Proposed development (µg/m^3)

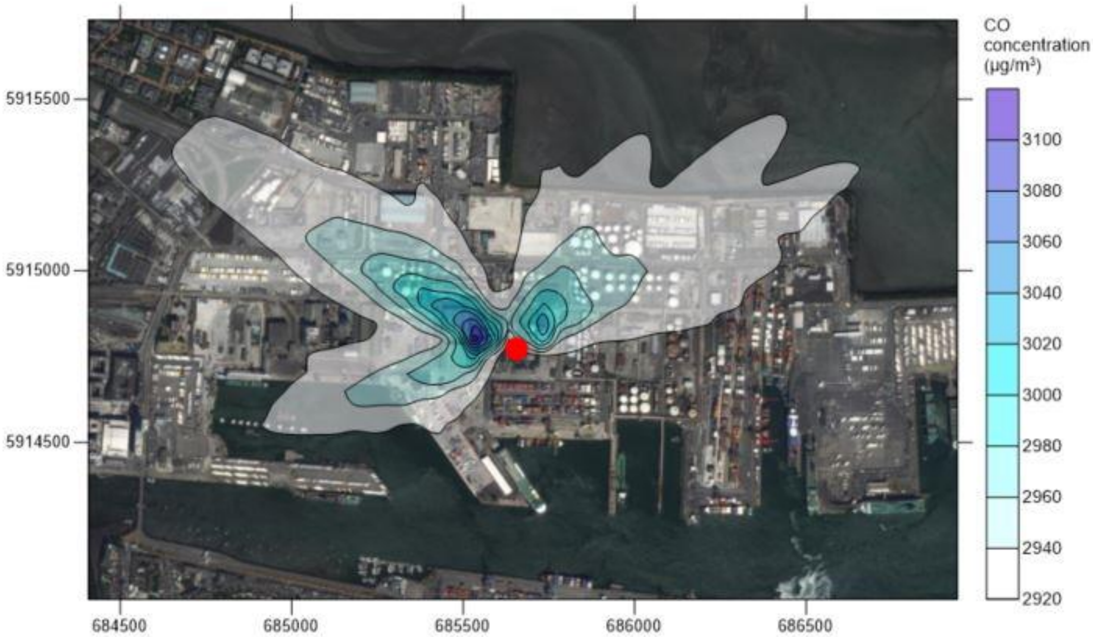
Notes: Red circle indicates the proposed development's location; Minimum contour level: 60µg/m^3: Maximum contour level: 120µg/m^3; Contour interval 10µg/m^3, Meteorological year 2015, baseline NO_2 48µg/m^3, PEC = Predicted Environmental Concentration

Figure 8.8: Annual mean NO_2 PEC - Proposed development (µg/m^3)



Notes: Red circle indicates the proposed development's location; Minimum contour level: 24.05µg/m^3: Maximum contour level: 24.2µg/m^3; Contour interval 0.05µg/m^3, Meteorological year 2015, baseline NO_2 24µg/m^3, PEC = Predicted Environmental Concentration

Figure 8.9: Eight hour running CO PEC - Proposed development (µg/m³)



Notes: Red circle indicates the proposed development's location; Minimum contour level: 2920/m³: Maximum contour level: 3100µg/m³; Contour interval 20µg/m³, Meteorological year 2016, baseline CO 2900µg/m³, PEC = Predicted Environmental Concentration

8.5.2.3 Ecological Receptors – Critical Levels

Table 8.15 presents predicted annual mean NOx concentrations at the modelled ecological receptors, for comparison against the NOx standard for the protection of sensitive vegetation and ecosystems.

Annual mean NOx PCs are less than 0.4% of the AQS at all modelled ecological discrete receptors. The maximum PC predicted is 0.32% of the AQS of 30µg/m³ and is predicted at 'South Dublin Bay and River Tolka Estuary SPA/North Dublin Bay pNHA/South Dublin Bay pNHA'. The background NOx concentration adopted for this assessment is 45µg/m³ as discussed in section 8.48.4 and already exceeds the AQS for the protection of vegetation of 30µg/m³.

Overall, the PCs indicate that the increases in NO_x concentrations as a result of the proposed development are small relative to the background concentration and the AQS. On this basis, the PC to atmospheric NOx at ecological sites is negligible and therefore significant impacts are not likely.

Table 8.15: Annual Mean NOx Results at Ecological Receptors

ID	Receptor	AQS (µg/m³)	PC (µg/m³)	PC as % of AQS
E1, E7, E8	South Dublin Bay and River Tolka Estuary SPA/North Dublin Bay pNHA/South Dublin Bay pNHA	30	0.096	0.32
E2, E3	North Bull Island SPA/North Dublin Bay SAC	30	0.037	0.12
E4	South Dublin Bay SAC	30	0.009	0.03
E5, E6, E9	Baldoyle Bay SAC/SPA/pNHA	30	0.014	0.05
E10	Royal Canal pNHA	30	0.015	0.05
E11	Grand Canal pNHA	30	0.012	0.04
E12	Santry Demesne pNHA	30	0.011	0.04

ID	Receptor	AQS ($\mu g/m^3$)	PC ($\mu g/m^3$)	PC as % of AQS
E13	Dolphins, Dublin Docks pNHA	30	0.012	0.04
E14	Booterstown Marsh pNHA	30	0.002	0.01

Notes: PC: Process contribution
PCs presented to at least one significant figure to show results are greater than 0 and is not an indication of model accuracy. Results prorated by a factor 500/8760 i.e. 500 hours out of 8760 in a calendar year.

8.5.2.4 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 is 0.014 kg/ha/year and occurs at receptor E1, E7 and E8. 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 significant impacts are not likely.

8.5.2.5 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 is 0.001 keq/ha/year and occurs at receptors E1, E7 and E8 indicating that predicted contributions of nitrogen to acid deposition are very small and hence are considered negligible and significant impacts are not likely.

8.5.2.6 Greenhouse Gas Emissions

The total emissions of CO_2e have not been calculated for the proposed development as it is an emergency generating plant and would not operate for a consistent number of hours each year. The plant could result in direct GHG emissions of up to a maximum of 58,000 tCO_2/yr, assuming that all six turbines operate at peak output for the maximum permitted 500 hours per year. However, this is very much a worst-case estimate, as the plant is intended to be used in emergency circumstances to provide security of supply. The plant is highly unlikely to be used this frequently in practice.

The emission intensity of the proposed development is calculated at 553 g CO_2/kwh when operating on natural gas. According to the EPA[51], Ireland's grid average emission intensity from power generation in 2020 was 295 g CO_2/kwh. This has reduced from 480 g CO2/kwh in 2016 due to decline in use of peat for electricity generation (51% decrease), and the growth in the renewable energy sector which accounted for over 42% of electricity generated in 2020.

It is expected that Ireland's grid average emission intensity from power generation would be lower than that of the proposed development, as the grid average includes electricity generated from renewable sources such as wind and hydropower. Wind and hydropower have increased by 15% and 5% respectively in 2020 reducing the emissions intensity of power generation by 8% in 2020[51].

The proposed development will be operated as an emergency generating plant providing electricity at short notice when required, which in turn enables the continued growth of less reliable renewable energy sources and therefore supports the reduction of grid average emission intensity. This is demonstrated by the year on year reduction in grid average emissions intensity with increase in the use of coal by 24%, natural gas by 2%, oil by 37% and biomass by 28% in 2020[51].

[51] Environmental Protection Agency - https://www.epa.ie/our-services/monitoring--assessment/climate-change/ghg/energy-/# [last accessed 22/02/2022]

The Institute of Environmental Management and Assessment (IEMA) guidance on assessing GHG emissions[52] advises that all GHG emissions should be considered significant, regardless of the scale of the emissions. Therefore, given that the plant is expected to result in some direct GHG emissions during the periods that it operates, it is reasonable to conclude that the plant could result in some short-term, negative significant effects. However, this conclusion arises from considering the plant in isolation, which ignores the plant's emergency support role which enables system-wide emergency support. Calculating the net impact of the proposed plant on system-wide GHG emissions is inherently complex, impossible to predict with any confidence and well beyond the scope of this assessment. However, considering the need for the development as set out in Chapter 2, it follows that the plant can be considered as providing system-wide emergency generation support. Viewed in this system-wide context, it is therefore reasonable to conclude that significant adverse impacts are not likely.

8.5.2.7 Climate Change Adaptation and Resilience

In terms of climate adaptation, energy infrastructure can be vulnerable to weather-related impacts, such as flooding or overheating, and climate change may exacerbate these. The plant will however only be operational for up to five years. Over this period, climate change projections show little change in climate variables compared to present day conditions.

Climate change projections for Ireland (latest IPCC data, accessible through the World Bank Climate Change Knowledge Portal) for the period 2021-2039 (note, this goes beyond the operational life of the scheme) under a high emissions scenario shows that:

- Mean summer temperature is projected to increase by 0.75 degrees C (compared to 1995 – 2014 baseline);
- Mean winter temperature is projected to increase by 0.35 degrees C (compared to 1995 – 2014 baseline);
- Mean summer rainfall is projected to decrease by 3.4% (compared to 1995 – 2014 baseline); and
- Mean winter rainfall is projected to increase by 2.0% (compared to 1995 – 2014 baseline)*[53].

Design of infrastructure is a key in the management of risks associated with current climate. The plant will be designed to international standards and the same standards allow infrastructure to operate around the world in varying climatic conditions, including projected climate conditions for Ireland over the operational lifetime.

Siting is also an important consideration particularly in relation to the management of flood risk. A flood risk assessment has been undertaken. As detailed in Chapter 10 of this EIAR, the development is at risk of flooding in Flood Zone B but passes the Justification test. Therefore, the development is considered suitable with appropriate management measures being implemented.

8.5.3 Do Nothing

As the existing North Wall Generating Station is not operational, a Do Nothing scenario would have no direct effect on air quality and is therefore significant impacts are not likely. However, a Do Nothing scenario would not contribute to alleviating the energy emergency within Ireland which this plant is designed to alleviate.

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[52] IEMA, 2017, Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance

[53] These are all 50th centile values

The existing substation will remain subject to potential SF_6 leakages from the GIS. It is assumed that routine servicing and maintenance of the SF_6 GIS to minimise leakages would continue as both without and with the proposed development. On this basis, the effect is considered to be negligible and significant impacts are not likely.

8.5.4 Decommissioning Phase

The power plant is expected to be in place and operating for a maximum of five years; after this time the plant will be disconnected and removed from site.

The removal of equipment from site is likely have a low dust raising potential. With the implementation of mitigation measures presented in section 8.6, dust emissions are expected to be negligible and significant impacts are not likely.

8.5.5 Cumulative Effects

8.5.5.1 Scope of Cumulative Effects

As discussed in section 8.3.3.2 ('Model Scenarios – Cumulative'), given the energy generation capacity of the proposed development and that of the existing and consented development on the Poolbeg Peninsula, a cumulative modelling scenario has been undertaken.

The assessment of cumulative effects considers the 1 hour NO_2 AQS only. This is on the basis that:

- The proposed development's process contribution is less than 5% of the annual mean NO_2 AQS at the maximum modelled location as demonstrated by the proposed development's annual mean NO_2 PC presented in Section 8.5.2.
- The proposed development, the consented Poolbeg and Ringsend Flexgen OCGTs and the Poolbeg Power Station auxiliary boiler (A1-4) only operate for a limited number of hours per year;
- The proposed development's process contribution is less than 5% of the 8 hour running mean CO AQS at the maximum modelled location as demonstrated by the proposed development's 8 hour running CO PC presented in Section 8.5.2.

The assessment of the cumulative 1-hour NO_2 cumulative effect is considered conservative as it assumes all plant would operate simultaneously and would coincide with the worst meteorological conditions.

Baseline concentrations are based on local ambient monitoring data, as summarised in Table 8.8. As the ambient monitoring station at Ringsend is likely to measure emissions from existing installations on the Poolbeg Peninsula, the inclusion of the plant is considered to represent a conservative worst case assumption when discussing the cumulative effect of the predicted environmental concentrations.

8.5.5.2 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?*

This subsection discusses the short term cumulative modelling results in the context of the above questions.

8.5.5.3 Cumulative Effects

Question 1

Table 8.16 presents the cumulative maximum predicted 1-hour NO_2 concentrations for comparison against the AQS for the protection of human health, which have been taken from the maximum offsite gridded receptor location[54]. The 1-hour AQS is not predicted to be exceeded and the predicted environmental concentration is below 70% of the AQS.

Modelled concentrations at discrete receptor locations are presented in Table 8.17. The resultant predicted environmental concentrations are below 55% of the 1-hour AQS. There are no discrete modelled receptors within the PSD increment area presented in Figure 8.10.

Table 8.16: Modelled Maximum Results (µg/m³) – Cumulative

Pollutant	Averaging Period	AQS	PC	PC as % of AQS	BC	PEC	PEC as % of AQS
NO_2	1 hour 99.79	200	77.2	38.6	48	125.2	62.6

Notes: PC: Process contribution; BC: Baseline concentration; PEC: Predicted environmental concentration

Table 8.17: Hourly 99.79 %ile NO_2 Results at Human Health Discrete Receptors (µg/m³) – Cumulative

Receptor	AQS	PC	PC as % of AQS	BC	PEC	PEC as % of AQS
1		59.0	29.5		107.0	53.5
2		55.8	27.9		103.8	51.9
3		58.7	29.4		106.7	53.4
4		58.5	29.3		106.5	53.3
5		59.0	29.5		107.0	53.5
6		60.1	30.1		108.1	54.1
7		60.7	30.4		108.7	54.4
8	200	60.9	30.5	48	108.9	54.5
9		59.6	29.8		107.6	53.8
10		57.4	28.7		105.4	52.7
11		51.6	25.8		99.6	49.8
12		34.9	17.4		82.9	41.4
13		50.8	25.4		98.8	49.4
14		59.1	29.6		107.1	53.6
15		62.0	31.0		110.0	55.0

Notes: PC: Process contribution; BC: Baseline concentration; PEC: Predicted environmental concentration

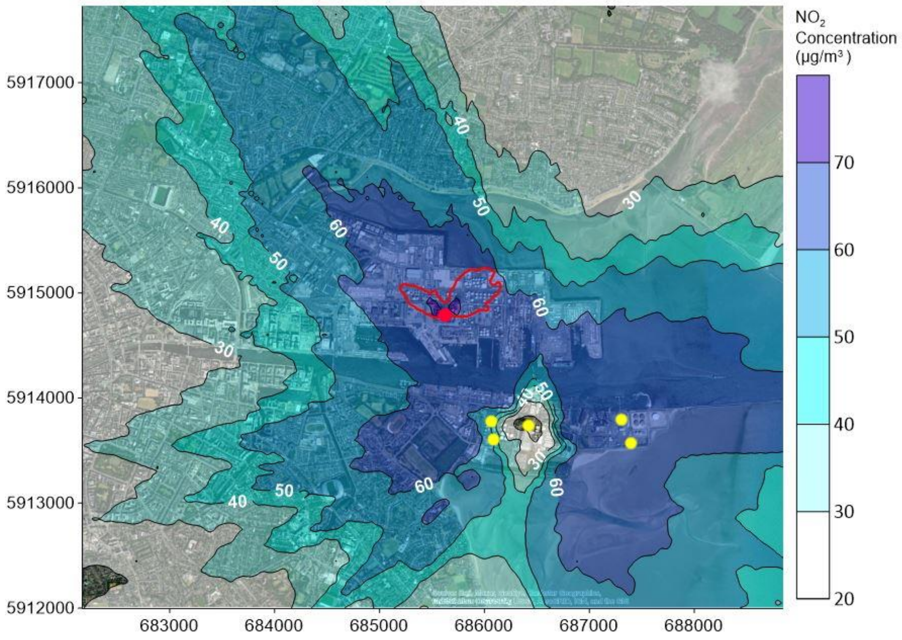
Question 2

Figure 8.10 presents a contour plot of the cumulative 1-hour NO_2 concentrations and the PSD increment area (demarked by a red line) where the proposed development's PC is above 25% of the 1-hour NO_2 AQS. The land-use in this area is primarily shipping container storage, bulk warehouses and tank storage facilities.

[54] Maximum offsite gridded receptor refers to the location within the model domain where the maximum concentration is predicted but excludes land occupied within the proposed development's site boundary or the sea.

At the point of maximum impact at offsite locations, within the PSD increment area, the cumulative 1-hour NO_2 concentration is 77.2µg/m^3 (38.6% of the 1-hour AQS). Table 8.12 above presents the proposed development in isolation and demonstrates that, at the same modelled location and at the same hour, the predicted 1-hour NO_2 concentration is also 77.2µg/m^3[55]. Therefore, at the location and hour of the maximum process contribution from the proposed development, the plant on the Poolbeg Peninsula is having a minimal cumulative contribution to the 1-hour AQS and does not constitute a significant concentration gradient in the vicinity of the proposed development.

Figure 8.10: 1-hour NO_2 99.79 percentile PC – Cumulative (µg/m^3)



Notes: Red circle indicates the proposed development's location; yellow circles indicate existing and consented plant, red line indicates proposed development's PC at 25% (50µg/m^3) of the 1-hour AQS known as the PSD increment area; Minimum contour level: 20µg/m^3: Maximum contour level: 70µg/m^3; Contour interval 10µg/m^3, Meteorological year 2015, PC = Process contribution

8.5.5.4 Cumulative Effects Summary

The cumulative assessment shows that there are no exceedances of the 1-hour AQS. Where the proposed development's process contribution is greater than 25% of the relevant AQS the 1-hour AQS process contribution from Poolbeg Peninsula is minimal. On this basis, the cumulative impacts are not likely even when considering the conservative nature of the assessment which assumes that all plant run continuously all year.

8.6 Mitigation Measures and Monitoring

8.6.1 Construction Phase

The construction phase is predicted to have a 'Negligible to Medium Risk' in terms of dust soiling and PM_{10} effects with no mitigation in place. Best practice mitigation measures adapted from the IAQM guidance are presented below and will be implemented through the CEMP.

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[55] The proposed development and cumulative concentrations are the same when rounded to one decimal place.

- 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 bunded areas and are not allowed to dry out, unless this is required for a particular process in which case ensure that appropriate additional controls 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
  - Record all inspections of haul routes

8.6.2 Operational 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.

In relation to operational impacts on climate change, regular maintenance checks to ensure that the gas turbines are operating according to calculated efficiency rates and best practice control measures will be implemented to mitigate against GHG emissions exceeding the intensity assessed.

8.7 Residual Impacts

There are no significant impacts predicted during the construction and operational phases for air quality with the successful incorporation of best practice mitigation as detailed in this EIAR.

As discussed in this chapter, there is some subjectivity in the assessment of significance with regards to GHG. If the plant is considered in isolation, then it is reasonable to conclude that there could be a likelihood of short-term negative significant effects, in line with IEMA guidance that all emissions should be considered significant regardless of their scale. However, considering the need for the development, as set out in Chapter 2, it follows that the plant can be considered as providing system-wide emergency generation support. Viewed in this system-wide context, it is therefore reasonable to conclude that significant adverse impacts are not likely.

9 Land, Soils and Hydrogeology

9.1 Introduction

This chapter presents the assessment of the likely significant effects arising from the proposed development on land and soils and hydrogeology. This chapter also provides an assessment of the compliance of the proposed development with the Water Framework Directive (WFD) 2000/60/EC, in terms of groundwater.

Proposed environmental control measures and additional mitigation measures to prevent, reduce and/or offset any potential impacts are presented as appropriate.

This assessment is based on the detail of the North Wall Emergency Generating Plant project provided in Chapter 3 *Description of the Development*.

9.2 Methodology

9.2.1 Legislative Context

This chapter has been prepared in accordance with the requirements of European Union Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (the 'EIA Directive') as amended by Directive 2014/52/EU.

Although there is no specific soil protection legislation in place in Ireland, the pollution prevention and control (including soils and groundwater) are managed by the EPA under the existing industrial emissions licence for the North Wall Generating Station.

The requirements of the following legislation have also been complied with:

- 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 2007and 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).

9.2.2 Guidance Used

This chapter has been prepared in accordance with the EIAR methodology outlined in Chapter 5 *EIAR Methodology*. Regard was also had to the following guidance:

- Institute of Geologists Ireland (2013): Guidelines for Preparation of Soils, Geology & Hydrogeology Chapters in Environmental Impact Statements;
- National Roads Authority (2009): Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes; and
- CIRIA 2006: Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532. London, 2006.

9.2.3 Sources of Data

In order to establish baseline conditions, a comprehensive desktop study was carried out, which reviewed publicly available datasets and historical geotechnical and environmental investigations conducted within the site.

The following is a list of sources of information that informed this chapter:

- Geological Survey of Ireland (GSI) website for Quaternary geological databases and maps was reviewed to determine the context of the study area in terms of soils, geology, aquifer classification and vulnerability, including geohazards;
- EPA Environmental Mapping Database for data on the National Soil Information System (SIS), subsoils and 2018 Corine land cover mapping;
- Environmental Protection Agency Map viewer - http://gis.epa.ie/
- Environmental Protection Agency Radon Map - http://www.epa.ie/radiation/radonmap
- Teagasc Soil Mapping; and
- Previous groundwater Investigations carried out on behalf of ESB. Reports from 1995 to date include:
  - K.T. Cullen & Co. Ltd, 1995. Electricity Supply Board, North Wall, Environmental Investigation, Final Report, Phase I, dated October 1995.
  - K.T. Cullen & Co. Ltd, 1996. Environmental Investigation at ESB North Wall, Alexandra Road, Dublin 1, Final Report, Phase II, dated November 1996.
  - White Young Green, 2002. Environmental Assessment, North Wall Generating Station, Alexandra Road, Dublin 1, dated November 2002.
  - Glovers Site Investigation, 2005. Site Investigation, North Wall Generating Station, Dublin, Standpipe installations, dated September 2005. Report No. 05-491.
  - URS Ireland Limited, 2005. Environmental Site Assessment, ESB North Wall Generating Station, Alexandra Road, Dublin, dated 21 November 2005. Ref: 45078452. Final, Issue No. 1.
  - URS Ireland Limited, 2007. Groundwater Quality Investigation, ESB North Wall Generating Station, Alexandra Road, Dublin Port, dated 02 January 2008. Ref: 45078771. Final, Issue No. 2.
  - URS Ireland Limited, 2008. Groundwater Quality Investigation, ESB North Wall Generating Station, Alexandra Road, Dublin 1, dated 01 April 2008. Ref: 49341548. Final, Issue No. 2.

- URS Ireland Limited, 2012. Groundwater Quality Investigation 2011, ESB North Wall Generating Station, dated 27 February 2012. Ref: 46402528. Final, Issue No. 5.
- URS Ireland Limited (2012) Environmental Site Assessment Report. Issue 3 30 August 2012.
- URS Ireland Limited (2013) Refinement of LNAPL CSM. ESB North Wall. Issue 2 dated 30 April 2013.
- URS Ireland Limited (2013) Remedial Options Appraisal. Issue 2 dated 14 May 2013.
- URS Ireland Limited (2013) North Wall Generating Station – Groundwater Monitoring 2013. Issue 3 dated 24 October 2013.
- URS Ireland Limited (2014) Bi-annual Groundwater Monitoring Dec 2013. Issue 3 dated 23 April 2014.
- URS Ireland Limited (2014). Groundwater Monitoring Feb 2014. Issue 2 24 April 2014.
- URS Ireland Limited (2015). Hydrogeological Assessment May 2015. Issue 20 May 2015.
- ESB International (2016). Decommissioning Management Plan April 2016. Issue 28 April 2016.
- AECOM Ireland Ltd. (2021) 2020 Groundwater Monitoring Annual Report (PR-474888_ACM_RP_EN_004).
- AECOM 2020, ESB North Wall Generating Station – ESB NW Baseline Assessment 2020 ref. PR-473553_ACM_RP_EN_003, dated 12 November 2020.

9.2.4 Assessment of Significance

9.2.4.1 Sensitivity of Receptor

The sensitivity of the receptors was assessed on completion of the desk study and baseline assessment.

Using Guidelines on procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009) as a guide, the criteria used for assessing the importance/sensitivity of the geological environments within the study area is outlined out in Table 9.1.

Table 9.1: Estimation of Importance of Soil, Geological and Hydrogeological attributes

Sensitivity	Criteria	Typical Examples
Very High	Attribute has a high quality and rarity on regional or national scale. Degree or extent of soil contamination is significant on a national or regional scale.	• World Heritage Sites; sites protected under EU wildlife legislation (SAC, SPA, SSSI, Ramsar site). • Geological features that are rare on a regional or national scale. • Groundwater supports river, wetland or surface water body ecosystem protected by EU legislation e.g. SAC or SPA status.
High	Attribute has a high quality and rarity on local scale. Degree or extent of soil contamination is significant on a local scale.	• Regional important geological sites. • Well drained and/or high fertility soils. • Contaminated soil on site with previous heavy industrial usage. • Regionally important potable water source supplying >2500 homes, groundwater vulnerability is classified as high; principal aquifer providing a regionally or locally important resource or supporting site protected under wildlife legislation.

Sensitivity	Criteria	Typical Examples
Medium	Attribute has a medium quality and rarity on local scale. Degree or extent of soil contamination is significant on a local scale.	• Moderately drained and/or moderate fertility soils. • Contaminated soil on site with previous light industrial usage. • Local potable water source supplying >50 homes, moderate classification of groundwater vulnerability; secondary aquifer providing water for agricultural or industrial use with limited connection to surface water.
Low	Attribute has a low quality and rarity on local scale. Degree or extent of soil contamination is significant on a local scale.	• Poorly drained and/or low fertility soils. • Local potable water source supplying <50 homes, deep secondary aquifer with poor water quality not providing baseflow to rivers.
Negligible	Very low importance and rarity on local scale.	• No rock exposures. • Urban classified soils. • Groundwater: Non-aquifer/Unproductive Strata.

Regionally Important (R) Aquifers are Principal Aquifers; Locally Important (L) Aquifers are Secondary Aquifers and Poor (P) Aquifers are Unproductive Strata. Different classifications exist for each of the aquifer types, as listed below:

- Regionally Important Aquifers:
  - Karstified bedrock dominated by conduit flow and/or diffuse flow
  - Fissured bedrock
  - Extensive sand and gravel
- Locally Important Aquifers:
  - Bedrock which is generally moderately productive
  - Bedrock which is moderately productive only in local zones
  - Sand and gravel
  - Locally important karstified bedrock
- Poor Aquifers:
  - Bedrock which is generally unproductive except for local zones
  - Bedrock which is generally unproductive

9.2.4.2 Magnitude of Potential Effect

The magnitude of a potential effect considers the scale of the predicted change to the baseline condition taking into account its duration (i.e. the magnitude may be moderated by the effects being temporary rather than permanent, short term rather than long term) and whether the effect is direct or indirect. Using NRA (2009) Guidance the criteria used for assessing impact magnitude on the soil and geological environment are described in Table 9.2.

Table 9.2: Criteria for Estimating Magnitude of Effect on Soil and Geological Attributes

Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute	• 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	Results in impact on integrity of attribute or loss of part of attribute	• Loss of moderate proportion of future quarry or pit reserves • Removal of part of geological heritage feature • Irreversible loss of moderate proportion of local high fertility soils • Requirement to excavate / remediate significant proportion of waste site • Requirement to excavate and replace moderate proportion of peat, organic soils and/or soft mineral soils beneath alignment
Small Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute	• 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
Imperceptible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	• No measurable changes in attributes
Minor Beneficial	Results in minor improvement of attribute quality	• Minor enhancement of geological heritage feature
Moderate Beneficial	Results in moderate improvement of attribute quality	• Moderate enhancement of geological heritage feature
Major Beneficial	Results in major improvement of attribute quality	• Major enhancement of geological heritage feature

Using NRA (2009) Guidance the criteria used for assessing impact magnitude on the hydrogeological environment are described in Table 9.3.

Table 9.3: Criteria for Estimating Magnitude of Effect on Hydrogeological Attributes

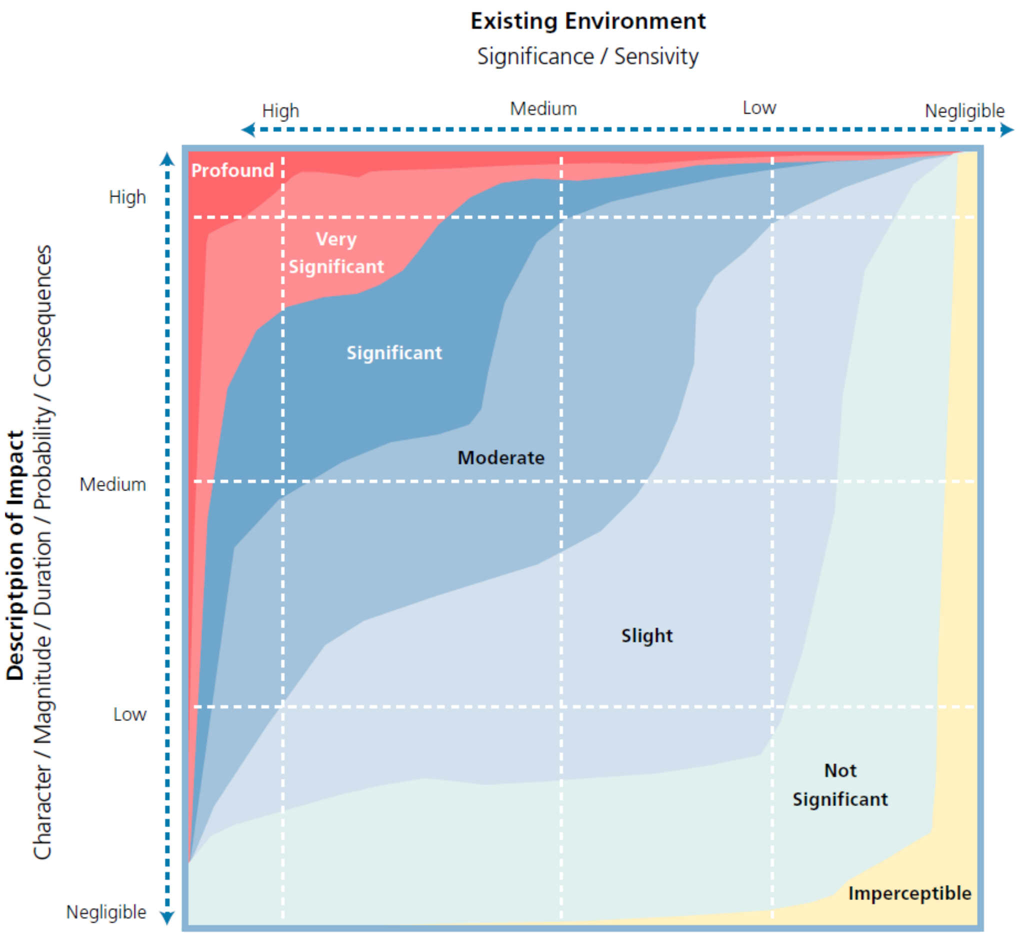
Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute	• Removal of large proportion of aquifer • Changes to aquifer or unsaturated zone resulting in extensive change to existing water supply springs and wells, river baseflow or ecosystems • Potential high risk of pollution to groundwater from routine run-off • Calculated risk of serious pollution incident >2% annually
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	• Removal of moderate proportion of aquifer • Changes to aquifer or unsaturated zone resulting in moderate change to existing water supply springs and wells, river baseflow or ecosystems • Potential medium risk of pollution to groundwater from routine run-off • Calculated risk of serious pollution incident >1% annually
Small Adverse	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
Imperceptible	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

Source: NRA, 2009

9.2.4.3 Significance Criteria

The significance of a specific potential impact is derived from both the sensitivity of the feature (refer to Table 9.1) and the magnitude of the effect (refer to Table 9.2 and Table 9.3), and can be determined using the matrix presented in Figure 9.1 (taken from the EPA Guidelines 2022).

Figure 9.1: There are seven generalised degrees of impact significance: Imperceptible, Not Significant, Slight, Moderate, Significant, Very Significant and Profound.



Source: EPA Guidelines 2022

9.3 Baseline Environment

9.3.1 Land and Soils

North Wall Generating Station is built on reclaimed permeable estuarine sands and gravels. The reclaimed fill underlying the site is mostly excavated sediments from the estuary or seabed. Fill generally comprises clay, silt, sand and gravel, often with shelly fragments. The fill overlies natural alluvial and estuarine deposits, comprising silty clays. The total thickness of overburden beneath the site is in excess of 20m (AECOM 2018 Groundwater Monitoring Annual Report IE Licence Register No. P0579-03).

In 2020, as part of a then proposed Open Cycle Gas Turbine Power Generating Plant (Dublin City Council Planning Reference Number 2697/20), Mott MacDonald, on behalf of the ESB, prepared a Phase 1 Geo-environmental Contaminated Land Desk Study focusing on the areas subject to groundworks as part of the upgrading works. The proposed development is within the existing North Wall Generating Station, in the same area as the 2020 proposal (permitted under 2697/20, alterations to the existing North Wall Generating station, refer to Section 5.4.9 for further detail). As part of the desk study undertaken at the time, a preliminary ground model was developed, based on historical investigation records. This is presented in Table 9.4 below.

Table 9.4: Preliminary Ground Model (Source: Planning Reference Number 2697/20)

Strata	Depth to Top of Strata (mbgl)	Approximate Thickness (m)	Description	Remarks
(1) Fill Material	Ground Level	0.5 – 1	Concrete, tarmac overlying hardcore, sandy gravel fill with fragments of deleterious materials	None
(2a) Reworked Estuarine Deposits	0.5 – 1	8 – 10	Loose grey and brown silty SAND and GRAVEL with shell fragments	Material used in historical reclamation of the area from Dublin Bay
(2b) Estuarine Deposits	20 – 30	10 – 20	Dense grey silty SAND with shell fragments and bands of laminated SILT and CLAY	None
(3) Glacial Till	28 – 30	0 – 2	Stiff grey silty CLAY with cobbles are boulders	Boulder band at top of strata
(4) Limestone	26 – 30	Not proven	Silt grade limestone of the Lucan Formation	Bedrock reported to be c.2-5m deeper in north-east corner of the site
Groundwater is anticipated to be encountered between 3 – 4mbgl and flows towards the south. Shallow groundwater is reported to not be tidally influenced; although deeper groundwater in the bedrock aquifer is reportedly in hydraulic connection with the estuary.				

9.3.1.1 Previous Site Assessments

A summary of previous reports and documents relating to possible spills and contamination incidents on the site are presented in Table 9.5.

Table 9.5: Contaminated Land

Report	Summary
URS, Environmental Site Assessment, November 2005	Summarises the findings of a ground investigation undertaken by URS following the loss of c.8,000 litres of diesel on site. The date of the leak is not specified. However, it reported that c.6,000 – 7,000 litres of diesel were recovered by ESB at the time. The leak reportedly occurred as a result of diesel being released into the false starts drains, which in turn discharged into an underground concrete service trench which traverses the site. The location of the service trench is not presented in the report. The GI comprised 6 window sample boreholes advanced to a nominal depth of 3.0mbgl; installation of 4 boreholes and collection of 12 soil and 4 groundwater samples. The report concluded that no remedial action was necessary; however, recommended groundwater monitoring in 6 months' time to enable this position to be reviewed.
ESB, North Wall Generating Station, Annual Environmental Report, 2011	Summarises: emissions to surface water, sewer and atmosphere; quantity of hazardous waste materials disposed of; fuel and water consumption 2011. A summary of environmental targets and current status is also provided. A single environmental incident is also recorded, namely: sodium hydroxide bulk tank drained into Water Treatment Tank. However, no discharge to the environment is reported to have occurred as sodium hydroxide was contained by sump and waste contractor subsequently removed contents of sump.
URS, Refinement of LNAPL CSM, April 2013	Presents a Generic Quantitative Risk Assessment (GQRA) based on the findings of further ground investigation, which comprises advancement of 10 boreholes; installation of 6 groundwater monitoring wells; 4 permeability tests; 1 baildown transmissivity test and collection and analysis of soil and groundwater samples. The purpose of the investigation was to refine the CSM previously developed in

Report	Summary
	relation to the risk posed to controlled waters from hydrocarbon contamination as a result of the spillage reported in the 2005 URS report. The report concluded that there was no significant risk to human health; however, a risk to controlled waters was present due to the presence of a plume of free phase light non-aqueous phase liquid (LNAPL) and dissolved phase petroleum hydrocarbons in the central area of the site. It was recommended that a Remedial Options Appraisal was prepared to identify the most appropriate remedial method for the site
URS, Hydrogeological Assessment, May 2015	Presents a hydrogeological assessment of the site as part of the sites former Integrated Pollution Control (IPC) permit. Contains a summary of the historical groundwater contamination on the site and states the Remedial Action Plan for the site is Monitored Natural Attenuation with Local Passive Product Recovery for a period of 4 to 5 years.
AECOM, 2017 Groundwater Monitoring Annual Report, February 2018	Summarises history of groundwater contamination at the site and presents the results of the 4 rounds of quarterly monitoring undertaken in 2017. LNAPL detected in each of the monitoring wells on site since February 2014. Report concludes that the LNAPL plume consists biodegraded diesel (therefore of low volatility) and is of low mobility and stable. The dissolved phase plume is also reported to be stable.
AECOM, 2018 Groundwater Monitoring Annual Report, March 2019	Summarises history of groundwater contamination at the site and presents the results of the 4 rounds of quarterly monitoring undertaken in 2018. Report concludes that the LNAPL plume appears relatively static and that the dissolved phase plume appears to be contracting.
AECOM, ESB North Wall Baseline Site Assessment 2020	Included drilling of shallow boreholes. Evidence of hydrocarbon contamination was noted at six drilling locations. Hydrocarbons present in shallow soils in CT4/CT5 area, although concentrations of TPH detected did not exceed GAC protective of human health. TPH in soil decreased with depth. Based on new monitoring well data, both LNAPL and dissolved phase TPH inferred plumes were extended northwards. However, LNAPL zone appears stable and has not spread laterally over the period of passive recovery and managed natural attenuation. Thickness of LNAPL detected had declined. Dissolved phase TPH plume has contracted. TPH in groundwater and PAHs and metals in soil leachate and groundwater exceed relevant GAC protective of controlled waters in CT4/CT5 area.
AECOM, 2020 Groundwater Monitoring Annual Report, 2021	Summarises history of groundwater contamination at the site and presents the results of the 4 rounds of quarterly monitoring undertaken in 2020, including new monitoring boreholes installed in 2020 as part of the Baseline Assessment. Report concludes that the LNAPL and dissolved phase TPH plumes appears relatively stable. Also concludes that LNAPL zone and dissolved phase plume beneath site have contracted since commencement of monitoring programme. Recommendation that new monitoring wells be included in the 2021 monitoring programme, including the inspection of the passive hydrocarbon absorbent sock installed in new monitoring well (MW21).

9.3.1.2 Sensitivity of Attributes

Having regard to the methodology outlined in Section 9.2, the sensitivity of land and soils associated with the proposed development, with reference to the attribute types presented in Table 9.6, is **negligible,** except soil which has **high** sensitivity.

Table 9.6: Sensitivity of Attributes (Soils and Geology)

Attribute	Type	Sensitivity of Attribute
Land / Land Use	Artificial Surface (established power generation facility).	Negligible
Soil [Underlying artificial surface]	Hardcore, sandy gravel fill with fragments of deleterious materials, with deeper reworked estuarine deposits. Hydrocarbon contamination observed in the central portion of site.	High
Bedrock	Calp Limestone, a black/grey argillaceous and cherty limestone and shale (Tobercolleen and Lucan Formations), which is found throughout the Dublin area.	Negligible
Geological Heritage Areas	A Geological Heritage Area (GHA) is one which contains geological or geomorphological features considered to be of national interest and recommended for Natural Heritage Area (NHA) designation by the GSI under the *Wildlife (Amendment) Act 2000*. There are no GHAs within the zone of impact of the proposed development. The nearest GHA the River Poddle is approximately 3.8km slightly south-west of the proposed development.	Negligible
Geohazards	Geohazards are natural earth processes that pose a risk to human life. They can range from geological hazards such as landslides, bog bursts, coastal erosion, and subsidence to hydro-metrological hazards like floods. There are no identified geohazards within the zone of impact of the proposed development. As anthropogenic ground there may be observed instability. The closest recorded geohazard is a karst feature, St Doolaghs Well, 7.7km north of the proposed development..	Negligible
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 400 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 the EPA website (http://www.epa.ie/radiation/radon/). Radon mapping on this website illustrates 10km x 10km grid squares which show the estimated percentage of homes above the reference level for radon. The radon measurements illustrated on this map for North Dublin 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/m^3.	Negligible

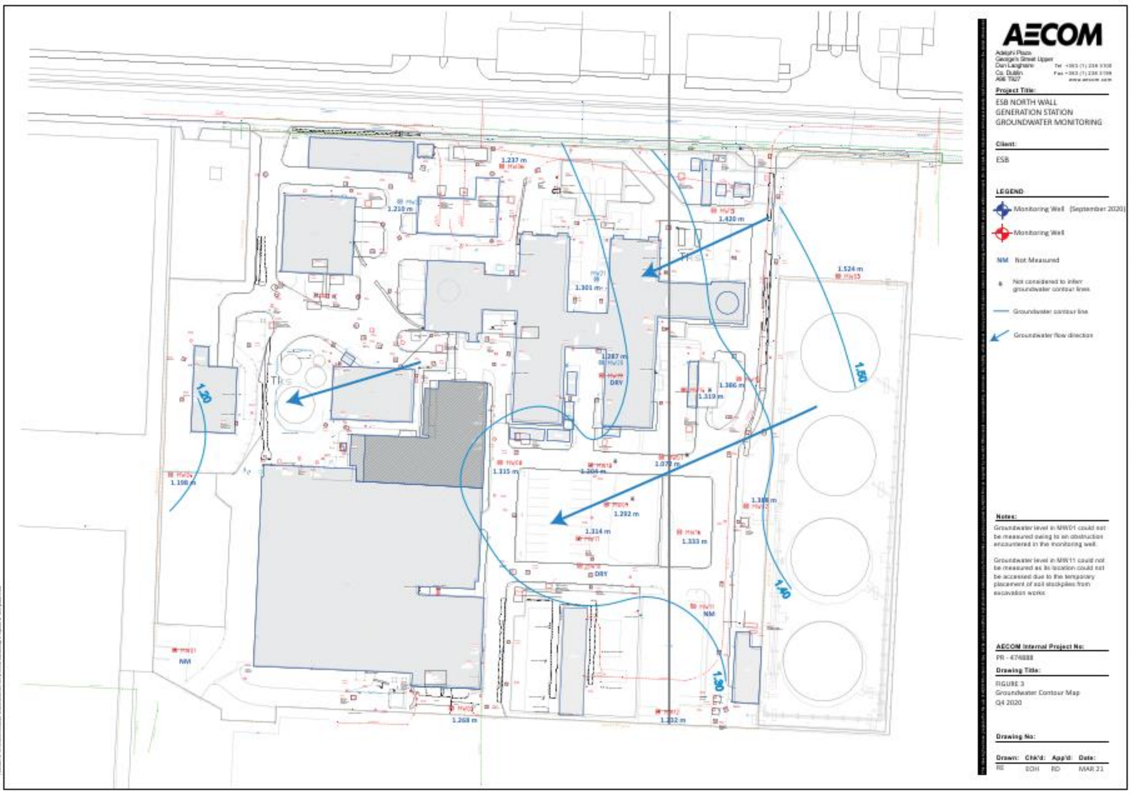
9.3.2 Hydrogeology

According to the GSI website, the underlying bedrock aquifer may generally be regarded as a locally important aquifer (bedrock which is moderately productive only in local zones). There are no Source Protection Zones or groundwater abstraction wells recorded within a 1km radius of the site.

The overlying sediments are not classified by the GSI as an aquifer. Shallow groundwater within the reworked estuarine deposits is brackish (recorded above 1000uS/com in previous monitoring rounds) and anticipated to be encountered between 3 – 4mbgl. It is reported not to be tidally influenced. Deeper groundwater associated with the limestone bedrock is reportedly in hydraulic connection with the estuary and is therefore influenced by tidal fluctuation (WYG, 1996 data). Given the proximity of the Liffey Estuary and Dublin Bay, groundwater underlying the site is likely to be brackish or saline due to hydraulic connection with the estuary. As such, both shallow and deep groundwater underlying the site is unlikely to be suitable for potable use. Additionally, given the industrial nature of land use in Dublin Port, the underlying aquifers would not be considered a potable source of groundwater due to the known presence (and ongoing remediation) of industrial contamination in the nearby area.

Based on previous site investigations, the inferred groundwater flow direction, in the fill/estuarine deposits at the site, is to the south or south-west towards the south or south-west discharging to Dublin Bay and the Liffey Estuary, as illustrated in Figure 9.2.

Figure 9.2: Groundwater contour map Q4 2020



Source: AECOM Ireland Ltd. (2021) 2020 Groundwater Monitoring Annual Report (PR-474888_ACM_RP_EN_004)

9.3.2.1 Groundwater Monitoring and Quality

There are 19 wells located within the boundary of the power plant which have undergone monitoring on a quarterly basis by AECOM Ireland Ltd (since 2014). The locations of the monitoring wells are shown in Figure 9.3.

The land on which the site is situated has a history of heavy industry and petroleum-based operations. Specifically, Dublin Port Company (DPC) environmental surveys have determined that the groundwater within areas of the port estate has been affected by historical industrial activities. In 2014 a Remedial Action Plan (RAP) was prepared for the site by AECOM to address the known light non-aqueous phase liquid (LNAPL) hydrocarbon contamination in the shallow groundwater. The RAP evaluated remedial options for the area given the constraints of the site being operational at the time, and the knowledge that the site would be decommissioned in 2019/2020.

The RAP proposed a programme of quarterly groundwater sampling from 19 wells across the site, in order to determine the following:

- Assess trends in the lateral extent of free-phase LNAPL and dissolved phase hydrocarbon contamination.
- Assess the trends in dissolved phase hydrocarbon contamination.
- Assess the efficacy of natural attenuation.
- Passive recovery using absorbent socks to recover free-phase hydrocarbons in the known free-phase plume in order to reduce the LNAPL mass.

The RAP was approved by the EPA in November 2014 subject to a number of conditions which included the preparation and submission to the EPA of an annual Groundwater Monitoring (GWM) Report. Although operation ceased at the site in October 2019, the site has not undergone the intended decommissioning due to the ESB proposal outlined within this EIAR. Following recommendations in the 2019 groundwater monitoring annual report, quarterly monitoring has been continued through to 2020 to monitor the extent of LNAPL contamination at the site.

Source-Pathway-Receptor Linkages

A conceptual site model identifying source-pathway-receptor linkages as described in AECOM GWM Report 2018 and 2020 is provided below:

Potential Sources	Viable Pathways	Potential Receptors
Spills and leaks associated with CT4 and CT5 Underground fuel lines Site drainage infrastructure Contaminated soil and groundwater	Human Health • Inhalation of vapours (LNAPL only) Controlled Waters • Lateral migration of contaminated groundwater and LNAPL through the permeable fill, reclaimed material and overburden • Preferential pathways through onsite drainage	Human Health (risk considered low) • Human presence (LNAPL only) • Onsite employees (LNAPL only) • Workers onsite undertaking subsurface workers Controlled Waters • Shallow groundwater beneath the site • Estuarine waters in Alexandra Basin East and the wider Liffey Estuary

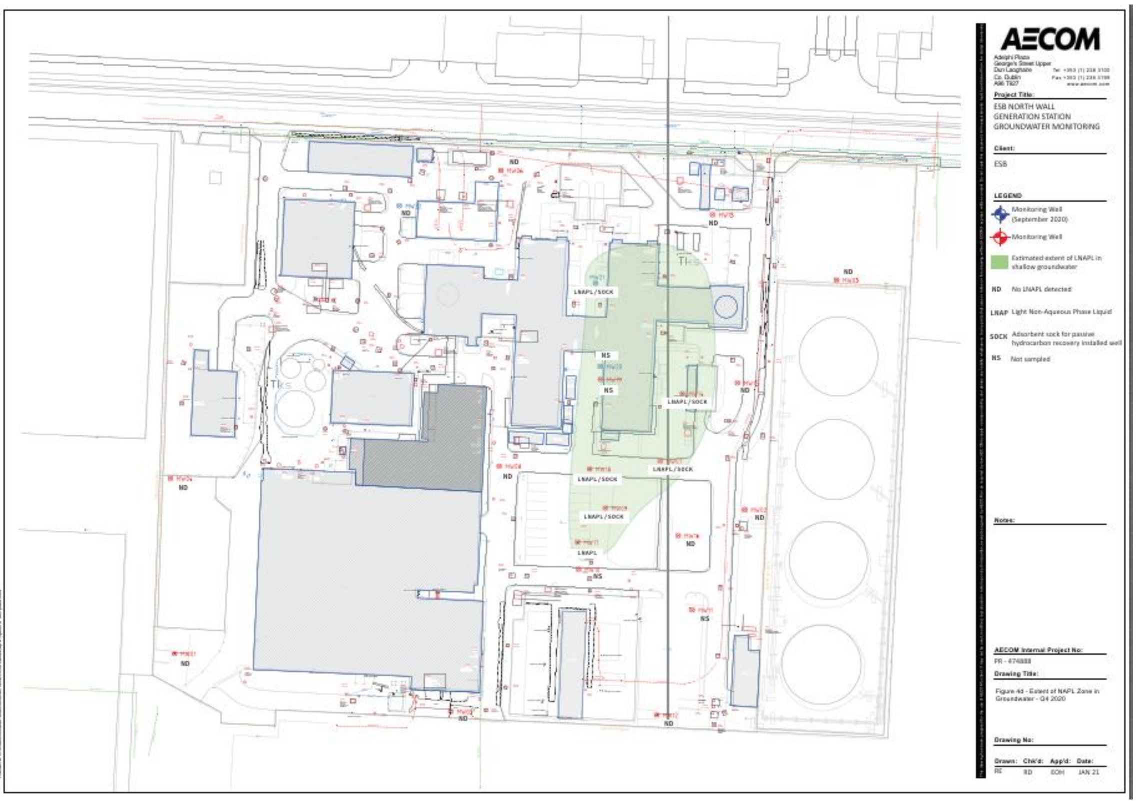
Groundwater monitoring well data has been collected from the site since 2013.

During Q1 to Q4 2020 the absorbent socks in each of the 4 monitoring wells in which they are installed were observed to contain petroleum hydrocarbon product. The most recent AECOM GWM Report (2020) states that in Q1 and Q2 the inferred plume extent remained consistent with the LNAPL zone previously inferred. Following discovery of LNAPL in a newly installed monitoring well (MW21) in Q3 and Q4, the inferred plume was extended northwards, however, the continued absence of LNAPL in an existing monitoring well further north (MW13) limited the extent to which the LNAPL zone was extended beyond previous inferences. The AECOM GWM Report (2020) reports *that the extent of the LNAPL zone across the central and southern portion of the site appears to be stable or decreasing* (AECOM, 2021). In addition, the thickness of LNAPL detected has declined over the period of LNAPL recovery (AECOM, 2020).

The previously inferred dissolved phase TPH plume was extended northwards in Q3 and Q4 2020 following detection of separate phase LNAPL in a newly installed monitoring well (MW21). However, the dissolved phase TPH plume has generally contracted since monitoring began, towards the source area (AECOM, 2021).

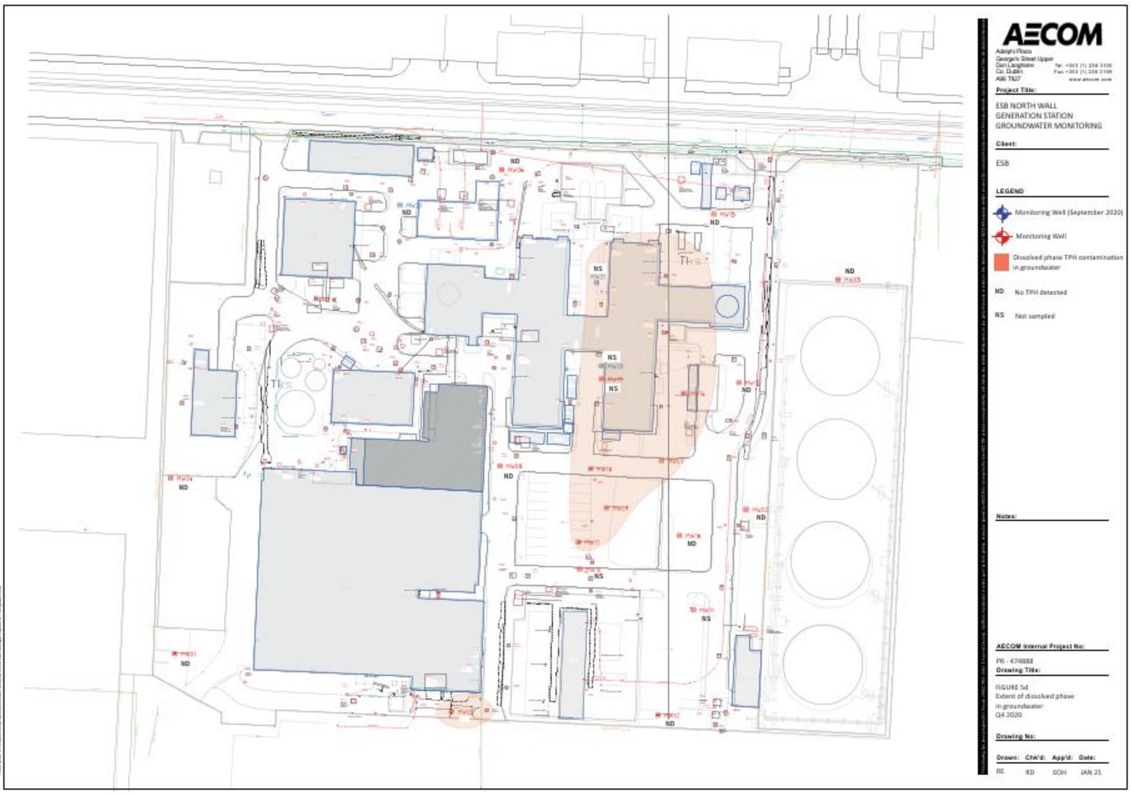
Most recent conceptual models of the LNAPL and dissolved phase TPH plume extents are shown in Figure 9.3 and Figure 9.4, respectively. Figure 9.5 illustrates a cross section of these updated conceptual models.

Figure 9.3: Groundwater monitoring well locations and Extent of LNAPL in groundwater Q4 2020



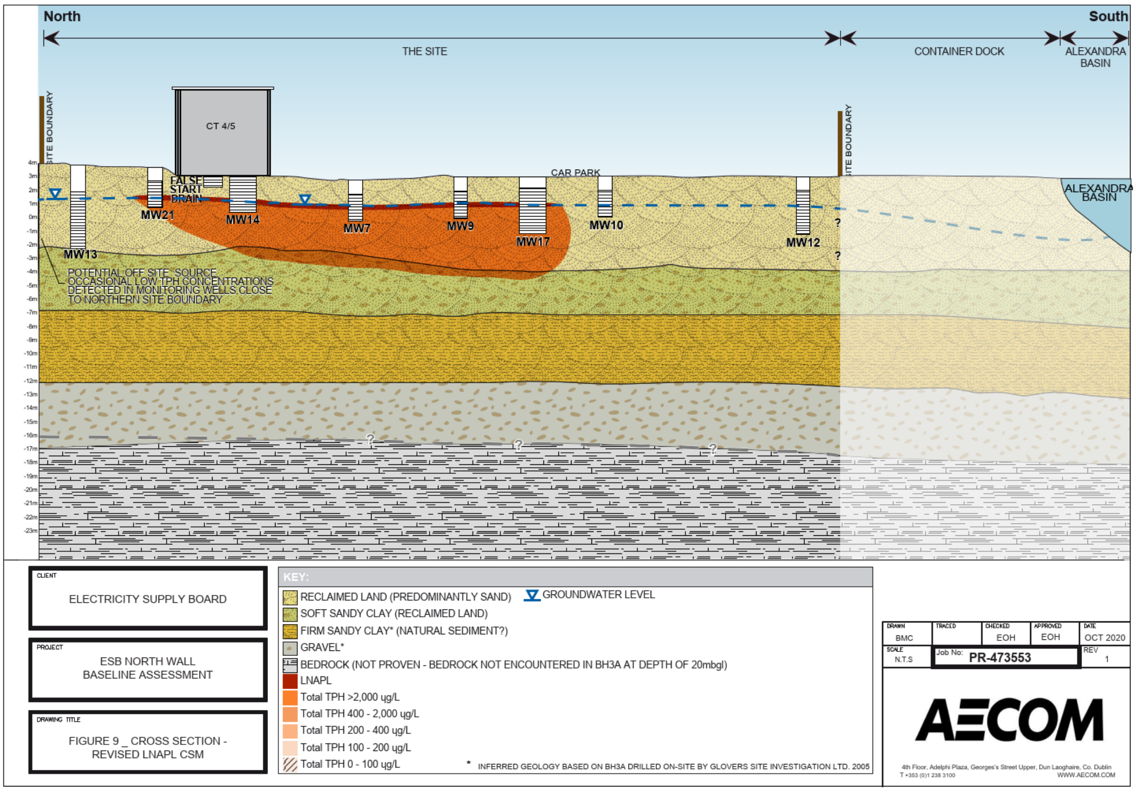
Source: AECOM Ireland Ltd. (2021) 2020 Groundwater Monitoring Annual Report (PR-474888_ACM_RP_EN_004)

Figure 9.4: Extent of Dissolved Phase TPH in groundwater Q4 2020



Source: AECOM Ireland Ltd. (2021) 2020 Groundwater Monitoring Annual Report (PR-474888_ACM_RP_EN_004)

Figure 9.5: LNAPL Conceptual Model (revised from monitoring data up to Q3 2020)



Source: AECOM (2020) ESB North Wall Generating Station – ESB NW Baseline Assessment 2020 (PR-473553_ACM_RP_EN_003

Risks to Controlled Waters

Concentrations of TPHs in groundwater, and of PAHs and metals in soil leachate and groundwater, from this [site] *exceed relevant Generic Assessment Criteria (GAC) protective of controlled waters* (AECOM, 2020).

- Manganese and iron were found to exceed the adopted GAC *… in all samples analysed from MW06, MW10, MW11, MW12, MW15, MW16 and MW17 in 2020* (AECOM, 2020). Groundwater sampled from MW13 and MW08 also exceeded the adopted GACs for manganese and iron (MW08 only) in certain 2020 monitoring rounds (AECOM, 2020).

Concentrations of PAH compounds and metals are detected in groundwater from monitoring wells across the site.

Evidence of LNAPL was found in wells MW07, MW09, MW14, MW17, MW18 and MW21 in 2020 and dissolved phase TPH compounds at concentrations that exceeded the adopted GAC were found in monitoring wells MW05 (Q4) and MW17 (Q3).

The baseline assessment of the site completed in 2020 in support of an IE Licence review application did not identify additional sources of contamination beneath the site, but did indicate, through installation of additional monitoring wells, that the LNAPL zone extended further north beneath CT4 / CT5 than could be interpolated from previous monitoring data (AECOM, 2020). Following this and the 2020 monitoring rounds, quarterly monitoring was continued through 2021 to allow continued assessment of the extent of LNAPL contamination beneath the site. Monitoring data from wells (MW6 and MW13) located to the north-west and north-east of MW21 respectively did not identify NAPL or dissolved phase hydrocarbons. The monitoring undertaken in 2021 also included the monitoring wells installed as part of the baseline assessment in 2020, including the inspection of the passive hydrocarbon absorbent sock installed in monitoring well MW21 (AECOM, 2021).

Based on data collected between 2013 and 2021, the potential risk to controlled waters from contaminated soil leachate and groundwater present on the central portion of the site is considered to be **low** given that: ·

- The LNAPL zone appears to be relatively static (based on data collected between January 2013 and December 2020);
- The LNAPL detected on site is considered to have low mobility (based on recoverability testing on site completed in 2013); and
- The dissolved phase TPH plume has contracted back towards the source area since January 2013 and now appears to be relatively stable within the site boundary, only fluctuating slightly between wells MW10, MW15 and MW17. Overall, dissolved phase hydrocarbons have been detected in progressively fewer wells since 2012 and concentrations in several wells down-gradient of the LNAPL source area are following a downward trend.
- Outside of the LNAPL zone, elevated concentrations of TPH, PAHs and metals detected in soil leachate and / or groundwater were limited to BH03, BH05 and MW22.

9.3.2.2 Water Framework Directive

The Dublin groundwater body (IE_EA_G_008) is of good status (2013-2018) and is identified as not being at risk.

9.3.2.3 Sensitivity of Attributes

Due to the location of the site within a zone of industrial development, the unsuitability of the groundwater for domestic use, and given the existence of groundwater contamination, which is being monitored and remediated, the sensitivity of the hydrogeology is considered **Low**, with reference to the methodology outlined in Section 9.2.

9.4 Likely Significant Impacts

9.4.1 Construction Phase

The construction phase of the proposed development comprises pre-construction works, demolition works, and plant construction works as described in Chapter 3: *Description of the Development.*

Of key relevance, groundworks for the development include shallow excavations for construction of new equipment foundations to a depth of 800mm below existing ground level. Existing foundations or buried structures will be removed to a depth of 800mm. Excavations will also be necessary for existing below ground services (surface water drains), which will be removed and rerouted around areas where new foundations are to be constructed. Piling may also be required.

Foundations for the proposed gas turbine generators will be adjacent and, in some cases, above the existing LNAPL and dissolved phase TPH plume.

9.4.1.1 Land and Soils

The assessment of construction effects on land use and soils is presented in the table below:

Table 9.7: Construction Phase Impacts on Land and Soils

Work Phase	Description	Magnitude of Effect	Significance of Impact
Dismantling/Hazards Removal	Contamination from dismantled structures and associated hazardous waste. Short duration.	Small Adverse Any waste arising will be managed in accordance with the Waste Management Act 1996 and associated Regulations and the Construction and Demolition Waste Management Plan.	Slight –Significant impacts are not likely
Excavation and Erosion	Excavation of potentially contaminated soil for foundations and underground service removal/re-routing. Short duration from temporary storage of excavated (including hazardous) material and laydown areas. Increased risk of soil erosion, contamination, and compaction. Short to medium term dependent on location, and nature and volume of contaminated soil encountered.	Low Adverse – Moderate Adverse due to known soil contamination on site. Appropriate risk assessments, method statements and environmental oversight required in line with current guidance.	Moderate – Slight
Construction phase abnormal load traffic	Land use disruptions due to temporary abnormal load traffic.	Moderate Adverse	Slight – Significant impacts are not likely
Accidental spillage or leakage of hydrocarbons / Chemicals stored on site	A number of chemicals will be stored and used on site including fuel and oil during the construction phase, including concrete, fuel and oil. These will be stored in suitable bunded area but if leaked they have the potential to contaminate surrounding land and soils.	Short-Medium Term Moderate Adverse	Slight

9.4.1.2 Hydrogeology

The assessment of construction effects on groundwater is presented in the table below:

Table 9.8: Assessment of Impacts on Groundwater during the Construction Phase

Work Phase	Description	Magnitude of Effect	Significance of Impact
Dismantling/Removal	Contamination from dismantled structures and associated hazardous waste stored on site and associated leachates.	Short Duration Small Adverse Any waste arising will be managed in accordance with the Waste Management Act 1996, as amended, to avoid leaching to soil and groundwater.	Slight
Excavation/Groundworks	Known groundwater and possible soil contamination beneath excavation zone. Contamination or mobilisation of contaminants from disturbance of contaminated soil or groundwater and/or inappropriate storage of contaminated spoil. There will be minimal excavation over contamination plume and avoidance of groundwater interception	Short-Medium Term Small Adverse Appropriate risk assessments, method statements and supervision by suitably qualified and experienced EnCoW required in line with current guidance.	Slight
Concrete	The use of concrete to develop some structures and foundations may give rise to high alkalinity waters and slurries which could affect groundwater quality.	Short-Medium Term Low Adverse	Slight
Accidental spillage or leakage of hydrocarbons / Chemicals stored on site	A number of chemicals will be stored and used on site during the construction phase, including concrete, fuel and oil. Should these contaminants enter the groundwater, they have the potential to adversely impact on the water quality. These will be stored in suitable bunded area but if leaked they have the potential to contaminate surrounding land and soils.	Short-Medium Term Moderate Adverse	Slight

9.4.1.3 Water Framework Directive

The small scale and nature of the proposals relative to the magnitude of the WFD waterbody is deemed to pose very low risk to the delivery of long term WFD objectives and / or no deterioration to the WFD status, such that no further (additional) assessment is required.

9.4.2 Operational Phase

The assessment of operational effects on land use, soils and groundwater is presented in the table below:

Table 9.9: Assessment of Impacts on Land Use, Soils and Groundwater during the Operational Phase

Work Phase	Description	Magnitude of Effect	Significance of Impact
Waste generation from operation and maintenance	Attendance by up to five operational staff seven days a week. Waste materials generated will be domestic such as paper and food waste, non-hazardous (e.g. clean metal and wood waste) and hazardous (waste oils and greases generated from the operation of the plant). Waste	Small Adverse – Imperceptible Any waste arising will be managed in accordance with the Waste Management Act 1996, as amended, to avoid leaching to soil and groundwater.	Slight – Significant impacts are not likely
Accidental spillage or leakage of hydrocarbons / chemicals stored on site	A number of chemicals will be stored and used on site during the operational phase, including concrete, fuel and oil. Should these contaminants enter the groundwater, they have the potential to adversely impact on the water quality.	Small Adverse - Imperceptible	Slight – Significant impacts are not likely

9.4.3 Do Nothing

In a 'Do Nothing' scenario, there would be no immediate impact on the baseline conditions of the site regarding land, soils and hydrogeology. The existing station is an Industrial Emissions Licence (IEL) site (Reg no. P0579-03) and will continue to comply with the conditions of the IEL.

9.4.4 Decommissioning Phase

The power plant is expected to be in place and operating for a maximum of five years; after this time the plant will be disconnected and removed from site. Existing underground services will remain in-situ.

The effects would be temporary and slight. The activities associated with the decommissioning phase will be similar to those associated with the construction phase of the project, whereby the plant would be dismantled in parts and taken off site. All lubricating oils other potentially polluting consumables and waste materials generated during the decommissioning of the plant will be managed and removed from site in line with the Waste Management Act 1996. The effects of decommissioning on land use, soils and hydrogeology would be slight - Significant impacts are not likely.

9.4.5 Cumulative Effects

Given the nature and scale of the proposals, and baseline environment, significant cumulative effects on land use, soils and hydrogeology are unlikely.

9.5 Mitigation Measures and Monitoring

9.5.1 Construction Phase

- All construction works will be carried out in accordance with a Construction Environmental Management Plan (CEMP) included in Appendix 3.1, which will define measures to reduce the risk of contaminants being mobilised during the proposed works.
- Mitigation measures to reduce the risk of coming in contact with the LNAPL and dissolved phase TPH plumes are set out in Chapter 3 Description of Development.

- All work will be carried out having regard to international and national legislation, and best practice guidance, including but not limited to guidance on preventing pollution from construction sites and pollution prevention guidance.
- A Construction Resource Waste Management Plan (CRWMP; part of the CEMP) will include identification and appropriate management and disposal of waste materials generated during the works.
- North Wall Generating Station (including the proposed development) will continue to comply with the conditions pertaining to Industrial Emissions Licence (P0579) from the Environmental Protection Agency.
- The only discharge to the ground during the operational phase of the proposed development will be uncontaminated stormwater (rainfall) run-off from the building roofs. All stormwater will be discharged to the surface water drainage system which connects to the Dublin Port drainage network on Alexandra Road which discharges to the Tolka Estuary to the north of the site (IEL monitoring point SW3) and to the River Liffey Estuary to the south of the site (IEL Monitoring point SW4).
- The only effluent discharging to the foul sewer will be from the toilets, and the emissions to sewer will comply with IEL Licence Condition 7 (emissions to sewer).
- Existing groundwater monitoring/treatment wells that may be affected by the works will be identified and amendments to the monitoring well network will be agreed with the EPA prior to commencement of works.
- All works in the area of the oil plume will be carried out within the parameters assessed in this EIAR and will be supervised by an appropriately experienced and qualified EnCoW.
- Piling will be avoided in the area of the plume as a raft type/floating design of the main equipment foundations will be used.
- 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;
  - All tanks and drums will be bunded in accordance with established best practice guidelines; and
  - Established best practices including preventative maintenance, routine monitoring and reporting of tanks and equipment integrity, as directed under the industrial emissions licensing process, will minimise the likelihood of leaks/spills occurring and ensure that any leaks are quickly detected and controlled.

9.5.2 Operational Phase

Operational phase measures outside the conditions specified in the Industrial Emissions Licence P0579 are not proposed.

9.5.2.1 Water Framework Directive

As detailed previously, the small scale and nature of the proposals relative to the magnitude of the WFD waterbody is deemed to pose very low risk to the delivery of long term WFD objectives and / or no deterioration to the WFD status, such that no further (additional) assessment is required. Notwithstanding, the mitigation detailed and proposed as part of this EIAR and the CEMP included in Appendix 3.1 will be implemented during construction to ensure that the proposed development will not cause the groundwater WFD status to deteriorate and will not prevent it from continuing to meet the biological and chemical characteristics for good status.

9.6 Residual Impacts

During the construction phase, impacts to land and land use are anticipated to be localised and temporary in duration and have been classified as slight or not likely to be significant.

Any impacts to the hydrogeological receiving environment will be adequately mitigated through the implementation of the CEMP and the CRWMP, the conditions of the IE licence in addition to the mitigation embedded in the design detailed in Chapter 3 *Description of the Development*.

Therefore, no significant adverse residual impacts are predicted as a result of the proposed development.

10 Surface Water and Flood Risk

10.1 Introduction

This chapter describes the existing surface water environment and the likelihood of impacts from the proposed emergency power generating plant on various surface water aspects such as water quality and flooding. Existing water quality in the vicinity of the site has been established based on a desktop study. The assessment is based on the development as described in Chapter 3 of this EIAR. Where potential adverse impacts are identified, mitigation measures are defined to prevent, reduce or offset potential adverse effects, or enhance potential beneficial effects where possible.

10.2 Methodology

10.2.1 Legislation Context

This chapter has been prepared having regard to the following legislation:

- 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 Water Framework Directive, WFD).
- European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003), which gave legal effect to the WFD in Ireland.
- Flood Risk Guidelines issued under Section 28 of Planning and Development Act 2000

The WFD 2000/60/EC commits EU member states to meet targets for the ecological and chemical status of waterbodies over a given period. 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, 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 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.

The current objective is to achieve a good status by 2021. Public Consultation on the draft River Basin Management Plan for Ireland 2022-2027 is due to close in March 2022.

10.2.2 Guidance

This assessment follows guidelines established by Transport Infrastructure Ireland (TII) / National Roads Authority (NRA) in its *Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (NRA, 2009), hereafter referred to as the NRA Guidelines. Regard has also been had to:

- EPA Guidelines 2022;
- 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); 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.

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.

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 10.1 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 10.1: 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).

10.2.3 Desktop Study

A desktop study was undertaken to identify the baseline characteristics relating to the surface water environment and local flood risk of proximate surface waterbodies.

The following is a list of sources of information consulted for use in this chapter:

- EPA (Water Framework Ireland Map viewer) databases for information on surface water features within proximity to the proposed development;
- Ireland's Water Catchments (www.catchments.ie);
- Water Quality in Ireland 2020 (EPA, 2021);
- OPW CFRAM Maps (www.floodinfo.ie);
- River Basin Management Plan for Ireland 2018 - 2021 (Department of Housing, Planning and Local Government, 2018);
- Climate data (Met Eireann);
- Ordnance Survey of Ireland, current and historic mapping;
- Aerial Photographs;
- Drone video (source – ESB);
- The North Wall Power Station Industrial Emissions Licence P0579-03; and
- North Wall Power Station Annual Environmental Reports.

10.2.4 Assessment of Significance

The following impact assessment methodology was adapted from the EPA Guidelines 2022, with reference to the NRA Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA 2009), specifically Section 5.6 (impact quality, type, magnitude/ significance and duration are considered relative to the importance of the hydrological attribute). This assessment methodology considers the sensitivity of the surface water receptors, the magnitude of the potential impact and the determination of the significance of the potential effect.

10.2.4.1 Sensitivity of the Receptor

The sensitivity of the receptors is determined according to the methodology shown in Table 10.2.

Table 10.2: Sensitivity of Receptor [Amended from *Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes* (NRA, 2009)]

Value (Sensitivity)	Typical Descriptors
Extremely High	Attribute has a high quality or value on an international scale. Examples: river, wetland or surface water body ecosystem protected by EU legislation. I.e. designated under the Habitats, Birds, Shellfish, Bathing Water or Freshwater Fish, Drinking Water or Nitrate Directives
Very High	Attribute has a high quality or value on a regional or national scale. Examples: river, wetland or surface water body ecosystem protected by national legislation (NHA status), Regional important potable water source supplying >2500 homes, nationally important amenity site for wide range of leisure activities, Quality Class A (Biotic Index Q4, Q5), Flood plain protecting more than 50 residential or commercial properties from flooding.
High	Attribute has a high quality or value on a local scale. Examples: Salmon fishery, locally important potable water source supplying >1000 homes, Quality Class B (Biotic Index Q3-4), Flood plain protecting 5 to 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. Examples: 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. Examples: 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

10.2.4.2 Magnitude of Potential Effect

The magnitude of potential effect has been defined in accordance with the Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009).

Table 10.3: Criteria for Estimating Magnitude of Effect on Surface Water

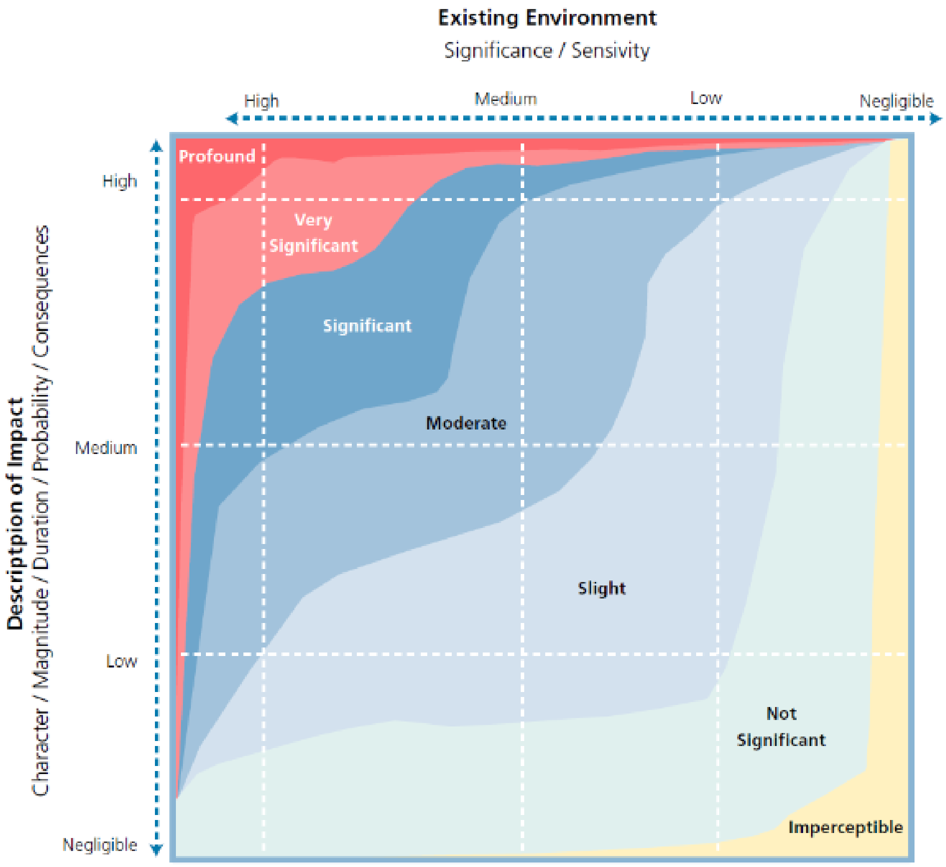
Magnitude of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute	Loss or extensive change to a water body or water dependent habitat
		Increase in predicted peak flood level >100mm
		Extensive loss of fisheries
		Extensive reduction in amenity value
		Potential high risk of pollution to water body from routine run-off
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
		Potential medium risk of pollution to water body from routine run-off
		Partial reduction in amenity value
Minor Adverse	Results in minor impact on integrity of	Increase in predicted peak flood level >10mm
		Minor loss of fishery
		Potential low risk of pollution to water body from routine run-off

Magnitude of Impact	Criteria	Typical Examples
	attribute or loss of small part of attribute	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; Negligible loss of amenity value; Negligible loss of fishery
Minor Beneficial	Results in minor improvement of attribute quality	
Moderate Beneficial	Results in moderate improvement of attribute quality	
Major Beneficial	Results in major improvement of attribute quality	

10.2.4.3 Determining Significance of Effect/Impact

The significance of a potential effect is derived from both the sensitivity of the feature (refer to Table 10.2) and the magnitude of the effect (refer to Table 10.3) and can be then determined using the matrix presented in Figure 10.1 (taken from the EPA Guidelines 2022).

Figure 10.1: Determination of Significance of Environmental Impacts



Source: EPA Guidelines 2022

10.3 Baseline Environment

10.3.1 Existing Drainage System

At a regional level, the North Wall Generating Station is located within the Liffey and Dublin Bay catchment (Hydrometric Area 09), the WFD River Sub Catchment Tolka (Tolka_020), and the WFD River Sub Basin Tolka (Tolka_060). The site is an industrially developed area and as such there are no natural surface water bodies on site (see Figure 10.2). Table 10.4 below outlines the location of the nearest surface waterbodies to the site.

Table 10.4: Surface Water Study Area Context

No.	Waterbody (WFD Name)	Distance
WB1	Liffey Estuary Lower	Ca. 215m south
WB2	Tolka Estuary	Ca. 365m north

The North Wall Generating Station site operates under Industrial Emissions Licence (IEL) No. P0579-03 regulated by the Environmental Protection Agency (EPA). The existing licensed waste water discharges are listed in the table below:

Table 10.5: Wastewater Discharges at Existing North Wall Generating Station

Monitoring Point	Description	Receiving Waterbody	Background Information
SW1	Condenser Cooling Water	Liffey Estuary	Cooling water abstraction and discharge discontinued in 2011
SW2	Water Treatment Neutralisation Tank	Liffey Estuary	Water Treatment Plant discharge was discontinued in 2011
SW3	Stormwater	Tolka Estuary	Weekly Monitoring in line with IE licence P0579
SW4	Stormwater	Liffey Estuary	Weekly Monitoring in line with IE licence P0579
SW5	Boiler Blowdown tank (sump)	Liffey Estuary	Boiler operation was discontinued in 2011

As detailed in Table 10.5, SW1, SW2 and SW5, associated with the CCGT (CT4) plant, were discontinued over ten years ago.

Surface water is collected in a series of stormwater drains. As detailed above, the stormwater system discharges off-site at two locations (refer to Drawing No. 229101053-MMD-00-XX-DR-C-0031):

- SW3 near the northern site boundary drains to the Dublin Port surface water drainage network on Alexandra Road. This drainage network serves all of Dublin Port to the north of the Liffey Estuary and ultimately discharges to the Tolka River Estuary.
- SW4 drains to the south and into the Liffey Estuary.

These discharges are subject to weekly monitoring, recording and reporting to the EPA as defined in Schedule 5(i) and 6(i) of IEL No. P0579-03. Samples at SW3 and SW4 are taken from within the interceptors. During dry weather periods when there is no flow through the interceptors, the sampling has resulted in exceedance of licence limits for chemical oxygen demand, total organic carbon, ammonia and fats/oils/greases. When exceedances occur, the contents of the interceptors are emptied by a licensed contractor and removed off-site by road tanker. There is no discharge from the site surface water to the off-site in these situations.

The area of the main carpark, where the Emergency Generation plant is to be located, drains, via the southern interceptor, to SW4. The new surface water drainage network for the gas turbine area will continue to drain to SW4.

SW4 discharges to the River Liffey Estuary to the south of the site. Prior to the construction phase of this proposed development ESB will have installed a new Class 1 oil interceptor upstream of SW4, immediately upstream of the existing interceptor which will remain in-situ.

Surface water to the north of the site will also continue to discharge to SW3 via a Class 1 oil interceptor.

Water collected in the existing bunded 220kV transformer will continue to be inspected prior to discharge to SW3, via the oil water interceptor, in accordance with the existing IE licence.

The water quality status of the closest receiving waterbodies is described in Table 10.6 below.

Table 10.6: WFD Waterbodies and Current Status adjacent to the North Wall Generating Station

Waterbody Name (WFD)	WB Code	Type	Water Quality 2010 - 2012	WFD Status 2013 – 2018	Objective	WFD Risk Status – 3rd Cycle
Liffey Estuary Lower	IE_EA_090_300	Transitional	Unpolluted	Good	Protect	Review
Tolka Estuary	IE_EA_090_200	Transitional	Potentially eutrophic	Moderate	Restore	At Risk

10.3.2 Natural Habitats

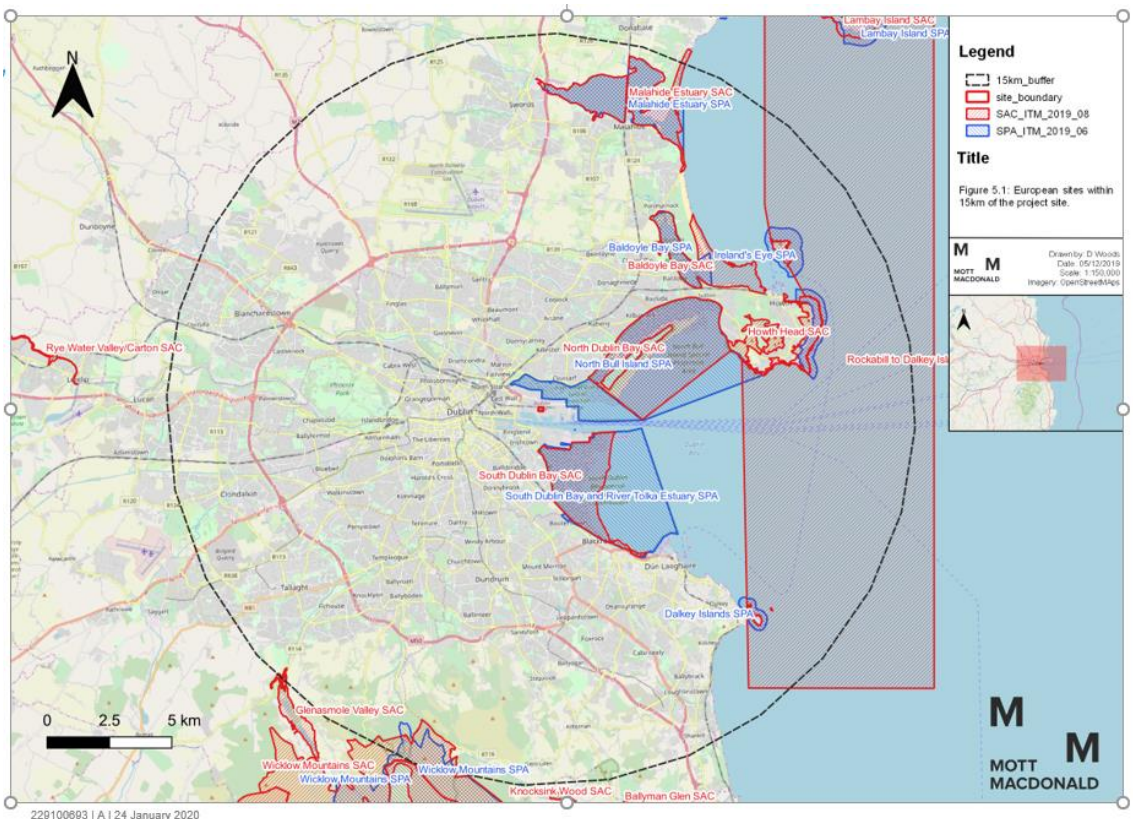
The site is not part of any site designated for nature conservation. Nearby designated sites are presented below and in Figure 10.2

- South Dublin Bay Special Area of Conservation (SAC) (site code 000210) - approximately. 1.36km from site
- North Dublin Bay Special Area of Conservation (SAC) (site code 000206) – approximately 2.16km from site;
- North Bull Island Special Protection Area (site code 004006) – approximately 2.16m from site; and
- South Dublin Bay and River Tolka Estuary Special Protection Area (SPA) (site code 004024) – approximately 0.35km from site.

Other Nature Conservation Sites include;

- South Dublin Bay proposed Natural Heritage Area (pNHA) (Site Code 000210) and
- North Dublin Bay proposed Natural Heritage Area (pNHA) (Site Code 000206).

Figure 10.2: Designated Sites in the Vicinity of North Wall Generating Station



Source: Mott MacDonald

10.3.3 Rainfall

Table 10.7 below provides the monthly rainfall values for Met Eireann Dublin Airport synoptic weather station (elevation 71mOD).

Table 10.7: Total Rainfall (mm) for Dublin Airport 2016- 2022 (Monthly Values)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2022	14.4	37.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2021	115.1	55.0	32.1	10.8	83.5	12.6	72.9	65.3	42.0	79.8	11.7	85.8	667
2020	36.0	130.4	31.8	12.8	9.3	69.6	98.9	87.1	60.9	80.6	48.1	83.1	749
2019	26.8	30.5	92.5	74.6	33.4	82.9	41.0	91.9	104.6	77.2	173.0	57.7	886
LTA [56]	62.6	48.8	52.6	54.1	59.5	66.7	56.2	73.3	59.5	79.0	72.9	72.7	758

Source: Met Eireann (Monthly Data - Met Éireann - The Irish Meteorological Service)

[56] Long Term Average

Evaporation is the rate of water loss from a free water surface such as a reservoir, lake, pool or saturated soil. The mean annual Potential Evaporation (PE) measured at Dublin Airport between 1981 and 2010 is approximately 538.6mm/year (Met Eireann). Actual evapotranspiration (AE) is the quantity of water that is removed from a surface due to the processes of evaporation and transpiration. In this region, average AE is likely to be in the order of 95% of PE, to allow for soil moisture deficits, which calculates to approximately 511.67mm/year. The average effective rainfall is obtained by subtracting the AE from the rainfall. Therefore, in this area, effective rainfall (water available for surface water runoff and potential groundwater recharge) is in the order of 246.23mm/year.

10.3.4 Drinking Water and Abstractions

The Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption was transposed into Irish law by the *European Communities (Drinking Water) (No. 2) Regulations 2007 (S.I. 278 / 2007)*. The EPA reports annually on the quality of drinking water in Ireland based on the monitoring data provided by Irish Water.

According to a review of EPA mapping, there are no licenced surface water abstraction points within the vicinity of the site, and potable water is not sourced within the vicinity of the site.

10.3.5 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 from Island bridge weir to Poolbeg Lighthouse, including the River Tolka Basin and South Bull Lagoon has been designated as a nutrient sensitive area. Ringsend WWTP currently discharges in the Lower Liffey Estuary.

10.3.6 Flood Risk

The site is not identified in the CFRAMS mapping as being at risk of coastal flooding. The site is set back from the coastline so wave overtopping, and erosion is not considered an issue. It is noted that the site is not located within flood risk zone A or B on the OPW flood risk maps, but an assessment has been made based on predicted sea levels and local topographic survey information.

In 2019, the MP2 Project EIAR Chapter 9 for the Dublin Port Company identified the extreme water levels at Dublin Port with the predicted extreme tidal water levels detail in Table 10.8:

Table 10.8: Dublin Port Extreme Water level (Dublin Port Company)

Annual Exceedance Probability (AEP)	Return Period	Water Level to AD (Malin)
0.5%	200 year	3.325
0.1%	1000 year	3.584

Topographic survey levels undertaken in 2019 indicate that the lowest ground levels on the site are 3.35mAD, near the northern entrance, with levels more typically around 3.50mAD across the site.

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 (less than 0.1% or 1 in 1000 for both river and coastal flooding).

Based on this and the topographic survey, part of the development may be located in Flood Zone B and with some parts in Flood Zone C. Conservatively for the purposes of this assessment it is assumed that the development is entirely within Flood Zone B.

The Planning Guidance describes development constraints in flood zone B as follows:

Zone B - Moderate probability of flooding. This zone defines areas with a moderate risk of flooding from rivers (i.e. 0.1% to 1% probability or between 1 in 100 and 1 in 1000) and the coast (i.e. 0.1% to 0.5% probability or between 1 in 200 and 1 in 1000). Development should only be considered in this zone if adequate land or sites are not available in Zone C or if development in this zone would pass the Justification Test. Highly vulnerable development, such as hospitals, residential care homes, Garda, fire and ambulance stations, dwelling houses and primary strategic transport and utilities infrastructure, would be considered inappropriate in this zone. Less vulnerable development, such as retail, commercial and industrial uses, sites used for short-let for caravans and camping and secondary strategic transport and utilities infrastructure, and water-compatible development might be considered appropriate in this zone.

Therefore, a justification test is required for the development in Flood Zone B due to it being utility infrastructure.

Planning guidance requires that the likely effects of climate change are taken into account in flood risk assessment. Because there remains a great deal of uncertainty, a precautionary approach is recommended, and the following items considered:

- The levels of structures designed to protect against flooding, such as flood defences, land-raising or raised floor levels are sufficient to cope with the effects of climate change over the lifetime of the development they are designed to protect, or
- Structures to protect against flooding and the development protected should be capable of adaptation to the effects of climate change when there is more certainty about the effects and still time for such adaptation to be effective.

Therefore, this assessment of flood risk considers the predicted flood level including a climate change allowance.

In the current brief to consultants designing flood protection schemes, the OPW recommends a climate change allowance for the Mid-Range Future Scenario (MRFS) and the High End Future Scenario (HEFS) of 0.5m and 1.0m respectively. Taking a precautionary approach, a climate change allowance of 1.0m has been assessed for the development.

10.3.7 Assessment of Sensitivity

The surface water on site drains directly to the Tolka Estuary (South Dublin Bay and River Tolka Estuary SPA) to the north (via water monitoring point SW3), and the Liffey Estuary Lower to the south (via water monitoring point SW4).

With reference to Table 10.6 *WFD Waterbodies and Current Status adjacent to the North Wall Generating Station* and the *3rd Cycle Draft Liffey and Dublin Bay Catchment Report (HA 09)* (EPA, August 2021), it is noted that

- Tolka Estuary, which is at Moderate Status, is At Risk of not meeting it's WFD objectives; and
- Liffey Estuary Lower has improved from Moderate to Good Ecological Potential since Cycle 2 characterisation and is under Review.

Taking the above into account, and with reference to Table 10.2, the sensitivity of the Tolka Estuary is **Very High** given its designation as a SPA (protected by EU legislation). The sensitivity of the Liffey Estuary is **Low-Medium**.

South Dublin Bay SAC, North Dublin Bay SAC and North Bull Island SAC are Natura 2000 sites within proximity to the North Wall site, however given the fact that these are transitional water bodies with a large volume and degree of mixing, significant impacts are not likely to occur.

10.4 Likely Significant Impacts

10.4.1 Construction Phase

The Construction Phase for the proposed development comprises pre-construction works, demolition works and plant construction works, as described in Chapter 3: *Description of the Development*.

Utilising current construction management practices described in Chapter 3: *Description of the Development* the assessment of construction effects is presented in the table below.

Table 10.9: Construction Phase Impacts on Surface Water

Work Phase	Description	Magnitude of Effect	Significance of Effect
Soft stripping of internal non-recyclable materials	Residual oils and heavy-duty cleaning products, any residual fuel contamination associated with pipework etc.	Negligible as the Contractor will meet all legislative obligations.	Imperceptible
Phased dismantling of building components	Dust generation – potential for surface water contamination (suspended solids). Stockpiling of building waste on site - potential for surface water contamination (pH, in particular)	Potential Minor Adverse Effect	River Liffey: Slight - Moderate Tolka Estuary: Slight - Moderate
Excavation and Erosion	Potential for excavation of contaminated soil. Direct contact of site workers and others with contaminated land which has been brought to the surface. Contamination of surface water by contaminants brought to the surface. Contamination of surface water by suspended solids mobilised during excavation. The creation of preferential pathways for shallow groundwater contamination to	Given the measures detailed in Section Section 3.3.2.3 of the Description of the Development the potential for contamination impacts is assessed as Moderate Adverse Effect	Lower Liffey Estuary: Slight - Moderate; Tolka Estuary: Slight - Moderate

Work Phase	Description	Magnitude of Effect	Significance of Effect
	impact on surface water bodies, in particular the Lower Liffey Estuary will be avoided, refer to Section 3.3.2.3.		
The use of concrete	Could cause high alkalinity surface water run-off	Minor Adverse	Lower Liffey Estuary: Slight
Contamination of surface water from chemicals stored and used on site.	A number of chemicals will be stored and used on site during the construction phase including fuel and oil. 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 Tolka Estuary).	Short Term Minor Adverse	Lower Liffey Estuary: Slight; Tolka Estuary: Slight.

10.4.2 Operational Effects

10.4.2.1 Surface Water Quality

During operation, the only wastewater discharges will be stormwater runoff via oil interceptors to SW3 (Tolka Estuary) and SW4 (Liffey Estuary). These discharge points will continue to be operated in compliance with the existing IEL. All chemicals and oils will be stored in suitably bunded areas and with weather protection. Operational impacts in terms of wastewater discharges will be imperceptible.

10.4.2.2 Water Supply

Water will be supplied to site via two existing Irish Water towns water connections. Water will be used by the following consumers:

- Potable water used for general purposes (drinking water, toilets etc.); and
- Water for fire-fighting purposes.

As the proposed gas turbines use Dry Low NOx technology, there will be no water consumed as part of the power generation process.

Water demand will typically be limited to domestic water consumption for staff welfare and there is sufficient existing water supply on site to meet water demand associated with the emergency plant. Operational impacts in terms of water demand will be imperceptible.

10.4.2.3 Flood Risk

The assessment of flood risk is based on existing information at the time of the study and recommendations of climate change allowances by the OPW.

The proposal is a development of up to five years. Only the changes proposed by the development have been assessed for flood risk, the remainder of the site is not considered, and its vulnerability has not been considered by this assessment.

A justification test is required for constructing utility infrastructure in Flood Zone B. The planning guidelines describe the two-part test.

In Part 1 all the following criteria are to be satisfied:

1. The area is within or adjoining the centre of a city or town designated for growth in key policy documents such as the National Development Plan, the National Spatial Strategy, any Regional Planning Guidelines in force, planning guidelines/directives under Sections 28/29 of the Planning and Development Act 2000 and/or an operative City/County development plan which has been adopted taking adequate account of these guidelines.
2. The area comprises significant previously developed and/or underutilised lands within the urban envelope.
3. Development of the area is essential to facilitate regeneration or town and city centre expansion, as demonstrated in city and county development plans that have been assessed in accordance with these guidelines.
4. Strategic Environmental Assessment has been undertaken, where applicable, taking full account of flood risk.
5. There are no reasonable and available alternative development areas or sites that meet the wider strategic policy requirements, as outlined at 1 above, within low or lower flood probability areas.

It is considered that Part 1 is satisfied by the proposed development for the reasons outlined below.

- Criteria 1, 2 and 3:
  - The site is within existing industrial zoned land and is a modification to existing infrastructure of the same type on the same area within the urban envelope. It is essential to install the equipment and use of the existing site is prudent in the development of Dublin City.
- Criteria 4:
  - An SEA has been undertaken for the Dublin Port area for the purposes of reviewing the Dublin Port Masterplan in 2017 to 2018, including an assessment of flood risk a further assessment is not considered necessary.
- Criteria 5:
  - There are no reasonable alternatives elsewhere due the equipment needing to be located in close proximity to a gas supply.

Therefore, the requirements of Part 2 are to be satisfied namely:

> *The development has been the subject of a sufficiently detailed flood risk assessment, as appropriate to the nature and scale of the development, and the potential risk that may arise, which demonstrates that:*
>
> *(a) the development will not increase flood risk elsewhere and, if possible, will reduce overall flood risk;*
>
> *(b) the development proposal includes measures to minimise flood risk to people, property and the economy and the environment as far as reasonably possible and to ensure that residual risks to the area and/or development can be managed to an acceptable level as regards the adequacy of existing flood protection measures or the design, implementation and funding of any future flood risk management measures.*

Part 2 is satisfied for the reasons outlined below:

- Due to the site being at risk of tidal flooding only, changes to the site will not affect the functional flood plain and so obstructions to the floodplain will not increase flood risk elsewhere.
- The height of the vulnerable equipment will be ca. 4.6mOD, so above the predicted 0.1%AEP flood level plus climate change (4.584mOD).

Overall the development is at risk of flooding in Flood Zone B but passes the Justification test. Therefore, the development is considered suitable with appropriate management measures being implemented.

10.4.3 Do Nothing

In a 'Do Nothing' scenario, there would be no change on the baseline conditions of the proposed development site regarding surface water.

10.4.4 Decommissioning Effects

Decommissioning effects would be similar to the construction phase, whereby the plant would be dismantled in parts and taken off site. The effects would be temporary and slight.

10.4.5 Cumulative Effects

Given the nature and scale of the proposals, significant cumulative effects on surface water and flood risk are not likely. Notwithstanding, prior to commencement of construction and during the construction phase engagement with the proponents of other developments in the area (including Dublin Port) will be undertaken 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 are minimised.

10.5 Mitigation Measures and Monitoring

10.5.1 Construction Phase

- A full-time on-site Environmental Clerk of Works (EnCoW) will be appointed prior to commencement of works.
- All construction works will be carried out in accordance with a Construction Environmental Management Plan (CEMP) included in Appendix 3.1 which will define measures to ensure that any contaminants resulting from the removal, dismantling, excavation, or construction will not enter the surface water.
- As outlined above, where works on other projects within the same ZoI 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;
  - 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.

10.5.2 Operational Phase

The proposed development will continue to operate in accordance with the current limits for wastewater discharge regulated by the EPA under the IE licencing regime.

The existing water quality monitoring programme will continue for surface water run-off. The parameters, thresholds and frequency, as set by the EPA, will be complied with.

10.6 Residual Impacts

The implementation of the measures detailed in this EIAR will ensure that the impact of the proposed development on water resources will not be significant.

The existing plant 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.

The proposed development will not introduce additional discharges to surface waters and does not involve significant changes to the existing surface water drainage on site. As a consequence, the overall residual impact of the proposed development on surface waters during the operational phase is slight.

With the implementation of the mitigation measures proposed the proposed development will not result in a change in status of any surface water WFD quality elements or prevent any surface water waterbodies from reaching good status in the future.

11 Biodiversity

11.1 Introduction

This chapter assesses the likely significant effects from the proposed development on biodiversity. The assessment is based on the development as described in Chapter 3 of this EIAR.

Biodiversity (or "biological diversity"), as defined at the United Nations Convention on Biological Diversity (CBD), is *'the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes genetic diversity within species, between species and of ecosystems'.*

The potential effects on biodiversity arising from the proposed development are assessed. The rating and type of effect on the receiving biodiversity has been determined in line with the EPA Guidelines 2022.

Mitigation measures are provided to avoid / reduce significant effects on biodiversity receptors and residual effects are determined.

11.2 Methodology

In assessing the likely significant effects on the prevailing biodiversity arising from the proposed works (including decommissioning works), due regard has been given to relevant legislation and guidance, including the following:

- EIA Directive (2014/52/EU);
- Planning and Development Acts 2000, as amended and the Planning and Development Regulations 2001, as amended;
- Wildlife Act 1976, as amended;
- Flora (Protection) Order 2015;
- EU Water Framework Directive 2000/60/EC;
- European Communities (Birds and Natural Habitats) Regulations 2011 (as amended);
- Dublin City Development Plan 2016 - 2022;
- Draft Dublin City Biodiversity Action Plan 2021 - 2025
- Dublin City Biodiversity Action Plan 2015 - 2020; and
- National Biodiversity Action Plan 2017 - 2021

In addition, the assessment was carried out having regard to the following guidance documents:

- 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 Guidelines 2022;
- Advice Notes for Preparing Environmental Impact Statements Draft (EPA, September 2015);
- Biodiversity Net Gain. Good practice principles for development. A practical guide. (CIRIA C776a, 2019);
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Union, 2013);
- Guidelines for Assessment of Ecological Impacts of National Road Schemes (National Roads Authority, 2009);

- Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (National Roads Authority, 2009);
- Guidelines for the Treatment of Badgers Prior to the Construction of National Road Schemes (National Roads Authority, 2005);
- Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (National Roads Authority, 2008);
- Guidelines for the Treatment of Bats During the Construction of National Road Schemes (National Roads Authority, 2005);
- A Guide to Habitats in Ireland (Fossit, 2000);
- Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2011);
- Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters;
- Countryside Bird Survey (2012) CBS Manual Guidelines for Countryside Bird Survey participates; and
- Bat Surveys: Good Practice Guidelines, Third Edition (Bat Conservation Trust, 2016).

11.2.1 Desktop Assessment

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 an interrogation of aerial imagery and available GIS datasets to investigate the potential for connectivity to designated and ecologically sensitive areas. Habitats which might be affected by the development were identified and their suitability to support sensitive, rare and protected species was assessed (having regard to the typical ranges of species known to occur in the locality).

Principal sources of information utilised for the desktop assessment included:

- Existing relevant mapping and databases e.g. species (protected and rare) and habitat distribution etc. (sourced from the Environmental Protection Agency (EPA), 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;
- Published documents from Marine Institute Ireland; and
- EPA (Water Framework Ireland Map viewer) databases for information on surface water features within proximity to the proposed development.

A review of findings of previous ecological surveys undertaken in proximity to the proposed development site was also carried out. Information reviewed included:

- Data from ecological surveys at Alexandra Basin provided in the Environmental Impact Statement for the Alexandra Basin Redevelopment Project (RPS, 2014). Planning ref.: PL29N.PA0034;
- Data from bird surveys at Alexandra Basin, Dublin Port Shipping Channel and Tolka Estuary provided in the Avian Impact Assessment for the Alexandra Basin Redevelopment Project (Nairn, 2014). Planning ref.: PL29N.PA0034;
- Data from ecological surveys provided in the Environmental Impact Assessment Report for the MP2 Project (RPS, 2019). Planning ref.: ABP-304888-19; and

- Data on waterbird numbers at Dublin Port and Tolka Estuary from the Dublin Bay Waterbird Survey Programme 2011/12 provided in NPWS (2014)[57].

Information from these surveys, and their location and relevance to the proposed development, are given in Section 11.3.1.3 below.

11.2.2 Previous Consultation

Written consultation was sent to Birdwatch Ireland and NPWS in 2020 requesting any available information in relation to waterfowl species and rare and protected species within the surrounding area.

Birdwatch Ireland reverted on 4 March 2020 and provided annual and monthly peak count data of waterfowl species within Dublin Bay sites.

The NPWS Scientific Unit reverted on 6 February 2020 providing known records of protected and rare plant and animal species occurring within the Irish Grid square O13X which encompasses the proposed development site.

11.2.3 Field Surveys

A preliminary walkover survey of the site was carried out by a Mott MacDonald ecologist on 16 September 2019, for the proposed alterations to the generating plant (Planning Permissions Reference 2697/20) to determine the scope of targeted ecological survey necessary to assess the likely effects of the project on biodiversity. The site is comprised almost entirely of hardstanding ground, buildings and structures. Small areas of amenity grassland will be removed to facilitate the project.

An additional ecological walkover of the site was conducted on 22 July 2021. The methodologies employed during the field surveys are set out below.

The walkover, coupled with the desktop assessment, concluded that given the location of the proposed development, and having regard to the built nature of the site, protected species likely to occur within the environs of the site are limited to bat species, which could potentially be roosting within structures within the existing power plant. There are no natural habitats or watercourses within or in proximity to the proposed development site. As such there is limited potential for the site to support protected mammals, birds, aquatic or invertebrate species.

11.2.3.1 Survey Methods

Flora / Habitats

Habitat survey was carried out with regard to '*Best Practice Guidance for Habitat Survey and Mapping*' (Heritage Council, 2011). Habitats were classified in accordance with '*A Guide to Habitats in Ireland*' (Fossitt, 2000).

The area was searched for evidence of invasive plant species 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.

Species protected under the Flora (Protection) Order, 2015 (S.I. No. 356 of 2015) or listed under the Irish Red Data List of Irish Plants were also searched for.

Bats

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[57] NPWS (2014) North Bull Island Special Protection Area (Site Code 4006) & South Dublin Bay and River Tolka estuary Special Protection Area (Site Code 4024)

A bat habitat assessment survey was undertaken of existing buildings within the North Wall Generating Station site on 7 November and 4 December 2019 in accordance with Collins, 2016. The survey comprised external and internal inspections of structures within the footprint of the proposed works. It should be noted that buildings adjacent to the proposed development site could not be surveyed due to landowner access restriction. The aim of the survey was to determine the presence/absence of roosting bats and identify any suitable roost features within the existing buildings. The buildings were rechecked as to suitability as potential bat roosts during the July 2021 survey.

Birds

No suitable habitat to support wintering or breeding bird species occurs within the proposed development site, thus targeted bird surveys within the site were not undertaken. However, any observations of ornithological activity within the proposed development site noted during the surveys was recorded. In addition, any potential, suitable nesting sites identified within the buildings within the site were also noted. The surveys considered the potential for the site to support nesting gull (Herring gull - *Larus argentatus* and Lesser black-backed gull - *Larus fuscus*) species and Peregrine (*Falco peregrinus*). These species breed locally on roofs and large built structures.

11.2.3.2 Survey Limitations

There were no significant limitations to the surveys. Most buildings could be accessed to determine likelihood of bat roosts and presence of breeding birds. The outside of all buildings could be checked as to potential for bat roosts. Visits conducted included surveys within the main breeding and botanic growing season.

As noted, bat surveys were not undertaken within the neighbouring buildings due to landowner access restrictions, however, visual assessments from within the development site, were made and buildings are generally unsuitable for roosting bats (flat roofed modern industrial structures with limited attic space) with no obvious access points for bats noted or evidence of bats noted. The site itself has no significant forage habitat being almost entirely made ground with very little woody vegetation such as trees or hedgerows.

11.2.4 Ecological Valuation and Assessment of Impacts

11.2.4.1 Ecological Value

The *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (NRA, 2009) were adopted as part of this methodology for the purpose of evaluating the importance of ecological features within the survey area. The site evaluation criteria from this assessment methodology are reproduced in Table 11.1 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 11.1: 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
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

11.2.4.2 Assessment of Impact

Impacts were assessed and characterised in accordance with the EPA Guidelines 2022 as reproduced in Table 11.2 below.

Table 11.2: Impact Magnitude and Duration Criteria (EPA, 2017).

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
	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

Impact Magnitude	Definition
	Frequency of Effects Once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually

Source: EPA, 2017

11.3 Baseline Environment

11.3.1 Outputs of Desktop Assessment

11.3.1.1 Designated Sites

Sites of International Importance

The Birds Directive (2009/147/EC) and the Habitats Directive (92/42/EEC) put an obligation on EU Member States to establish the Natura 2000 network. The Natura 2000 network comprises sites of high biodiversity importance for rare and threatened habitats and species across the EU. In Ireland, the Natura 2000 network of European sites comprises Special Areas of Conservation (SAC) and Special Protection Areas (SPA). SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats.

The site of the proposed development is wholly outside of any European site. The closest European site to the proposed development is South Dublin Bay and River Tolka Estuary SPA, located *c.*350m north. The SPA is designated for 13 wintering bird species and has a special conservation interest for wetlands and waterbirds. The SPA is also designated for two breeding bird species. Both common tern and artic tern breed in Dublin Docks, on a man-made mooring structure known as the E.S.B dolphin which is included within the South Dublin Bay SPA site boundary (NPWS, 2015[58]). The E.S.B dolphin is located at the closest point approximately 1.4km from the proposed development site.

South Dublin Bay SAC, at its closest point, is located *c.*1.4km south of the proposed development, beyond the Great South Wall. North Dublin Bay SAC and North Bull Island SPA are both located, at their closest points, *c.*2.2km north-east of the proposed development, beyond the North Bull Wall. The European sites, their qualifying interests / special conservation interests and the distance from the proposed development site are listed Table 11.3 below.

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 has been prepared to accompany the application.

Table 11.3: European sites

Site Name and Code	Distance from North Wall Generating Station	Qualifying Interests / Special Conservation Interests (SCI) of the European Site (* denotes priority habitat)
South Dublin Bay and River Tolka Estuary SPA [004024]	0.35km	• Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Oystercatcher (*Haematopus ostralegus*) [A130] • Ringed Plover (*Charadrius hiaticula*) [A137] • Grey Plover (*Pluvialis squatarola*) [A141]

[58] NPWS (2015) Site Synopsis, Site Name: South Dublin Bay and River Tolka Estuary SPA (Site Code: 004024)

Site Name and Code	Distance from North Wall Generating Station	Qualifying Interests / Special Conservation Interests (SCI) of the European Site (* denotes priority habitat)
		• Knot (*Calidris canutus*) [A143] • Sanderling (*Calidris alba*) [A144] • Dunlin (*Calidris alpina*) [A149] • Bar-tailed Godwit (*Limosa lapponica*) [A157] • Redshank (*Tringa totanus*) [A162] • Black-headed Gull (*Chroicocephalus ridibundus*) [A179] • Roseate Tern (*Sterna dougallii*) [A192] • Common Tern (*Sterna hirundo*) [A193] • Arctic Tern (*Sterna paradisaea*) [A194] • Wetland and Waterbirds [A999]
South Dublin Bay SAC [000210]	1.36km	• Tidal Mudflats and Sandflats [1140] • Annual vegetation of drift lines [1210] • *Salicornia* and other annuals colonising mud and sand [1310] • Embryonic shifting dunes [2110]
North Dublin Bay SAC [000206]	2.16km	• [1140] Tidal Mudflats and Sandflats • [1210] Annual Vegetation of Drift Lines • [1310] *Salicornia* Mud • [1330] Atlantic Salt Meadows • [1410] Mediterranean Salt Meadows • [2110] Embryonic Shifting Dunes • [2120] Marram Dunes (White Dunes) • [2130] Fixed Dunes (Grey Dunes)* • [2190] Humid Dune Slacks • [1395] Petalwort (*Petalophyllum ralfsii*)
North Bull Island SPA [004006]	2.16km	• Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] • Shelduck (*Tadorna tadorna*) [A048] • Teal (*Anas crecca*) [A052] • Pintail (*Anas acuta*) [A054] • Shoveler (*Anas clypeata*) [A056] • Oystercatcher (*Haematopus ostralegus*) [A130] • Golden Plover (*Pluvialis apricaria*) [A140] • Grey Plover (*Pluvialis squatarola*) [A141] • Knot (*Calidris canutus*) [A143] • Sanderling (*Calidris alba*) [A144] • Dunlin (*Calidris alpina*) [A149] • Black-tailed Godwit (*Limosa limosa*) [A156] • Bar-tailed Godwit (*Limosa lapponica*) [A157] • Curlew (*Numenius arquata*) [A160] • Redshank (*Tringa totanus*) [A162] • Turnstone (*Arenaria interpres*) [A169] • Black-headed Gull (*Chroicocephalus ridibundus*) [A179] • Wetland and Waterbirds [A999]
Rockabill to Dalkey Island SAC	8km	• Reefs [1170] • Harbour porpoise (Phocoena phocoena) [1351]

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 which 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.

No sites of national designation occur within or in proximity to the proposed development site. The closest NHA site is Skerries Islands NHA (001218) which is located approximately 25km north of the site. No source-pathway-links were identified between the NHA and the proposed development site.

The closest pNHA is the North Dublin Bay pNHA (000206) which is located approximately 350m north of the site. No site synopsis is currently available for the site, however it is understood that the pNHA has the same conservation interests as North Dublin Bay SAC (*pers. comm.* with NPWS).

The Dolphins Dublin Docks pNHA (000201), which covers the manmade structures utilised as nesting sites by tern species, is located at the closest point approximately 1.1km south-east of the project site. The Dublin Docks pNHA forms part of the South Dublin Bay River Tolka Estuary SPA and similarly is designated for the same conservation interests as the SPA.

South Dublin Bay pNHA (000210) is located approximately 1.4km south of the proposed development site. The pNHA has the same conservation interests as South Dublin Bay SAC (000210).

Other National Sites

Other sites of nature conservation in relation to the proposed development are as follows:

- No National Parks occurs within the vicinity or have connectivity to the proposed development;
- North Bull Island is also designated as a Nature Reserve and is located *c.*2.5km north of the North Wall Generating Station;
- There are two Ramsar sites in the vicinity of the proposed development – Sandymount Strand / Tolka Estuary (832) and North Bull Island (406). There are no further Ramsar sites within the vicinity of the project site;
- The North Bull Island Wildfowl Sanctuary (WFS-19) is located *c.*2.5km north of the proposed development. There are no further Wildfowl Sanctuaries within the vicinity of the project site.
- Dublin Bay is also designated as a UNESCO Biosphere reserve.

These above national sites are encompassed by the European sites of North Dublin Bay SAC, South Dublin Bay SAC, North Bull Island SPA and South Dublin Bay and River Tolka Estuary SPA. The potential for impact on these National sites is therefore analogous to the above European sites, i.e. there is no potential for significant effects on these sites.

11.3.1.2 Records of rare and protected species and habitat

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. Data sources reviewed included:

- National Parks and Wildlife Services & National Biodiversity Data Centre;
- Botanical Society of Britain and Ireland;
- BirdWatch Ireland;
- National Biodiversity Data Centre; and
- Review of unpublished ecological assessments carried out within proximity to the site.

The findings are summarised hereunder.

Records of rare and/or protected flora species

Known records of protected or rare flora species occurring within the Irish Grid square O13X were supplied by the NPWS Scientific Unit. These primarily relate to historic records from 50-100 years ago outside of Dublin Port. Species recorded included; shepherd's-needle (*Scandix pecten-veneris*) (1948), blue fleabane (*Erigeron acer*) (2000), rough poppy (*Papaver hybridum)* and wild clary (*Salvia verbenaca*)*.* There are records of wood small-reed (*Calamagrostis epigejos)* within Dublin Port from 1999, near the Tolka Quay Road*.*

Referring to the NPWS vascular plant Red List for Ireland, wood small-reed is currently listed as 'Vulnerable', blue fleabane and wild clary are both listed as 'Least Concern' and rough poppy and shepherd's-needle are both listed as 'Regionally Extinct'.

A desktop search of the Botanical Society of Britain and Ireland's (BSBI) Distribution Database for the 10km tetrad O13X which encompasses the proposed development site was undertaken. Recent records (between 2000 – 2019) indicate that 60 plant species have previously been recorded within the tetrad. Only one species; wood small-reed is listed as 'Vulnerable' within the Ireland Red List No. 10 Vascular Plants[59].

Protected Mammal Species

National Biodiversity Data Centre records of protect mammal species which have been recorded within the 2km grid square (O13X) which encompass the proposed development site are included in Table 11.4.

Table 11.4: NBDC Mammal Records

Name	Date of Record	Title Dataset	Designation(s)
Fin Whale	4/10/2019	IWDG Cetacean Strandings Database	EU Habitats Directive: Annex II and IV; Wildlife Act
Otter (*Lutra lutra*)	08/10/2015	Atlas of Mammals in Ireland 2010-2015	EU Habitats Directive: Annex II & Annex IV; Wildlife Acts.
	01/09/2010	National Otter Survey of Ireland 2010/12	

Bat species have been recorded in the wider environment including Brown Long-eared Bat (*Plecotus auritus*), Lesser Noctule (*Nyctalus leisleri*), and Soprano Pipistrelle (*Pipistrellus pipistrellus sensu lato*).

Protected Bird Species

<u>Dublin Waterbird Survey Programme 2011/12</u>

Low-tide and high-tide winter bird surveys were undertaken across Dublin Bay as part of the Waterbird Survey Programme in 2011/12 (NPWS, 2014[60]). The survey area included South Dublin Bay SPA and North Bull Island SPA site boundaries which were further subdivided into subsites. The closest subsite to North Wall Generating Station is subsite 0UL44 (Clontarf Baths) which is located approximately 350m north of the site, within the Tolka Estuary. Following a review of survey findings, it was noted that the majority of foraging and roosting sites of the designated waterbird species occur at subsites 0UL43 (Fairview Park) located at the closest point approximately 690m north-west of the Power Plant and subsites 0U465 (Wooden Bridge – Causeway), 0U466 (North of Causeway) and 0UL48 (Sutton Strand South), which are located

[59] Wyse Jackson, M., FitzPatrick, Ú., Cole, E., Jebb, M., McFerran, D., Sheehy Skeffington, M. & Wright, M. (2016) Ireland Red List No. 10: Vascular Plants. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

[60] NPWS (2014) North Bull Island Special Protection Area (Site Code 4006) & South Dublin Bay and River Tolka Estuary Special Protection Area (Site Code 4024).

north of North Bull Island, which lies at the closest point approximately 2.2km north-east of the proposed development site.

A slightly lower number of birds were recorded foraging at subsite 0UL44. A total of 11no. species were recorded within the subsite during the low-tide surveys: brent geese, shelduck, teal, oystercatcher, grey plover, knot, black-tailed godwit, curlew, redshank, turnstone and black-headed gull (NPWS, 2014).

Irish Wetland Bird Survey (I-WeBS)

The Irish Wetland Bird Survey (I-WeBS), a joint scheme of BirdWatch Ireland and the National Parks and Wildlife Service, 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 (0U404) located within Dublin Port and the Tolka Estuary.

The closest site to proposed development is subsite Poolbeg (Liffey) (0U603) which is located, at the closest point, approximately 600m south-west of the site. Following a request for data, BirdWatch Ireland provided the annual peak counts for subsite 0U603 on the 02/03/2020 which is outlined in Table 11.5 below.

Table 11.5: Annual Peak Counts at Subsite 0U603

Species	1% National	1% International	Annual Peak Count (2016/17)
Mute Swan	90	100	1
Light-bellied Brent Goose	350	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
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		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) I-WeBS monitoring site. It is noted that this is a recently established monitoring subsite. Of these 22 species, one has been recorded in numbers of national importance; black-tailed godwit.

Dublin Bay Birds Project

There are several common and arctic tern nesting sites within Dublin Harbour which are monitored by BirdWatch Ireland as part of the Dublin Bay Birds Project. These monitored nesting sites comprise four small artificial structures within the Tolka and Liffey Estuaries (Tierney *et al.*, 2017). One of these four nesting sites, the ESB Dolphin, is designated as part of South Dublin Bay and River Tolka Estuary SPA and located over 1.4km from the proposed development; the closest is Pontoon TP1, located in the Tolka Estuary *c.*790m to the northeast.

<u>National Biodiversity Data Centre (NBDC)</u>

Records of protect bird species which have previously been recorded within the 2km grid square (O13X) around the proposed development site are included in Table 11.6.

Other birds of conservation concern which have been recorded in the wider environment include Barn Owl (*Tyto alba*) (Red List), Barn Swallow (*Hirundo rustica*) (Amber List), Merlin (*Falco columbarius)* (Amber List) and Short-eared Owl (*Asio flammeus*) (Amber List).

Table 11.6: Records of protected birds

Name	Date of Record	Title Dataset	Location in relation to the survey area	Designation(s) [61]
Black Guillemot *(Cepphus grylle)*	05/06/2016	Seabird 2000	Previously recorded within the 10km square grid which encompasses the site.	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Black-headed Gull *(Larus ridibundus)*	10/03/2012	Birds of Ireland	Previously recorded within the 10km square grid which encompasses the site. Sighting also recorded ca. 350m north of the site.	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Kittiwake *(Rissa tridactyla)*	10/03/2012	Birds of Ireland	Previously recorded within the 10km square grid which encompasses the site.	Protected Species: Wildlife Acts || Threatened Species: OSPAR Convention || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Black-tailed Godwit *(Limosa limosa)*	31/12/2011	Bird Atlas 2007 - 2011	Previously recorded within the 10km square grid which encompasses the site.	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Brent Goose *(Branta bernicla)*	31/12/2011	Bird Atlas 2007 - 2011	Previously recorded within the 10km square grid which encompasses the site. Sighting also recorded ca. 440m south of the site.	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Guillemot *(Uria aalge)*	09/03/2009	Birds of Ireland	Sightings recorded ca. 350m north of the site. Sightings also recorded ca. 690m east of the site.	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List

[61] Gilbert G, Stanbury A and Lewis L (2021), "Birds of Conservation Concern in Ireland 2020 –2026". Irish Birds 9: 523—544

Name	Date of Record	Title Dataset	Location in relation to the survey area	Designation(s) [61]
Redshank *(Tringa totanus)*	31/12/2011	Bird Atlas 2007 - 2011	Previously recorded within the 10km square grid which encompasses the site.	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Shelduck *(Tadorna tadorna)*	31/12/2011	Bird Atlas 2007 - 2011	Previously recorded within the 10km square grid which encompasses the site.	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Curlew *(Numenius arquata)*	31/12/2011	Bird Atlas 2007 - 2011	Previously recorded within the 10km square grid which encompasses the site.	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex II, Section II Bird Species || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Oystercatcher *(Haematopus ostralegus)*	31/12/2011	Bird Atlas 2007 - 2011	Previously recorded within the 10km square grid which encompasses the site.	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Red List
Teal *(Anas crecca)*	31/12/2011	Bird Atlas 2007 - 2011	Previously recorded within the 10km square grid which encompasses the site.	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species || Protected Species: EU Birds Directive >> Annex III, Section II Bird Species || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Great Black-backed Gull *(Larus marinus)*	31/12/2011	Bird Atlas 2007 - 2011	Previously recorded within the 10km square grid which encompasses the site.	Protected Species: Wildlife Acts ||
Great Cormorant *(Phalacrocorax carbo)*	31/12/2011	Bird Atlas 2007 - 2011	Previously recorded within the 10km square grid which encompasses the site.	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Great Crested Grebe *(Podiceps cristatus)*	31/12/2011	Bird Atlas 2007 - 2011	Previously recorded within the 10km square grid which encompasses the site.	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Herring Gull *(Larus argentatus)*	10/03/2012	Birds of Ireland	Previously recorded within the 10km square grid which encompasses the site. Sighting also recorded ca. 350m north of the site.	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List

Name	Date of Record	Title Dataset	Location in relation to the survey area	Designation(s) [61]
Lesser Black-backed Gull *(Larus fuscus)*	31/12/2011	Bird Atlas 2007 - 2011	Previously recorded within the 10km square grid which encompasses the site.	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Little Egret *(Egretta garzetta)*	31/12/2011	Bird Atlas 2007 - 2011	Previously recorded within the 10km square grid which encompasses the site.	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex I Bird Species
Mallard *(Anas platyrhynchos)*	31/12/2011	Bird Atlas 2007 - 2011	Previously recorded within the 10km square grid which encompasses the site.	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex II, Section I Bird Species || Protected Species: EU Birds Directive >> Annex III, Section I Bird Species>> Birds of Conservation Concern - Amber List
Common Gull *(Larus canus)*	13/09/2014	Birds of Ireland	Previously recorded within the 10km square grid which encompasses the site.	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Mute Swan *(Cygnus olor)*	31/12/2011	Bird Atlas 2007 - 2011	Previously recorded within the 10km square grid which encompasses the site.	Protected Species: Wildlife Acts || Threatened Species: Birds of Conservation Concern || Threatened Species: Birds of Conservation Concern >> Birds of Conservation Concern - Amber List
Red-breasted Merganser *(Mergus serrator)*	31/12/2011	Bird Atlas 2007 - 2011	Previously recorded within the 10km square grid which encompasses the site.	Protected Species: Wildlife Acts || Protected Species: EU Birds Directive || Protected Species: EU Birds Directive >> Annex II, Section II Bird Species

11.3.1.3 Review of other Ecological Assessments in the vicinity

Alexandra Basin West Redevelopment

Alexandra Basin West is situated approximately 200m south-west of the proposed development. Habitat surveys were undertaken at the site in 2013 (RPS, 2014)[62] and recorded only man-made habitats within the survey area and all were assigned either a ‘low’ or ‘negligible’ ecological value. No protected flora were recorded, nor any invasive species, listed under Part 1 of the Third Schedule.

RPS also undertook terrestrial mammal surveys, which included badger, otter and bat surveys, to inform the Redevelopment Project application. No signs of badger activity were recorded at the Alexandra Basin site. The assessment stated that “*this is not surprising given the complete dearth of suitable foraging habitat in the wider area*”. Similarly, no otter or evidence of same were recorded during the surveys.

RPS carried out automated passive monitoring bat survey over a two-week period in May and June of 2013 at a structure within the development site (located *c.*500m west of the North Wall Generating Station). Two bat species were recorded during this monitoring period: common

[62] RPS (2014) Alexandra Basin Redevelopment Project, Environmental Impact Statement. (Unpublished report)

pipistrelle (*Pipistrellus pipistrellus*) and Leisler's bat (*Nyctalus leisleri*). Leisler's bat was the most active based on the number of recordings.

Winter bird surveys were also undertaken at the site by Natura Consultants Ltd. in 2012/13 and 2013/14. During these surveys light-bellied Brent geese (hereafter "Brent geese") were recorded feeding on spilt agricultural products along the quays (primarily at berths 29-33) in addition to swimming in flocks within the Basin between feeding events. Peak counts of 450 Brent geese, which is of international importance[63], were recorded within Alexandra Basin West in both 2012/13 and 2013/14 wintering seasons. Small numbers of other bird species were also recorded at Alexandra Basin West during these surveys, either feeding on spilt agricultural foodstuff or roosting in small numbers on jetties within the Basin, including black-headed gull, herring gull and cormorant (Nairn, 2014). These species were not recorded in numbers of national or international importance.

The Tolka Estuary, located *c.*350m to the north of the project site at its closest point, supports large concentrations of wintering Brent goose, oystercatcher, golden plover, knot, dunlin, redshank, black-tailed godwit, bar-tailed godwit, curlew, black-headed gull, common gull and herring gull (Nairn, 2014 & NPWS, 2014).

<u>MP2 Project</u>

The MP2 Project is a Strategic Infrastructure Development at Dublin Port which will include the construction of a new Ro-Ro jetty, construction of new quay walls, works to existing berths, new berth 53, dredging works and amendments to consented developments with planning reference numbers 3084/16 & 3638/18, and the ABR Project (ABP Ref. 29N.PA0034). An Environmental Impact Assessment Report (EIAR) of the project was undertaken by RPS on behalf of Dublin Port Company (RPS, 2019)[64].

RPS undertook habitat and terrestrial mammal surveys in 2018 and 2019 to inform the MPS Project. The survey area included the entirety of the northern extent of Dublin Port including lands located immediately east and north-east of the proposed development site.

During habitat/botanical surveys no protected habitats or plant species were recorded within the survey area. Similarly, no invasive species listed in the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended.

No evidence of terrestrial (non-volant) mammal species were recorded during the surveys.

Dawn and dusk transect bat surveys were undertaken, as part of the MP2 Project in 2018 and 2019, within the extent of Dublin Port east of the North Wall Generating Station. The findings of the surveys are summarised as follows "….*no bat roosts were identified and no buildings or structures were categorised as having moderate or high bat roost potential. No bats were detected emerging from or returning to roosts, and no foraging or commuting bat activity was recorded in survey over two consecutive seasons in 2018 and 2019*" (RPS, 2019)[64].

[63] The threshold for sites of national and/or international importance are based on the regular presence of flocks exceeding the respective 1% population estimates. In the case of brent geese these thresholds are currently 360 for sites of national importance and 400 for sites of international importance (Burke et al. 2018 & Wetlands International, 2012).

[64] RPS (2019) MP2 Project Environmental Impact Assessment Report Main Document (Part 1)

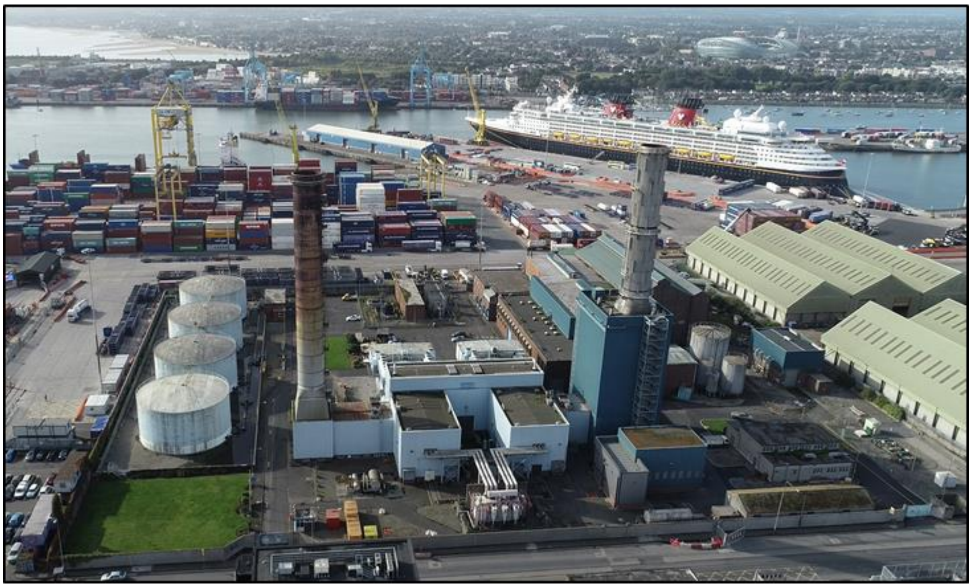
11.3.2 Output of Field Surveys

11.3.2.1 Habitat and Flora

A description of the habitats located within the proposed development site is presented in this section. Habitats are described in accordance with Fossitt (2000)[65]. An assessment of the habitats was undertaken in accordance with the NRA Guidelines (2009)[66] and CIEEM Guidelines (2018)[67].

An aerial image of the existing North Wall Generating Station facility is shown in Figure 11.1 below.

Figure 11.1: Existing North Wall Generating Station facility (drone footage, looking south)



Source: ESB, 2019

Building and Artificial Surfaces (BL3)

The proposed development site comprises predominantly hardstanding and large buildings and structures. The site is entirely tarmacked with the exception of a few small areas of amenity grassland. A small carpark is located towards the centre of the site which is used by site personnel. The site is enclosed by a concrete wall, with a main entrance gate located off Alexandra Road.

The building/structures and artificial surfaces within the site were all assessed as having Local Importance (Lower Value) due to the low ecological value the habitats provide.

65 Fossit (2000) A Guide to Habitats in Ireland, The Heritage Council

66 NRA (2009), Guidelines for Assessment of Ecological Impacts of National Roads Scheme.

67 CIEEM (2018, updated 2019) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater Coastal, and Marine Version 1.1.

Figure 11.2: Existing buildings located within the proposed development site

Source: Mott MacDonald, 2019

Amenity Grassland (GA2) and Ornamental Shrub (WS3)

Small patches of amenity grassland occur at the centre and north-eastern corner of the site. Ornamental shrubs also occur in areas around the site. The habitats were assessed as having Local Importance (Lower Value) due to the low ecological value the habitats provide.

Figure 11.3: Amenity grassland and ornamental shrubs within the proposed development site

Source: Mott MacDonald, 2019

Tidal River (CW2)

The River Liffey at its closest point is located approximately 200m to the south of the proposed development site boundary. The river, at this location, is classified as the transitional waterbody Liffey Estuary Lower (IE_EA_090_0300). The watercourse forms part of the Dublin Port Channel and is regularly traversed by ships.

The transitional watercourse is currently assigned ‘intermediate’ WFD status (2018-2020). The watercourse does not form part of an international or nationally designated site but is directly linked to coastal designated sites in Dublin Bay.

Inland Fisheries Ireland (IFI) carried out fish stock surveys at a total of seven sites within the Liffey Estuary in 2010, both the lower and upper Liffey estuary were assigned 'Moderate' ecological status (IFI, 2010)[68]. A total of 17 species were recorded within the watercourse during the survey, with thick-lipped grey mullet (*Chelon labrosus*) being the most common. The River Liffey has county important populations of Otter (*Lutra lutra*), Salmon (*Salmo salar*), Kingfisher (*Alcedo atthis*) and other species.

The River Liffey is directly avoided by the development and is evaluated as being of County Importance.

Protected and Invasive plant species

No rare or threatened species or species listed as a Flora Protection Order (FPO) species or Annex I habitats protected under the Habitat Directive were recorded within the proposed development site. Similarly, no invasive species listed in the Third Schedule of S.I. No. 477 of 2011, European Communities (Bird and Natural Habitats) Regulations 2011 were identified within the site.

Butterfly-bush (*Buddleja davidii*) a non-native species and considered moderately invasive[69] plant species occurs locally on the site.

11.3.2.2 Fauna

Protected Mammal (non-volant)[70] Species

No evidence of protected mammal species or suitable habitat to support same was identified within the proposed development site. The hardstanding and built nature of the site provides negligible value to protected species.

Evidence of foxes (*Vulpes vulpes*) and feral cats (*Felis catus*) were noted within the site boundary included scat and feeding remains. No breeding sites were recorded. Foxes are not currently protected under National law; however, there is an obligation to protect biodiversity within Ireland under the Convention on Biological Diversity.

Bats

All bat species and their roost sites are protected under both National and European legislation.

Mott MacDonald ecologists undertook a daytime bat roost assessment of all structures affected by the proposed works on 7th November and 4th of December 2019. The findings of the survey are included within a separate report (included in Appendix 11.1).

A follow up survey was conducted during July 2021. The survey included visual checks of the exterior of all buildings and interior of all buildings proposed for demolition.

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. All buildings within the proposed development site were assessed as having '*Negligible'* suitability to support bat roosts in accordance with Collins (2016)[71].

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[68] Inland Fisheries Ireland (2010) Sampling fish for the Water Framework Directive – Transitional Waters 2010. Liffey Estuary.

[69] Kelly, J., O'Flynn, C., and Maguire, C. 2013. Risk analysis and prioritisation for invasive and non-native species in Ireland and Northern Ireland. http://invasivespeciesireland.com/wp-content/uploads/2013/03/Risk-analysis-andprioritization-29032012-FINAL.pdf

[70] Not capable of flight

[71] Collins (2016) Bat Surveys for Professional Ecologists, Good Practice Guidelines

Birds

All wild birds and their nests and eggs are protected under the Wildlife Acts.

The proposed development site comprises built ground and has limited suitable habitat to support breeding bird species. There are a number of ornamental shrubs located within the site which may provide some nesting habitat for breeding birds, however considering the highly disturbed nature of the site this is likely to be limited.

Mott MacDonald ecologists examined the internal and external areas of buildings which will be affected by the proposed works on 7th November and 4th of December 2019 and again in July 2021. The buildings were examined for evidence of usage by birds e.g. old nest material, droppings, pellets and feathers, and for suitable access points for birds. No evidence of usage by birds was observed. The buildings have low suitability for usage by birds. They are generally in regular use, are well sealed and are illuminated internally and externally on a 24-hour basis. No suitable habitat to support wintering bird species is found within the proposed development site. The site comprises predominantly hardstanding and built structures which provide no value for wintering bird species. Small areas of amenity grassland occur within the site. Considering the small areas of amenity grassland within the site, and its highly disturbed nature, there is no potential that the amenity grassland provides an important foraging habitat for protected wintering bird species.

Invertebrate, Amphibian and Reptile Species

No suitable habitat to support protected invertebrate, amphibian or reptile species was identified within the proposed development site. In addition, there are no records of protected invertebrate, amphibian or reptile species previously recorded within the 2km grid square O13X which encompasses the site. The built up and highly disturbed nature of the site makes it unfavourable for these protected species.

11.3.3 Summary of Ecological Evaluation and identification of Key Ecological Receptors

The key ecological receptors within the Zone of Influence (ZoI) of the proposed development are evaluated in accordance with the evaluation criteria set out in Table 11.1. The existing baseline condition / population stability, conservation status, rarity and legal protection of the key ecological receptors were considered as part of this evaluation. ZOI relates to potential connectivity of receptors to impacts from the proposed development including noise and pollutant runoff associated with the development. A summary of the ecological valuation and identification of Key Ecological Receptors is provided below in Table 11.7. KER identified as potentially within the ZOI are offsite and associated with Liffey estuary and coastal waters.

Table 11.7: Ecological valuation and identification of Key Ecological Receptors (KER)

Habitats/Species	Ecological Value (as per NRA guideline)	Potential to occur within the zone of influence (ZoI)	Key Ecological Receptors
Designated sites			
South Dublin Bay and River Tolka Estuary SPA (004024)	International	Yes – due to the proximity of the SPA to the proposed development site (ca. 350m) there is potential for the SCI species to occur within the ZOI of the proposed development.	**Yes**
North Bull Island SPA (004006)	International	No – considering the distance of the SPA from the proposed development site and lack of suitable habitat for SCI species on the site there is no potential for significant impact.	No

Habitats/Species	Ecological Value (as per NRA guideline)	Potential to occur within the zone of influence (ZoI)	Key Ecological Receptors
North Dublin Bay SAC (000206)	International	No – The proposed development will not include any works within the SAC (>2km). Based on proposed works and distances to the SAC no significant connectivity is identified.	No
South Dublin SAC (000210)	International	No – The proposed development will not include any works within the SAC (>1km). Based on proposed works and distances to the SAC no significant connectivity is identified.	No
Rockabill to Dalkey Island SAC (003000)	International	Yes - the SAC is designated for harbour porpoises which may occur within the ZOI of the proposed development.	**Yes**
North Dublin Bay pNHA (000206)	National	Yes – considering the proximity of the pNHA to the proposed development site (ca. 350m) there is potential for conservation interests to occur within the ZOI.	**Yes**
Dolphin, Dublin Docks pNHA (000201)	National	Yes – considering the proximity of the pNHA to the proposed development site (ca. 1.1km) there is potential for conservation interests to occur within the ZOI.	**Yes**
South Dublin Bay pNHA (000210)	National	No – Considering the set back distance of the pNHA and the proposed development site and the lack of connectivity, there is no potential for impact.	No
Habitats and Flora			
Buildings and artificial surfaces (BL3)	Local Importance (Low Value)	Yes – A number of existing buildings/ structures will be demolished to facilitate the refurbishment works.	No
Amenity grassland (GA2) and Ornamental Shrubs (WS3)	Local Importance (Low Value)	Yes – There is potential that areas of amenity grassland will be cleared to facilitate the works.	No
Tidal River (CW2)	Local Importance (High Value)	No – No works will occur within the watercourse. Abstraction and discharge into the watercourse has ceased	No
Fauna			
Bat species	Local Importance (High Value)	No – No active roosts or potential roost habitat were identified within the footprint of the works.	No
Wintering birds	International Importance	Yes – potential for disturbance of wintering species during construction and demolition works should they occur within the ZoI for noise.	**Yes**
Breeding birds	Local Importance (High Value)	Yes – Removal of ornamental shrubs has the potential to disturb breeding species which nest at the site.	**Yes**
Marine mammals	International	Yes – the Annex II species; harbour porpoises, grey seal and harbour seal have the potential to occur within the ZOI of the proposed development.	**Yes**

11.4 Likely Significant Impacts

11.4.1 Construction Phase

11.4.1.1 Designated Sites

European Sites

Mott MacDonald prepared a screening for an Appropriate Assessment report (which accompanies this application) which investigated the potential for the proposed development to have significant effects on European Site(s) either alone or in combination with other plans or projects.

The Appropriate Assessment screening assessment investigated the potential for significant effects on the Natura 2000 Network arising from the proposed development. The assessment considered whether the proposed development, alone or in combination with other projects or plans, will have potential for significant effects on any European sites. It concluded that, in the absence of mitigation, there is potential for significant effects on European sites from the proposed development, either alone or in-combination with other plans and/or projects.

A Natura Impact Assessment (NIS) was prepared to provide information to accompany the Appropriate Assessment process carried out by the planning consenting authority. The NIS concluded given the nature, scale and location of the proposed development, and with implementation of precautionary mitigation for protection of water quality (Chapter 10, Surface Water and Flood Risk), no adverse effects are likely to European sites.

National Sites

Both North Dublin Bay pNHA (000206) and Dolphins Dublin Docks pNHA (000201) are located in proximity to the proposed development site.

Both pNHA site boundaries overlap with the South Dublin Bay and River Tolka Estuary SPA boundary but do not entirely form the same boundary. Due to the similar location and scientific interests of the SPA, it can be concluded that there is no additional potential for impacts to the nationally designated sites, and precautionary mitigation outlined for European sites, will avoid possible adverse effects on sensitive ecological receptors.

Aquatic Ecology

Chapter 10, *Surface Water and Flood Risk* found that, with the implementation of the mitigation measures proposed, the proposed development will not result in a change in status of any surface water WFD quality elements or prevent any surface water waterbodies from reaching good status in the future.

Habitats

Habitats within the proposed development site include hardstanding and small areas of amenity grassland. These habitats within the site are of local importance (lower value) and have negligible biodiversity value. As such, effects on these habitats would constitute an imperceptible effect.

As there are no valuable habitats within the site, there will be no degradation of habitats.

Construction activities associated with the proposed development which are likely to result in the generation of dust include demolition works and ground excavations for equipment foundations. The dust soiling effects and PM_{10} effects from the construction works is assessed in the Air Quality and Climate Chapter 8 and determined as 'Negligible to Medium Risk' without mitigation. Referring to the Air Quality Management (IAQM) '*Guidance on the assessment of* *dust from demolition and construction'*, the sensitivity of the area to ecological effects is considered 'Low' at <50m from the source. The spatial limits of dust impacts is therefore determined as 50m from the proposed demolition works.

There are no protected sites or habitats located within 50m of the proposed demolition works. The closest protected site to the proposed development site is the South Dublin Bay and River Tolka Estuary SPA which is located approximately 350m north of the site. The River Liffey is located approximately 200m south of the proposed development site and thus outside the spatial limits of dust impacts. There is a small area of amenity grassland located within the proposed development site, however this will be used for the location of part of the modular power plant. Dust may be deposited upon the ornamental shrubs within the site. Considering the small area of vegetation within the site, and the temporary duration of construction works (ca. 11 months (preconstruction, demolition and civil works) it is considered that any potential dust impacts are likely to have a temporary, imperceptible effect, at a local geographical scale, on the vegetation within the site.

Rare and Protected Plant Species

No protected or rare plant species of conservation value or habitats protected under the Habitats Directive were identified within the proposed development site during the field surveys. In addition, no protected or rare plant species have previously been recorded within the survey area. Considering the built up and disturbed nature of the proposed development site it is unlikely for new protected plant species to establish within the site between the time of survey and installation works. There is no potential for the proposed works to result in impacts to protected plants or habitats.

Invasive Plant species

No invasive non-native species listed under Part 1 of the Third Schedule of S.I No. 477 of 2011 were recorded within the survey area during the field surveys. As there will be no importation of soil during the construction/installation phase, there is limited potential for the introduction of invasive non-native species.

The presence of Butterfly-bush (*Buddleja davidii*) a non-native species on the site is noted. This species has some biodiversity value. It is common throughout Dublin particularly in built up areas that have not been disturbed recently. Any removal of spoil or materials from the site that may contain this plant will go to an EPA licenced landfill and no significant impacts are likely.

11.4.1.2 Fauna

Breeding and Wintering Birds

Loss of habitat

The proposed development will result in the removal of amenity grassland within the site. This has no potential for supporting wintering or breeding bird species.

Ornamental shrubs that occur locally within the site have some low potential as breeding sites for common passerine bird species such as wren, robin and dunnock. However, it is noted that no common passerine species were recorded in the August 2021 surveys which is within the bird breeding season.

The surveys of buildings within the site found that they did not support any protected bird species. Considering the disturbed nature of the site, the works are unlikely to negatively affect the abundance or distribution of the local breeding bird population within the area. The loss of habitat will have imperceptible effects on breeding bird species.

No suitable wintering bird habitat was identified within the proposed development site. There is no potential for effects to local SPA sites as no supporting (non-designated) habitat for SCI bird species occurs.

Disturbance

Construction related noise and vibration and the physical presence of machinery and construction personnel can result in the disturbance of species.

The Tolka Estuary (included within South Dublin Bay SPA) is located at the closest point approximately 350m north of the proposed development site. Several important tern breeding sites are located within Dublin Harbour, at the closest point approximately 790m north-east of the proposed development site. In addition, Brent geese have been recorded in internationally important numbers at Alexandra Basin West, approximately 200m southwest of the development site.

There is no potential for the visual disturbance to species in the above areas, as the construction works will be screened by existing building/structures located around the site.

The construction works will result in an increase in noise levels within the vicinity of the site. Potential noise impacts associated with the construction phase was assessed within the Noise and Vibration Chapter 7 and the worst-case predicted noise levels during the construction phase were modelled, inclusive of background ambient noise levels. The proposed development will not include any blasting and thus vibration impacts associated with the proposed works are considered negligible. These predicted noise levels have been assessed against published noise threshold levels for disturbance in waterbirds, as informed by the Waterbird Disturbance and Mitigation (WDM) Toolkit. The WDM Toolkit[72] is a resource provided under the TIDE Toolbox service which provides information on disturbance effects to a range of commonly occurring waterbirds from construction works at coastal sites.

In relation to construction noise, inclusive of background ambient noise, the worst-case predicted daytime noise levels at the closest point of the Tolka Estuary to the proposed development from construction activities, inclusive of background ambient noise, are below 55dB. These levels are in-line with existing background noise levels and are significantly below any documented levels for noise disturbance in waterbirds known to regularly occur at the estuary. The WDM Toolkit outlines, as a precautionary approach, a threshold for most waterbirds of between 60-70dB at the bird when assessing the potential for noise disturbance. Predicted noise levels from the proposed development are well below these values and there is therefore no potential for disturbance to birds at the Tolka Estuary from the proposed development.

Similarly, the four tern nesting sites within Dublin Bay are all >700m distance from the proposed development site. Predicted worst-case noise levels at the closest nesting site are below 45dB during construction works, inclusive of background ambient noise. These levels are in-line with existing background noise levels, and significantly below any documented levels for noise disturbance in birds (e.g. as provided in the WDM Toolkit).

While outside of any SPA, Brent geese are known to occur at Alexandra Basin West, where they opportunistically forage on spilt agricultural foodstuff along the berths. The berths/piers at Alexandra Basin West are an opportunistic temporary feeding site for Brent geese. This is not an important roosting area for Brent geese[73] and the birds are known to only be present at the

[72] Produced by the Institute of Estuarine & Coastal Studies (IECS), University of Hull, 2013.

[73] A dawn survey at Alexandra Basin site on 21st February 2018, as part of the 2017/18 Light-bellied brent goose dawn census, recorded zero roosting individuals at the site - Dublin Bay Birds Project: Annual Technical Report 2017/18 Year Five.

berths after ships have recently unloaded at the Basin. The birds do not feed on the berths while ships are unloading and predominately revert to their more habitual wintering feeding grounds between cargo deliveries, i.e. coastal *Zostera* beds and terrestrial grassland sites (Nairn, 2014). The WDM toolkit states that the noise level at source required to create a high-level disturbance for Brent geese at 100m distance is 110-115dB, increasing to 120-125dB at 300m. Alexandra Basin West is located c.200m from the proposed development site at its closest point. The worst-case noise level at source[74] during the construction and operational phases of the proposed development, inclusive of background ambient noise, have been modelled and are below 55dB(A). These levels are far below the outlined threshold noise level for disturbance to Brent geese. Alexandra Basin West is therefore outside of the zone of influence of the project in relation to noise disturbance.

In summary no adverse disturbance effects are likely to wintering birds.

Bats

No potential roost sites occur within the proposed development site. No suitable forage or commuting bat habitat occurs on the site and the site is surrounded by built up land which is also unsuitable for bat species. Imperceptible impacts are likely to local bat populations.

Marine Mammals (harbour porpoise and seals species)

<u>*Disturbance*</u>

Harbour porpoises are known to occur in proximity to Lambay and Rockabill Islands (located approximately 19km and 30km northeast of the proposed development site respectively), while lower comparative concentrations have been recorded in the southern extent of this area i.e. outer Dublin Bay (located at the closest point, approximately 8km of the proposed development site) (O'Brien and Berrow, 2013[75] & Berrow *et al.*, 2008[76]).

Similarly, grey seal and harbour seal are also known to occur of the Irish coast (Morris & Duck, 2019[77]). However, the principal breeding colonies of the two species is at Lambey Island located approximately 19km north-east of the of the proposed development site (NPWS, 2018[78]).

No marine works within Dublin Harbour are proposed as part of the proposed works, as such, there is no potential for direct disturbance to harbour porpoise or to the seal species. No excessively noisy construction works (i.e. blasting) will be undertaken during the construction phase and the proposed development site is located over 200m away from any areas of open water. Piling may be required, however these will be shallow piles and will be over 200m from the nearest area of water and therefore unlikely to have an effect. Worst-case noise levels from the proposed development at this distance are in-line with existing background noise levels, i.e. there is no perceptible effect. Considering the distance between the proposed development site, and the location of the harbour porpoises and seal colonies; there is no potential for the

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[74] The maximum predicted noise levels at each point of the site boundary (i.e. north, south, east and west; at 1.5m height) during construction and operation was extrapolated from the noise model. The overall maximums of these predicted values were then chosen as the worst-case values (i.e. 80dB(A) during construction and 87dB(A) during operation).

[75] Berrow, S. & O'Brien (2013). Harbour Porpoise SAC Survey 2013. Report to the National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Irish Whale and Dolphin Group

76 Berrow, S.D., Hickey, R., O'Brien, J. O'Connor, I. and McGrath, D. (2008). Harbour Porpoise Survey 2008. Report to the National Parks and Wildlife Service. Irish Whale and Dolphin Group

[77] C.D. Morris & C.D. Duck (2019) Aerial thermal-imaging survey of seals in Ireland, 2017 to 2018. Irish Wildlife Manuals, No. 111 National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

[78] NPWS (2013) Conservation Objectives: Lambay Island SAC 000204. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.

proposed works to result in disturbance to the protected marine mammals. In summary no adverse disturbance effects are likely to marine mammals.

11.4.2 Operational Phase

11.4.2.1 Designated Sites and Aquatic Ecology

Pollution due to Storage of Materials

During the operation of the proposed development, chemicals and hydrocarbons will be stored on site. All material will be stored in tanks within designated, bunded areas. The tanks will be bunded in accordance with the requirements set out in the EPA publication, 'Storage and Transfer of Materials for Scheduled Activities' (2004), which states that bunds are to contain 110% of the volume of the tank in the event of a tank rupture. Considering the bunded storage areas and the lack of hydrological connectivity between the proposed development site and nearby watercourses, there is no potential for leaks or spills of material to negatively impact nearby watercourses.

Surface Water Emissions

Surface water runoff will be generated from all surfaces within the proposed development site which are exposed to rainwater or to which water is applied in order to wash down. This includes all hardstanding surfaces, roofs, and other impermeable surfaces.

Surface water will be discharged to the Tolka Estuary to the north of the site (IE licence monitoring point SW3) which is fitted with a Class 1 oil interceptor. Surface water will also be discharged to the River Liffey Estuary to the south of the site (IEL Monitoring point SW4). Water collected in the bunded 220kV transformer will be inspected prior to discharge in accordance with the existing IE licence.

No change in run-off volume is proposed as the proposed plant area is on an area of existing hardstanding which drains to existing surface water drainage system, in accordance with the EPA regulated IE licence. It will however be necessary to reconfigure the drainage network in the area of the main carpark where the Emergency Generation plant is to be located. This area currently drains to the southern interceptor and the new surface water drainage network for the gas turbine area will continue to drain to the proposed new southern interceptor which will be constructed as part of the works.

A new Class 1 full retention oil interceptor is proposed to receive surface water drainage from the hard surfacing area including access roads and pathways, beneath the proposed new gas turbines prior to discharge into the port surface water drainage system and ultimately to the Liffey estuary.

This new interceptor will be installed upstream of the existing oil interceptor which will remain in place. Surface waters will pass through the proposed new interceptor before passing through the existing interceptor.

Foul Water

The existing foul wastewater drainage system will continue to be used. No new toilets or welfare facilities are proposed as existing facilities will be used.

There are two existing foul wastewater discharge points, one under the northern boundary (proximate to the 220 kV Substation) with the second at the southern boundary near the entrance to the control building. The existing foul wastewater system discharges to the main Dublin City sewer system.

The system has adequate capacity for both the construction and operational phase of his development.

Process Wastewaters

Wastewater will be generated by the fuel gas scrubber which will be stored in the fuel gas condensate tank. 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.

Wastewater will also be generated by gas turbines during a compressor wash cycles. Wastewater from each gas turbine will be collected in its own dedicated Gas Turbine (GT) Area Drain Tank. The content 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. No process wastewaters will be discharged to drain.

In summary no adverse wastewater type emission effects are likely to sensitive aquatic receptors within or outside designated sites.

Air Emissions

During the operation of the power station, exhaust gases will be discharged to atmosphere through the associated plant stacks. The primary gases released will include; oxides of nitrogen (NOx), carbon monoxide (CO), sulphur dioxide (SO2) and particulate matter (PM).

As identified in the Air Quality and Climate chapter (chapter 8), Atmospheric Dispersion Modelling System was undertaken by Mott MacDonald to assess the dispersion of pollutants from the power plant following the refurbishment works and was used to predict ground level pollutant concentrations at nearby designated sites. Predicted concentrations have been compared against the relevant Air Quality Standards (AQS). The dispersion model indicated that the European sites located within the zone of influence of the Power plant included the sites set out in Table 11.8 below.

Table 11.8: Annual Mean NOx Results at Ecological Receptors

ID	Receptor	AQS ($\mu g/m^3$)	PC ($\mu g/m^3$)	PC as % of AQS
E1, E7, E8	South Dublin Bay and River Tolka Estuary SPA/North Dublin Bay pNHA/South Dublin Bay pNHA	30	0.096	0.32
E2, E3	North Bull Island SPA/North Dublin Bay SAC	30	0.037	0.12
E4	South Dublin Bay SAC	30	0.009	0.03
E5, E6, E9	Baldoyle Bay SAC/SPA/pNHA	30	0.014	0.05
E10	Royal Canal pNHA	30	0.015	0.05
E11	Grand Canal pNHA	30	0.012	0.04
E12	Santry Demesne pNHA	30	0.011	0.04
E13	Dolphins, Dublin Docks pNHA	30	0.012	0.04
E14	Booterstown Marsh pNHA	30	0.002	0.01

Table 11.8 presents the maximum predicted annual mean NO_x concentrations at the above-mentioned designated sites within the study area for comparison against the NO_x standard for the protection of sensitive vegetation and ecosystems. The assessment indicated that the annual mean NO_x process contribution (PC) are less than 1% of the AQS at all modelled designated sites. The assessment concluded that maximum PC is predicted at the South Dublin Bay and River Tolka Estuary SPA/North Dublin Bay pNHA; the PC here is 0.32% of the AQS, which is well below the ‘significance level’ of 5% according to EPA guidance. At its closest point, the River Tolka Estuary SPA and pNHA are located approximately 400m from the proposed

development site and this represents the worst-case location with respect to air quality impacts on the ecological designated sites.

In addition, the assessment noted that the process contributions of NOx at the designated sites are well below the significance level and therefore no further consideration of nitrogen deposition has been included within the assessment.

In conclusion, air emissions associated with the operation of the North Wall Generating Station are considered low and will not result in adverse effects to designated sites or protected habitat and vegetation.

11.4.2.2 Habitats and Flora

There are currently no habitats or flora of note on the proposed development site. The ESB will explore opportunities for biodiversity enhancement on the site as part of its ongoing group policy on environment and sustainability. As part of this policy the ESB is committed to the All-Ireland Pollinator Plan[79].

11.4.2.3 Fauna

Noise

The operational phase of proposed development will result in the generation of noise in the vicinity of the site. Potential noise impacts associated with the operational phase are assessed within the Noise and Vibration Chapter 7 and conclude that the worst-case predicted noise levels during the operational phase, inclusive of background ambient noise are below 55dB(A) at the closest ecological receptor.

These levels are well below documented thresholds for noise disturbance in waterbird species known to regularly occur at the estuary (i.e. approximately. 70dB, as outlined in the WDM Toolkit[80]). Similarly, there is no potential for disturbance to protected marine mammals, considering the distance (ca. 19km and 30km) from the proposed development site to the location of seal colonies. There is no potential for disturbance during the operational phases on marine seal and cetacean species including harbour porpoise.

11.4.3 Do Nothing

In the Do-Nothing scenario, the existing North Wall Generating Station site will remain as at present. There would be no effect on biodiversity.

11.4.4 Decommissioning Phase

The decommissioning of the proposed development will have similar effects to the installation/construction stage and no significant effects are likely to occur.

11.4.5 Cumulative Effects

This section presents the assessment to examine whether any other proposed developments have the potential to act cumulatively with the proposed development and give rise to likely significant effects on biodiversity.

The MP2 Project is a Strategic Infrastructure Development at Dublin Port which will include the construction of a new Ro-Ro jetty, construction of new quay walls, works to existing berths, new berth 53, dredging works and amendments to consented developments with planning reference

[79] https://esb.ie/blog/low-carbon-future/low-carbon-future/2021/07/29/esb-commits-to-all-ireland-pollinator-plan

[80] Waterbird Disturbance & Mitigation Toolkit (https://www.tide-toolbox.eu/tidetools/waterbird_disturbance_mitigation_toolkit/)

numbers 3084/16 & 3638/18, and the ABR Project (ABP Ref. 29N.PA0034). An Environmental Impact Assessment Report (EIAR) of the project was undertaken by RPS on behalf of Dublin Port Company (RPS, 2019[81]). The assessment identified the potential for impacts to fisheries, marine mammals and potential disturbance and loss of nesting habitats of avian species. The assessment sets out mitigation measures which will be implemented and concluded that the proposed project will not result in any residual impacts. There is therefore no potential for cumulative effects with the proposed development.

The Brexit Infrastructure at Dublin Port project assessed 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. As the proposed development will have imperceptible effects on biodiversity, no cumulative effects will arise with this development.

Dublin Port (Alexandra Basin) Development consists of the redevelopment of Alexandra Basin West, including demolition of part of North Wall Quay Extension, new quay walls, dredging, infilling works, two new berths and an interpretive centre. Works began in 2016 and are continuing. As the proposed development will have imperceptible effects on biodiversity, no cumulative effects will arise with this development.

The Liffey-Tolka Project / Tolka Estuary Greenway consists of works to the Port's 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. As the proposed development will have imperceptible effects on biodiversity, no cumulative effects will arise with this development.

The proposed development is located within the Dublin City administrative area. The Dublin City Development Plan 2016-2022 includes objectives and policies which are associated with the protection of the natural environment, European sites and natural heritage areas. Relevant objectives to this assessment include: GI2, GI16, GI22, GI23, GI24 and GIO24. All new plans and projects proposed within proximity to the proposed development must adhere to the above-mentioned policies and objectives. Adherence to the Council's policies and objectives will ensure that any new plans and projects will not result in significant effects on biodiversity and international and national sites. There is therefore no potential for significant cumulative negative effects on biodiversity.

11.5 Mitigation Measures and Monitoring

Mitigation which will be employed to ensure no significant adverse effects on biodiversity from the proposed works are described in this section.

Mitigation is prescribed with regard to the 'Mitigation Hierarchy' set out in the EPA Guidelines 2022. The guidelines require mitigation by avoidance as a first approach. Where this is not achievable, measures to prevent impacts from giving rise to adverse effects will be adopted (e.g. design of bunded storage for chemicals). Where impacts cannot be avoided, e.g. generation of noise, mitigation by reduction of impact is prescribed to limit the exposure of the ecological receptor to an acceptable level (often achieved by interrupting the pathway between the source and receptor). When adverse effects cannot be prevented, mitigation to counteract the effects is required i.e. offsetting measures.

[81] RPS (2019) MP2 Project Environmental Impact Assessment Report Main Document (Part 1)

11.5.1 Construction Phase

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 to instruct the Contractor to stop works and to direct the carrying out of emergency mitigation / clean-up operations. The EnCoW will also manage consultation with key stakeholders as appropriate. The EnCoW will be responsible for carrying out regular monitoring of the Contractor's 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).

Vegetation Clearance

- In accordance with Section 40 of the Wildlife Acts, if required, the removal of the ornamental shrubs, which may be used as nesting sites by breeding birds, will be cleared outside of the birds nesting season (1st March to 31st August inclusive).
- During the construction works, the appointed Contractor, in order to comply with Regulations 49 and 50 of the European Communities (Birds and Natural Habitat) Regulations (2011), will ensure biosecurity measures are implemented throughout the construction phase to ensure that the introduction and translocation of invasive species are prevented.

Sediment and Pollution Control

- Good site practice as per the *CIRIA C741 Environmental good practice on site guide (fourth edition)* will be implemented during the construction phase at all times.
- All construction works will be carried out in accordance with a Construction Environmental Management Plan (CEMP) as described in Chapter 3: Description of the Development which will define measures to ensure that any contaminants resulting from the removal, dismantling, excavation, or construction will not enter the surface water.
- All pollution control measures will be designed, installed, and maintained in accordance with CIRIA guidance for 'Environmental Good Practice on Site' (C741) and 'Control of water pollution from construction sites. Guidance for Consultants and Contractors' (C532). 'Control of water pollution from linear construction projects. Technical guidance' (C648) and the IEL.
- The Contractor will be responsible for the construction of the equipment foundations, including the excavation and appropriate disposal of excavated material as well as the construction of the main equipment raft foundations and any piled foundations needed. The Main Contractor will be responsible for the management of excavated material and the safe disposal of this material to a suitably licenced waste disposal facility. In-situ concrete casting will be fully controlled to ensure that cement bound materials do not present any pollution risk.
- Trucks, mixers, and concrete pumps that have contained concrete will be washed out in a designated impermeable area to prevent pollution. Washout water will be stored and disposed of in line with the existing industrial emissions licence.
- 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;
  - 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.

11.5.2 Operational Phase

- The proposed development will operate in accordance with the limits for wastewater discharge determined by the EPA under the IEL.
- The existing water quality monitoring programme will continue for surface water run-off. The parameters, thresholds and frequency are set by the EPA under the Industrial Emissions licensing regime and will be revised.
- Waste materials generated on site will be domestic such as paper and food waste from the personnel on site, non-hazardous waste such as clean metal and wood waste from delivery pallets and hazardous waste from waste oils and greases generated from the operation of the plant will be appropriately segregated and will be collected by suitably licenced waste contractors for disposal and in accordance with the existing IE licence.

11.5.3 Decommissioning

- The operational life of the proposed development is expected to be up to five years. Thereafter, it will be disconnected and removed from site.
- Remaining equipment such as the water tank, gas compressors, pipework and cabling, will be made safe and retained on site for potential future uses at the site. Equipment will be stored under appropriate conditions and the site and all associated buildings will be secured. All lubricating oils other potentially polluting consumables will be removed from site.
- Waste materials generated during the decommissioning on of the plant will be removed from site.
- When the facility is decommissioned, a Closure and Aftercare Management Plan will be prepared and provided to the EPA as part of the Industrial Emissions Licensing process. The Plan will include appropriate environmental measures to ensure there is no potential for the decommissioning works to result in environmental pollution.

11.6 Residual Impacts

Following the implementation of mitigation measures and given the built up and disturbed nature of the site, the residual effect on biodiversity is assessed as imperceptible.

12 Archaeology and Cultural Heritage

12.1 Introduction

This chapter provides an assessment undertaken by Faith Bailey (MA, BA Hons, MIAI, MCIfA) of IAC Archaeology in order to assess likely significant impacts upon the archaeological and cultural heritage resource, that may arise as a result of the proposed development. The assessment is based on the development as described in Chapter 3 of this EIAR.

This study determines, as far as reasonably possible from existing records, the nature of the archaeological and cultural heritage resource within the vicinity of the proposed development site using appropriate methods of study. A study area of 500m from the proposed development site was used for the baseline and impact assessment with regard to archaeology and cultural heritage. Desk-based assessment is defined as a programme of study of the historic environment within a specified area or site that addresses agreed research and/or conservation objectives. It consists of an analysis of existing written, graphic, photographic and electronic information in order to identify the likely heritage assets, their interests and significance and the character of the study area, including appropriate consideration of the settings of heritage assets (CIfA 2014). This leads to the following:

- Determining the presence of known archaeological sites that may be affected by the proposed development;
- Assessment of the likelihood of finding previously unrecorded archaeological remains during the construction programme;
- Determining the impact upon the setting of known cultural heritage sites in the surrounding area; and
- Suggested mitigation measures based upon the results of the above research.

The study involved detailed interrogation of the archaeological and historical background of the development site and surrounding environment. This included information from the Record of Monuments and Places of County Dublin, the Dublin City Industrial Heritage Record, the Dublin City Development Plan (2016 - 2022), the topographical files of the National Museum of Ireland, and cartographic and documentary records. Inspection of the aerial photographic coverage of the site and surrounding area held by the Ordnance Survey, Bing Maps, and Google Earth has also been carried out. A field inspection has been carried out in an attempt to identify any known archaeological and cultural heritage sites and previously unrecorded features, structures and portable finds within the area.

12.1.1 Definitions

In order to assess, distil and present the findings of this study, the following definitions apply:

'*Cultural Heritage'* where used generically, is an over-arching term applied to describe any combination of archaeological and cultural heritage features, where;

- The term 'archaeological heritage' is applied to objects, monuments, buildings or landscapes of an (assumed) age typically older than AD 1700 (and recorded as archaeological sites within the Record of Monuments and Places); and
- The term 'cultural heritage', where used specifically, is applied to other (often less tangible) aspects of the landscape such as historical events, folklore memories and cultural associations. This designation can also accompany an archaeological or architectural designation.

12.1.2 Consultations

Following initial research, a number of publicly available resources published by statutory and voluntary bodies were consulted to gain further insight into the cultural background of the application area, receiving environment and study area (See Figure 12.1), as follows:

- Department of Housing, Local Government and Heritage – the Heritage Service, National Monuments and Historic Properties Section: Record of Monuments and Places; Sites and Monuments Record; Monuments in State Care Database; Preservation Orders; Register of Historic Monuments; National Inventory of Architectural Heritage; and the database of Irish excavation reports;
- National Museum of Ireland, Irish Antiquities Division: topographical files of Ireland; and
- Dublin City Council: Planning Section.

12.1.3 Significance of Effect

Definitions as per EPA Guidelines 2022:

Table 12.1: Significance of Effect Definitions

Type of Impact	Definitions
Profound	Applies where mitigation would be unlikely to remove adverse effects. Reserved for adverse, negative effects only. These effects arise when an archaeological site is completely and irreversibly destroyed by a proposed development.
Very Significant	Effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Significant	An impact which, by its magnitude, duration or intensity, alters an important aspect of the environment. An impact like this would be where part of a site would be permanently impacted upon, leading to a loss of character, integrity and data about the archaeological feature / site.
Moderate	A moderate impact arises where a change to the site is proposed, which although 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.
Slight	An impact which causes changes to the character of the environment which are not significant or profound and do not directly impact or affect an archaeological feature or monument.
Not Significant	Impacts which cause noticeable changes in the character of the environment but without significant consequences.
Imperceptible	An impact capable of measurement but without noticeable consequences.

12.2 Methodology

Research has been undertaken in two phases. The first phase comprised a desk-based study of available archaeological, historical, and cartographic sources. The second phase involved a field inspection of the proposed development site and surrounding area.

12.2.1 Desk-Based Study

The following sources were examined and a list of areas of archaeological, architectural and cultural heritage potential was compiled.

- Record of Monuments and Places for County Dublin;
- Sites and Monuments Record for County Dublin;
- Monuments in State Care Database;
- Preservation Orders;

- Register of Historic Monuments;
- National Inventory of Architectural Heritage;
- Topographical files of the National Museum of Ireland;
- Dublin City Industrial Heritage Record;
- Cartographic and written sources relating to the study area;
- Dublin City Development Plan (2016 - 2022);
- Place name analysis;
- Aerial photographs; and
- Excavations Bulletin (1970-2021).

Record of Monuments and Places (RMP) is a list of archaeological sites known to the National Monuments Section, which are afforded legal protection under Section 12 of the 1994 National Monuments Act and are published as a record.

Sites and Monuments Record (SMR) holds documentary evidence and field inspections of all known archaeological sites and monuments. Some information is also held about archaeological sites and monuments whose precise location is not known e.g. only a site type and townland are recorded. These are known to the National Monuments Section as 'un-located sites' and cannot be afforded legal protection due to lack of locational information. As a result, these are omitted from the Record of Monuments and Places. SMR sites are also listed on the website created by the Department of Housing, Local Government and Heritage (DoHLGH) - www.archaeology.ie.

National Monuments in State Care Database is a list of all the National Monuments in State guardianship or ownership. Each is assigned a National Monument number, whether in guardianship or ownership, and has a brief description of the remains of each Monument.

The Minister for the DoHLGH may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

Preservation Orders List contains information on Preservation Orders and/or Temporary Preservation Orders, which have been assigned to a site or sites. Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.

Register of Historic Monuments was established under Section 5 of the 1987 National Monuments Act, which requires the Minister to establish and maintain such a record. Historic monuments and archaeological areas present on the register are afforded statutory protection under the 1987 Act. The register also includes sites under Preservation Orders and Temporary Preservation Orders. All registered monuments are included in the Record of Monuments and Places.

National Inventory of Architectural Heritage is a state initiative established under the provisions of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999 to identify, record, and evaluate the post-1700 built heritage of Ireland, uniformly and consistently as an aid to its protection and conservation.

The topographical files of the National Museum of Ireland are the national archive of all known finds recorded by the National Museum. This archive relates primarily to artefacts but also includes references to monuments and unique records of previous excavations. The find spots of artefacts are important sources of information on the discovery of sites of archaeological significance.

Dublin City Industrial Heritage Record (DCIHR) is a database of industrial heritage sites across the city which may not be subject to statutory protection as RMP sites or Protected Structures but which are considered to be of heritage value.

Cartographic sources are important in tracing land use development within the development area as well as providing important topographical information on areas of archaeological potential and the development of buildings. Cartographic analysis of all relevant maps has been made to identify any topographical anomalies or structures that no longer remain within the landscape.

- Bernard De Gomme, The city and suburbs of Dublin from Kilmainham to Ringsend, 1673
- Thomas Phillip, An exact survey of city of Dublin, and part of the harbour, 1685
- John Rocque, A Survey of the City, Harbour, Bay and Environs of Dublin on the same Scale as those of London, Paris & Rome, 1757
- John Taylor, Map of the environs of Dublin, extending 10 to 14 miles from the castle, 1816
- Ordnance Survey maps of County Dublin, 1843 - 1938

Documentary sources were consulted to gain background information on the archaeological and cultural heritage landscape of the proposed development site and surrounding area.

Development Plans contain a catalogue of all the Protected Structures (RPS) and archaeological sites within the county. The Dublin City Development Plan (2016 - 2022) was consulted to obtain information on cultural heritage sites in and within the immediate vicinity of the proposed development site.

Place Names are an important part in understanding both the archaeology and history of an area. Place names can be used for generations, and in some cases, have been found to have their root deep in the historical past.

Aerial photographic coverage is an important source of information regarding the precise location of sites and their extent. It also provides initial information on the terrain and its likely potential for archaeology. A number of sources were consulted including aerial photographs held by the Geological Survey of Ireland, the Ordnance Survey and Google Earth.

Excavations Bulletin is a summary publication that has been produced every year since 1970. This summarises every archaeological excavation that has taken place in Ireland during that year up until 2010, and since 1987, has been edited by Isabel Bennett. This information is vital when examining the archaeological content of any area which may not have been recorded under the SMR and RMP files. This information is also available online (www.excavations.ie) from 1970 - 2021.

12.2.2 Field Survey

Field survey is necessary to determine the extent and nature of archaeological remains and can also lead to the identification of previously unrecorded or suspected sites and portable finds through topographical observation and local information.

The archaeological field inspection entailed:

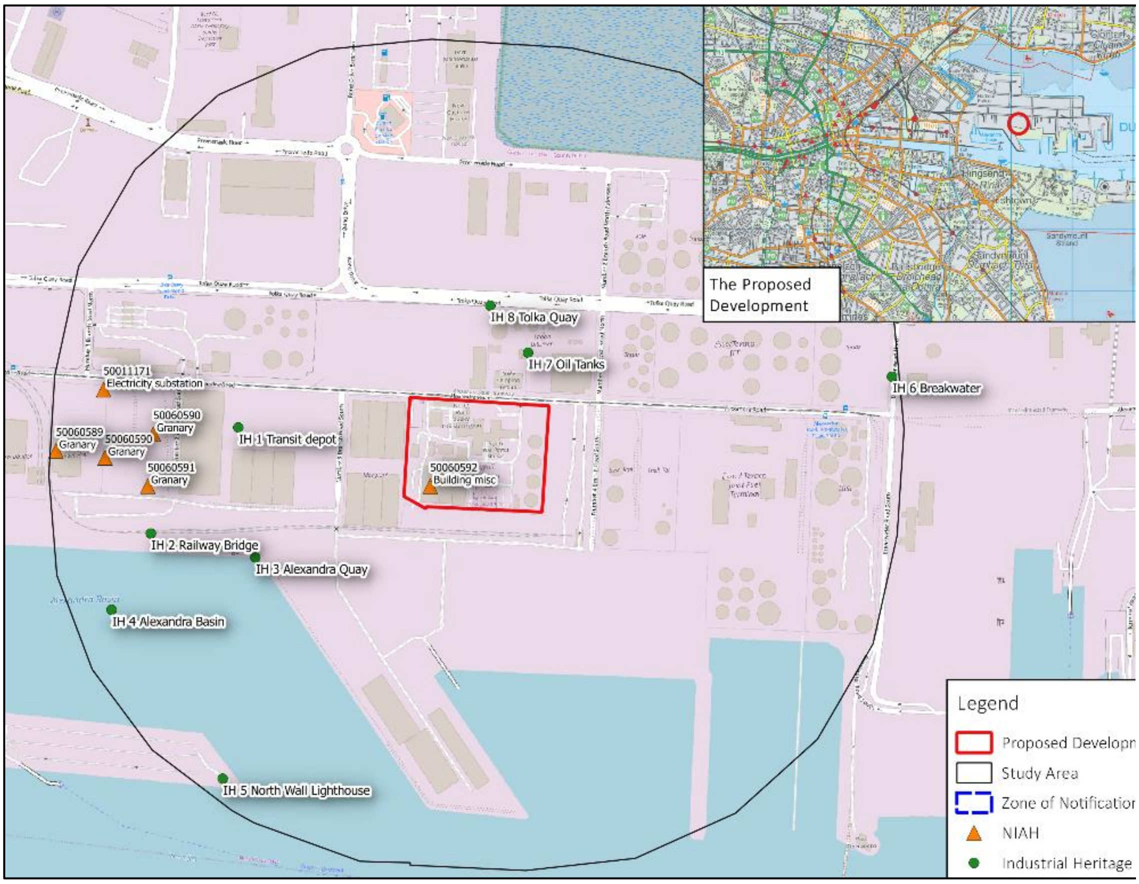
- Walking the proposed development site and its immediate environs;

- Noting and recording the terrain type and land usage;
- Noting and recording the presence of features of archaeological or cultural heritage significance;
- Verifying the extent and condition of recorded sites; and
- Visually investigating any suspect landscape anomalies to determine the possibility of them being anthropogenic in origin

12.3 Baseline Environment

The proposed site is located on reclaimed land from the River Liffey Estuary. There are no recorded monuments within a 500m radius of the site, the nearest consists of the zone of archaeological potential for the Great South Wall (DU018-066) approximately 710m to the south. An early 20th century, detached, multiple-bay, multi-storey, industrial redbrick building is located in the southwest corner of the site and included on the NIAH Building Survey (NIAH 50060592). The entry records that the building "may be one of the earliest of its type in the port" and is "a good example of early steel-frame construction, contributing to the architectural history of Dublin Port and its rich industrial heritage." A number of industrial heritage sites are also located within 500m of the proposed development site.

Figure 12.1: Location of proposed development, NIAH buildings, industrial heritage sites and surrounding recorded monuments



Source: IAC Archaeology

12.3.1 Archaeological and Historical Background

12.3.1.1 Prehistoric Period (8000 BC-AD 500)

The Mesolithic period (8000 - 4000 BC) is the earliest time from which there is clear evidence for prehistoric activity in Ireland. During this period people hunted, foraged and gathered food and appear to have had a mobile lifestyle. Evidence for settlement during this period is rare. However, due to the proximity of the River Liffey and former estuarine area (now reclaimed), there is potential for remains dating to this period to be preserved beneath the level of the reclamation deposits. This was illustrated in 2004 by the discovery of Mesolithic fish traps during the development of the Spencer Dock area, c. 1.7km to the west-southwest of the proposed development area (Licence 03E0654, Bennett 2004:0565).

The fish traps were found to be late Mesolithic in date and during the excavations the Mesolithic shoreline was identified c. 5m below the current ground level and c. 30m north of the current edge of the River Liffey. This area may represent the northern bank of the river or an estuarine island. The traps were set in estuarine silts and preserved under a later accumulation of silts. The silts had been sealed by post medieval reclamation deposits. The fish traps were constructed almost exclusively of hazel, and while fragmentary were in a relatively good state of preservation, with tool marks in evidence. Radiocarbon dates from five wood samples returned a date range of between 6100 - 5720BC, suggesting that these are presently the earliest fish traps recorded in Ireland and the UK. A further trap, consisting of the remains of a wattle fence, was found higher up in the silts, which returned a Middle Neolithic date. This formed part of a larger fish trap structure, likely an ebb weir (McQuade 2008, 8-11; Licence 06E0668, Bennett 2007:494).

No recorded prehistoric sites or artefacts have been identified within the study area of the proposed development.

12.3.1.2 Early Medieval Period (AD 500-1169)

Settlement across County Dublin advanced during the early medieval period when the area now known as County Dublin straddled the ancient kingdoms of Brega (north of the River Tolka) and Laigin (south of the Tolka). The early cartographic representations of Dublin City indicate the position of the estuary shoreline prior to the commencement of reclamation works. On the northern side of the River Liffey it is possible that Amiens Street (formerly the North Strand), c. 2.3km to the west, represents this former shoreline (De Courcy 1996, 270); whilst the southern shoreline would have included a complex marshy delta at the mouth of the River Dodder. De Courcy also argues that this is likely to have been the position of the shore line as far back as AD850 (*ibid*. xxvii).

The name Dublin (*Dubhlinn*), meaning black medieval pool, is generally taken to refer to the pool or pond that was located directly south-east of the site of the present Dublin Castle. However, this name has been suggested as referring to an early Christian monastic settlement south of the black pool and Clarke (1990, 58) believes that this interpretation of *Dubhlinn* would explain why the town has two names – *Dubhlinn* (for the enclosed ecclesiastical area) and *Baile Ath Cliath* – a secular settlement that was developed to guard over the 'ford of the hurdles'.

The Vikings had established themselves in Dublin by the middle of the 9th century and by the 10th century Dublin had become a recognised urban centre. One of the first Viking landing points was marked by a standing stone or pillar stone ('The Long Stone'), which was erected according to Norse custom (De Courcy 1996, 235). The Long Stone stood just above the high-tide shoreline at the confluence of the Liffey and the Steine on the southern side of the River Liffey (DU018-020129). Today this is thought to be on the northern side of Trinity College. The first Viking settlement within Dublin consisted of a longphort, which was a semi-permanent

Viking encampment, then developed over the next 60 years into a commercial centre that was an important marketplace for slaves and luxury goods.

There are no early medieval sites recorded in the receiving environment of the proposed development area. During this period the area was located within the estuary of the River Liffey and River Tolka, with settlement occurring further to the west.

12.3.1.3 Medieval Period (AD 1169-1600)

After the Anglo-Norman invasion of Ireland in 1169, the medieval town of Dublin enjoyed a period of prosperity and development, which continued until the beginning of the 14th century. The Anglo-Norman administration was responsible for reinforcing the town walls with defensive towers. Further improvements to the defences involved erecting a number of gates on the built-up streets outside the walls and supplementing the defensive gates already in place along the town wall itself. The boundary of the medieval town is located c. 2.3km to the west of the proposed development area.

Approximately c. 1.1km southwest of the proposed development area is the settlement known as Ringsend (DU018-053). It takes its name from a dry spit of land formed by the easternmost channel of the River Dodder delta at its confluence with the River Liffey. This is *An Rinn* in Irish, meaning ‘the point’ (De Courcy 1996, 325). It is possible that the area was first utilised as a settlement during the 14th century, being mentioned briefly in records in 1488. The primary function of the settlement was as a fishing community. During the 16th and 17th centuries there was fierce competition between Ringsend and the fishermen of Clontarf, encouraged by the overlords who were the King family of Clontarf and the Fitzwilliams of Merrion and Thorncastle (De Courcy 1996, 325). As a result, Ringsend was subject to some development; however, the fishing industry was to fade away during the 18th century.

12.3.1.4 Post-Medieval and Modern Period (AD 1600-present day)

The proposed development area continued to occupy an estuarine location until the 20th century as the area to the west of the site to Amiens Street was gradually reclaimed from the 18th century onwards. The North Lotts Scheme was authorised by Dublin Corporation in 1682. This scheme proposed to reclaim a large area of land submerged beneath the tidal waters of the Liffey and Tolka to the east of the city, c. 885m west of the site. The land was divided into 152 lots and the money raised from the distribution of these lots by lottery would be used to contain the river. The scheme was then abandoned in 1686 due to constant flooding (turtlebunbury.com). Custom House Quay (DU018-020564) was initially embanked by the Ballast Office between 1715 and 1725. The North Lotts Scheme was resurrected in 1717, this time with 132 lots. The Corporation planned to use the rent of the lots to improve the retaining walls and roads in the reclaimed area. Brooking’s map indicates the area was still subject to tidal flooding in 1728 but the retaining wall from Amiens Street to East Wall Road had finally been built by 1743. The north embankment of the Liffey was built to match the earlier quay walls of Sir John Rogerson's Quay (DU018-020201), which were completed by 1728.

The original Dublin Port was located at Wood Quay; however, Dublin Bay was described in 1674 as wild, open and exposed to every wind with transports often forced to take shelter at Ringsend or Clontarf. Dublin Corporation approved a project to embank the South Bull sands from Ringsend to Poolbeg in 1715 to improve shelter for shipping in the harbour (DU018-066, DU019-029001/2). The work was carried out by the Ballast Office Committee and completed in 1731. The initial embankment consisted of ‘The Piles’, three rows of piles braced together and sheeted along the two outer rows with woven wattle hurdle to form a casing, filled with shingle and stones to a height of 1.5m, from the present Pigeon House Harbour to the present Poolbeg Lighthouse (DU019-029001). A floating lighthouse was placed at the end of ‘The Piles’. However, this construction was not strong enough and ‘The Piles’ were replaced by a double stone wall, the Ballast Office wall (DU019-029002). This wall was constructed at Ringsend (DU018-053) in 1759 connecting to the quays and the floating lighthouse was replaced by Poolbeg Lighthouse in 1761. The construction of the lighthouse led to the gradual construction of a stone pier consisting of large granite blocks and by 1795 the Great South Wall/South Bull Wall (DU018-066, DU019-029001/2) was complete, making it the largest sea wall in the world at that time (archiseek.ie; dublincity.ie; dublinportarchive.com).

The Great South Wall (DU018-066, DU019-029001/2) did not prevent the build-up of sand in shipping channels into Dublin Port. Captain Bligh of the Bounty suggested the construction of the North Bull Wall in 1801 which solved the siltation problem after its completion in 1842 and eventually led to the creation of North Bull Island (archiseek.ie; dublincity.ie; dublinportarchive.com).

The opening of the Custom House in 1791 led to the movement of Dublin Port to Custom House Quay (DU018-020564) in 1796, which was replaced by George's Dock in 1821. Deep-water berths were constructed at the North Wall in 1836 and extended in the 1870s with additional deep-water berths opened at the Alexandra Basin prior to World War I and Ocean Pier to the south of the site was completed after World War II (archiseek.ie; dublincity.ie; dublinportarchive.com). The ESB opened its first thermal power plant at North Wall in 1949 and has occupied the proposed development area since then.

12.3.2 Summary of Previous Archaeological Fieldwork

A review of the Excavations Bulletin (1970 - 2021) has revealed that there have not been any archaeological investigations within the proposed development site; however, there have been three previous investigations within a 500m radius.

Monitoring of marine dredging eastwards from the Tom Clarke Bridge for a distance of c.10km identified modern deposits and nothing of archaeological significance (Licence 01E1004, Bennett 2001:358). Monitoring of site investigation works for the Alexandra Basin Redevelopment project, c. 500m to the southwest, did not encounter any finds, features, or deposits of archaeological interest (Licence 16E0212, www.excavations.ie).

A third programme of archaeological monitoring, to upgrade works centred along the extension of Promenade Road with works also extending along Bond Drive onto Tolka Quay Road, c. 166m to the northwest (Licence 18E0172, Duffy and Hanbidge 2021), confirmed the presence of 20th century reclamation deposits which consisted mainly of imported beach sands.

12.3.3 Cartographic Analysis

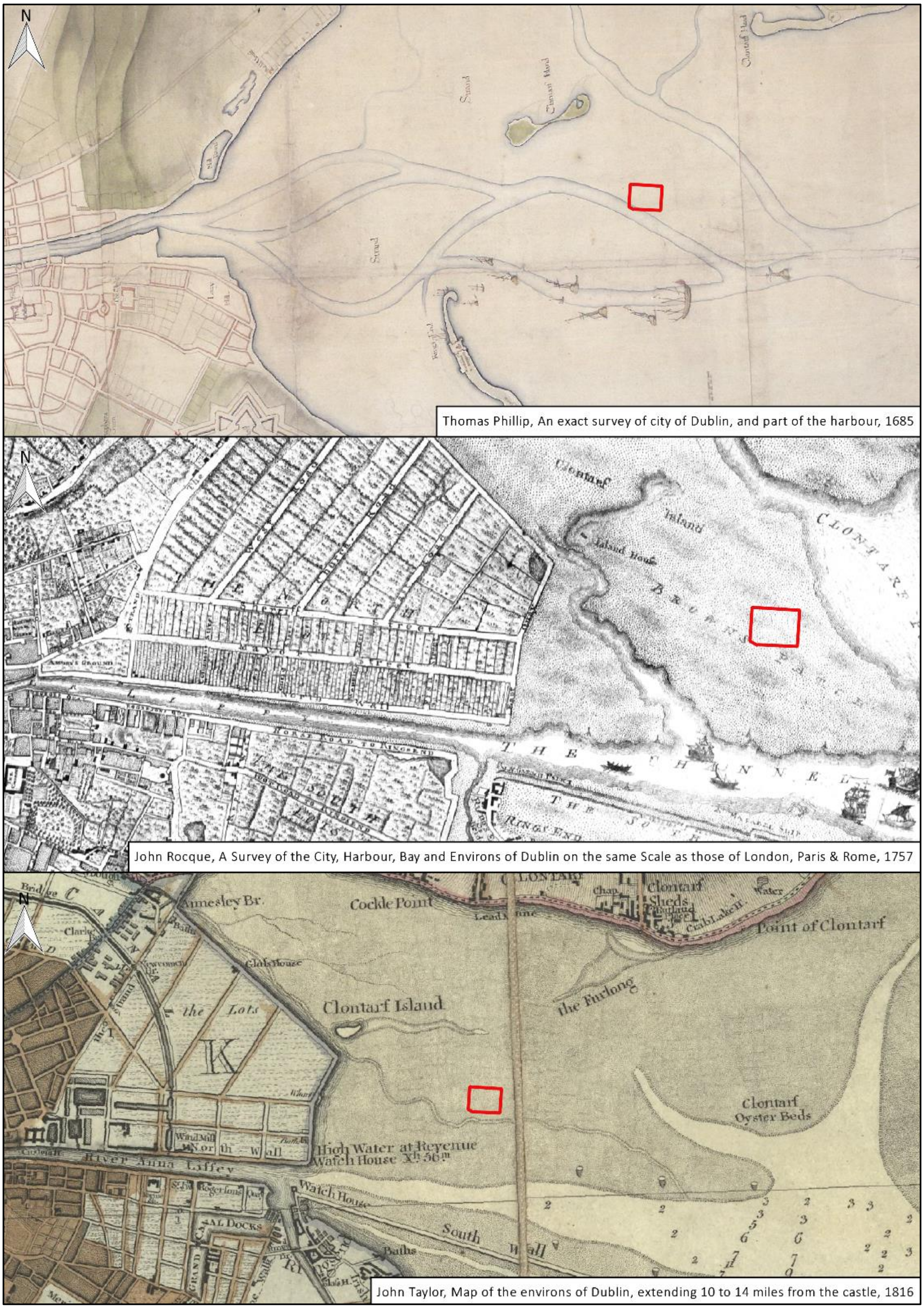
Bernard De Gomme, *The city and suburbs of Dublin from Kilmainham to Ringsend...*, 1673

Despite the early date of this map, it shows the proposed development area situated within the tidal plains of the Rivers Liffey and Tolka, to the east of the Strand Road (modern Amiens Street) and northeast of Ringsend.

Thomas Phillip, *An exact survey of city of Dublin, and part of the harbour*, 1685 (Figure 12.2)

The approximate location of the proposed development area is depicted as an estuarine area within this map.

Figure 12.2: Extract from Phillip (1685), Rocque (1757), and Taylor (1816) showing the proposed development



Source: IAC Archaeology

Figure 12.3: Extract from the 1843, 1906-9, and 1935-8 OS maps showing the proposed development

Source: IAC Archaeology

John Rocque, *A Survey of the City, Harbour, Bay and Environs of Dublin on the same Scale as those of London, Paris & Rome*, 1757 Figure 12.2)

By the time of this map, the proposed development is situated in an area known as Brown's Patch. A large body of water annotated as Clontarf Pool borders Brown's Patch to the northeast. An Island House is depicted on Clontarf Island c. 535m to the west-northwest. The South Wall (DU018-066) is depicted to the south leading eastwards from Ringsend (DU018-053). To the west a large portion of the former strand, bounded by the North Wall (DU018-020) and East Quay, has been reclaimed and divided into lots and roads as part of the North Lotts Scheme.

John Taylor, *Map of the environs of Dublin, extending 10 to 14 miles from the castle*, 1816 (Figure 12.2)

There are no significant changes to the proposed development area on this map, which is still located in riverine estuaries. The house is no longer depicted on Clontarf Island.

Ordnance Survey Map, 1843, scale 1:10,560 (Figure 12.3)

This is the first map to depict the proposed development area in great detail. The site has still to be reclaimed, however, a patent slip has been constructed off of the East Wall, c. 745m to the west, and a hachured area indicative of future marine development in the estuarine area is marked c. 540m to the west. Clontarf Pool from Rocque's map is annotated as The Pool.

Ordnance Survey Map, 1906-9, scale 1:2,500 (Figure 12.3)

By this time the site is located within an area of sand and body of water, however, there have been further reclamation works in the surrounding environs of the site and the county borough boundary forms the western limit of the site. A breakwater with a lighthouse and port, known as Port Crionain, has been built to the north and east. The area around the patent slip has expanded to include a number of buildings related to industrial and shipping activities. The Alexandra Basin and North Quay Extension have been constructed to the southeast.

Ordnance Survey Map, 1935-8, scale 1:10,560 (Figure 12.3)

The proposed development area has been reclaimed and is depicted within pasture on this map. The detached multiple-bay multi-storey industrial building (NIAH 50060592) within the site, while supposedly built c. 1920, is not depicted. A portion of Alexandra Road has been constructed, however the section to the immediate north of the site is only drawn in outline. Oil tanks and timber yards are depicted within the study area on the recently reclaimed land. There are no other changes of note.

12.3.4 City Development Plan

The Dublin City Development Plan (2016 - 2022) recognises the statutory protection afforded to all RMP sites under the National Monuments Legislation (1930 - 2014). The development plan lists a number of aims and objectives in relation to archaeological heritage (Appendix 12.2). It is a policy of the Development Plan to promote the in-situ preservation of archaeology as the preferred option where development would have an impact on buried artefacts. Where other alternatives are acceptable or exceptional circumstances are determined by the relevant statutory agencies. Where preservation in-situ is not feasible, sites of archaeological interest shall be subject to archaeological investigations and recording according to best practice, in advance of redevelopment.

There are no recorded monuments within a 500m radius of the proposed development. The nearest comprises the zone of archaeological potential for the Great South Wall – Sea Wall (DU018-066) c. 710m to the south.

12.3.5 Cultural Heritage Sites

The term 'cultural heritage' can be used as an over-arching term that can be applied to both archaeology and architecture. However, it also refers to more ephemeral aspects of the environment, which are often recorded in folk law or tradition or possibly date to a more recent period. Within the study area of the proposed development there are 13 cultural heritage features, full details of these are given in Appendix 12.1. Of these, five are NIAH structures, one of which, a 20th century building (NIAH 50060592), is situated within the southwest corner of the site (Table 12.2). The NIAH entry records that the detached, multiple-bay, multi-storey, industrial, redbrick building "may be one of the earliest of its type in the port" and is "a good example of early steel-frame construction, contributing to the architectural history of Dublin Port and its rich industrial heritage".

The Dublin City Industrial Heritage Record (DCIHR) was consulted and while there are no industrial heritage sites recorded within the proposed development boundary, eight have been recorded within the study area. These largely represent the post-medieval and modern development of the docklands and are listed in Table 12.2 below.

Two of the NIAH Records (50060589 and 50060590) are also recorded in the DCIHR as a Grain Silo and as a Flour Mill respectively.

Table 12.2: Cultural Heritage Sites

ID No.	Classification	Distance from Development	Source
50060592	Building miscellaneous	Within the proposed development	NIAH
50060590	Odlum's Mills - Granary	c.355-420m west	NIAH
50060591	Odlum's Mills - Granary	c. 360m west	NIAH
50011171	Electricity substation	c. 430m west	NIAH
50060589	R. & H. Hall - Granary	c. 490m west	NIAH
IH 1	Transit depot	c. 236m west	DCIHR
IH 2	Railway Bridge	c. 359m west southwest	DCIHR
IH 3	Alexandra Quay	c. 220m southwest	DCIHR
IH 4	Alexandra Basin	c. 220m southwest	DCIHR
IH 5	North Wall Lighthouse	c. 470m southwest	DCIHR
IH 6	Breakwater	c. 480m east northeast	DCIHR
IH 7	Oil tanks	c. 70m north	DCIHR
IH 8	Tolka Quay	c. 135m north	DCIHR

12.3.6 Place Name Analysis

Townland and topographic names are an invaluable source of information on topography, land ownership and land use within the landscape. They also provide information on history; archaeological monuments and folklore of an area. A place name may refer to a long-forgotten site, and may indicate the possibility that the remains of certain sites may still survive below the ground surface. The Ordnance Survey surveyors wrote down townland names in the 1830s and 1840s, when the entire country was mapped for the first time. Some of the townland names in the study area are of Irish origin and through time have been anglicised. The main reference used for the place name analysis is *Irish Local Names Explained* by P.W Joyce (1870). A description and possible explanation of each townland name in the environs of the proposed route are provided in Table 12.3.

The proposed development area is located within Dublin North City in the electoral division North Dock B, North Dock Ward, and Barony of Dublin, County Dublin.

Table 12.3: Place Names

Name	Derivation	Possible Meaning
Dublin	*Baile Átha Cliath*	Ford of the hurdles
North Dock B	*Bóthar Duga Thuaidh*	North Dock Road

12.3.7 Aerial Photographic Analysis

Inspection of the aerial photographic coverage of the proposed development area held by the Ordnance Survey (1995, 2000, 2005-2012 and 2011-2013), Google Earth (2003-2021) and Bing Maps revealed that the site has been developed and remained unchanged since 1995. No previously unknown archaeological features were identified.

12.3.8 Field Inspection

The field inspection sought to assess the site, its previous and current land use, the topography and any additional information relevant to the report. During the course of the field investigation the proposed development site and its surrounding environs were inspected.

The proposed development area is largely occupied by buildings and infrastructure associated with the existing ESB station (Photos 12.1-12.3), as well as car parking areas (Photo 12.4) and one small green area at the north east corner (Photo 12.5).

Photo 12.1: ESB infrastructure, facing north

Source: IAC Archaeology

Photo 12.2: ESB infrastructure, facing southeast

Source: IAC Archaeology

Photo 12.3: ESB infrastructure, facing southeast

Source: IAC Archaeology

Photo 12.4: Car park and buildings, facing southwest

Source: IAC Archaeology

Photo 12.5: Green area at northeast corner, facing southeast

Source: IAC Archaeology

All buildings on the site date to the 20th century, with the NIAH structure (NIAH 50060592) located at the southeast part of the site (Plates 12.6-12.7). The NIAH records this structure as consisting as a detached multiple-bay multi-storey industrial building, built in 1920, it has pitched roofs with replacement steel sheeting and a raised central section with timber louvres to the sides. The redbrick walls are laid in stretcher bond on a riveted iron frame. There are randomly placed tripartite timber-framed windows inserted at a later date. The building is located at west end of Dublin Port, in an area largely comprising recent industrial and maritime buildings, interspersed with patches of wasteland. It is abutted by a more recent two-storey red brick building to east (Plate 7). Due to the presence of asbestos, the interior of the building was not inspected, note the management of asbestos in this building is within the scope of another ESB project and no alterations to this building are proposed.

Immediately outside and to the north of this proposed development and running along the length of Alexandra Road is a rail line representing the former GS & WR North Wall Extension. This rail line is now set within the modern road surface and the DCIHR notes that this railway line only now serves the zinc ore terminal for Tara Mines.

Photo 12.6: NIAH structure, facing northeast

Source: IAC Archaeology

Photo 12.7: NIAH structure, facing south

Source: IAC Archaeology

Photo 12.8: NIAH structure with modern red brick structure abutting, facing southeast

Source: IAC Archaeology

12.3.9 Baseline Summary

There are no recorded monuments within the study area, a 500m radius, of the proposed development. The nearest recorded monument comprises of the zone of archaeological potential for the Great South Wall (DU018-066) c. 710m to the south. There have been three programmes of archaeological monitoring within the study area of the site at Alexandra Basin, the River Liffey and along Promenade Road, none of which identified anything of archaeological significance. Monitoring along Promenade Road did confirm that the reclamation deposits were based on beach sands mixed with post-medieval inclusions.

The large early 20th-century, multi-storey industrial red-brick structure which is situated in the southwest corner of the proposed site is included on the NIAH Building Survey (NIAH 50060592). The NIAH records in its appraisal that this large exoskeleton design which features a steel frame construction may be one of the earliest examples of early 20th century architecture within the Dublin Port area. There are a further four NIAH sites and eight industrial heritage sites (DCIHR) within the study area to the west of the proposed development. Two of these structures are listed in the NIAH survey and also included in the DCIHR survey.

An analysis of the available cartographic sources for the proposed development revealed that the site was originally within an open estuarine area between the Tolka River estuary to the north and the River Liffey estuary to the south. This area remained like this until the early 20th century when it was reclaimed as part of quayside developments. The 1935-8 OS map indicates that this site was still undeveloped by 1935-38. A review of the aerial photographic coverage revealed that the site of the proposed development has comprised of a power generating plant since at least 1995. This North Wall Power Generating Plant represents the ESB's first thermal powered plant and was commissioned in 1949. In 1982, the power generating station was converted from an oil-fired operation to a combined cycle plant operating on gas and distillate, installing two new GE frame 9E gas turbines and a waste heat recovery boiler.

No previously unrecorded archaeological or additional cultural heritage sites were noted during the site inspection. However, the proposed site does overlook the rail line of the former GS & WR North Wall Extension, a historic line which formed an integral element in the movement of goods to and from the Dublin Port area. Although its use may have declined, the DCIHR notes that it remains in use serving the zinc ore terminal of Tara Mines. Iarnród Éireann Freight Fleet Information timetable records that this line operates three trains a day from Tara Mines to Dublin Port five days per week.

12.4 Likely Significant Impacts

12.4.1 Construction Phase

12.4.1.1 Archaeology

Potential archaeological features may survive beneath the existing ground level within the proposed development site, particularly related to post medieval industrial heritage of the power generating plant of the early to mid-20th century. Ground disturbances associated with the proposed development have the potential to directly and negatively affect any such remains. Depending on the nature, extent and significance of archaeological deposits, potential impacts (prior to the application of mitigation) may range from moderate negative to significant negative.

The proposed development site occupies reclamation deposits at least 4m in depth. Given that minimal ground disturbances are required for the proposed development, impacts on former estuarine layers (beneath the reclamation deposits), which possess archaeological potential, are not predicted.

An examination of the proposed works indicates that much of the proposed development involves the construction and the rapid installation of above ground modular gas turbines and associated infrastructure. To facilitate the installation of these gas turbines on this site, it will require the demolition of some of the existing structures and buildings. These demolition works will include the removal of the ends of the existing (CT4 and C5) turbine halls and the demolition of the redundant 38kV building and the gas compressor building. Details of the demolition works required to the twelve areas within this site are summarised below in Table 12.4. Modifications will also be required to the existing site drainage system. New equipment foundations for this project are expected to extend over an area of approximately 3,500 m^2, have a thickness of 300 to 400mm, with up to 200mm of this depth above existing ground level. Beneath this proposed foundation will be a layer of new formation stone capping extending up to 800mm below existing ground level. Existing foundations or buried structures will be removed to a depth of 800mm. Existing below ground services (surface water drains) will be rerouted around areas where foundations are to be constructed.

Table 12.4: Demolition Works with Potential Archaeological Impacts

Equipment / Structure to be Removed	Details of ground works	Potential Impacts on Archaeological Resource
Gas Compressor Building	The building together with redundant plant, equipment and piping will be demolished to slab level. Existing foundations, ground slab and below ground services in conflict with the new foundations will also be demolished as required. Works are anticipated not to exceed 800mm in depth.	Potential for direct negative impact on post medieval/ industrial heritage remains. Impacts may be slight to significant, dependent on the nature, extent and significance of remains identified.
38kV Building & Transformer Bunds	The 38kV building will be demolished to a maximum of 800mm below existing ground level. The transformer bunds and fire walls will be demolished. Existing foundations and below ground services above 800mm below ground level, will also be demolished as required. This excavation will be backfilled where necessary with appropriate engineering fill and finished at ground level to facilitate the placement of the emergency generation equipment.	Potential for direct negative impact on post medieval/ industrial heritage remains. Impacts may be slight to significant, dependent on the nature, extent and significance of remains identified.
Fuel Oil Pump House	The building will be demolished to ground level. Existing foundations and below ground services in conflict with the new foundations will also be demolished as required. Works will not exceed 800mm in depth. The equipment floor area of the building is approximately 1.2m below ground level. This area will be backfilled with appropriate engineering fill and finished at ground level.	Potential for direct negative impact on post medieval/ industrial heritage remains. Impacts may be slight to significant, dependent on the nature, extent and significance of remains identified.
Air Inlet Filter House and Electrical Rooms	The southern ends of the CT4 and CT5 turbine halls contain a ground bearing concrete slab with a number of trenches accommodating redundant below ground services. These services will be removed and the trenches infilled with well-compacted granular fill. Localised areas of the existing ground bearing slab will be demolished to accommodate new foundations – 800mm in depth.	Potential for direct negative impact on post medieval/ industrial heritage remains. Impacts may be slight to significant, dependent on the nature, extent and significance of remains identified.
Gate Keeper’s House	The existing gate house is a single store building of traditional block work construction. This building will be demolished to slab level.	No potential impacts identified.

The installation of the equipment will affect a number of existing ground water monitoring wells. Alternative sample well locations are to be agreed with the EPA prior to construction.

Works which include an increased risk level to the archaeological resource are described below in Table 12.5:

Table 12.5: Proposed Works with Potential Archaeological Impacts

Equipment / Structure to be Removed	Details of ground works	Potential Impacts on Archaeological Resource
Shallow piled foundations may be required	The excavation of a trench and the insertion of piles into the ground linking which are subsequently linked together via a foundation beam to the top	Potential for direct negative impact on post medieval/ industrial heritage remains. Impacts may be slight to significant, dependent on the nature, extent and significance of remains identified.
A fire water storage tank of approximately 1250m3 will be installed on site. Water supply to this tank will be via an existing Irish Water connection.	Excavation of a deep pit to accommodate the large water tank 800mm max depth	Potential for direct negative impact on post medieval/ industrial heritage remains. Impacts may be slight to significant, dependent on the nature, extent and significance of remains identified.

Equipment / Structure to be Removed	Details of ground works	Potential Impacts on Archaeological Resource
Siphon Pit	The siphon pit is below ground but is surrounded by pipework and a blowdown tank. All pipework and the blowdown tank will be removed. The outfall will be carefully sealed and the Siphon Pit will be back filled to allow for vehicle traffic along this southern access road.	No potential impact identified.

12.4.1.2 Cultural Heritage

No construction impacts are predicted upon the specific cultural heritage resource.

12.4.2 Operational Phase

12.4.2.1 Archaeology

No potential impacts upon the archaeological heritage resource have been identified during the operation of the proposed development.

12.4.2.2 Cultural Heritage

No potential impacts upon the cultural heritage resource have been identified during the operation of the proposed development.

12.4.3 Do Nothing

In a 'Do Nothing' scenario, there would be no impact on the baseline conditions of the proposed development site regarding archaeological or cultural heritage resources.

12.4.4 Decommissioning Phase

No impacts upon the archaeological or cultural heritage resource are predicted as a result of the decommissioning phase of the proposed development.

12.4.5 Cumulative Effects

In terms of cumulative effects on the archaeological and cultural heritage resource arising from the proposed development through its construction, operation and decommissioning, there is no predicted cumulative effect to these resources within the site or study area.

12.5 Mitigation Measures and Monitoring

Archaeological monitoring will be carried out within the proposed development area for all sub-surface groundworks during the construction phase.

Archaeological monitoring will be carried out by a suitably qualified, competent archaeologist under license and in accordance with the provisions of the National Monuments Acts 1930-2004.

If significant archaeological material is encountered during the course of archaeological monitoring, then resolution of any such significant material will be determined in consultation with the National Monuments Service (DHLGH) and the Dublin City Archaeologist.

Where possible, every reasonable effort will be made to preserve in situ or reduce the effect on any identified archaeological material. Where preservation in situ cannot be achieved, either in whole or in part, then a programme of full archaeological excavation will be implemented to ensure the preservation by record of the portion of the site that will be directly effected upon. This work will be carried out by a suitably qualified archaeologist under license and in accordance with the provisions of the National Monuments Acts 1930-2004.

12.6 Residual Impacts

With the implementation of the mitigation measures detailed above, there will be no significant residual impacts upon the archaeological and cultural heritage resource.

13 Roads and Traffic

13.1 Introduction

This chapter provides an assessment of the likely roads and traffic impacts associated with the proposed development of six 35MWe nominal capacity modular gas turbine generators (LM2500Xpress units) within the existing North Wall Generating Station. The assessment is based on the development as described in Chapter 3 of this EIAR.

The existing conditions of the environment and details of the traffic that is likely to be generated by the proposed development is set out within this chapter. An assessment of the effect on the local, regional and national road network has been undertaken and mitigation measures to reduce impacts are presented, as appropriate.

Due to the relatively low number of construction phase workers, and the distribution of those workers to work sites at a number of dispersed geographical locations, a Workplace Travel Plan is not deemed necessary, based on professional judgement.

13.2 Methodology

The methodology is based on the Transport Infrastructure Ireland (TII) Traffic and Transport Assessment Guidelines (PE-PDV-02045) published in May 2014.

A significant amount of traffic data was available from the MP2 Project, EIA Report Main Document (Part 2) [82]which is relevant to the North Wall assessment. A specific site traffic survey was therefore not undertaken as part of this assessment.

The MP2 Project, EIA Report Main Document (Part 2) provides details for existing traffic flows at Dublin Port accesses carried out in 2018 to assess the volumes of vehicles passing through the key junction into the port. The junctions of relevance to this project include Alexandra Road / East Wall Road Junction, and Promenade Road/ Bond Road Junction. The classifications for vehicles recorded during the junction turning count survey includes:

- Car;
- LGV (Light Goods Vehicle);
- HGV (Heavy Good Vehicle);
- PSV (Public Service Vehicles);
- MC (Motorcycle); and
- PC (Pedal Cycles)

13.3 Baseline Environment

13.3.1 Site Location

The proposed development site is located on Alexandra Road in Dublin Port, north of the River Liffey, adjacent to several industrial sites and container storage yards. The site is approximately 1.6km south east of the M50 Dublin Port Tunnel.

[82] MP2 Project, EIA Report Main Document (Part 2)

13.3.2 Access Arrangements

The study area for the traffic and transport assessment is the public road network local to the development site which includes Alexandra Road, Promenade Road and R131. The primary traffic access route is from R801 via the R131, R101, M50 and the Dublin Tunnel Port.

The proposed development site will be accessed from either the M50 and Dublin Port Tunnel or from the North Wall Quay / East Wall Road junction. Local access will be via two junctions, Promenade Road / Bond Road junction or Alexandra Road / East Wall Road junction.

The Promenade Road / Bond Road junction is located approx. 770m northwest of the site and is the primary junction for traffic accessing Dublin Port from the Dublin Port Tunnel. Alexandra Road / East Wall Road Junction is approximately 940m west of the site and is the main junction for vehicles travelling from Dublin City Centre.

13.3.3 Existing Traffic Flows

Local (public) roads in the vicinity of the development site include Alexandra Road, East Wall Road, Promenade Road, Bond Drive, Tolka Quay Road and Breakwater Road. These routes are of sufficient geometry and robustness to accommodate HGV traffic.

The majority of the roads referred to above have footways on both sides of the road. Tolka Quay Road is a dual carriageway and has a footway adjacent to the eastbound carriageway only and Breakwater Road has a footway adjacent to the southbound carriageway only. None of the above-referenced roads incorporate bus lanes.

Alexandra Road operates one-way eastbound between its junctions with 2 Branch Roads South and 2 Branch Roads North. Alexandra Road is an important access road for vehicles accessing the port terminals. Alexandra Road incorporates centrally located railway lines which are still in use to transport lead and zinc ore from mines across Ireland to Dublin Port on a weekly basis.

The proposed development site is located within an industrial area, dominated by Port activities. Immediately west of the M50 is a primary school, student accommodation, a shopping centre and a hotel as illustrated in Figure 13.1. Traffic generated by these locations is included within the base traffic counts.

The EIAR for the MP2 project included details of traffic surveys of various junctions near the Dublin port. Surveys were carried out by Streetwise for a 24-hour period on Wednesday, the 23 May 2018 from midnight to midnight. Figure 13.2 presents the locations of the traffic surveys, junctions 1-24.

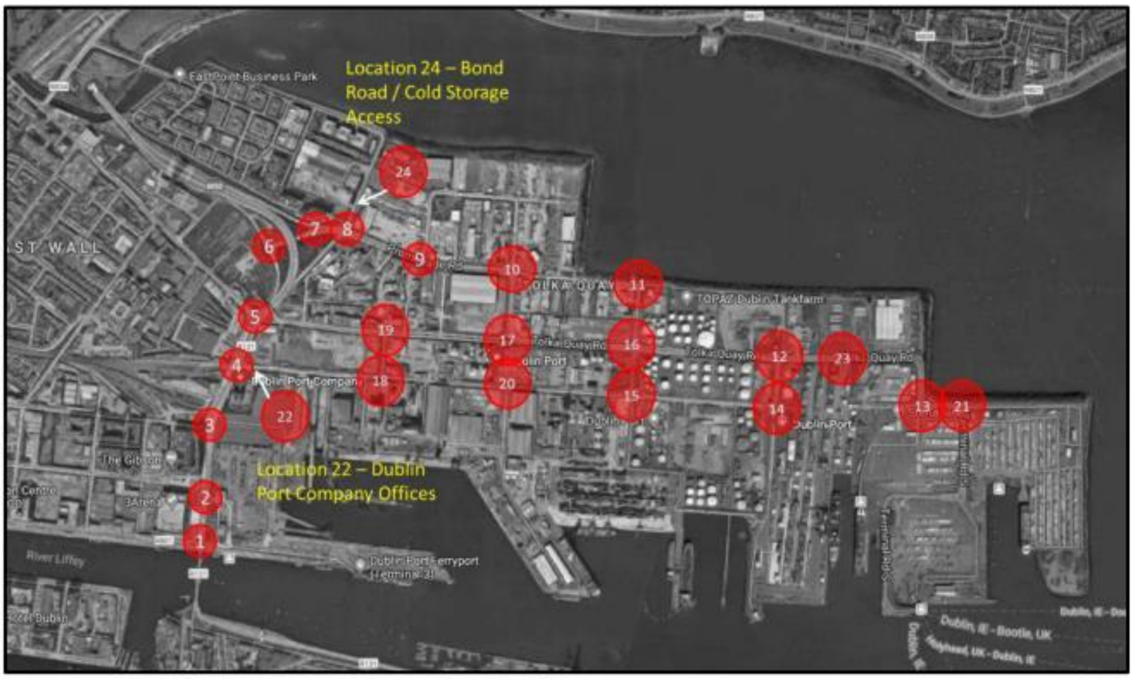
For the purpose of this road and traffic assessment, the junctions of interest are junctions 4 and 8. Junction number 4 includes East Wall Road/Alexandra Road signalised junction. Number 8 includes Promenade Road/Bond Road/Slip to East Wall Road priority junction.

A summary of the relevant daily trip arrivals and departures into Dublin Port, based on data from the MP2 Project, is included in Table 13.1.

Figure 13.1: Attraction Points and Site Location

Source: ArcGIS

Figure 13.2 Location of Traffic Surveys



Source: EIAR Main Document (Part 2), RPS (2018)

Data includes traffic leaving and entering Alexandra Road and Promenade Road. There are two peak hour times in the morning and one peak hour in the evening. A % of total traffic generated both ways shows that HGVs are the most used transport mode when entering and leaving the port.

Table 13.1: Arrivals and Departures of Existing Vehicles to Dublin Port by Vehicle Type in 2018

Time	Car	LGV	HGV	Bus	MC	Total
Northbound						
AM1 06:15-07:15	300	56	965	52	0	**1373**
AM2 07:30-08:30	318	32	566	77	0	**993**
PM 16:45-17:45	394	77	174	33	1	**679**
TOTAL	**1012**	**165**	**1706**	**161**	**1**	**3045**
Southbound						
AM1 06:15-07:15	337	175	719	65	**3**	**1298**
AM2 07:30-08:30	497	132	233	65	1	**928**
PM 16:45-17:45	668	54	473	127	13	**1335**
TOTAL	**1501**	**360**	**1426**	**257**	**17**	**3561**
Total 2 Way	**2513**	**525**	**3132**	**418**	**18**	**6606**
% of Total Traffic	***38%***	***8%***	***47.4%***	***6.3%***	***0.3%***	***100%***

Source: EIAR Main Document (Part 2), RPS (2018)

13.3.4 TII Growth Factors

The TII growth factors from the Project Appraisal Guidelines for National Roads Unit 5.3 - Travel Demand Projections (PE-PAG-2017) published in May 2009 have been used to estimate the baseline traffic flow in 2023. TII 'High Sensitivity Growth Rates' for the Dublin Metropolitan Area were applied. A summary of the predicted daily trip arrivals and departures in 2023 into Dublin Port based on data from the MP2 Project is included below in Table 13.2. The table predicts that in five years' time, the number of HGVs entering and leaving the port will increase by over 1% and the number of cars entering and leaving the port will decrease by over 1%.

Table 13.2 Predicted Arrivals and Departures of Existing Vehicles to Dublin Port by Vehicle Type in 2023

Time	Car	LGV	HGV	Bus	MC	Total
Northbound						
AM1 06:15-07:15	330	62	1134	61	0	**1587**
AM2 07:30-08:30	350	35	665	90	0	**1140**
PM 16:45-17:45	433	85	205	39	1	**763**
TOTAL	**1113**	**182**	**2004**	**190**	**1**	**3490**
Southbound						
AM1 06:15-07:15	370	192	845	76	3	**1486**
AM2 07:30-08:30	546	145	274	77	1	**1043**
PM 16:45-17:45	734	59	556	150	15	**1513**
TOTAL	**1650**	**396**	**1675**	**302**	**19**	**4042**
Total 2 Way	**2763**	**578**	**3679**	**492**	**20**	**7532**
% of Total Traffic	**36.7%**	**7.7%**	**48.8%**	**6.5%**	**0.3%**	**100%**

Source: EIAR Main Document (Part 2), RPS (2018)

13.3.5 Public Transport

13.3.5.1 Bus and Rail

There are multiple bus stops, a tram line and a train station within or in close proximity to North Wall Generating Station. Table 13.3 presents the route summary for bus and rail routes in proximity to the site.

Table 13.3 Local Bus and Rail Routes

Service Number	Route Summary	Service Operator	Weekday Frequency (Mon – Fri)	Existing/Proposed
53	Talbot Street (opp Bank of Ireland) – Irish Ferries Terminal	Dublin Bus	Between 07:00 and 20:15: 14 services in total between these times from Talbot Street and Between 07:05 and 19:19: 13 services in other direction	Existing
500	Abbeyvale Brackenstown Road – Dublin, Marlborough Street	Swords Express	Between 06:15 and 22:43: 32 services in total between these times from Abbeyvale Brackenstown Road and Between 07:00 and 23:43: 37 services in total between these times in other direction	Existing
502	Swords, Forest Road - Dublin, Marlborough Street	Swords Express	Between 07:16 and 17:32: 3 services in total between these times from Swords, Forest Road	Existing
142	Wendell Avenue – University College of Dublin UCD	Dublin Bus	Between 07:10 and 09:25: 5 services in total between these times from Wendell Avenue and Between 16:35 and 18:52: 4 services in total between these times in other direction	Existing
191	Stadalt Cross, Mountain View – Dublin, Marlborough Street	James Carolan	Between 06:30 and 09:35: 3 services in total between these times from Stadalt Cross, Mountain View and Between 17:15 and 19:06: 2 services in total between times in other direction	Existing
Red Line	The Point - Saggart	Luas	Approximately every seven – fifteen minutes daily from The Point Approximately every ten – twenty minutes daily form Saggart	Existing

13.3.5.2 Walking and Cycling

There is a good pedestrian network in proximity to the proposed development site with footways on both sides of most roads in the study area.

There is a limited formal cyclist provision in immediate proximity to the proposed development, although there are designated cycle lanes at North Wall Quay Road and between the East Wall Road / Alexandra Road junction and the North Wall Quay / East Wall Road roundabout.

13.4 Likely Significant Impacts

13.4.1 Construction Phase

The total number of staff on-site during the construction phase is expected to peak at approximately 100 persons.

Site working hours during the construction phase will be between 07.00 and 19.00 on weekdays, and 08.00 and 17.00 on Saturday.

A summary of the construction schedule is provided below.

Table 13.4 Construction Schedule

Phase	Timeline
Pre-construction works	Two months
Demolition works	Two months
Plant construction works	Eleven months (six months civil works and five months installation works)
Total	**15 months**

13.4.1.1 Traffic Generation

It has been conservatively assumed that a maximum of 100 construction staff will travel to site during all phases of the construction phase, with 95% (95 construction staff) travelling via passenger vehicle.

For the purposes of this assessment an average car occupancy of 1.2 passengers per vehicle has been assumed. As such, it is estimated that a maximum of 79 vehicles will arrive at the site during the day. Given the proximity to the Luas Red Line, and several bus stops, it has been assumed that 5% (five construction staff) will use public transport to travel to site.

Of the 79 passenger vehicles, it can conservatively be assumed that 80% (63 passenger vehicles) of staff will arrive and depart site during morning peak hour (07:30 and 8:30) and evening peak hour (16:45 and 17:45) respectively.

The dismantling of existing plant / buildings and construction / installation of the new equipment will contribute to traffic on the local road network.

For the demolition works it is estimated that up to 50 HGVs (100 HGV movements) will arrive and depart the site during the removal and demolition stage. After the demolition phase is complete, a construction stage will begin. At the peak of the construction works, approximately 15 HGV loads daily (30 HGV movements) will be required.

There will be an average of approximately four HGV loads per day during the construction phase. A worst-case scenario during the peak construction phase assumes that a maximum of 15 HGVs will be required to remove material and to deliver loads to and from the site daily. It has conservatively been assumed that 50% (eight HGVs) loads will arrive and depart during the morning and evening peak hours.

A summary of estimates for construction traffic trip generation during demolition and construction phases is included in Table 13.5.

Table 13.5: Estimated Construction Traffic Generation

Traffic Type	AM Peak Hour (07:30 and 8:30)		PM Peak Hour (16:45 and 17:45)		Weekday Daily	
	In	**Out**	**In**	**Out**	**In**	**Out**
Construction Workers	63	0	0	63	79	79
Loads	8	0	0	8	15	15
Total	71	0	0	71	94	94

The impact of the estimated construction traffic generated during the demolition and construction phases was assessed using Table 2.1 of the TII Traffic and Transport Assessment Guidelines (PE-PDV-02045). This assessment demonstrates that traffic to and from the site does not exceed the 10% threshold during the morning and evening peak hours while demolition and construction stages are taking place and therefore significant impacts due to traffic generation are not likely.

13.4.1.2 Abnormal Loads

Any HGV vehicles entering or departing the site between 07:00 and 19:00 will need to travel via the Dublin Port Tunnel. The Dublin City Centre HGV Management Strategy prohibits HGVs with five or more axles from travelling within certain areas of Dublin City Centre during working hours 07:00 to 19:00.

A number of abnormal load deliveries will be required during the construction phase of the project. These abnormal loads will be delivered to Dublin Port. From Dublin Port, abnormal loads will be transferred directly to the site via Dublin Port internal road network and will therefore not need to use the public road network. The expected abnormal loads are as follows;

- 6 x Turbine Module Units
- 6 x Control Module Units,
- 6 x Generator Module Units;
- 3 x Balance of Plant Power Control Modules; and
- 1 x Fire Fighting Module.

Therefore, there will be no impact relating to abnormal loads on the local (public) road network.

13.4.2 Operational Phase

During the operational phase, the proposed development will be managed by up to five staff during the day and two staff at night. Scheduled maintenance will be undertaken on a phased basis. Maintenance requirements will be dependent on the operating profile of the plant but are expected to occur annually and take approximately 14 days depending on the level of maintenance required. Therefore, impacts to traffic on the local road network associated with traffic during the operational phase will be imperceptible.

13.4.3 Do Nothing

The ‘do-nothing’ scenario will have no impact on roads and traffic.

13.4.4 Decommissioning Phase

The activities associated with the decommissioning phase will be similar to those associated with the construction phase of the project.

13.4.5 Cumulative Effects

Dublin Port Company are proposing the Alexandra Basin Redevelopment Project which will include the redevelopment of Alexandra Basin, Berths 52 and 53 and dredging of the channel of the River Liffey together with associated works in Dublin Port (Planning Ref: PL29N.PA0034).

The Alexandra Basin Redevelopment Project is located approximately 200m south of the proposed development site, construction commenced in 2016 and is ongoing. There is potential that both projects could be progressed simultaneously. However, based on a conservative estimate that 63 vehicles depart the site during the evening peak hour, they would account for less than 10% of the traffic generated.

The Brexit Infrastructure at Dublin Port project assessed proposed port-cabin structures, resurfacing and amalgamation of eight existing yards, modification of drainage and lighting, provision of parking, gates, signage and ancillary site works.

The MP2 Project is a Strategic Infrastructure Development at Dublin Port which will include the construction of a new Ro-Ro jetty, construction of new quay walls, works to existing berths, new berth 53, dredging works and amendments to consented developments with planning reference numbers 3084/16 & 3638/18, and the ABR Project (ABP Ref. 29N.PA0034). The EIAR undertaken by RPS on behalf of Dublin Port Company (RPS, 2019[83]) identified the potential for impacts to traffic. Therefore, impact of the proposed development on roads and traffic is likely to be imperceptible. Based on a robustly conservative estimate that 63 vehicles departing the site during the evening peak hour for the North Wall Project, they would account for less than 10% of the traffic generated. Therefore, no cumulative effects are predicted.

13.5 Mitigation Measures and Monitoring

13.5.1 Construction Phase

All construction impacts will be temporary in nature and not significant. Nonetheless, locally focused construction traffic management mitigation measures to enable an efficient and safe construction phase will be implemented as follows:

- A traffic control person will be used to control traffic to and from the site, as required.
- Sufficient and clearly displayed signage will be provided on both the western and eastern approaches to the site to provide warning to port traffic of the potential construction traffic entering and exiting the site.
- Wheel cleaning facilities will be provided on site.
- ESB will liaise with Dublin Port and Iarnród Eireann in relation to traffic movements e to ensure they do not coincide with the movement of rail freight on Alexandra Road.
- HGV traffic will access the site using a pre-planned route entering and departing Dublin Port via Promenade Road.

13.5.2 Operational Phase

Mitigation measures will not be required for the operational phase of the development.

13.6 Residual Impacts

The vehicles travelling to/from the site, which is located near Dublin Port, will use roads outside of the study area. The vehicles will then divide into smaller traffic volumes entering the site as

[83] RPS (2019) MP2 Project Environmental Impact Assessment Report Main Document (Part 1)

there are several access points. Accordingly, professional judgement suggests that significant traffic impacts are not likely on roads either within or outside of the study area.

Aided by locally focused construction traffic management mitigation measures, the residual impact of the proposed development on roads and traffic is likely to be imperceptible.

14 The Landscape

14.1 Introduction

This Landscape and Visual Impact Assessment (LVIA) has been prepared in respect of a planning application for the proposed development as described in Chapter 3 of this EIAR. This LVIA describes the landscape context of the proposed project and assesses the likely landscape and visual impacts of the proposed development on the receiving environment. Although closely linked, landscape and visual impacts are assessed separately.

Landscape Impact Assessment (LIA) relates to assessing effects of a development on the landscape as a resource in its own right and is concerned with how the proposed development may 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).

This LVIA uses methodology as prescribed in the following guidance documents:

- EPA Guidelines 2022 and the accompanying Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (updated draft 2017);
- Landscape Institute and the Institute of Environmental Management and Assessment publication entitled Guidelines for Landscape and Visual Impact Assessment (2013).

14.2 Methodology

Production of this LVIA involved:

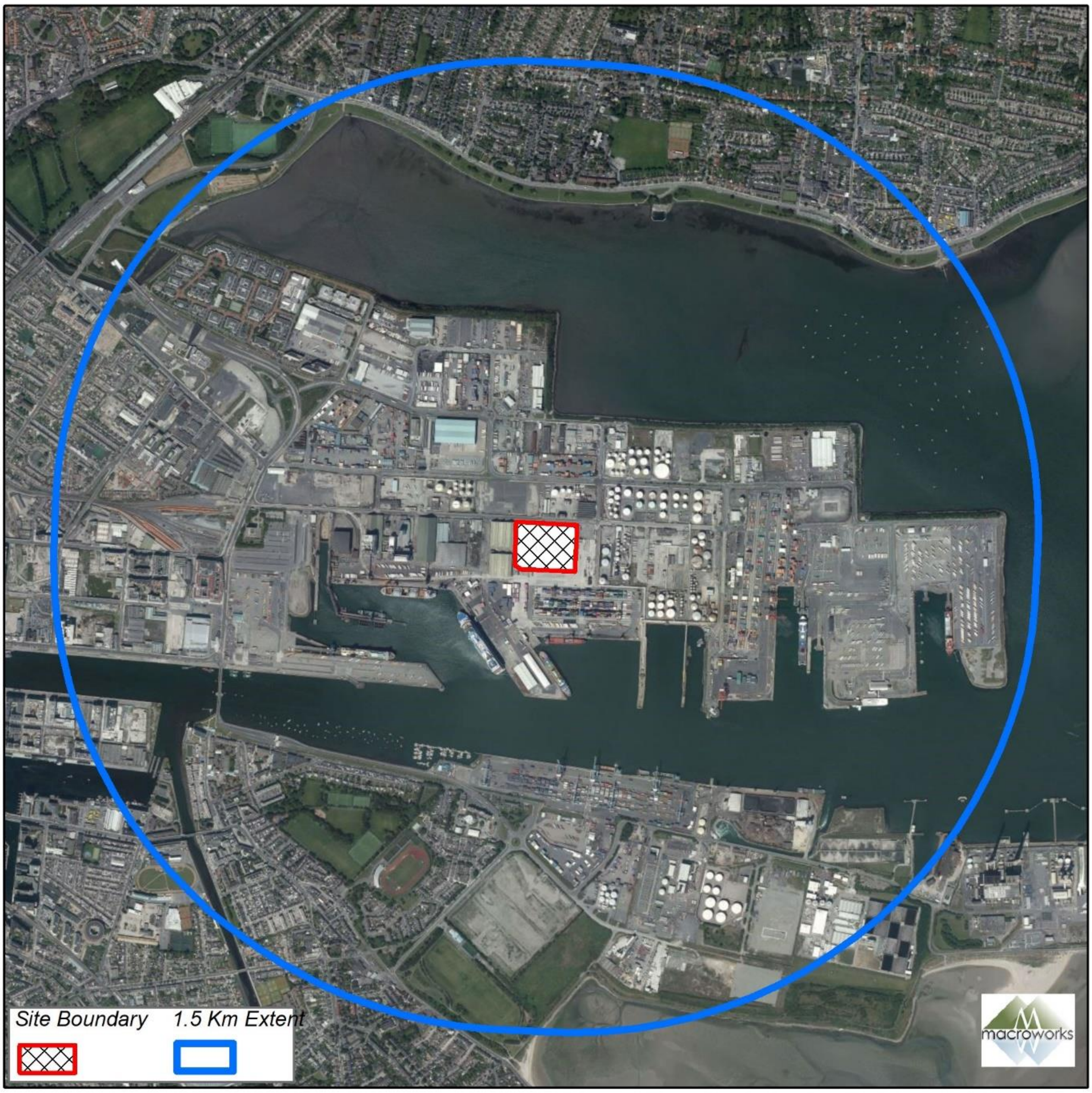
- A desktop study to establish an appropriate study area, relevant landscape and visual designations in the Dublin City Development Plan (CDP) 2016-2022, as well as other sensitive visual receptors. This stage culminates in the selection of a set of potential viewpoints from which to study the effects of the proposed development;
- Fieldwork to establish the landscape character of the receiving environment and to confirm and refine the set of viewpoints to be used for the visual assessment stage;
- Assessment of the significance of the landscape impact of the proposed development as a function of landscape sensitivity weighed against the magnitude of the landscape impact; and
- Assessment of the significance of the visual impact of the proposed development as a function of visual receptor sensitivity weighed against the magnitude of the visual impact. This aspect of the assessment is supported by photomontages prepared in respect of the selected viewpoints.

For more detailed information on the Landscape and Visual Impact Assessment Criteria, as well as assessment methodology, please see Appendix 14.1. Photomontages are included in Appendix 14.2.

14.2.1 Definition of Study Area

Owing to the highly industrialised land use to all sides of the proposed development 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 1.5km radius study area is used in this instance (see Figure 14.1, below).

Figure 14.1: Study area in relation to the site of the proposed development



14.3 Baseline Environment

The landscape baseline represents the existing landscape context and is the scenario against which any changes to the landscape brought about by the proposed development 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 development.

The evolution of Dublin Port is what has chiefly generated the landform of the site; that is, flat, low-lying land reclaimed from Dublin Bay over the last two centuries. The site is a manmade landscape, close to the centre of what is the Dublin Port peninsula (i.e. between the Liffey mouth and Clontarf). Being an entirely anthropocentric creation, the only “natural” watercourse within 225m south of the site is the River Liffey estuary, as well as Dublin Bay, which lies approx. 360m to the north (see Figure 14.2, below).

Figure 14.2 – Historical OSI Historic 6 Inch map (1837-1842) extract, demonstrating that the Dublin Port Peninsula was still part of Dublin Bay within the last 200 years (Source: geohive.ie)

Figure 14.3 – Landform and land use of the Dublin Port Peninsula, when viewed from the north/Clontarf

Figure 14.4 – Site in relation to surrounding land use on the peninsula (Source: Goggle Earth)

Figure 14.5 – land use of the Dublin Port Peninsula, when viewed from the Great South Wall

Unlike the Poolbeg peninsula to its south, there are no known recreational/leisure or heritage amenities upon the Dublin Port peninsula. Land use is largely restricted to industrial (e.g. energy production and storage) or transport infrastructure (i.e. docks and associated facilitating ferries, cruise liners and freight/container ships, as well as container storage yards); highly visible infrastructure reflective of the industrial zoning. There are two main, publicly accessible roads running east-west across the peninsula, one of which (Alexandra Road), aligns the northern boundary of the site and facilitates traffic from the city to the Irish Ferries terminal, which serves passenger ferries connecting Dublin Port to the UK and France. However, large articulated lorries and other industrial vehicles are the most common vehicles about the peninsula.

The *de facto* western edge of Dublin Port constitutes the R131, which connects the Fairview/Clontarf and Port Tunnel/M50 with the Eastlink toll bridge/north wall; to the east of which there are no known residences upon the peninsula. To the north, east and south, the Liffey and/or Dublin Bay demarcate the peninsula. The nearest known residences to the site of the proposed development to the south are approx. 750m (at Ringsend, south of the River Liffey), approx. 1km to the west (by the Point Village) and approx. 1.1km to the north (i.e. along Clontarf Road). The site is adjacent to the stacking area of Dublin Port, as well as other similar heavy-duty industries associated with Port activity. The wider surrounding area also contains similar industrial operations, including the Irish Tar and Bitumen site to the east and a metal scrapyard to the immediate south-west of the site boundary.

Figure 14.6 – View of the site from east along Alexandra Road.

The Alexandra Road aligns the northern boundary of the site, while the proposed development site is within 250m of the Alexandra basin (i.e. the River Liffey). The site is under ESB ownership, and contains numerous, large, highly visible industrial structures, the largest and most noticeable of which are two exhaust stacks, each with an output of approximately 110MW and over 60m in height, as well as three steam turbines; each with an output of approximately 17MW. The site also includes a previously designated Seveso II facility (refer to Section 3.5.2 of this EIAR) within its western fringe (i.e. an EU directive requiring technology risk reduction, where dangerous substances are used or stored in large quantities). Consistent with such an industrial zone, there are no protected structures or cultural heritage features on the site. Within the site there are also some unused hardstand areas, in addition to car parking and storage areas. There is a relatively small (i.e. approx. 1000m sq.), maintained, lawn-like area (amenity grassland) in the northeast corner of the site, as well as three other, small, lawn-like areas closer to the centre of the site. Existing access to the site is through a security-manned, palisade gateway off Alexandra Road, while a further gateway into the site, further west, is in less regular use. The site boundary chiefly takes the form of a high concrete wall to all sides. The nearest residential property is located approximately 760m to the south of the site.

Figure 14.7 – Section of the northern site boundary along Alexandra Road.

14.4 Planning Policy

14.4.1 National Parks and Wildlife Service (NPWS)

Within the study area there are a number of ecological sites designated by the NPWS. The North Dublin Bay pNHA (Site Code 000206) and the South Dublin Bay and River Tolka Estuary SPA (site code 004024) is located within 400m north of the site. The North Dublin Bay SAC (site code 000206), and the South Dublin Bay SAC and pNHA (site code 000210) are located further than 1.4km from the site. These are exclusively marine/riverine designations that are adjacent to, rather than within, the Dublin Port peninsula.

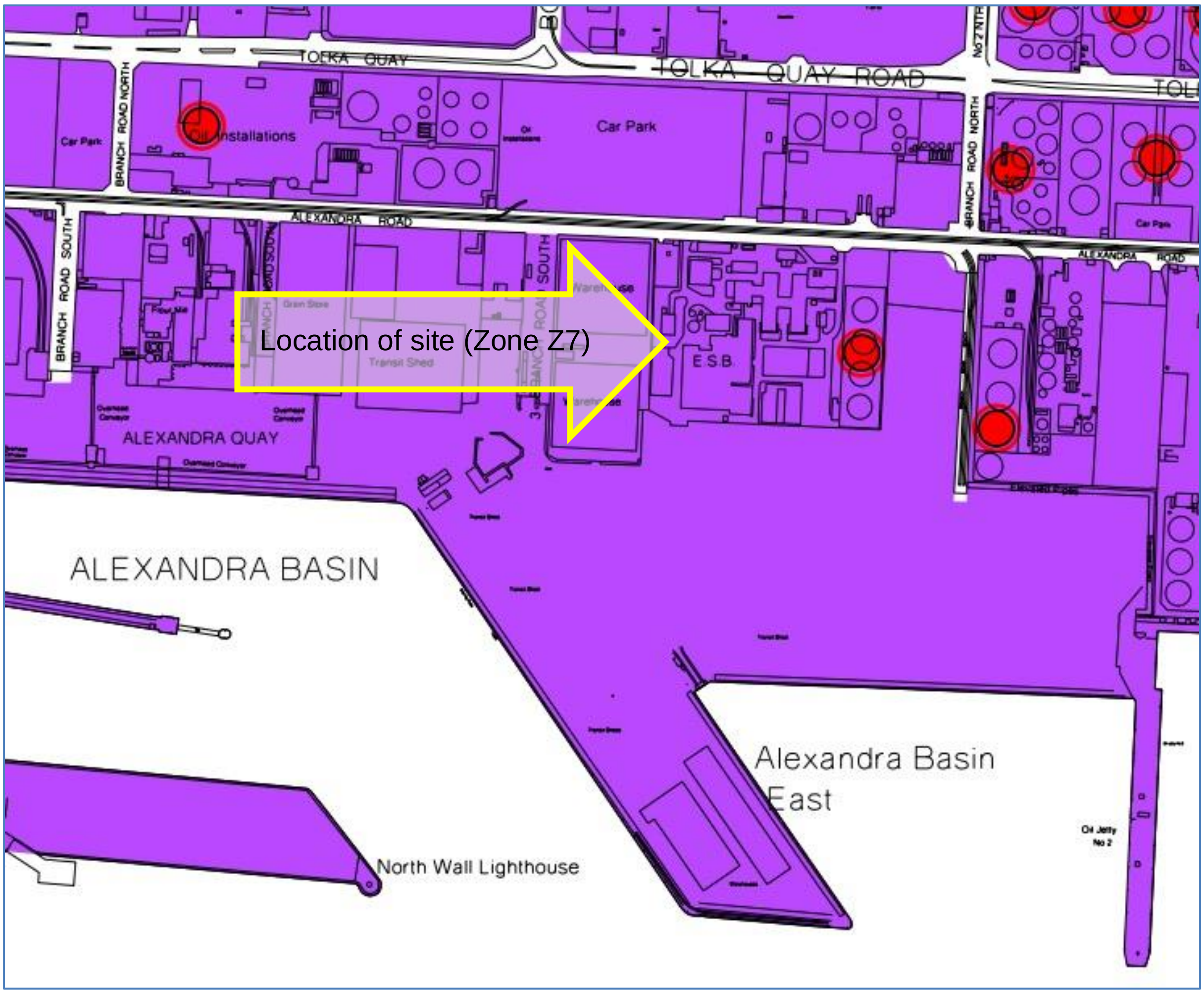
Although not a NPWS designation, it should be noted that there are two Special Amenity Orders within the study area. The 'core zone' of the Dublin Bay UNESCO Biosphere is located approx. 360m to the north of the site, while the North Bull Island National Special Amenity Area is located in the north-eastern fringe of the study area (i.e. more than 2km from the site).

14.4.2 Dublin City Development Plan 2016-2022 (Dublin CDP)

According to the Dublin 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." The site and its vicinity to the north and west are also designated as being of "low" sensitivity (see Figure 14.8, below).

With regards to Chapter 10 ('Green Infrastructure, Open Space and Recreation') and Chapter 11 ('Built Heritage and Culture') of the Dublin CDP, there are no policies or objectives that are relevant to the applicant site, nor the proposed development. Furthermore, there are no designated/protected routes, views or prospects within the study area.

Figure 14.8 – Extract from Dublin CDP Map F showing the site within 'Zone Z7.'



14.5 Landscape Impact Assessment

14.5.1 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 14.1.

The ESB opened its first thermal power plant at North Wall in 1949 and has occupied the proposed development area since then. As with most port land, the landscape quality/condition of the proposed development site is indicative of the industrialised nature of Dublin Port. Unlike most terrain elsewhere in the city, county and country, the site is on land reclaimed from Dublin Bay specifically for such industrial and/or port-related purposes. As a result, it is of low quality, condition and integrity. As with most industrialised, brownfield sites, there is minimal or absent scenic quality, or conservation, heritage or recreation value associated with the site. Similarly, in the context of an industrialised, brownfield site set within a port peninsula, there is little, if any, rarity with the proposed development site. In summary, and in accordance with the site's location as designated in the Dublin CDP, the site and its vicinity are of Low sensitivity.

14.5.2 Magnitude of Landscape Impact

14.5.1.1 Construction Stage Landscape Impacts

Major excavation for foundations will not be required within the site. However, there will be some removal of existing structures within the site to facilitate the installation of the proposed gas turbines and associated plant. Such enabling works will take place within a highly modified and visually contained power station site, enveloped by an industrial port. Not only will the construction stage works be largely screened from view, the movement of heavy vehicles, construction machinery and workers is akin to the daily nature of activity at the port. Furthermore, the duration of the construction stage is intended to be 15 months so the duration of effects will be short-term.

For the reasons outlined above, the magnitude of construction stage landscape impacts will be Negligible and of a Neutral quality.

14.5.1.2 Operational Stage Landscape Impacts

For similar reasons that the construction stage landscape effects are considered to be of a Negligible magnitude, so too will the operational stage landscape effects. Though not of an insubstantial scale and extent of development, it is the context that is key in this instance. The proposed development will be nested within an existing power station site where it is surrounded by generally larger industrial structures within the site and the site is, in turn, contained within an industrial port facility with no sensitive landscape features / receptors present. There will be no material alteration to the prevailing, industrial landscape character,

For the reasons set out above, the magnitude of operational stage landscape impacts will be Negligible and of a Neutral quality.

14.5.1.3 Significance of Landscape Impacts

Based on the combination of Low landscape sensitivity and a Negligible magnitude of landscape impact at both the temporary construction and short-term operational stage, the significance of landscape impacts is deemed to be Imperceptible.

14.6 Visual Impact Assessment

Viewshed Reference Points (VRP's) 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 chapter and make it 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 shown in Figure 14.9 below.

Figure 14.8 – Viewpoint Map

14.6.1 Sensitivity of Visual Receptors

On the basis of the criteria set out in Appendix 14.1.

- Viewpoint 5 with coastal amenity from Clontarf promenade is deemed to be of Medium sensitivity;
- Viewpoints 2 and 3 with views across the River Liffey are deemed to be of Medium-low sensitivity.
- Viewpoints 1 and 4 within the industrial / port context are deemed to be of Low sensitivity.

14.6.2 Visual Impact Magnitude

The assessment of visual impacts at each of the selected viewpoints is aided by photomontages (i.e. verified views) of the proposed development. Photomontages are a 'photo-real' depiction of the scheme within the view utilising a rendered three-dimensional model of the development, which has been geo-referenced to allow accurate placement and scale. For each 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 view (where applicable) – a photoreal depiction of the proposed development within the baseline context, supporting the application.

Table 14.1: VP1

Viewshed Reference Point			**Viewing distance**	**Direction of View**
VP1	Alexandra Road, Dublin Port		87m	W/SW
Representative of:	Dublin Port			
Receptor Sensitivity	**Low**			
Existing View	Less than 100m from the site boundary, this location is near the intersection of Alexandra Road and 'Branch Road North,' deep within the Dublin Port peninsula. Alexandra Road aligns the northern boundary of the site and facilitates traffic from the city to the Irish Ferries Dublin Port terminal. Being a port setting, the context is reflective of its industrial zoning and is largely restricted to industrial (e.g. energy production and storage) or transport infrastructure (i.e. docks, including container storage yards). As one can expect in such an environment, this vista is distinctively poor in visual amenity. Across the road and at the centre of this view is the site, which contains numerous large, highly visible industrial structures, the largest and most noticeable of which are the two aforementioned exhaust stacks, each over 60m in height. These stacks are visually dominant from this location, dwarfing all other visible buildings and structures. The rust-coated appearance of the nearest stack (i.e. the most eastern) is visually incompatible to the altering texture, height, width and tone of the more distant stack (i.e. the western stack); considerable sections of the latter are encased in a voluminous, box-like heat recovery steam generator encased around it's lower half. Elsewhere within the site, very large tanks are evident, as are double-storied prefab buildings and associated, capacious energy infrastructure, all of which contribute to a distinct, disharmonious sense of visual clutter.			
Visual Impact of proposed development	The only visible element from the proposed development will be the upper sections of a cylindrical tank just inside the boundary wall at the northern side of the site. Whilst noticeable, this tank is flanked and backdropped by larger industrial structures of a compatible nature and it has no material bearing on visual amenity. Consequently, the magnitude of visual impact is deemed to be Negligible.			
Summary	Based on the assessment criteria and matrices outlined in Appendix 14.1, the significance of residual visual impact is summarised below.			
	Visual Receptor Sensitivity	Visual Impact Magnitude	**Significance of Visual Impact**	
Visual Impact Significance	Low	Negligible	**Imperceptible**	

Table 14.2: VP2

Viewshed Reference Point			Viewing distance	Direction of View
VP2	Eastlink approach road, at Poolbeg Boat club		757m	NE
Representative of:	• Local Community Views; • Heritage & Amenity feature; • Centres of population.			
Receptor Sensitivity	**Medium-low**			
Existing View	While this vista is characterised by the Liffey, and its attendant port, industrial and recreational offerings, a broader context of this location will prove helpful. Located along the R131/ Eastlink approach road, it is positioned along a port-side footpath by the Poolbeg Boat club. The Eastlink bridge is located approx. 600m to the west, while the Irish Ferries terminal is approx.1.5km to the east. Numerous residences are located to the south of the R131, which share similar views to this vista. Within the port, numerous large tankers are apparent, beyond which the industrial setting of Dublin Port is apparent. At the centre of this view, the two tall stacks within the site are apparent. At less than 800m distance, it is clear that one stack is wider and taller than the other, while sharing a different texture/finish. The wide/taller stack also has a voluminous, box-like heat recovery steam generator encased around it's lower half. Due to their lack of uniformity, it is not evident that both stacks are part of the same development or are within the same site.			
Visual Impact of proposed development	The proposed development will not be visible from here due to screening by intervening buildings and structures. Therefore, the magnitude of visual impact is **Negligible** by default.			
Summary	Based on the assessment criteria and matrices outlined in Appendix 14.1, the significance of residual visual impact is summarised below.			
	Visual Receptor Sensitivity	Visual Impact Magnitude	**Significance of Visual Impact**	
Visual Impact Significance	Medium-low	Negligible	**Imperceptible**	

Table 14.3: VP3

Viewshed Reference Point			Viewing distance	Direction of View
VP3	Sir John Rogerson's Quay		1.4km	NE
Representative of:	Centre of population			
Receptor Sensitivity	**Medium-low**			
Existing View	Aside from its deep historical connection with Dublin's centuries-old maritime tradition, in the last quarter century Sir John Rogerson's Quay has been subject to exponential commercial and residential growth and development, as Dublin Docklands continue to be regenerated. East of the spectacular Samuel Beckett bridge, the quay sees a negligible degree of maritime/nautical activities each year, but it is home to a vast array of multi-storey offices and apartments. Across the Liffey on North Wall Quay, multi-storey buildings are also being constructed within the broader vicinity of the 3Arena (former Point Depot). East along the Liffey, the low-slung Eastlink Toll bridge serves as a visual full-stop to the river mouth, while the industrial infrastructure of Dublin Port is visible beyond/behind it. Exceptionally large construction cranes near North Wall Quay dominate the skyline, dwarfing all other elements. Between the 3Arena and the port cranes, the two aforementioned stacks within the site are partially visible, with at least their lower halves being screened by an intervening building.			
Visual Impact of proposed development	The proposed development will not be visible from here due to screening by intervening buildings and structures. Therefore, the magnitude of visual impact is **Negligible** by default.			
Summary	Based on the assessment criteria and matrices outlined in Appendix 14.1, the significance of residual visual impact is summarised below.			
	Visual Receptor Sensitivity	Visual Impact Magnitude	**Significance of Visual Impact**	
Visual Impact Significance	Medium-low	Negligible	**Imperceptible**	

Table 14.4: VP4

Viewshed Reference Point			Viewing distance	Direction of View
VP4	East Wall Road, at junction with Port Tunnel		873m	SE
Representative of:	• Views from East Wall; • Centre of population.			
Receptor Sensitivity	**Low**			
Existing View	The context of this location is that of a busy intersection, in an industrial setting, where the R131/East Wall Road meets the Port Tunnel road. The wide intersection takes up most of the foreground, with a low office-type building (i.e. Conway House) to the north (i.e. left) of the road. Traffic going to or from the Port Tunnel can be seen to the far left, or north, of this intersection. Behind tall, industrial-scale railings and wall on the far/east side of the adjoining road, some of the tall buildings and structures associated with Dublin Port peninsula can be seen, as well as very numerous lighting masts in the middle-distance. Further in the distance, the silhouette of the two aforementioned stacks, which are within the site, are visible, as is the silhouette of the voluminous heat recovery steam generator encased around the lower half of the nearest stack. However, although the stacks are within the direct line of sight for road users travelling east (i.e. travelling toward the Port Tunnel, Dublin Port or the East Link Toll Bridge), the stacks are not patent, as they appear well below the industrialised skyline and are located more than 800m from this intersection.			
Visual Impact of proposed development	The proposed development will not be visible from here due to screening by intervening buildings and structures. Therefore, the magnitude of visual impact is **Negligible** by default.			
Summary	Based on the assessment criteria and matrices outlined in Appendix 14.1, the significance of residual visual impact is summarised below.			
	Visual Receptor Sensitivity	Visual Impact Magnitude	**Significance of Visual Impact**	
Visual Impact Significance	Low	Negligible	**Imperceptible**	

Table 14.5: VP5

Viewshed Reference Point			Viewing distance	Direction of View
VP5	Clontarf Promenade, near 'The Baths'		1.1km	S
Representative of:	Heritage & Amenity; Centre of Population; Local Community Views.			
Receptor Sensitivity	**Medium**			
Existing View	For well over a century, Clontarf promenade is a very popular recreational base for walkers, runners and cyclists. The promenade stretches almost 3km, from the R834/ Alfie Byrne Road to the North Bull Wall/Bull Island, while enjoying similar views out to the south as can be seen in this vista. It is a vista made up of the waters of Dublin Bay in the foreground, with the low rise of the Dublin mountains in the distance. In the middle ground are the industrial structures of Dublin Port and the Poolbeg peninsula (e.g. the twin stacks, and plumes emanating from them, of the Dublin Waste to Energy facility/Covanta incinerator), with the tree-screened development of East Point Business Park further to the east (i.e. right). In the centre of this view, located to either side of a large port crane, are the two stacks of the North Wall ESB Power Station (i.e. the site), reflected in the foreground waters, with a very large heat recovery steam generator attached to the base of the most westerly stack. Seen in this profile, it is not apparent that both are part of the same development, or share the same functions, as they are of different heights, widths, forms and textures. However, they do pierce the skyline quite noticeably, while their lack of synergy or balance draws the eye fractionally further.			
Visual Impact of proposed development	The proposed development will not be visible from here due to screening by intervening buildings and structures. Therefore, the magnitude of visual impact is **Negligible** by default.			
Summary	Based on the assessment criteria and matrices outlined in Appendix 14.1, the significance of residual visual impact is summarised below.			
	Visual Receptor Sensitivity	Visual Impact Magnitude	**Significance of Visual Impact**	
Visual Impact Significance	Medium	Negligible	**Imperceptible**	

14.7 Cumulative Impact Assessment

The proposed development site and Dublin Port area are dynamic in terms of change and there has been considerable commercial development approaching the docklands from the direction of the city. There is also a considerable degree of mixed use development permitted in the vicinity across the River Liffey on the Poolbeg Peninsula. However, given the scale, nature and context of the proposed development and the fact that it is not considered to give rise to any material landscape and visual impacts in its own right, there can be little potential for it to contribute cumulative impacts either. Thus, cumulative impacts are not considered to be significant in this instance.

14.8 Summary of Impacts

This landscape and visual chapter considered the landscape impacts of the proposed development at both construction stage and during the temporary operational stage. In both instances, due to the scale and nature of this industrial development to be located in an existing power station site nested in the wider context of Dublin Port, landscape impact significance is deemed to be Imperceptible.

For the visual impact assessment, five representative viewpoints were used. Only at VP1 within the adjacent port facility is there any visibility of any aspect of the proposed development and this is considered so minor and compatible with the baseline setting that the visual impact is still Imperceptible. The proposed development is not visible from the remaining four viewpoints.

14.9 Statement of Significance

Based on the landscape and visual impact assessment, the proposed development will not give rise to any significant impacts.

15 Material Assets

15.1 Introduction

This chapter considers the likelihood of impacts on built assets and infrastructure in addition to natural assets. The assessment predicts the impacts on the surrounding environment arising from the construction and operation of the proposed development and, where appropriate, specifies mitigation measures to reduce potential impacts. This chapter also considers non-renewable resource use and waste management. Impacts on roads and traffic are discussed in Chapter 13.

15.2 Methodology

This chapter has been prepared having regard to the following documents:

- EPA Guidelines 2022; and
- Advice Notes for Preparing Environmental Impact Statements (EPA, Draft September 2015);
- Advice Notes on Current Practices in the Preparation of Environmental Impact Statements (EPA 2003).

15.3 Baseline Environment

The proposed development is located within the site of an established power station in Dublin Port. The immediate environment is dominated by other similar industrial uses, warehouses etc. The site is adjacent to container stacking areas in the south and west and the Irish Tar and Bitumen site is located to the east. Doyle Shipping group is located to the North of the site off Alexandra Road. The nearest residential property is located approximately 760m to the south of the power station, south of the River Liffey on Pigeon House Road.

Two existing gates are currently used to access the site from Alexandra Road. The M50 Dublin Port Tunnel is located approximately 1.6km south east of the site and is the major route in and out of the docklands for HGVs. Alexandra Road branches off the East Wall Road which is frequently used by commuters during peak hours.

The Point Square is located approximately 860m west of the proposed development. The 3 Arena, Red Luas Line and Gibson Hotel are situated within the square and the EXO Building office development.

In terms of natural assets, the River Liffey is located to the south of the proposed development site and is used for commercial and recreational shipping. As discussed in more detail in Chapter 11 Biodiversity, the closest European Site is the South Dublin Bay and River Tolka Estuary SPA, located ca. 350m to the north along with North Dublin Bay pNHA. South Dublin Bay SAC is located ca. 1.4km to the south of the proposed development.

The proposed development will use natural gas only as a fuel, supplied from the GNI National Grid.

15.4 Likely Significant Impacts

15.4.1 Construction Phase

Due to the short construction period of 15 months and the location of the site effects on the surrounding industry are not likely to be significant and limited to traffic entering and exiting the site. Further detail on roads and traffic is provided in Chapters 13.

15.4.2 Operational Phase

During the operational phase, activities will be controlled under the existing IE licence. ESB is in the process of preparing a Technical Amendment to IE licence P0579 to allow for the proposed development.

There will be an increase in the use of gas to fire the power plant. Gas is a non-renewable asset, however, given that the plant will be in use for the short-term only and will not be permanent, the resulting effects are deemed to be slight.

15.4.3 Do Nothing

If the proposed development does not proceed, the existing infrastructure will remain as is. Due to demand pressure on the grid however there will be likely effects for industry, commercial and residential users if outages occur on the system, resulting in potentially significant adverse effects.

15.4.4 Decommissioning Phase

The effects during decommissioning would be similar to the construction period, relating to traffic entering and exiting the site, and are assessed as being slight.

15.4.5 Cumulative Effects

In terms of cumulative effects on resources, other gas fired power plants currently on the grid will also be utilising gas. The addition of the emergency power generation plant will have a slight effect over the short-term. In terms of roads, the proposed development will have a cumulative effect with other construction projects within the general area, however, given the urban nature of the site, this effect is deemed to be slight and temporary.

15.5 Mitigation Measures and Monitoring

Please refer to Chapter 7 *Noise and Vibration* and Chapter 13 *Roads and Traffic* for mitigation relating to traffic.

15.6 Residual Impacts

Following the implementation of mitigation measures, the residual impact is not likely to be significant.

16 Major Accidents and/or Disasters

16.1 Introduction

This chapter 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.

16.2 Methodology and Limitations

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.

16.2.3 Methodology for Assessment of Effects

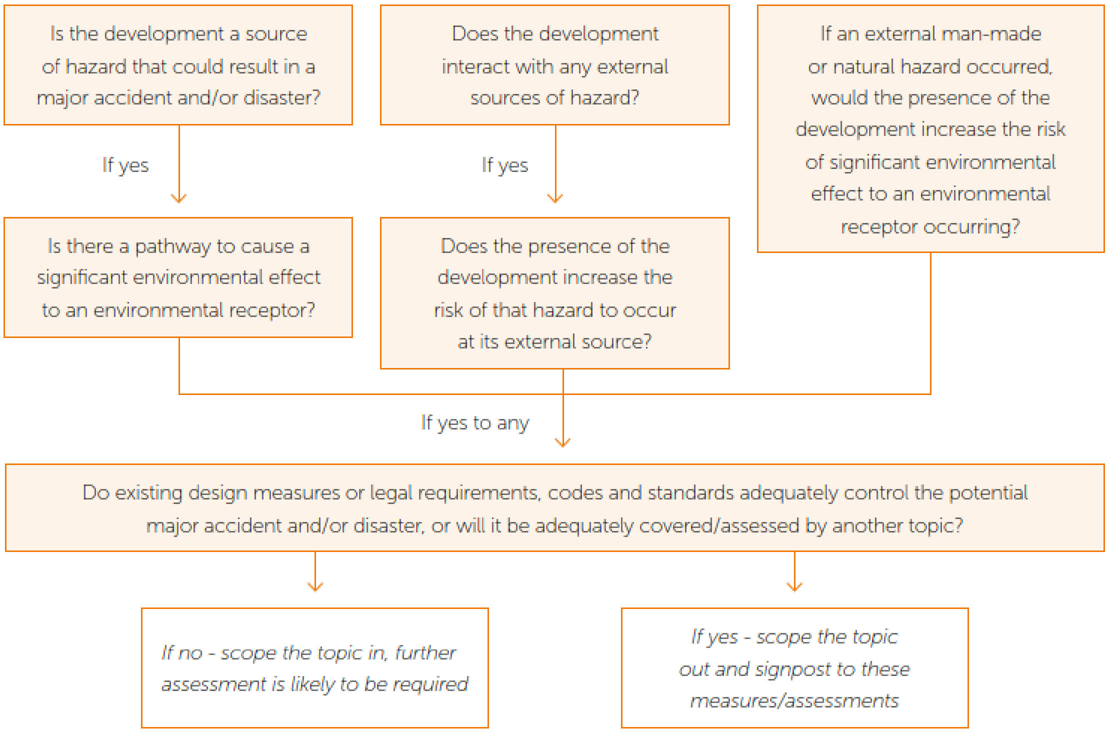
The methodology applied is based on the scoping decision process flow provided in Figure 16.1 *Scoping Decision Process Flow*.

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.

For established linkages, the risks of major accidents and / or disasters are low / unlikely where existing design measures or legal requirements, codes and standards adequately control the potential for major accident and / or disaster, or where such risks are adequately covered/assessed by another topic in this EIAR.

Where required, additional mitigation measures are proposed to manage the identified risks to the environment.

Figure 16.1: Scoping Decision Process Flow



Source: Major Accidents and Disasters in EIA: A Primer (IEMA, September 2020)

16.3 Receiving Environment

The receiving environment is an established electricity generation plant operating in accordance with EPA regulated IE licence registration number P0579-03.

North Wall Generating Station was previously designated a lower tier COMAH site due to the quantity of liquid fuel stored on site. No bulk distillate fuel oil is stored on site in North Wall and no bulk distillate fuel oil storage is proposed as part of this development. As of the 8 September 2021, following a site inspection by the HSA, the North Wall Generating Station site has been De-Notified as a Seveso Site.

A list of chemicals expected to be stored on site is provided in Section 3.2.12 Chemical Storage. The volumes of hazardous substances to be stored on site will be less than the requirements of the COMAH regulations.

16.4 Likely Significant Impacts of the Development

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 as appropriate.

Table 16.1: Likely Significant Adverse Effects

Source and / or Pathway / Receptor	Reasonable Worst-Case Consequence	Embedded 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	None. Given the nature of the proposals major accidents disasters are unlikely	Equipment raised above 0.1%AEP flood level.	No	Yes	Flood Risk is discussed in detail in Chapter 10 Surface Water, including Flood Risk
Fire					
Emergency generator plant	A generator fire resulting in emission of smoke and fumes	The site will be manned and a fire water storage tank of approximately 1250m^3 will be installed on site. Firefighting on site will predominately be carried out by manual fire suppression using the fire water hydrant network on site. Specific items of equipment will have gaseous fire suppressions, for example, the gas turbine enclosure.	No	Yes	No likely significant adverse effects.
The existing transformer could fuel a fire which could be started by an internal electrical fault in combination with failure of the electrical protection systems.	A transformer fire resulting in emission of smoke and fumes and rupture of a transformer tank with loss of oil into the containment bund below.	The transformer has a containment bund which will retain any leaking oil. Large stones within the bund will suppress fire in the case of leaked oil burning. 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	No	Yes	No likely significant adverse effects.

		emissions so have not been considered further. Should this event occur, any nearby sensitive receptors would be informed to take action such as closing their windows and remaining indoors until the fire is brought under control to further reduce the risk of adverse impacts.			
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.
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	No	Yes	No likely significant adverse effects. Loss of functionality to the proposed development only, no environmental impacts.
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 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	Roads and Traffic are discussed in Chapter 13

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
Tsunami / tidal wave					
A tsunami/tidal wave of sufficient intensity to inflict severe damage is unlikely	None. Major accident / disaster unlikely	Not applicable	Not applicable	Not applicable	No likely significant adverse effects
Biological hazard – epidemic, pandemic					
Apart from construction workers and maintenance staff the proposed development does not generate human interaction. The proposed development also does not generate interaction with animals. Construction phase activities will be carried out in accordance with Government guidelines	None. Major accident / disaster unlikely	Not applicable	Not applicable	Not applicable	No likely significant adverse effects
Malicious attacks/cyber-attack					
The proposed development will form part of Ireland's electrical transmission grid and could be subject to malicious physical or cyber-attacks.	Damage would likely be limited to disruption of the generator's ability to operate until the damage was repaired.	The site will be manned. The site is secured by high walls with security gates, remotely operated by security.	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 and, in some cases, above an existing oil plume on site.	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 hydrocarbons discussed in Chapter 9
Spillage or seepage of pollutants into watercourse/ground					
The proposed plant will operate on natural gas only. All chemicals and oils will be stored in suitably bunded areas and with weather protection. Mineral oil is contained within the existing transformer on site	Oil seepage into the ground which could lead to contamination of the soil and waterways.	The transformer bund is sized to collect the full volume of oil from the transformer. The bund is subject to annual integrity tests in line with the existing IE licence.	No	Yes	Surface Water is discussed in Chapter 10 Land, Soils and Hydrogeology is discussed in detail in Chapter 9.
As the cables are solid insulation type there are no sources of pollution and they will not offer a pathway to any receptors.	None. Major accident / disaster unlikely	Not applicable	Not applicable	Not applicable	Not applicable

17 Interaction Between the Topics

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 17.1 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 matrices is therefore to highlight key interactions that are recognised to be specific to this proposed development and warranting special consideration. In the matrices, 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

Interactions of Effects Between the Factors	Population and Human Health	Noise and Vibration	Air Quality and Climate	Land, Soils and Hydrogeology	Surface Water, including Flood Risk	Biodiversity	Archaeology and Cultural Heritage	Roads and Traffic	The Landscape	Material Assets
Population and Human Health										
Noise and Vibration										
Air Quality and Climate										
Land, Soils and Hydrogeology										
Surface Water, including Flood Risk										
Biodiversity										
Archaeology and Cultural Heritage										
Roads and Traffic										
The Landscape										
Material Assets										

Table 17.2: Interaction of effects

Interaction or Indirect Effect	Description
Population and Human Health and Noise and Vibration and Roads and Traffic	There is the potential for interactions between population and traffic and noise. This interaction has been discussed in Chapter 7 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
Population and Human Health and The Landscape	There is the potential for interactions between population and human health and the landscape. This was assessed in Chapter 14 with the assessment concluding that the proposed development will not give rise to significant landscape and visual impacts
Population and Human Health and Land, Soils and Hydrogeology	There is potential for interactions between population and human health and land, soils and hydrogeology and these have been assessed in chapter 9 of this EIAR With the implementation of the CEMP and the CRWMP, the conditions of the IE licence in addition to the mitigation embedded in the design detailed in Chapter 3 Description of the Development no significant adverse residual impacts are predicted
Population and Human Health and Surface Water and Flood Risk	Interactions between surface water and population and human health were considered in chapter 10 of this EIAR. There are no licenced surface water abstraction points within the vicinity of the site, and potable water is not sourced within the vicinity of the proposed development site The existing plant 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. The proposed development will not introduce additional discharges to surface waters and does not involve significant changes to the existing surface water drainage on site. As a consequence, the overall residual impact of the proposed development on surface waters during the operational phase is slight. With the implementation of the mitigation measures proposed the proposed development will not result in a change in status of any surface water WFD quality elements or prevent any surface water waterbodies from reaching good status in the future
Population and Human Health, Air Quality and Biodiversity	There is the potential for interactions between air quality and population and human health and designated ecological habitats. This interaction has been discussed in Section 8.5.2 of this EIAR and the effects are not likely to be significant.
Biodiversity, Noise, Air Quality, Land, Soils and Hydrogeology and Surface Water	Interactions could potentially occur between biodiversity, noise, air quality, land and soils and water. These interactions have been assessed in Chapter 11 in terms of construction noise, surface water runoff, operational noise, dust and air quality emissions and the effects are not likely to be significant.
Cultural Heritage	In the context of the proposed development, no interactions have been identified that are relevant to the assessment of the archaeological and cultural heritage resource
Material Assets and Roads and Traffic	Interactions with the roads and traffic assessment were taken into account in the assessment, refer to section 15.4 of this EIAR and the effects are Imperceptible

18 Summary of Mitigation and Monitoring 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. The 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 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
Chapters 3	
General	• The CEMP included in Appendix 3.1 of this EIAR 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. All construction activities, including construction traffic, will be managed through the site CEMP. • Foundations will be constructed above the water table to avoid impacts on groundwater . • A number of existing ground water monitoring wells will need to be relocated. New locations will be agreed with the EPA prior to construction but are expected to be located down gradient of the existing plume. • The excavation depth over the plume will be minimised to avoid encountering groundwater and contaminated material. • The requirements for excavation over the plume will be minimised. • The following measures will also be implemented: – The majority of the civil works are planned to take place in summer months. Where heavy rainfall is forecast during the civil works, or if the civil works extend into the Winter season, the following measures will be put in place to restrict rainwater seepage into the ground over the plume: – Minimise extent and duration of exposed excavation surfaces. – Cover/protect excavations with use of water-tight membranes together with use of pump sumps or equivalent where required. – Excavations to be blinded with concrete immediately following excavation together with use of pump sumps or equivalent. – Surface water runoff will be treated in accordance with Ciria C750 Groundwater Control – Design and Practice. – Site services (fuel gas, water supply, electrical cables, control and instrumentation cables will be positioned above ground level on pipe and cable racks. Plant infrastructure will be positioned away from the location of the plume. – The main foundations supporting plant and equipment will be designed so as to not extend below the ground water level on the site. The level of the top of the foundations will extend above the current level of the existing site to minimise the depth of exaction required. – A raft type / floating design of the main equipment foundations will avoid requirements for piling through the plume. This will limit excavation to 800mm. Surface water drainage network work will be designed to be above the ground water level. – Piling will be avoided in the area of the plume. • Where piling is required outside the area of the oil plume, it will be undertaken in accordance with the parameters assessed in this EIAR and in the NIS and in the CEMP. A Source-Pathway-Receptor hazard risk assessment will be undertaken in consideration of the extensive monitoring regime present on site. The pile type will be selected and installed by a specialist contractor and be considerate of current guidance such as Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention published by the UK Environment Agency National Groundwater and Contaminated Land Centre Report No. NC/99/73. The following will be incorporated into the detailed design: – Low vibration piling techniques. – Piling techniques which avoid the creation of preferential pathways. – Piling techniques which avoid pushing contaminated soil into uncontaminated soil. • On completion of construction, the site will comprise paved surfaces of similar area to existing, laid to falls above the ground water plume. Surface rainwater will be collected at low points by a series of gulleys or equivalent and be conveyed by a network of underground drainage pipes laid to shallow falls in accordance with with

Reference	Mitigation and / or Monitoring Measure
	Specification for Road Works Series 500 - Drainage and Service Ducts, CC-SPW-00500 March 2015, Transport Infrastructure Ireland, connecting into the existing site main drainage infrastructure. ● The Contractor will comply with the Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites and with the conditions detailed in the existing IE licence. ● Excavated soil, and piling arisings if any, will be tested on site prior to disposal off site or reuse on site. ● Excavation in the area over the contamination plume will be supervised by a qualified and experienced hydrogeologist/soil contamination expert and the Environmental Clerk of Works (EnCoW) throughout the period of such works. ● Existing ground water monitoring/treatment wells that may be affected by the works will be identified and amendments to the monitoring well network will be agreed with the EPA prior to commencement of works.
Chapter 6 Population and Human Health	
6.1	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, including due to traffic. 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.
Chapter 8 Air Quality and Climate	
8.1	● 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
8.2	● 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
8.3	● 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

Reference	Mitigation and / or Monitoring Measure
	– 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
8.4	● 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
8.5	● 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
8.6	● Measures specific to construction – Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process in which case ensure that appropriate additional controls measures are in place.
8.7	● 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 – Record all inspections of haul routes
8.8	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. In relation to operational impacts on climate change, regular maintenance checks to ensure that the gas turbines are operating according to calculated efficiency rates and best practice control measures will be implemented to mitigate against GHG emissions exceeding the intensity assessed.
Chapter 9 Land, Soils and Hydrogeology	
9.1	● All work will be carried out having regard to international and national legislation, and best practice guidance, including but not limited to guidance on preventing pollution from construction sites and pollution prevention guidance. ● The Construction Resource Waste Management Plan (CRWMP; part of the CEMP) will include identification and appropriate management and disposal of waste materials generated during the works.

Reference	Mitigation and / or Monitoring Measure
	● North Wall Generating Station (including the proposed development) will continue to comply with the conditions pertaining to Industrial Emissions Licence (P0579) from the Environmental Protection Agency. ● The only discharge to the ground during the operational phase of the proposed development will be uncontaminated stormwater (rainfall) run-off from the building roofs. All stormwater will be discharged to the surface water drainage system which connects to the Dublin Port drainage network on Alexandra Road which discharges to the Tolka Estuary to the north of the site (IEL monitoring point SW3) and to the River Liffey Estuary to the south of the site (IEL Monitoring point SW4). ● The only effluent discharging to the foul sewer will be from the toilets, and the emissions to sewer will comply with IEL Licence Condition 7 (emissions to sewer). ● Existing groundwater monitoring/treatment wells that may be affected by the works will be identified and amendments to the monitoring well network will be agreed with the EPA prior to commencement of works. ● All works in the area of the oil plume will be carried out within the parameters assessed in this EIAR and will be supervised by an appropriately experienced and qualified EnCoW. ● Piling will be avoided in the area of the plume as a raft type/floating design of the main equipment foundations will be used. ● 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; – All tanks and drums will be bunded in accordance with established best practice guidelines; and – Established best practices including preventative maintenance, routine monitoring and reporting of tanks and equipment integrity, as directed under the industrial emissions licensing process, will minimise the likelihood of leaks/spills occurring and ensure that any leaks are quickly detected and controlled.
Chapter 10 Surface Water, including Flood Risk	
10.1	● A full-time on-site Environmental Clerk of Works (EnCoW) will be appointed prior to commencement of works. ● Where works on other projects within the same ZoI 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; – 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.
10.2	During the operational phase the proposed development will continue to operate in accordance with the current limits for wastewater discharge regulated by the EPA under the IE licencing regime. The existing water quality monitoring programme will continue for surface water run-off. The parameters, thresholds and frequency, as set by the EPA, will be complied with.

Reference	Mitigation and / or Monitoring Measure
Chapter 11 Biodiversity	
10.1	● 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 to instruct the Contractor to stop works and to direct the carrying out of emergency mitigation / clean-up operations. The EnCoW will also manage consultation with key stakeholders as appropriate. The EnCoW will be responsible for carrying out regular monitoring of the Contractor's 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).
10.2	● In accordance with Section 40 of the Wildlife Acts, if required, the removal of the ornamental shrubs, which may be used as nesting sites by breeding birds, will be cleared outside of the birds nesting season (1st March to 31st August inclusive). ● During the construction works, the appointed Contractor, in order to comply with Regulations 49 and 50 of the European Communities (Birds and Natural Habitat) Regulations (2011), will ensure biosecurity measures are implemented throughout the construction phase to ensure that the introduction and translocation of invasive species are prevented.
10.3	● Good site practice as per the *CIRIA C741 Environmental good practice on site guide (fourth edition)* will be implemented during the construction phase at all times. ● All construction works will be carried out in accordance with a Construction Environmental Management Plan (CEMP) as described in Chapter 3: Description of the Development which will define measures to ensure that any contaminants resulting from the removal, dismantling, excavation, or construction will not enter the surface water. ● All pollution control measures will be designed, installed, and maintained in accordance with CIRIA guidance for 'Environmental Good Practice on Site' (C741) and 'Control of water pollution from construction sites. Guidance for Consultants and Contractors' (C532). 'Control of water pollution from linear construction projects. Technical guidance' (C648) and the IEL. ● The Contractor will be responsible for the construction of the equipment foundations, including the excavation and appropriate disposal of excavated material as well as the construction of the main equipment raft foundations and any piled foundations needed. The Main Contractor will be responsible for the management of excavated material and the safe disposal of this material to a suitably licenced waste disposal facility. In-situ concrete casting will be fully controlled to ensure that cement bound materials do not present any pollution risk. ● Trucks, mixers, and concrete pumps that have contained concrete will be washed out in a designated impermeable area to prevent pollution. Washout water will be stored and disposed of in line with the existing industrial emissions licence. ● 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; – 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.
10.4	● The proposed development will operate in accordance with the limits for wastewater discharge determined by the EPA under the IEL. ● The existing water quality monitoring programme will continue for surface water run-off. The parameters, thresholds and frequency are set by the EPA under the Industrial Emissions licensing regime and will be revised. Waste materials generated on site will be domestic such as paper and food waste from the personnel on site, non-hazardous waste such as clean metal and wood waste from delivery pallets and hazardous waste from waste oils and greases generated from the operation of the plant will be appropriately segregated and will be collected by suitably licenced waste contractors for disposal and in accordance with the existing IE licence.

Reference	Mitigation and / or Monitoring Measure
Chapter 12 Archaeology and Cultural Heritage	
12.1	• Archaeological monitoring will be carried out within the proposed development area for all sub-surface groundworks during the construction phase. • Archaeological monitoring will be carried out by a suitably qualified, competent archaeologist under license and in accordance with the provisions of the National Monuments Acts 1930-2004. • If significant archaeological material is encountered during the course of archaeological monitoring, then resolution of any such significant material will be determined in consultation with the National Monuments Service (DHLGH) and the Dublin City Archaeologist. • Where possible, every reasonable effort will be made to preserve in situ or reduce the effect on any identified archaeological material. Where preservation in situ cannot be achieved, either in whole or in part, then a programme of full archaeological excavation will be implemented to ensure the preservation by record of the portion of the site that will be directly effected upon. This work will be carried out by a suitably qualified archaeologist under license and in accordance with the provisions of the National Monuments Acts 1930-2004.
Chapter 13 Roads and Traffic	
13.1	• A traffic control person will be used to control traffic to and from the site, as required. • Sufficient and clearly displayed signage will be provided on both the western and eastern approaches to the site to provide warning to port traffic of the potential construction traffic entering and exiting the site. • Wheel cleaning facilities will be provided on site. • ESB will liaise with Dublin Port and Iarnród Eireann in relation to traffic movements e to ensure they do not coincide with the movement of rail freight on Alexandra Road. • HGV traffic will access the site using a pre-planned route entering and departing Dublin Port via Promenade Road.

19 References

19.1 Chapter 7

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www.dublinportachive.com – Brief history of Dublin Port.

19.5 Chapter 15

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Guidance on Waste Acceptance Criteria at Authorised Soil Recovery Facilities (EPA. 2020)

Waste Framework Directive 2008/98/EC

Waste Management Act 1996

Appendices

1. EIAR Competencies

Table 1.1: EIAR Competencies

Chapter	Chapter Heading	Competent Expert (Main Author/Peer Reviewer)
6	Population and Human Health	**Donna Hassett** (Mott MacDonald), Bsc. HDip, has over 22 years' experience carrying out environmental assessments. Donna manages statutory approval processes for large scale infrastructure developments in Ireland and internationally through consenting processes including EIA scoping and EIA screening, environmental constraints and route/site options analysis, EIARs and Planning and Environmental Considerations Reports (PECR). She also has a background in waste management and contaminated land assessment. Donna has prepared and peer reviewed numerous chapters of EIARs and has coordinated and delivered many environmental assessment reports and consent applications for transmission and power generation projects. Donna specialises in the environmental assessment and consenting of power generation and transmission projects having successfully delivered numerous consent applications for power generation projects including CCGT at Great Island in County Wexford, Endesa, OCGT / CCGT at Tarbert, County Kerry, Endesa, CCGT at Toomes, County Louth, Ireland, Quinn Power, Edenderry Power Plant, Co. Offaly, Bord na Mona, Midlands, Ireland, Clifton Pier Power Plant Redevelopment, Bahamas Electricity Board, Bahamas, Pembroke Power Station, BELCO, Bermuda, St Louis Power Plant in Mauritius. Donna also had a checking and peer review role on the recent successful application for an OCGT on the North Wall site.
7	Noise and Vibration	**Richard Perkins** (Technical Director – Acoustics, Mott MacDonald), BEng(Hons) Chartered Engineer, Honorary Fellow of the Institute of Acoustics has over 25 years' experience in multi-disciplinary acoustics, noise & vibration consultancy. He has been the lead Acoustician on many high-profile transportation, buildings, industrial noise and environmental projects in the UK and abroad. He is an experienced Expert Witness at Public Inquiries and Development Consent Order hearings and was from 2003-2012 a technical advisor to the UK Government on Environmental and Neighbourhood Noise. Richard is member of two standing committees of the British Standards Institution (EH1/3 Noise and MCE16 Gas Turbine Noise).
8	Air Quality and Climate	**James Brookes** (Mott MacDonald), BSc (Hons), MSc, is an environmental scientist with over 10 years of consultancy experience specialising in air quality. James is experienced in undertaking air quality assessments, utilising both monitoring and advanced detailed dispersion modelling techniques for projects including major highway development schemes, small and large scale power generation projects, strategic assessments, environmental permit applications, EIARs and international ESIAs. James has undertaken many air quality assessment for power generation projects both in Ireland and internationally, some of which include Belcamp Peaking Plant in Ireland, Huntstown Power Station Expansion in Ireland, Tilbury Energy From Waste in the UK, Stanley Power Station in The Falkland Islands, Fujairah F3 Independent Power Plant in the UAE and CHP5 in Mongolia. James also had a technical checking role on the recent successful application for an OCGT on the North Wall site. **Christopher Mills** is Mott MacDonald's Air Quality discipline lead. He has 13 years' experience undertaking and leading air quality assessments on major road infrastructure projects globally including in Ireland. He is a member of the Institute of Air Quality Management (MIAQM) and the Institute of Environmental Sciences (MIES) and he holds a degree in Environmental Science and a Masters in Air Pollution Management and Control. Recently, Christopher has been the technical lead for the air quality assessment of a number of major highway schemes in England and represented them at their respective Oral Hearings. Within Ireland, Chris has been the technical lead on a number of power projects, and is responsible for the production of relevant assessments for required EIA's and PPC Licence applications. **Alex Greenwood** is an MSc qualified Chartered Environmentalist specialising in carbon management and assessment, a Member of the Institute of Environmental Management & Assessment (IEMA) with over 12 years' environmental assessment experience. She has multi-sector

Chapter	Chapter Heading	Competent Expert (Main Author/Peer Reviewer)
		experience, including working on major transport and power sector projects. Alex has considerable experience of delivering and reviewing climate mitigation assessments, as well as in data management and assessment for carbon foot printing and managing carbon reduction.
9	Biodiversity	**Roger Macnaughton** (Principal Ecologist. Mott MacDonald). Roger is a qualified and experienced environmental consultant specialising in ecology. He has over eighteen year's professional experience in the environmental consultancy sector and an additional seven years of primarily research-based experience in freshwater and marine ecology. He specialises in the delivery of Ecological Impact Assessment (EcIA) and Appropriate Assessment (AA) for a broad range of projects potentially affecting; terrestrial, freshwater and marine ecology. His project related experience to date includes; two 400kV overhead lines, five 110kV overhead lines, overhead line up-rates, electricity substations, underground power cables, 35 terrestrial wind farms, two marine wind farms and five solar farms. **Elaine Bennett** (Principal Environmental Scientist), PhD, BSc, CEnv, C.WEM is a qualified and experienced ecologist and environmental scientist. She has over 15 years' experience in the consultancy sector. She has supported clients in providing environmental support for a wide variety of large-scale infrastructure, including wastewater treatment plants and pipelines, gas infrastructure, electrical infrastructure, wind farms and cables, solar farms, quarries and greenways. Elaine manages Environmental Impact Assessment Reports, Environmental Reports, Ecological Assessments and Appropriate Assessments (Screening and Natura Impact Statements). Elaine has prepared Ecological Impact Assessments for other power generation projects including CCGT at Great Island in County Wexford, Endesa and the OCGT / CCGT at Tarbert, County Kerry, Endesa.
10	Surface Water, including Flood Risk	**Donna Hassett** (as above) **Laurence Cload** (Flood risk engineer. Mott MacDonald) is a Chartered Civil Engineer with over 20 years' experience of managing and engineering small and multi-million pound coastal and river structures throughout the UK and overseas. Laurence is experienced in 1D and 2D hydraulic modelling and the application of model results to detailed design. Laurence has undertaken a number of flood risk studies throughout Ireland.
11	Land, Soils and Hydrogeology	**Jane Dottridge** (Mott MacDonald), BA MSc CGeol FGS, is a well known hydrogeologist with over 40 years' experience in water resources, groundwater, contaminated land and EIA. She has significant experience in contaminated land and its impact on groundwater, including site investigation, risk assessment and remediation, for a range of organic contaminants such as hydrocarbons and solvents, in United Kingdom, Europe and the United States. Jane manages and reviews geology and soils, land quality and water chapters of Environmental and Social Impact Assessments and Environmental Statements for international projects and major infrastructure projects, including Thames Tideway Tunnel, HS2, power generation and transmission and petrochemicals. She also provides advice on contamination and environmental issues for due diligence on site acquisitions and sales.
12	Archaeology and Cultural Heritage	**Faith Bailey** (Associate Director, IAC) BA, MA, MCIFA is a Senior Archaeologist and Cultural Heritage Consultant with IAC Ltd. She holds an MA in Cultural Landscape Management and a BA in single honours archaeology from the University of Wales, Lampeter. She is a licence eligible archaeologist and has over 13 years' experience working in commercial archaeology. Faith has been responsible for the production and delivery of a large number of archaeological and built heritage desk top assessments, EIA, master plans, LAP/SEA and management plan associated with all sectors of development in the Republic and Northern Ireland. EIA for large scale road schemes, include the M11 Enniscorthy Bypass in County Wexford and the N22 Ballyvourney-Macroom Bypass in County Cork. EIA assessment for large scale wind farms includes Derrysallagh in County Sligo and Evishagarren in County Derry.

Chapter	Chapter Heading	Competent Expert (Main Author/Peer Reviewer)
		Faith's in-depth knowledge of the planning systems and heritage legislation within both the Republic of Ireland and Northern Ireland, twinned with the excellent working relationship she has developed between our clients and statutory authorities makes her one of the most experienced archaeological and cultural heritage consultants currently operating within the sector.
13	Roads and Traffic	**John Dooley** (Mott MacDonald) (BA, FCILT, IEng MICE, MCIHT) is a Chartered professional and Projects Director for Mott MacDonald's Integrated Division, an experienced transportation planner/engineer and technical lecturer with more than 30 years' experience. John has led several high profile projects with responsibility for assessment of transport matters associated with power transmission lines, wind farms, power stations and associated infrastructure in the UK and overseas. He has provided dedicated traffic, transport and related advice for more than 50 power and energy projects internationally; covering a variety of aspects including principal author or peer reviewer roles with EIAR Chapters, ESIA Chapters, Road Safety Assessments, Construction Traffic Management Plans, Access & Logistics Studies and other measures to assist discharge of Planning Conditions. John has served at several public / legal hearings; including attendance at the Court of Session, Edinburgh as a lead transport witness, providing submission for the Public Inquiry covering Traffic and Transport and Access in support of the RWE Innogy Hemswell Wind Farm project and providing lead in-person evidence (representing Scottish Power Energy Networks) relating to traffic and transport at Extraordinary Council Committee Meeting held after South West Scotland Connections power transmission project was refused approval; the decision was subsequently overturned.
14	The Landscape	**Richard Barker** (Landscape and Visual Specialist, MacroWorks) MLA. PG Dip Forestry. BA Env. MILI has 22 years of experience working as a land use planner and Landscape Architect with the last 16 years specifically dedicated to landscape and visual impact assessment of commercial and infrastructure development projects. Much of Richard's experience relates to renewable energy having personally assessed over 100 wind energy projects and a similar number of solar projects. He also has a broad range of experience assessing other forms of water, road and electrical linear infrastructure projects many of which were classified as Strategic Infrastructure Development (SID). Consequently, Richard has presented expert witness evidence at more than a dozen An Bord Pleanála Oral Hearings.
15	Material Assets	**Donna Hassett** (as above)
16	Major Accidents and / or Disasters	**Patrick Nolan** [(ESB) Bachelor of Engineering; Diploma in Mech. Engineering, ACCA Diploma in Financial Management, Fellow, C Eng., Institution of Engineers Ireland (FIEI), Chartered Member, Institution of Mechanical Engineers (MIMechE), Eur. Ing. (FEAN.I)] is an experienced engineer with broad international experience and specialised expertise in the management and co-ordination of environmental aspects of projects in the electricity sector over 30 years. He has played a key role in the development of large scale power plants and other large development projects. His experience includes all aspects of project development and operation in the power sector including, project development; planning consent; integrated pollution prevention and control licensing; environmental impact assessment; due diligence; asset management and plant condition surveys. He has successfully led a number of EIA teams for a wide range of energy projects across the UK and overseas. He has extensive DCO experience in the UK. Patrick has worked on projects in a number of countries including Ireland, the UK, Spain, the Netherlands, Bulgaria, Romania, Italy, Nigeria, Oman and Rwanda.

2. Need for the Development

2.1 Supporting Documentation

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Líonraí Gáis Éireann | Gas Networks Ireland

4th June 2021

Ms. Aoife MacEvilly
Commission for Regulation of Utilities (CRU)
The Grain House
The Exchange
Belgard Square North
Tallaght
Dublin 24
D24 PXW0

Re: Transmission Gas Connections to the Electrical Power Generation Market

Dear Aoife,

I am writing to you further to our discussions on the significant level of enquiries received by Gas Networks Ireland (GNI) for connection to the gas transmission system to enable new electricity generation plant and the need for additional security of supply on the electricity system. GNI has also engaged with the Department of the Environment, Climate and Communications and Eirgrid to understand the potential consequences of delays in developing new power generation capacity.

GNI has had extensive engagement with potential electricity generation plant developers over the past three years and to-date has issued fourteen connection offers and a number of further offers pending further detail from the developers. Despite the high number of enquiries and the successful completion of the T-4 capacity auction by Eirgrid, all but one connection offer remains outstanding with developers reluctant to commit to a connection agreement at this time. The on-going delays with developers committing to a gas connection means the proposed timelines for the delivery of these projects can no longer be met and GNI is concerned that the security of electricity supply may be impacted as a result.

GNI has undertaken a detailed analysis of the optimum approach to resource the delivery of these projects, the proposed connection methodology, deep reinforcement requirements and potential for grouping projects that would share elements of their connection or deep reinforcement and has identified a number of locations where GNI could undertake advance work, including deep reinforcement, Above Ground Installation (AGI) upgrade and pipe laying with a low level of risk of non-recovery of capital invested and thus low level of risk to the gas customer.

The work GNI propose to undertake is broken into three categories;

Detailed Design
GNI propose to undertake the detailed design for up to sixteen connections over the coming 12 to 18 months. The detail design will allow GNI to determine if any long lead time components are required and prepare planning applications where necessary. Progressing

planning and long lead time component orders can have a significant impact on overall project timelines. The current estimate for completion of the detail design (excluding long lead time items) is **€9.1m**.

Deep Reinforcement
To date GNI has identified that some of the projects referred to above have a common requirement for deep reinforcement in areas of the GNI network. Specifically, three of the projects require deep reinforcement and upgrade requirements at the existing Abbotstown AGI. A further two projects require re-enforcement of the wider network within the Grangecastle area. GNI propose to progress these two re-enforcements in their entirety, while being cognisant of the expected future demand on Abbostown AGI arising from the impending T-3 auctions, at a total cost of **€11.8m**. This expenditure will occur over the next 24 to 30 months.

Material Procurement
The ordering of long lead time materials is a critical path item for each of the 16 projects which we are proposing to progress through detailed design. In particular, lead times for Pressure Reduction Skid (PRS) and pipe materials can be in excess of 12 months. We intend to place orders for these materials for those projects where the design is sufficiently advanced and there is a high confidence of a connection agreement being executed. As a further measure to minimise risk, we will endeavour to ensure that materials procured can be utilised on multiple projects. We expect the cumulative cost of this material procurement to be circa **€5.4m** which represents 25% of the overall projected cost of the PRS and pipe materials across the 16 projects. This expenditure is likely to be incurred in the next 12 months and materials ordered will be assigned to contracted customers on a first come first served basis and then reordered as necessary.

The cost of this work will ultimately be shared between the relevant connecting parties in line with the connections policy and while there is a risk of non-recovery due to projects not progressing, GNI believe this risk is low and outweighed by the security of electricity supply risk. The expenditure should not be considered as a single commitment, as outlined above it will be measured and gradual. Our intent is that the multiple investments will be dynamic enough to be changed to meet the changing landscape of the outcome of electricity auction processes.

Please do not hesitate to contact me if you require any further detail in order to consider our proposal.

Yours sincerely,

Denis O Sullivan
Managing Director
Gas Networks Ireland

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Commercial in Confidence

Ms. Karen Trant
Director of Energy Networks and Legal
The Commission for Regulation of Utilities
Belgard Square North
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By Email: ktrant@cru.ie

15th June 2021

Report to CRU in Accordance with Regulation 28(3) and 28(4) of S.I. 60/2005 and Associated Temporary Emergency Generation Requirements

Dear Karen

I am writing to you in respect of EirGrid's statutory security of supply obligations as set out in Regulation 28 of S.I. 60/2005, and your letter dated 5th May 2021 ref. D/21/10286 in relation to Winter Outlook 2021/22 and the CRU's request for proposed arrangements that will contribute to the resolution of system adequacy issues for Winter 2021/22. This letter is further to extensive engagement with the CRU on these matters.

Further to our responsibilities under Regulation 28 (3) of S.I. 60/2005 to report to the CRU on security of supply matters, we have prepared a report titled "Security of Supply Winter 2021/22". The report is attached to this letter and clearly sets out the scale of the electricity security of supply challenge that will be faced by Ireland this winter, given in particular the significant and unexpected failure of equipment at both the Huntstown and Whitegate generating stations and the associated timeframes and risk in relation to their return to service.

As outlined in our report, and in accordance with Regulation 28 (4), it is clear that security of supply is threatened, or is likely to be threatened, this winter. Our report clearly sets out the measures that EirGrid is implementing and the measures necessary to cover peak demand and deal with the shortfalls detailed within.

The specific necessary measure that EirGrid wishes to draw the Commission's attention to immediately is, the requirement for the delivery of c. 200MW of emergency additional generation by Winter 2021 that would be capable of providing the necessary services to the system. This type of emergency generation, which is mobile and temporary, can be deployed in a much shorter timeframe than traditional generation, assuming that the necessary statutory licensing and consents etc. can be dis-applied or fast tracked. The necessary decisions in this regard would have to be taken almost immediately if the temporary generation to mitigate and manage this emergency situation has any possibility of being available in time to provide the necessary services for this coming winter.

As you are aware, due to the immediacy of Winter 2021, EirGrid accordingly commenced a formal process of engagement with a number of generation developers that could potentially provide the necessary system services in this emergency context. We issued a request for proposal to a number of large conventional generation developers in Ireland to assess the feasibility of this measure. This was necessary as, given the urgency of the situation, it was not practicable in the time available to otherwise take the measures necessary to seek to secure security of supply. Two responses were received however following a technical review only one submission was suitable to proceed. This submission included up to 6 new 33MW emergency gas generating units on an existing north inner city Dublin generation site.

We have been advised as part of this engagement process that the cost of securing the temporary generation to provide the necessary services would be expected to be of the order of This cost range is based on additional generation of c. 200MW. The actual cost will depend on the amount actually sourced and delivered as well as a number of other factors. We have considered this likely cost against the pressing need to mitigate the serious and imminent risks outlined in our attached report. Deploying this emergency generation to provide the services as outlined would mitigate the considerable risk of material load shedding which would be present absent this measure for this winter period.

Any emergency load shedding would, of course, impact on customers. The cost of reducing this risk of load shedding equates to approximately €1.50 - €2.00 on a domestic customer bill, per month, over the next year. We believe that it is reasonable to assume the 'willingness to pay' amongst customers to secure their electricity supply and mitigate this risk would exceed this amount. The cost of securing this generation is also within the parameters which the Regulatory Authorities have already set in relation to the overall SEM design under the various market mechanisms to attract and reward marginal new generation. This means that customers may in any given year, under the existing approved Regulatory Authority parameters, have to fund marginal market outcomes to secure electricity supply that would give rise to costs significantly higher than that required to be funded under the arrangements as set out above.

The costs associated with these necessary measures would need to be recovered through Transmission Use of System ("TUoS") charges commencing 1 October 2021, consistent with the existing mechanism for the recovery of the costs associated with system services provision, and we seek confirmation that all costs and liabilities EirGrid would enter into by virtue of sourcing such temporary emergency generation would be recoverable by it. Without this EirGrid will not be in a position to proceed.

In accordance with our statutory obligations specifically Regulation 28 (4) of S.I. 60/2005, we have written this letter and provided the attached report to the CRU as we are in an emergency situation whereby there is a clear and likely threat to security of supply this winter. We request that the CRU considers the information provided in this letter and in our attached report in accordance with its statutory functions under Regulation 28 of S.I. 60/2005, and as a matter of urgency grants its approval to proceed in relation to taking such measures as it deems appropriate in the context of that Regulation.

Yours Sincerely

Sent by email and accordingly bears no signature

Bill Thompson
Group Head of Regulation

cc. Jim Gannon, Commissioner, CRU
Michael Mahon, Chief Infrastructure Officer, EirGrid plc.
Rodney Doyle, Chief Operations Officer, EirGrid plc.

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Minister Eamon Ryan TD
Department of the Environment, Climate & Communications
29-31 Adelaide Road
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16th June 2021 Our Ref: D/21/13893

Re: Request for consent under Article 28(10) of the European Communities (Internal Market in Electricity) Regulations (SI 60 of 2005) (the "Regulations").

Dear Minister,

We refer to the Regulations, and to our duties under Part 10 thereof with regard to security of supply of electricity. We also refer to our previous and ongoing discussions with your Department on the issue of security of supply.

The Commission for Regulation of Utilities (the "**CRU**") has, in accordance with those duties, been engaging with EirGrid in relation to security of supply and system adequacy concerns for Winter 2021/22. As a consequence, EirGrid has issued a letter and prepared a report titled "Security of Supply Winter 2021/22", both of which are enclosed with this letter as Appendix 1, in discharge of EirGrid's obligations under Regulation 28(3) and (4) to, inter alia, report on the monitoring of security of supply matters and where it is of the view that security of supply is threatened or is likely to be threatened, to advise the CRU of this and make recommendations to the CRU on measures necessary to cover peak demand and to deal with shortfalls.

In assessing the security of supply situation EirGrid has considered the adequacy of generation capacity, the state of the transmission network and whether it has sufficient ancillary, or system, services. Its analysis of the winter risk in relation to Winter 2021/22 has lead it to the following conclusions (as further described in the attached report):

- The significant risk posed by the Huntstown and Whitegate units not returning as scheduled or in advance of Winter 2021/22, presents a real possibility that load shedding may need to be called on to protect the power system this winter (2021/2022).

- In order to meet system security requirements there is an immediate need to source 200 MW of additional system reserve by means of temporary emergency generation capacity to meet the power system requirements.

- This will require regulatory and government support relating to funding mechanisms; statutory licensing, consents and other requirements; and media/public engagements.

- EirGrid is in the process of taking every action that it can to mitigate the risk and is working closely with the CRU, DECC and other stakeholders as outlined in its report.

Regulation 28(5) provides that the CRU shall take such measures as it considers necessary to protect security of supply. On the basis of the enclosed correspondence from EirGrid, the CRU is satisfied that, in accordance with Regulation 28(10), it has identified a likely and substantial risk to security of supply,

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described by EirGrid as an '*emergency situation'*, which is likely to emerge in Winter of 2021/22. In terms of the nature of the specific measures appropriate to address this situation, EirGrid has recommended the delivery of c. 200MW emergency additional generation by Winter 2021 that would be capable of providing the necessary services to the system. This type of emergency generation, which is mobile and temporary, can be deployed in a much shorter timeframe than traditional generation. However, it is important to note that it can only be deployed in this timeframe if the necessary statutory licensing and consents etc. can be dis-applied or fast tracked.

In considering whether, in the time available, it is practicable to use any other means to ensure security of supply, EirGrid has advised that it is not, as the necessary decisions to ensure the delivery of such generation would have to be taken almost immediately if the temporary generation to mitigate and manage this emergency situation has any possibility of being available in time to provide the necessary services for this coming winter.

Therefore, in light of the EriGrid report, we have concluded that it is not practicable in the time available to otherwise ensure the security of supply risk for Winter 2021/22 can be addressed. Consequently, and as is set out in our request for consent below, we are proposing that EirGrid be directed to secure the delivery of such temporary urgent emergency generation units for the purposes of the provision of system services, including reserve.

As you are aware, due to the immediacy of Winter 2021, EirGrid commenced, through the issuance of a request for proposal, a process of engagement with a number of large conventional generation developers that could potentially provide the necessary system services in this emergency context, as further detailed in their letter and report. Two responses were received, and from a technical review EirGrid has assessed one submission as being suitable to proceed. That submission includes up to 6 new gas generating units on an existing North Inner City Dublin generation site. We will review and approve the final arrangements to be entered into by EirGrid.

We have been advised as part of this engagement process that the cost of securing this generation would be expected to be in the order of This cost range is based on additional generation of 200MW and the final cost will depend on the amount actually sourced and delivered as well as a number of other factors. Those costs, when settled, are anticipated to be recovered through the Transmission Use of System ("TUoS") charges, in respect of the period commencing 1 October 2021, consistent with the current methodology for the recovery of costs associated with system services. We have considered this likely cost against the pressing need to mitigate the serious and imminent risks outlined in the EirGrid report.

Therefore, in accordance with and for the purposes of discharging our statutory obligations under Regulation 28(10), and given that (for the reasons set out above) it is not practicable in the time available to otherwise ensure security of supply, we hereby apply for the consent of the Minister to allow CRU to direct EirGrid, in its capacity as the transmission system operator, to secure the delivery of c. 200MW of emergency additional generation for the purposes of the provision of system services, including reserve. Should you issue your consent, we will work with your Department and EirGrid, and relevant key stakeholders as appropriate, on the practical steps to secure the additional emergency generation, including the dis-application and / or fast-tracking of environmental and other consents and requirements.

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We have included at Appendix 2 hereto a draft form of consent letter for your consideration.

Yours sincerely

Aoife MacEvilly
Chairperson

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APPENDIX 1

EIRGRID INFORMATION

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APPENDIX 2

Commission for Regulation of Utilities
The Exchange
Belgard Square North
Tallaght
Dublin 24

[•] June 2021

Re: Request for consent under Article 28(10) of the European Communities (Internal Market in Electricity) Regulations (SI 60 of 2005) (the "Regulations").

Dear Commissioners**,**

We refer to your letter dated 15 June 2021 requesting consent pursuant to Article 28(10) of the Regulations to issue a direction to EirGrid, in its capacity as the transmission system operator ("**TSO**").

In light of the likely and substantial risk of an electricity security of supply emergency in respect of which it is not practicable in the time available to otherwise ensure security of supply, as evidenced by the information prepared by the TSO which was provided at Appendix 1 to your letter, the Minister for the Environment, Climate and Communications hereby grants consent to the Commission for Regulation of Utilities direct the TSO to procure the delivery of c. 200MW of emergency additional generation for the purposes of the provision of system services, including reserve.

Your sincerely

____
For and on behalf of
the Minister for the Environment, Climate and Communications

An Roinn Comhshaoil,
Aeráide agus Cumarsáide
Department of the Environment,
Climate and Communications

Ms. Aoife MacEvilly,
Chairperson
The Commission for Regulation of Utilities
The Grain House
The Exchange
Belgard Square North
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Dublin 24
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23rd June, 2021

Re: Request for consent under Article 28(10) of the European Communities (Internal Market in Electricity) Regulations (SI 60 of 2005) (the "Regulations")

Dear Chairperson,

Ensuring a continued secure supply of electricity is vital for the proper functioning of society and the economy. It is also necessary to ensure people and businesses have confidence in switching to electrified solutions such as heat pumps and electric vehicles, which are core elements of the Government's Climate Action Plan.

In this context, the position Ireland now finds itself in – set out in your letter of 16 June as there being a "likely and substantial risk to security of supply" – is deeply concerning.

The Commission for Regulation of Utilities (CRU) has, under Regulation 28(1) of S.I. 60 of 2005, the duty of monitoring the security of supply of electricity, and further under Regulation 28(5) the CRU shall take such measures it considers necessary to protect security of supply. Given the CRU's statutory responsibility in this area, I believe it is incumbent on the CRU to consider how such a situation has arisen and how you will ensure it does not occur again in future.

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

The use of Regulation 28 (10) is on the basis that it is “not practicable in the time available otherwise to ensure security of supply” such as provided for in Regulation 28(6). In its letter to the CRU of 15 June, EirGrid set out the existence of “an emergency situation whereby there is a clear and likely threat to security of supply this winter”. This letter was accompanied by a report prepared by EirGrid entitled “Security of Supply Winter 2021/22”. This was submitted in fulfilment of EirGrid’s specific responsibilities under Regulation 28 of S.I. 60 of 2005 which includes to report and advise on security of supply matters.

In its letter to the CRU, EirGrid identified the need for “the delivery of c.200MW of emergency additional generation by Winter 2021”.

In your letter to me of 16 June, it is stated that the CRU is satisfied that, in accordance with Regulation 28(10), you have identified a likely and substantial risk to security of supply, which is likely to emerge in Winter of 2021/22. This letter also set out that, in light of the EirGrid report, it is not practicable in the time available to otherwise ensure the security of supply risk for Winter 2021/22 can be addressed, again in line with the requirements of 28 (10), and as a result, the CRU, pursuant to Regulation 28(10) seeks my consent to direct EirGrid, as transmission system operator, to secure the delivery of circa 200MW of emergency additional generation for the purposes of the provision of system services, including reserve.

I accept that the CRU has identified a likely and substantial risk to security of supply and that it is not practicable in the time available otherwise to ensure security of supply, in line with the requirements of Regulation 28(10). I note your conclusions in this regard on the basis of your assessment of the report and letter from EirGrid, that you are satisfied there is a likely and substantial risk to security of supply, which is likely to emerge in Winter 2021/22 and that it is not practicable, in the time available, to otherwise ensure security of supply other than by direction to EirGrid.

On that basis, I therefore consent to the CRU to direct EirGrid to secure the delivery of circa 200 MW of emergency additional generation as identified in your letter. Noting that the cost of securing the necessary services is expected to be in the order of [redacted] and that these costs will be recovered through Transmission Use of System Charges, the provision of this consent is subject to the CRU ensuring that securing the delivery of the emergency additional generation for system services is carried out in compliance with State Aid rules. Supporting analysis will be required in this regard in advance of the commencement of any required development.

I understand that EirGrid have commenced the procurement of the emergency generation and I expect that they will, at the direction of the CRU and with my consent provided above, contract with the generation developer whose submission has been identified as suitable to proceed to provide the emergency generation. I understand the emergency generation will total circa 200 megawatts and be located at North Wall in Dublin city.

I understand that, in order for this generation to be provided for the coming winter, it is considered necessary that I would make an Order under Section 181(2)(a) of the Planning and Development Act 2000 (as amended) in respect of the proposed development. Prior to making such an Order, an application is required to be made to An Bord Pleanála for approval of the proposed development under Section 181(2A) of the Act, so that the Board can carry out any required environment impact assessment and/or appropriate assessment in respect of the proposed development. I expect the CRU, EirGrid and the developer to provide the necessary documents and assistance to my Department in preparing this application. Separately, I am notifying An Bord Pleanála of my intention to make such an application.

In parallel with the request pursuant to Regulation 28(10) to provide emergency generation, I acknowledge that the CRU and EirGrid are engaged in a range of measures to mitigate the risks to security of supply.

In its report, EirGrid noted a number of these measures such as improvement of the performance of existing conventional generators and engagements with demand side units to improve their performance.

It is important that the CRU also consider why the current electricity market structure and the regulatory measures in place are not delivering the required level of new generation capacity necessary to ensure security of supply in Ireland and thus support the Government's emission reduction targets. It would seem appropriate that the CRU would review and evaluate the performance of the market and the regulatory measures in place and consider if changes to the market and/or additional measures are required.

My officials will continue to work closely with the CRU and EirGrid to ensure security of electricity supply in Ireland.

Yours sincerely,

Eamon Ryan

Eamon Ryan, T.D.
Minister for the Environment, Climate and Communications

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1st July 2021 Ref: D/21/15245

Re: Direction to GNI re gas fired generators seeking connection to the Transmission Gas Network

Dear Denis,

Thank you for your letter dated 4th June regarding the volume of connection enquiries from gas fired generators seeking connection to the gas network. Over the coming years, it is clear that further generation capacity will be required to meet increasing electricity demand and ensure that capacity is available at times of peak demand and when renewable generation is low. We are of the view that gas and the gas network will continue to provide a key supporting role in the move to a decarbonised economy. Gas fired power generation will play an important role in meeting growing electricity demand and new gas fired generators will need to be connected to the gas network in a timely fashion. We appreciate your very constructive proposal in light of the security of supply concerns that will be faced if there are delays to the delivery of this new generation capacity.

The CRU notes the increasing role of gas fired generation in the All–Island Generation Capacity statement and recent T-4 auction results, which should see the capacity of gas fired generation increase to 3.4 GW by the gas year 2024/ 25. Delivery of new gas fired power generation will be important to ensure security of electricity supply. This issue is more critical when we look at the supply deficit the electricity system will face in the coming years. Generation capacity must be available over that period of time and it appears that gas fired generation, if connected in timely manner, can help avoid serious and significant supply issues for the electricity system, unless addressed by new generation coming into the market.

We note the high volume of connection enquiries (16 applications) you have received from generators and the concerns you have in relation to connection timelines and its impact on security of electricity supply. We note that your concerns are linked to the time it is taking for connection agreements to be signed by generators and its impact on when the gas connection can be delivered by (delays in one generally leads to delays in the other). I would like to thank you for proactively raising this issue with us and your proactive efforts to identify the impacts of such delays and potential solutions to them.

The CRU has reviewed your proposal, designed by you to mitigate the risk of delay in connecting these gas fired generators while minimising any financial risks on the gas customer. The proposal sees GNI carrying out detailed design work, deep reinforcement and

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material procurement earlier than normal; before contractual obligations are in place with the generator. The estimated costs for these activities are given as:

Detailed design – €9.1 million
Deep reinforcement - €11.8 million
Material Procurement - €5.4 million

In the event that generators progress with their connection, none of the above costs will be placed on the general gas customers. Rather, they will be charged to the generators in line with the current gas connection policy. However, if a generator does not progress, there may be a shortfall the gas customer would be left to pay. In order to mitigate this risk, the CRU notes that your proposal seeks to commit spend at appropriate times and is proposing to progress with works that would benefit multiple projects. For example, it will:

- target deep reinforcements that benefit more than one project
- seek to procure materials that could be used in other projects, and
- only commence material procurement when "*there is a high confidence of a connection agreement being executed*"

The CRU also notes that the proposal is based on detailed analysis demonstrating "*a low level of non-recovery of capital invested and thus low level of risk to the gas customer*". The CRU has carefully considered the risk on the gas customer against the benefit of connecting gas generators sooner to assist in mitigating the increasing risk of security of supply issues. The CRU agrees that your proposal places a relatively low risk of additional costs on the gas customer while providing practical benefits to assist in maintaining a secure energy supply for all customers.

On balance, the CRU considers that the benefits to customers outweigh the risks and supports the measures being pursued in ensuring that the gas network continues to support electricity security of supply. As such, the CRU hereby directs GNI, under Section 19A of the Gas (Interim)(Regulation) Act 2002, to implement the proposals as outlined in your letter of 4th June and to monitor their effectiveness. The CRU will assess the most appropriate way to recoup any shortfall in costs during the PC5 decision making process.

Once again, thank you for your engagement on this matter and should you have any additional queries, please do not hesitate to contact me.

Kind regards,

Aoife MacEvilly

____
Aoife MacEvilly
Chairperson

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2nd July 2021 Ref: D/21/15418

Re: Direction pursuant to Article 28(10) of the European Communities (Internal Market in Electricity) Regulations (SI 60 of 2005) (the Regulations)

Dear Mark,

We refer to your letter dated 15 June 2021 in which you provided evidence of a likely and substantial risk of an electricity security of supply emergency which is likely to emerge in the winter of 2021/22.

Having considered and on the basis of the evidence provided by you, the Commission for Regulation of Utilities (CRU) has identified a likely and substantial risk of a security of supply emergency in respect of which it is not practicable in the time available to otherwise ensure security of supply. Accordingly, the CRU applied to the Minister for the Environment, Climate and Communications under Article 28(10) of the Regulations for consent to direct you to secure the delivery of emergency additional generation for the purposes of the provision of system services. By letter dated 23 June 2021, the CRU received the consent of the Minister to issue such direction to you.

Accordingly, pursuant to Article 28(10) of the Regulations, we hereby direct you to secure the delivery of circa 200MW of emergency additional generation capacity, as identified in your letter and report of 15 June 2021. You are further directed, prior to the commencement of any required development, to provide to the CRU, for its approval in advance, the terms and conditions applicable to the contract for the delivery of the additional capacity, together with satisfactory supporting analysis which addresses whether and the extent to which the securing of this generation may have an impact on the CRM and/or the Wholesale Market and addresses any relevant State aid issues or concerns.

The costs which may arise to EirGrid in its fulfillment of this direction may be recovered through the Transmission Use of System (TUoS) charges, for which the CRU will make the necessary provision.

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Yours Sincerely,

Aoife MacEvilly

____

Aoife MacEvilly,
Chairperson

Encl. Letter from Minister Eamon Ryan dated 23 June 2021

3. Description of the Proposed Development

3.1 Construction Phase Management Plan

Construction Environmental Management Plan

North Wall Emergency Power Generation Plant

April 2022

Contents

Tables

Figures

1 Introduction

1.1 Overview of the Proposed Development

The Electricity Supply Board (ESB) is proposing to install an emergency power plant within the existing North Wall Generating Station. The proposed emergency power plant will be operational for a period of up to five years from early 2023 to late 2027.

The proposed works will consist of the demolition of a number of buildings and plant within the existing site and installation of a temporary modular emergency power plant comprising six turbines (General Electric LM2500Xpress units). Modifications will also be required to the existing site drainage system.

The emergency generating plant will operate up to 500 hours per annum on natural gas only, typically four hours per day when called on to run.

Natural gas will be provided by the existing gas compound on site. The Gas Networks Ireland Above Ground Installation (AGI) is located in the Northwest corner of the site. On-site gas compression will be provided to meet the inlet pressures required by the gas turbines.

Each emergency generating unit will be connected to the existing on site 220kV transformer by means of cables running on elevated pipe/cable racks. The 220kV transformer is connected to the national grid through the existing on-site 220kV Substation. No changes to the gas and electricity transmission infrastructure will be required to facilitate the proposed development.

The North Wall Generating Station site operates, and will continue to operate, under the existing Industrial Emissions (IE) licence (Registration Number: P0579). regulated by the Environmental Protection Agency (EPA). At the time of writing this report, ESB was in the process of preparing a Technical Amendment to IE licence P0579 to allow for the proposed development.

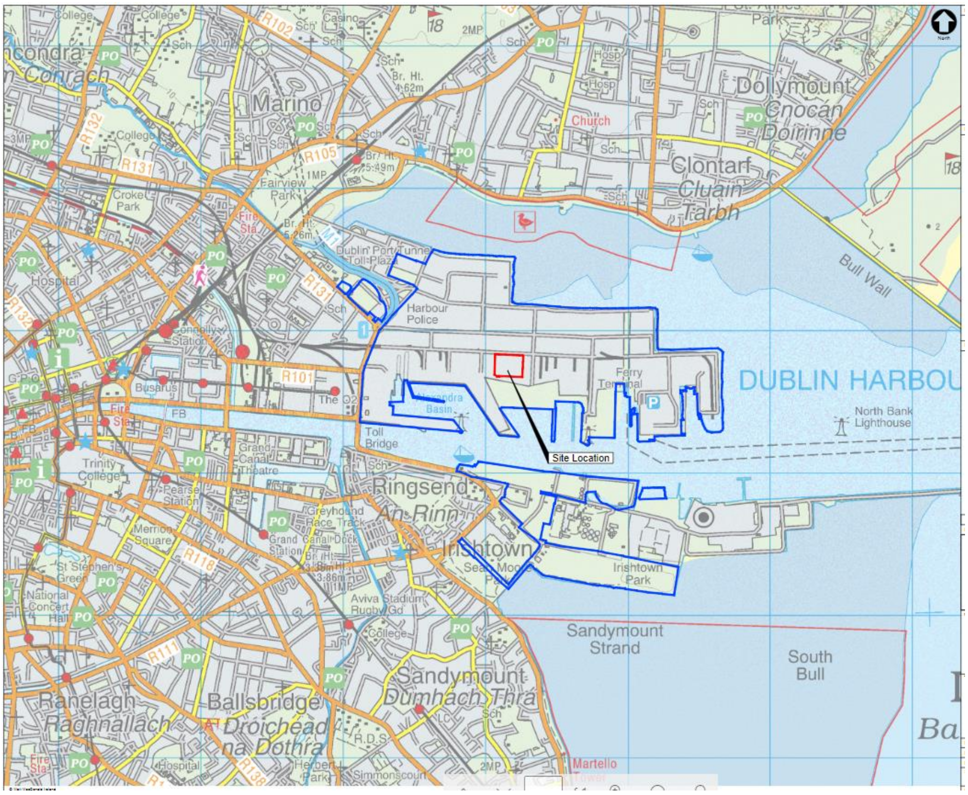
Figure 1.1 presents an image of the proposed emergency gas turbine plant. Figure 1.2 illustrates the proposed development's geographical location within its wider industrial setting in Dublin Port. Figure 1.3 presents a 2019 drone image of the site, looking south towards the River Liffey Estuary.

Chapter 3 *Proposed Activities* describes the proposed construction phase activities.

Figure 1.1: LM2500Xpress Gas Turbine Generator

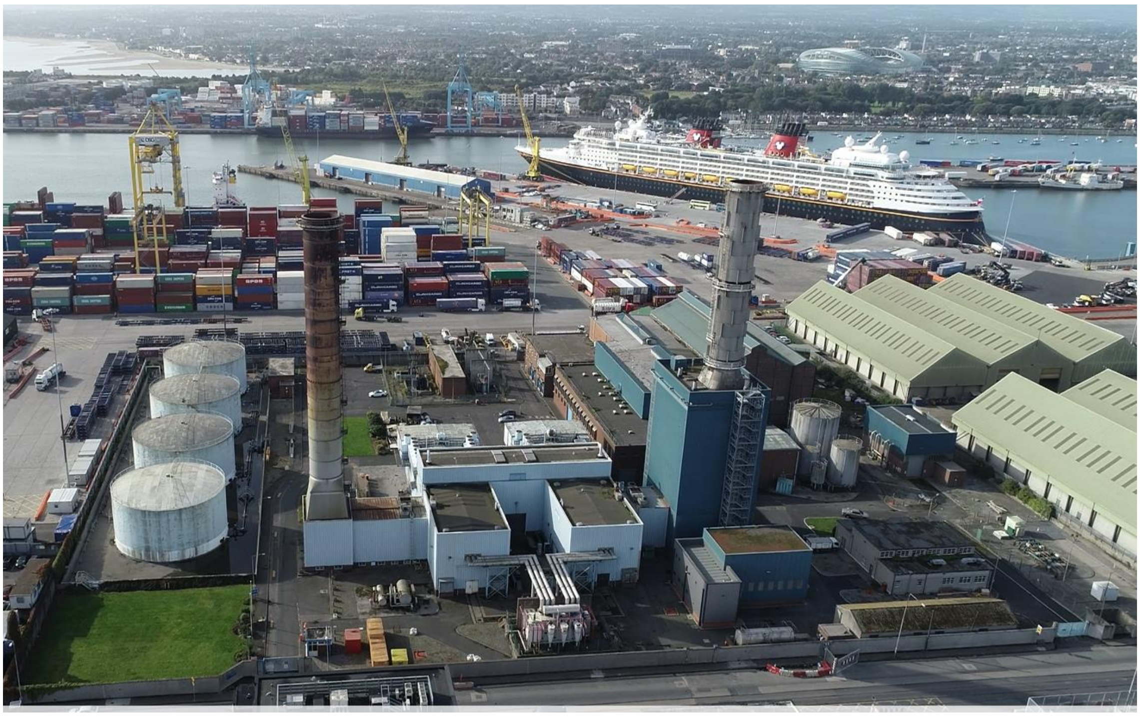
Source: GE

Figure 1.2: Site Location



Source: Mott MacDonald (©Ordnance Survey Ireland/Government of Ireland. Ordnance Survey Ireland Licence No. EN0034520)

Figure 1.3: North Wall Power Station looking south towards the River Liffey Estuary



Source: ESB Drone image 2019

1.2 Purpose of this CEMP

The purpose of this Construction Environmental Management Plan (CEMP) is to document and describe the main activities that will be undertaken to facilitate the proposed development and to provide a framework of environmental protection measures that will be implemented prior to commencement of, and throughout the duration of, the proposed works. This document will be further developed by the appointed Contractor, within the parameters assessed in the application particulars, taking into account any conditions of the statutory Approval (which, it is anticipated, will include a requirement for agreement of the content of this CEMP with the relevant planning authority – Dublin City Council). This CEMP will remain a 'live' document which will be reviewed regularly and revised as necessary and appropriate.

The works will be undertaken by Contractors engaged by ESB. This CEMP will be provided to the appointed Contractor prior to the commencement of works, and will be further developed by the appointed Contractor. The appointed Contractor will be required to obtain approval of any updated CEMP by ESB prior to commencement of any works.

The Contractor's updated CEMP will set out the approach and methodology which the Contractor will follow in scheduling and undertaking the work and will incorporate the control (mitigation) measures detailed in this version of the CEMP in addition to any relevant planning conditions, the measures provided in the Natura Impact Statement (NIS) and the Environmental Impact Assessment Report (EIAR) and any commitments given by ESB in relation to environmental protection associated with the activities described in this version.

The primary objective of the CEMP is to safeguard the environment, site personnel and nearby receptors from site activity which may cause harm or nuisance. As such, the CEMP sets out a project framework to ensure that key mitigation measures 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.

A contractual obligation will be included within the tendering processes and implemented on appointment of the Contractor to ensure that the proposed works are developed in compliance with the requirements of the CEMP, EIAR and NIS and relevant planning conditions which will take precedence over this current version of the CEMP in the event of conflicting information.

ESB will monitor the contractor(s) performance on a regular basis and will undertake the following compliance checks throughout the duration of the construction period:

- Review contractor documents against the requirements of the 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.

1.3 Structure of this CEMP

The structure of this CEMP is set out below.

- Chapter 1 describes the purpose of this CEMP.
- Chapter 2 describes the roles and responsibilities of the construction phase team.
- Chapter 3 describes the proposed construction activities.
- Chapter 4 describes the control measures that will be implemented.
- Chapter 5 includes an Environmental Incident Management Plan.
- Chapter 6 describes the training and auditing protocols that will be implemented.
- Chapter 7 describes the communications and procedure for complaints.

Appendix A includes a Construction Resource Waste Management Plan

2 Roles and Responsibilities

2.1 About the ESB

The Electricity Supply Board (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. ESB will procure and oversee the engineering, design, installation and commissioning of the equipment and ensure that the Emergency Power Generation Plant meets all the legislations, regulations, licences, standards and codes applicable to allow for flexible, safe and reliable operation.

2.2 About EirGrid

EirGrid is the state-owned independent Transmission System Operator (TSO) and developer of Ireland's national high voltage electricity grid (also called the "Transmission System"). The European Communities (Internal Market in Electricity) Regulations 2000 (SI 445 of 2000) sets out the role and responsibilities of the TSO in particular Article 8(1) (a) gives EirGrid, as TSO, the exclusive function:

"To operate and ensure the maintenance of and, if necessary, develop a safe, secure, reliable, economical, and efficient electricity transmission system, and to explore and develop opportunities for interconnection of its system with other systems, in all cases with a view to ensuring that all reasonable demands for electricity are met *having due regard for the environment*."

EirGrid has contracted ESB to install the Emergency Generating Plant at North Wall Generating Station to meet an expected shortfall in generation capacity (Ref: EirGrid ENQEIR778).

2.3 Land Ownership

Dublin Port Company (DPC) are the freehold owners of the North Wall Generating Station site; ESB has operated a power station at North Wall since the late 1940's from which time ESB has been the leaseholders of the site. ESB and DPC are in the process of negotiating a new long-term lease, which will commence directly following the expiry of the current lease at the end 2023. The continuing use of the site for electricity generation is reflected in the inclusion of the site within the Dublin Port 2040 Masterplan which allocates the site as a power generating site.

This CEMP identifies the key roles for the construction works.

An organogram of the Design Team is provided in Figure 1.1 *Overview of the Design Team*. The following sections provide further detail on roles and responsibilities. The contractor will update this CEMP and will set out detailed roles and responsibilities (including named individuals) and an organogram of the team structure.

2.4 Employer

ESB is the Employer and has the following responsibilities:

- Manages the process towards construction including liaison with stakeholders.
- Undertakes a Client Engineering function, including inspections, to ensure that detailed designs, plant, materials and works including scheduling meet the requirements of outline designs and the proposal requirements.
- Employ an independent Environmental Clerk of Works (EnCoW) to assess the construction of the Proposed Development, and advise the Contractor on the implementation of the agreed Contractors CEMP.

2.5 Contractor

A Contractor will be appointed following a tendering process and will be responsible for the Health and Safety of site workers, for the implementation of all mitigation as set out in Table 4.1 and the completion of the works to the satisfaction of the Employer.

2.6 Project Supervisor Design Process / Project Supervisor Construction Stage

- ESB will be appointed PSDP for the initial design phase of this project.
- Upon their appointment the specialist Demolition Contractor will be appointed to the role of PSDP and will take on the role of PSCS as the demolition works move to their execution phase.
- Following completion of the demolition works on site, the Main Contractor will be appointed to the role of PSDP and PSCS for the installation, commissioning and testing of all equipment including the gas turbines.

2.7 Site Manager

The Site Manager will be responsible for the day to day running of the site and will direct and oversee the activities of the Contractor and subcontractors throughout the works. The Site Manager will be responsible for programming of the works, will consult regularly with the Employer and will maintain site safety.

2.8 Environmental Clerk of Works

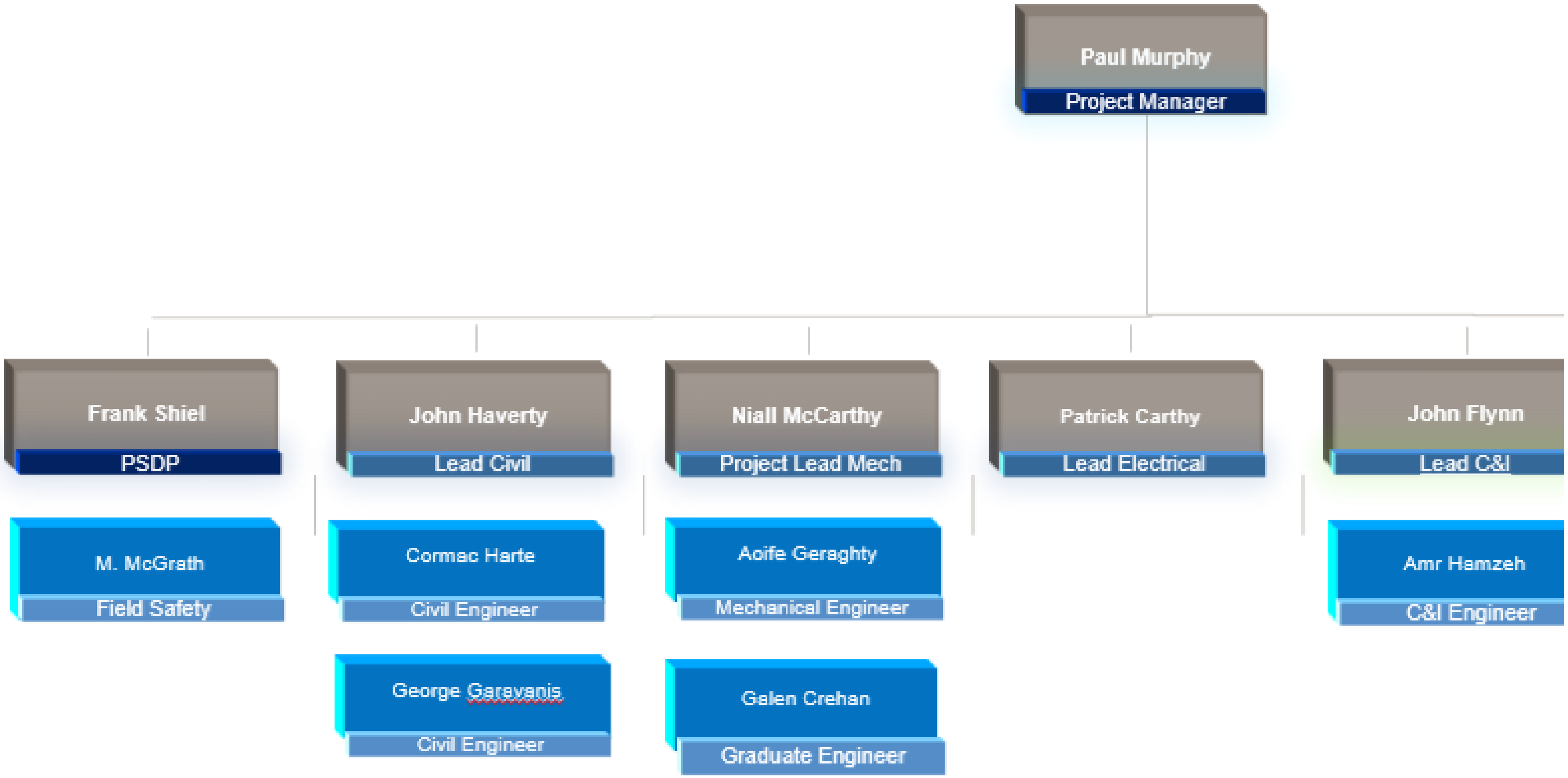
The EnCoW will have suitable environmental qualifications and the necessary experience and knowledge appropriate to the role. The Contractor's EnCoW will be delegated sufficient powers under the construction contract so that they will be able to instruct the Contractor to stop works and to direct the carrying out of emergency mitigation / clean-up operations.

The EnCoW will be responsible for carrying out regular monitoring of the Contractors CEMP, and will report monitoring findings as required.

2.9 Resource Manager

A Resource Manager will be appointed by the Contractor and will be responsible for all aspects of waste management at the different stages of the proposed development, and overall implementation of the CRWMP (included in Appendix B of this CEMP) and associated procedures.

Figure 2.1: Overview of the Design Team



Source: ESB

3 Proposed Activities

3.1 Construction Phase Activities

The following sections provide a description of the construction phase activities, which will be carried out in three phases, as detailed in Table 3.1.

3.1.1 Construction Phase Description and Duration

The total number of construction staff on-site will vary during the construction phase of the works but are expected to peak at approximately 100 persons.

Normal working hours for external site activities during the construction period are expected to be Monday to Friday 07:00 to 19:00 hours and 08.00 to 17.00 on Saturday. During certain stages of the construction phase, it is expected that some work will have to be carried out outside of normal working hours however this will be kept to a minimum.

Construction activities will gradually phase from pre-construction site preparation and removal of redundant structures to predominantly construction and modular assembly works followed by commissioning and testing of the proposed power plant and equipment.

The construction phase of the project is expected to commence in Q2 / Q3 2022 and last for approximately 15 months. Table 3.3 provides an outline schedule of the proposed activities.

Table 3.1: Construction Schedule

Phase	Timeline
1. Pre-construction works	Two months
2. Demolition works	Two months
3. Plant construction works	Eleven months (six months civil works and five months installation works)
Total	**15 months**

The demolition works and plant construction works will be carried out by separate contractors. This approach has been adopted to ensure that a contractor with the appropriate competency and experience is carrying out the relevant construction phase.

All waste arisings will be managed in accordance with the Waste Management Act 1996, and associated regulations.

3.1.2 Pre-construction Works

The pre-construction phase of development includes preparatory works and consultation with statutory bodies [Health and Safety Authority (HSA), EPA etc] and the public as required. Following this process, site clearance activities will commence. Typical activities will include preparation of the construction working area, laydown area and site clearance as required. During this period the structural assessments of any buildings proposed for demolition will be undertaken to determine demolition method and sequencing.

The site has been in use for electricity generation since the late 1940's and its history of use is well known and documented. A number of areas of the site will require excavation for construction purposes. In addition to the previous studies carried out and the assessment presented in this EIAR, soil in these areas will be tested in advance of or during the construction phase to identify the appropriate waste classification which will determine the appropriate route for disposal.

3.1.2.1 Demolition Works

The proposed foundations for the temporary generation plant will generally be constructed to finish above the existing ground levels on site. Where existing substructures or foundations are encountered, these will be removed where necessary. It is expected that the maximum depth of any new foundation inclusive of stone capping layers will be 800mm. Below ground services in conflict with the new foundations will also be removed as required.

Where openings are created in buildings by the removal of equipment or part of the building during the alterations works, recycled similar finish materials from the site will be used to close the openings where possible. This will help reduce the waste generated by the works while ensuring the finish to buildings matches with the current finishes. Where recycled material cannot be used new materials will be sourced to match the existing finishes.

The equipment and structures identified in Drawing No 229101053-MMD-00-XX-DR-C-0010 will be removed by a specialist contractor prior to the construction phase.

The general methodology of removal will be by mechanical dismantling that will bring all structures and equipment to ground level/grade in a progressive manner using a top-down approach. All buildings will go through a structural appraisal process prior to dismantling works commencing, to ensure the proposed demolition sequence maintains the stability of the remaining buildings and unplanned collapse is prevented. All open spaces/voids created as part of the removal process will be backfilled with suitable materials to the surrounding grade levels.

Prior to general removal works all hazardous materials will be identified and will be removed by specialist contractors in advance of the general dismantling and demolition works.

Services to the buildings and structures will be isolated and physically disconnected. Any remaining chemicals will be removed, and tanks/vessels will be decontaminated to reduce the residual risk to as low as reasonably practicable.

Further detail on specific equipment and structures is provided in Table 3.2 overleaf.

Table 3.2: Equipment and structures to be removed

Equipment / Structure to be Removed	Details
Gas Compressor Building	The building is constructed on a concrete foundation with an internal precast concrete frame and a mixture of brick and corrugated cladding for the lower and upper parts of each elevation. The lower part of the building is of cavity wall construction with a blockwork inner leaf. The roof consists of a steel frame with purlins and roof bracing. The roof is finished with profiled with steel cladding. The structure is roughly 204m^2 measuring approximately 17m long x 12m high x 12m wide. The building together with redundant plant, equipment and piping will be demolished to slab level. Existing foundations, ground slab and below ground services in conflict with the new foundations will also be demolished as required. There is a switch room to the North of the building, that will also be demolished to ground level. The switch room houses the electrical switch gear for the compressors and is constructed from brick with a block inner leaf and a concrete roof.
38kV Substation	The 38kV substation is located to the south of the main car park and must be removed in its entirety to facilitate the installation of the temporary gas turbines. The 38kV substation building is approximately 29m long x 6m wide x 5m high and covers approximately 174m^2. It is a free-standing single-story building of cavity wall construction (brick outer leaf with concrete block inner leaf) accessible from ground level The building contains a concrete slab (which is believed to be ground bearing) with the floor coated with an epoxy paint. All equipment internal to the 38kV building has previously been removed. The 38kV building will be demolished to a maximum of 800mm below existing ground level. The transformer bunds and fire walls will be demolished. Existing foundations and below ground services above 800mm below ground level, will also be demolished as required. This excavation will be backfilled where necessary with appropriate inert engineering fill and finished at ground level to facilitate the placement of the emergency generation equipment.
Fuel Oil Pump House	The Fuel oil Pump House is located on the south-eastern side of the site, adjacent to oil tanks 3 and 4 and the 38kV substation. The building will be demolished to ground level. Existing foundations and below ground services in conflict with the new foundations will also be demolished as required. The equipment floor area of the building is approximately 1.2m below ground level. This area will be backfilled with appropriate inert engineering fill and finished at ground level.
Air Inlet Filter House and Electrical Rooms	The air intake structures located at the southern ends of the turbine hall for CT4 and CT5, supplied combustion air to the now redundant gas turbines on site. Below each air intake is a decommissioned electrical room that contains high voltage switchgear and control and instrumentation panels for the redundant gas turbines. The intake structure is a steel skeletal frame and a mixture of brick and corrugated cladding. The air intake structure also supports a number of fin fan coolers which formed part of the gas turbine cooling water system The air intake structure, Speedtronic rooms and a number of fin fan coolers will be demolished and a new gable end to the building installed on the remaining portion of the turbine halls. .
Gate Keeper's House	The existing gate house is a single store building of traditional block work construction. This building will be demolished to slab level.

3.1.2.2 Site Offices, workshop and storage building

The existing administration and workshop building will be used as site offices and a workshop and storage building during both the construction and operational phases. This work is likely to include the electrical rewiring of the building to electrically separate the building form any existing electrical circuits and allow for the safe completion of the demolition works described below.

During the construction phase temporary welfare facilities will be provided. These will be connected to a sealed holding tank to be emptied and disposed of off-site by a licensed contractor to an approved licenced facility, in accordance with the Waste Management Act 1996 and associated regulations.

3.1.2.3 Ground Works

The areas for the installation of new equipment will be levelled and new equipment foundations will be constructed. New equipment foundations are expected to extend over an area of approximately 3,500 m^2, have a thickness of 300 to 400mm, with up to 200mm of this depth above existing ground level. Beneath this proposed foundation will be a layer of new formation stone capping extending up to 800mm below existing ground level. Existing foundations or buried structures will be removed to a depth of 800mm. Existing below ground services (surface water drains) will be rerouted around areas where foundations are to be constructed.

It is anticipated that foundations will be raft type ground bearing foundations however some shallow piled foundations may be required.

In 2004 there was an incident on site that resulted in the loss of approximately 8,000 litres of diesel on site. Approximately 6,000 – 7,000 litres of diesel were recovered by ESB, however an oily plume remains under part of the site and is the subject on ongoing monitoring.

Foundations for the gas turbine generators will be adjacent and, in some cases, above the existing oil plume on site. Foundations will be constructed above the water table to avoid impacts on groundwater .A number of existing ground water monitoring wells will need to be relocated. New locations will be agreed with the EPA prior to construction but are expected to be located down gradient of the existing plume.

The minimum recorded depth below the surface to the plume in the affected part of the site is approximately 1.57m, although it has been recorded at depths to 2.3m. As the source of the contamination has lower density than water, it forms a narrow layer on the top of the groundwater.

To avoid interaction with the plume during construction the excavation depth over the plume will be minimised to avoid encountering groundwater and contaminated material.

The following measures will also be implemented:

- The majority of the civil works are planned to take place in summer months. Where heavy rainfall is forecast during the civil works, or if the civil works extend into the Winter season, the following measures will be put in place to restrict rainwater seepage into the ground:
  - Minimise extent and duration of exposed excavation surfaces.
  - Cover/protect excavations with use of water-tight membranes together with use of pump sumps or equivalent where required.
  - Excavations to be blinded with concrete immediately following excavation together with use of pump sumps or equivalent.
  - Surface water runoff will be treated in accordance with *Ciria C750 Groundwater Control – Design and Practice*.

- The requirements for excavation over the plume will be minimised. Site services (fuel gas, water supply, electrical cables, control and instrumentation cables will be positioned above ground level on pipe and cable racks.
- The main foundations supporting plant and equipment in the area of the plume will be designed so as to not extend below the ground water level. The level of the top of the foundations will extend above the current level of the existing site to minimise the depth of excavation required.
- A raft type / floating design of the main equipment foundations will avoid the requirement for piling in the area of the plume. Excavation depth will be limited to 800mm in this area. The surface water drainage network will be designed to be above the ground water level.
- Piling will be avoided in the area of the plume.
- Where piling is required outside the area of the plume, it will be undertaken in accordance with the parameters assessed in this EIAR and in the NIS and in the CEMP. A Source-Pathway-Receptor hazard risk assessment will be undertaken in consideration of the extensive monitoring regime present on site. The pile type will be selected and installed by a specialist contractor and be considerate of current guidance such as *Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention* published by the National Groundwater and Contaminated Land Centre Report No. NC/99/73 (UK Environment Agency). The following will be incorporated into the detailed design:
  - Low vibration piling techniques.
  - Piling techniques which avoid the creation of preferential pathways.
  - Piling techniques which avoid pushing contaminated soil into uncontaminated soil.
- On completion of construction, the site will comprise paved surfaces of similar area to existing, laid to falls. Surface rainwater will be collected at low points by a series of gulleys or equivalent and be conveyed by a network of underground drainage pipes laid to shallow falls in accordance with with *Specification for Road Works Series 500 - Drainage and Service Ducts, CC-SPW-00500* March 2015, Transport Infrastructure Ireland, connecting into the existing site main drainage infrastructure.

All works will be carried out within the parameters assessed in this EIAR and the parameters assessed in the NIS supporting the application and the measures detailed in the Construction and Environmental Management Plan (CEMP).

The Contractor will comply with the *Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites* and with the conditions detailed in the existing IE licence.

Excavated soil, and piling arisings if any, will be tested on site prior to disposal off site or reuse on site.

Excavation will be supervised by a qualified and experienced hydrogeologist/soil contamination expert and the Environmental Clerk of Works (EnCoW) throughout the period of such works.

Existing ground water monitoring/treatment wells that may be affected by the works will be identified and amendments to the monitoring well network will be agreed with the EPA prior to commencement of works.

3.1.3 Plant Construction Works

The Main Contractor will be responsible to ESB for the design and installation of the emergency power generation plant. This will include the design, supply, and installation of all equipment and the installation of all equipment foundations.

Most of the new equipment will be skid mounted or containerised elements fabricated off site and delivered finished or for final assembly on site. The main exception to this is the pipe and cable corridor which will contain the plant pipework (natural gas, fire water etc) and cables (power cables, control cables etc) which will have to be fabricated on site.

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

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

In the area of the main carpark, where the gas turbines are to be installed, the existing surface water network will need to be modified and re-routed. Surface water drains will also be re-routed and/or sealed in advance of any concrete being cast.

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

The maximum proposed excavation will not exceed a depth of 800mm for the raft foundations. If piled foundations are required, it is envisaged that these would require a similar depth of below ground excavation.

3.1.4 Construction Traffic

The majority of construction traffic will be generated during phase two and phase three the demolition phase and the construction phase. The demolition phase which will see material being removed from site and being disposed of at various licenced waste disposal facilities, depending on the waste classification and quantity of material to be removed from site. As part of the demolition phase there will also be some inert material imported to site. This will generally be used to infill existing but redundant service trenches and basement structures.

For the demolition works it is estimated that up to 50 Heavy Good Vehicles (HGVs) loads from the site (100 HGV movements) will be required (maximum of 15 loads per day) to remove material over the period of asbestos removal and demolition which is expected to extend over a period of two months.

On completion of the demolition phase, the construction phase will commence. The construction phase will see the delivery of construction material such as packaged skids, piping, cabling, secondary steel support frames and bulk material like concrete for the construction of foundations.

Excavated material for the construction of foundations will also be disposed of offsite to suitably licenced waste facilities during the construction phase. It is expected that a peak of construction, approximately 15 HGV loads daily (30 HGV movements) will be required. An average of four HGV loads daily (8 HGV movements) is anticipated.

Much of the emergency generation plant and equipment, for example, LMXpress units, fin fan coolers, gas skids, pumps skids will be shipped to Ireland through Dublin Port and directly to site and will therefore not need to use the public road network. The proposed new equipment is set out in Table 3.3 below.

Two existing gates are currently used to access the site from Alexandra Road. The M50 Dublin Port Tunnel is located approximately 1.6km to the south-east of the site and is the major route in and out of the docklands for HGVs.

Table 3.3: Proposed New Equipment

Item	Description	Construction Method
1	LM2500Xpress Gas Turbines	Delivered to Site in Prefabricated Modules to be connected together on site
2	Water Wash Drain Tank	Delivered to Site Prefabricated
3	Fuel Gas Filter Skid	Delivered to Site Prefabricated
4	BOP PCM	Delivered to Site Prefabricated
5	N2 Storage Rack	Delivered to Site Prefabricated
6	Air Compressor for Gas Compressor	Delivered to Site Prefabricated
7	Fuel Gas Scrubber	Delivered to Site Prefabricated
8	Fuel Gas Condensate Tank	Delivered to Site Prefabricated
9	Raw & Fire Water Tank	Delivered to Site in Prefabricated Modules with final assembly on site
10	Fire Water Pump Skid	Delivered to Site Prefabricated
11	Current Limiting Rectors	Delivered to Site Prefabricated
12	Fuel Gas Emergency Shut-Off	Delivered to Site Prefabricated
13	MV Motor Starter Panel for Gas Compressor	Delivered to Site Prefabricated
14	Fuel Gas Compressor and Fin Fan Cooler	Delivered to Site Prefabricated
15	Water Storage Tank	Delivered to Site Prefabricated
16	Service and Potable Water Pressure Unit	Delivered to Site Prefabricated
17	Fuel Gas Skid	Delivered to Site Prefabricated
18	LM2500Xpress Control House	Delivered to Site Prefabricated
19	Pipe & Cable Corridor	Delivered to Site in Prefabricated Modules with final assembly on site
20	Crossover (Pedestrian)	Delivered to Site in Prefabricated Modules with final assembly on site
21	Stack (11.0m)	Delivered to Site in Prefabricated Modules with final assembly on site
22	Diesel Fire Fighting Pump	Delivered to Site in Prefabricated Modules with final assembly on site
23	Fuel Condensate Pump	Delivered to Site Prefabricated
24	Pipe & Cable Corridor (Pipebridge)	Delivered to Site in Prefabricated Modules with final assembly on site
25	GT Area Drain Tank	Delivered to Site Prefabricated

A number of abnormal load deliveries will be required during the construction phase of the project. These abnormal loads will be delivered to Dublin Port. From Dublin Port, abnormal loads will be transferred directly to the site via Dublin Port internal road network and will therefore not need to use the public road network. The expected abnormal loads are as follows;

- 6 x Turbine Module Units
- 6 x Control Module Units,
- 6 x Generator Module Units;
- 3 x Balance of Plant Power Control Modules;
- 1 x Fire Fighting Module.

The two existing entrances will be used to access the site during the construction and demolition phases. A traffic control person will be used to control traffic to and from the site, as required. Sufficient signage will be provided on both the western and eastern approaches to the site to provide warning to port traffic of the potential construction traffic entering and exiting the site.

The number of construction workers required during the construction phase is expected to peak at approximately 100 persons. It is assumed that staff will travel to site via a combination of public transport, cycling, carpooling, minibus and private passenger vehicles. The site has good public transport links given its proximity to the Luas Red Line and several bus stops.

It is anticipated that a mobile crane will be needed on site for part of the construction and demolition works on site. It is not anticipated that there will be a requirement to over-sail any adjacent sites.

3.1.5 Construction Compounds / Laydown Areas

Given the modular nature of the development, no designated construction compound / laydown area is proposed.

Equipment will be delivered to site in a phased manner and located in its final position on arrival. Small items of plant and materials such as pipework, cables, tools and installation equipment will be stored in the existing stores building.

4 Control Measures

4.1 Introduction

The following sections detail the minimum control (mitigation) measures that will be implemented prior to commencement and throughout the duration of the proposed works.

4.2 General Site Environmental Rules

- The proposed works area will be demarcated and pollution prevention measures will be implemented prior to commencement of construction works.
- 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 under the supervision of an EnCoW.
- All mitigation will be implemented under the supervision of the EnCoW.
- The EnCoW will carry out daily inspection of works areas for evidence of pollution, and areas where corrective action is required

4.3 Construction Environmental Management

The mitigation and monitoring measures detailed in the EIAR and NIS are detailed in Table 4.1, each under the separate headings as per the EIAR. Also detailed in Section 4.3 are the mitigation measures and monitoring specified in the Natura Impact Statement (NIS).

Table 4.1: Mitigation and Monitoring Measures

Topic	Mitigation and / or Monitoring Measure
General	• This 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. All construction activities, including construction traffic, will be managed through this CEMP. • Foundations will be constructed above the water table to avoid impacts on groundwater . • A number of existing ground water monitoring wells will need to be relocated. New locations will be agreed with the EPA prior to construction but are expected to be located down gradient of the existing plume. • The excavation depth over the plume will be minimised to avoid encountering groundwater and contaminated material. • The requirements for excavation over the plume will be minimised. • The following measures will also be implemented: – The majority of the civil works are planned to take place in summer months. Where heavy rainfall is forecast during the civil works, or if the civil works extend into the Winter season, the following measures will be put in place to restrict rainwater seepage into the ground over the plume: – Minimise extent and duration of exposed excavation surfaces. – Cover/protect excavations with use of water-tight membranes together with use of pump sumps or equivalent where required. – Excavations to be blinded with concrete immediately following excavation together with use of pump sumps or equivalent. – Surface water runoff will be treated in accordance with Ciria C750 Groundwater Control – Design and Practice. – Site services (fuel gas, water supply, electrical cables, control and instrumentation cables will be positioned above ground level on pipe and cable racks. Plant infrastructure will be positioned away from the location of the plume. – The main foundations supporting plant and equipment will be designed so as to not extend below the ground water level on the site. The level of the top of the foundations will extend above the current level of the existing site to minimise the depth of exaction required. – A raft type / floating design of the main equipment foundations will avoid requirements for piling through the plume. This will limit excavation to 800mm. Surface water drainage network work will be designed to be above the ground water level. – Piling will be avoided in the area of the plume. • Where piling is required outside the area of the oil plume, it will be undertaken in accordance with the parameters assessed in the EIAR and in the NIS and in the CEMP. A Source-Pathway-Receptor hazard risk assessment will be undertaken in consideration of the extensive monitoring regime present on site. The pile type will be selected and installed by a specialist contractor and be considerate of current guidance such as Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention published by the UK Environment Agency National Groundwater and Contaminated Land Centre Report No. NC/99/73. The following will be incorporated into the detailed design: – Low vibration piling techniques. – Piling techniques which avoid the creation of preferential pathways. – Piling techniques which avoid pushing contaminated soil into uncontaminated soil. • On completion of construction, the site will comprise paved surfaces of similar area to existing, laid to falls above the ground water plume. Surface rainwater will be collected at low points by a series of gulleys or equivalent and be conveyed by a network of underground drainage pipes laid to shallow

Topic	Mitigation and / or Monitoring Measure
	falls in accordance with Specification for Road Works Series 500 - Drainage and Service Ducts, CC-SPW-00500 March 2015, Transport Infrastructure Ireland, connecting into the existing site main drainage infrastructure., connecting into the existing site main drainage infrastructure. ● The Contractor will comply with the Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites and with the conditions detailed in the existing IE licence. ● Excavated soil, and piling arisings if any, will be tested on site prior to disposal off site or reuse on site. ● Excavation in the area over the contamination plume will be supervised by a qualified and experienced hydrogeologist/soil contamination expert and the Environmental Clerk of Works (EnCoW) throughout the period of such works. ● Existing ground water monitoring/treatment wells that may be affected by the works will be identified and amendments to the monitoring well network will be agreed with the EPA prior to commencement of works.
Population and Human Health	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, including due to traffic. 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.
Air Quality and Climate	● 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
Air Quality and Climate	● 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
Air Quality and Climate	● 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

Topic	Mitigation and / or Monitoring Measure
	– Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment, where practicable
Air Quality and Climate	• 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
Air Quality and Climate	• 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
Air Quality and Climate	• Measures specific to construction – Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process in which case ensure that appropriate additional controls measures are in place.
Air Quality and Climate	• 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 – Record all inspections of haul routes
Land, Soils and Hydrogeology	• All work will be carried out having regard to international and national legislation, and best practice guidance, including but not limited to guidance on preventing pollution from construction sites and pollution prevention guidance. • The Construction Resource Waste Management Plan (CRWMP; part of the CEMP) will include identification and appropriate management and disposal of waste materials generated during the works. • North Wall Generating Station (including the proposed development) will continue to comply with the conditions pertaining to Industrial Emissions Licence (P0579) from the Environmental Protection Agency. • The only discharge to the ground during the operational phase of the proposed development will be uncontaminated stormwater (rainfall) run-off from the building roofs. All stormwater will be discharged to the surface water drainage system which connects to the Dublin Port drainage network on Alexandra Road which discharges to the Tolka Estuary to the north of the site (IEL monitoring point SW3) and to the River Liffey Estuary to the south of the site (IEL Monitoring point SW4).

Topic	Mitigation and / or Monitoring Measure
	• The only effluent discharging to the foul sewer will be from the toilets, and the emissions to sewer will comply with IEL Licence Condition 7 (emissions to sewer). • Existing groundwater monitoring/treatment wells that may be affected by the works will be identified and amendments to the monitoring well network will be agreed with the EPA prior to commencement of works. • All works in the area of the oil plume will be carried out within the parameters assessed in the EIAR and will be supervised by an appropriately experienced and qualified EnCoW. • Piling will be avoided in the area of the plume as a raft type/floating design of the main equipment foundations will be used. • 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; – All tanks and drums will be bunded in accordance with established best practice guidelines; and – Established best practices including preventative maintenance, routine monitoring and reporting of tanks and equipment integrity, as directed under the industrial emissions licensing process, will minimise the likelihood of leaks/spills occurring and ensure that any leaks are quickly detected and controlled.
Surface Water Quality	• A full-time on-site Environmental Clerk of Works (EnCoW) will be appointed prior to commencement of works. • Where works on other projects within the same ZoI occur in parallel appropriate mitigation measures, within the parameters assessed in the 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; – 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.
Biodiversity	• 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 to instruct the Contractor to stop works and to direct the carrying out of emergency mitigation / clean-up operations. The EnCoW will also manage consultation with key stakeholders as appropriate. The EnCoW will be responsible for carrying out regular monitoring of the Contractor's 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).
Biodiversity	• In accordance with Section 40 of the Wildlife Acts, if required, the removal of the ornamental shrubs, which may be used as nesting sites by breeding birds, will be cleared outside of the birds nesting season (1st March to 31st August inclusive).

Topic	Mitigation and / or Monitoring Measure
	• During the construction works, the appointed Contractor, in order to comply with Regulations 49 and 50 of the European Communities (Birds and Natural Habitat) Regulations (2011), will ensure biosecurity measures are implemented throughout the construction phase to ensure that the introduction and translocation of invasive species are prevented.
Biodiversity	• Good site practice as per the *CIRIA C741 Environmental good practice on site guide (fourth edition)* will be implemented during the construction phase at all times. • All construction works will be carried out in accordance with a Construction Environmental Management Plan (CEMP) as described in Chapter 3: Description of the Development which will define measures to ensure that any contaminants resulting from the removal, dismantling, excavation, or construction will not enter the surface water. • All pollution control measures will be designed, installed, and maintained in accordance with CIRIA guidance for 'Environmental Good Practice on Site' (C741) and 'Control of water pollution from construction sites. Guidance for Consultants and Contractors' (C532). 'Control of water pollution from linear construction projects. Technical guidance' (C648) and the IEL. • The Contractor will be responsible for the construction of the equipment foundations, including the excavation and appropriate disposal of excavated material as well as the construction of the main equipment raft foundations and any piled foundations needed. The Main Contractor will be responsible for the management of excavated material and the safe disposal of this material to a suitably licenced waste disposal facility. In-situ concrete casting will be fully controlled to ensure that cement bound materials do not present any pollution risk. • Trucks, mixers, and concrete pumps that have contained concrete will be washed out in a designated impermeable area to prevent pollution. Washout water will be stored and disposed of in line with the existing industrial emissions licence. • 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; – 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.
Archaeology and Cultural Heritage	• Archaeological monitoring will be carried out within the proposed development area for all sub-surface groundworks during the construction phase. • Archaeological monitoring will be carried out by a suitably qualified, competent archaeologist under license and in accordance with the provisions of the National Monuments Acts 1930-2004. • If significant archaeological material is encountered during the course of archaeological monitoring, then resolution of any such significant material will be determined in consultation with the National Monuments Service (DHLGH) and the Dublin City Archaeologist. • Where possible, every reasonable effort will be made to preserve in situ or reduce the effect on any identified archaeological material. Where preservation in situ cannot be achieved, either in whole or in part, then a programme of full archaeological excavation will be implemented to ensure the preservation by record of the portion of the site that will be directly effected upon. This work will be carried out by a suitably qualified archaeologist under license and in accordance with the provisions of the National Monuments Acts 1930-2004.
Roads and Traffic	• A traffic control person will be used to control traffic to and from the site, as required. • Sufficient and clearly displayed signage will be provided on both the western and eastern approaches to the site to provide warning to port traffic of the potential construction traffic entering and exiting the site. • Wheel cleaning facilities will be provided on site.

Topic	Mitigation and / or Monitoring Measure
	• ESB will liaise with Dublin Port and Iarnród Eireann in relation to traffic movements e to ensure they do not coincide with the movement of rail freight on Alexandra Road. • HGV traffic will access the site using a pre-planned route entering and departing Dublin Port via Promenade Road.

5 Environmental Incident Response Plan

5.1 Introduction

In the unlikely event of an incident, the Environmental Incident Response Plan will ensure that any incident is dealt will effectively, and that the response is timely and appropriate. This plan will be further developed by the appointed Contractor, in line with the mitigation measures detailed in the EIAR and NIS for the proposed development, to describe the procedures, lines of authority and processes that will be followed to ensure that all incident response efforts are prompt, efficient and appropriate to the particular incident.

5.2 Plan Objectives

The objectives of the plan are:

- To ensure the health and safety of all workers on site
- To minimise environmental effects.
- To devise response procedures.
- To establish procedures for an effective response to the incident which minimises effects on the environment and the health and wellbeing of personnel.

5.3 Implementation of the Plan

Risks and appropriate responses for incidents will be reviewed and updated regularly to ensure that all risks and response mechanisms are included within the plan. It will identify the risks associated with health and safety and the environment and will evolve throughout the project lifecycle, with inputs from the contractor / PSCS and sub-contractors.

5.4 Environmental Emergency Response Procedures

The mitigation measures specified in the EIAR and NIS will minimise / avoid environmental pollution. However, procedures must be in place in the unlikely event of an incident. The following are required to ensure that the project / site / activity risks are known to all personnel on site:

- Identify all activities related to the project which have the potential to cause an incident;
- Conduct a risk assessment for each activity;
- Ensure effective planning of the works and the required equipment to deliver EIAR mitigation requirements;
- Contact details for those contacts detailed in section 5.5 to be distributed to personnel and displayed on site; and
- Training of staff/personnel in relation to response procedures, including drills.

In the unlikely event of an incident, the response will follow the following steps:

Figure 5.1: Incident Response Procedure

1 Identification of the incident

2 Contact Site Manager/Supervisor, Contractor's EnCoW, and independent EnCoW in Employer's Representative Team

3 Ensure all personnel are safe

4 Put in place containment measures

5 Remove the contamination

7 Assess the potential of environmental effects and the scale of the incident

8 Notify the relevant authorities and the client

An example of emergency response actions required, in the event of a spillage is as follows:

1. If safe, stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
2. If safe, contain the spill using the absorbent spills material provided. Do not spread or flush away the spill.
3. Cover or bund off any vulnerable areas where appropriate.
4. If possible, clean up as much as possible using the absorbent spills materials.
5. Do not hose the spillage down or use any detergents.
6. Contain any used absorbent material in weather tight containers bins/bags so that further contamination is limited.
7. Notify the Site Manager so that used absorbent material can be disposed of using a licensed Waste Contractor, and
8. An accident investigation should be performed in accordance with procedures and the report sent to the Site Manager.

All works in the vicinity of the incident must be ceased until such a time as the Site Manager notifies personnel that it is safe to proceed with the works. The Contractor’s EnCoW will be responsible for formulating any corrective actions that are required (e.g. repairs silt fencing in the event of damage from extreme weather) in consultation with the Contractor and relevant stakeholders.

For each incident, the following will be reported:

- Location of the incident;
- Time and Date;
- Scale of the incident;
- Nature of the incident and source-pathway and receptor;
- Remediation measures undertaken;
- Name of the personnel who reported the incident; and
- Any other relevant details.

The Site Manager will keep a log of all environmental incidents on file and these will be made available to the Local Authority, the independent EnCoW within the Employer’s Representative Team and other agencies, as required, such as the Inland Fisheries Ireland or the Environmental Protection Agency.

5.5 Emergency Contact List

An emergency contact list will be displayed at prominent and suitable locations at construction sites during the proposed works. An example is provided in Table 5.1, and this will be further developed to include contact details for key personnel with environmental responsibilities, as detailed in Chapter 2 of this CEMP.

Table 5.1: Emergency Services and Authorities Contact Details

Emergency Services	Contact Telephone Number
Ambulance	999 or 112
Dublin City Council Fire Services	01 222 2222
Dublin City Council Environment Department	01 222 0200
Dublin Port Authority	01 887 6000
National Parks and Wildlife Services	1890 383 000/ (01) 888 3200
Environmental Protection Agency	1890 33 55 99 / 053 9160600
Environmental Protection Agency (Industrial Emission Licence Notifications)	01 268 0100
ESB Emergency	1850 372 999
Bord Gáis Emergency	1850 20 50 50
Irish Water Emergency	1850 278 278
Health and Safety Authority	1890 289 389

6 Training and Auditing

6.1 Environmental Induction and Awareness Training

All site personnel will receive environmental induction and awareness training in conjunction with site safety training. The environmental training and awareness training will ensure that staff are familiar with the principles of the CEMP, the environmental aspects and potential impacts associated with their activities, the controls in place to mitigate said impacts. Prior to working in areas of particular sensitivity, the Contractor's EnCoW will give a toolbox talk to site personnel. All site personnel will be trained in relation to incident response procedures and drills will be undertaken to ensure timely and effective responses to incidences.

All signed training records will be held on site for future inspection.

6.2 CEMP Reviews and Auditing

Internal and external auditing will facilitate the assessment of the effectiveness of the CEMP and compliance against regulatory and legislative requirements. Audit reports will be produced identifying examples of good practice, opportunities for improvement, non-conformances, and corrective actions taken, as appropriate. Recommendations for follow-up audits will also be provided. The findings of the audits will be reported to the Site Manager, the Contractor and the EnCoW.

The EnCoW will bring any changes required to the CEMP to the attention of the Contractor. A report on each change to the CEMP will be appended to the CEMP. The EnCoW will monitor and track any changes in environmental legislation and any changes required will be brought to the attention of the Site Manager and Contractor. Changes to the CEMP may also arise due to changes in activities and measures contained in the CEMP may need to be updated / altered to take account of this.

The EnCoW will carry out regular reviews of the CEMP to ensure that the Contractor is conducting the works in compliance with the EIAR, NIS and any conditions arising.

The CEMP, environmental inspection reports and audit records will be maintained for inspection.

7 Communications and Complaints

7.1 Communication and Engagement

Communication with the public and other stakeholders will be a two-way mechanism, to ensure awareness of the project and to share information. The Contractor will share important information with the public and other stakeholders.

The communication strategy will include:

- List of stakeholders: the Contractor will provide stakeholders with advance notice of works as appropriate.
- Details of key contacts: Employer, Site Manager, EnCoW.
- Road users: the Contractor will ensure that traffic disruption is minimised during construction.
- Method and frequency of communication: this can include personal contact, letter drops, emails, telephone, meetings.
- Details of the consultation register: a record will be maintained of all third-party communication and consultation.

7.2 Environmental Complaints

A formal complaints procedure will be developed and implemented by the Contractor. Signage will be provided at site entrances or on perimeter hoarding locations showing details of whom to contact in the event of a complaint.

The Contractor will:

- Assess what corrective and preventive action is required.
- Carry out further investigation if necessary.
- Provide a response within a reasonable timescale.
- Notify the relevant stakeholder of the proposed corrective and preventive actions to be adopted.
- On completion of the corrective action and following agreement that the complaint has been adequately addressed; the Site Manager will close the case and record the date of closure. The complaints register will include details of the preventative measures undertaken to avoid a reoccurrence and will be agreed with the EnCoW.

The Contractor will additionally communicate the specifics of any environmental complaint to the ESB at Site Manager.

A. Construction Resource Waste Management Plan

Construction Resource Waste Management Plan

North Wall Emergency Power Generation Plant

April 2022

Contents

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1 Introduction

1.1 Overview of the Proposed Development

The Electricity Supply Board (ESB) is proposing to install an emergency power plant within the existing North Wall Generating Station. The proposed emergency power plant will be operational for a period of up to five years from early 2023 to late 2027.

The proposed works will consist of the demolition of a number of buildings and plant within the existing site and installation of a temporary modular emergency power plant comprising six turbines (General Electric LM2500Xpress units). Modifications will also be required to the existing site drainage system.

The emergency generating plant will operate up to 500 hours per annum on natural gas only, typically four hours per day when called on to run.

Natural gas will be provided by the existing gas compound on site. The Gas Networks Ireland Above Ground Installation (AGI) is located in the Northwest corner of the site. On-site gas compression will be provided to meet the inlet pressures required by the gas turbines.

Each emergency generating unit will be connected to the existing on site 220kV transformer by means of cables running on elevated pipe/cable racks. The 220kV transformer is connected to the national grid through the existing on-site 220kV Substation. No changes to the gas and electricity transmission infrastructure will be required to facilitate the proposed development.

The North Wall Generating Station site operates, and will continue to operate, under the existing Industrial Emissions (IE) licence (Registration Number: P0579). regulated by the Environmental Protection Agency (EPA). At the time of writing this report, ESB was in the process of preparing a Technical Amendment to IE licence P0579 to allow for the proposed development.

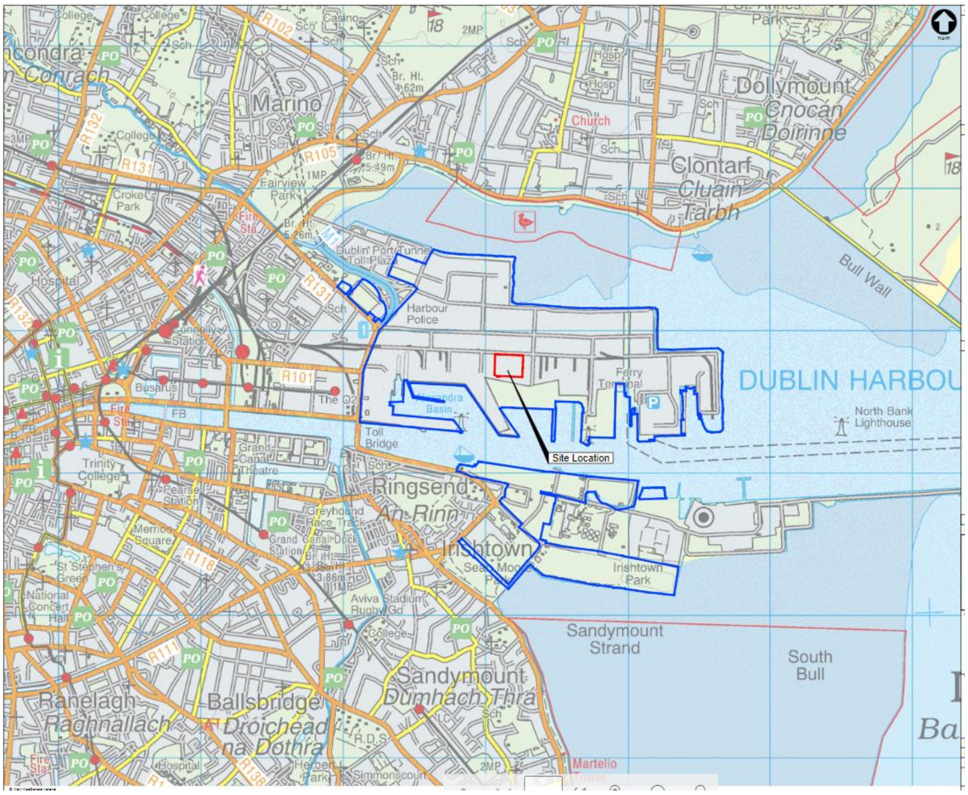
Figure 1.1 presents an image of the proposed emergency gas turbine plant. Figure 1.2 illustrates the proposed development's geographical location within its wider industrial setting in Dublin Port. Figure 1.3 presents a 2019 drone image of the site, looking south towards the River Liffey Estuary.

Chapter 3 *Proposed Activities* describes the proposed construction phase activities.

Figure 1.1: LM2500Xpress Gas Turbine Generator

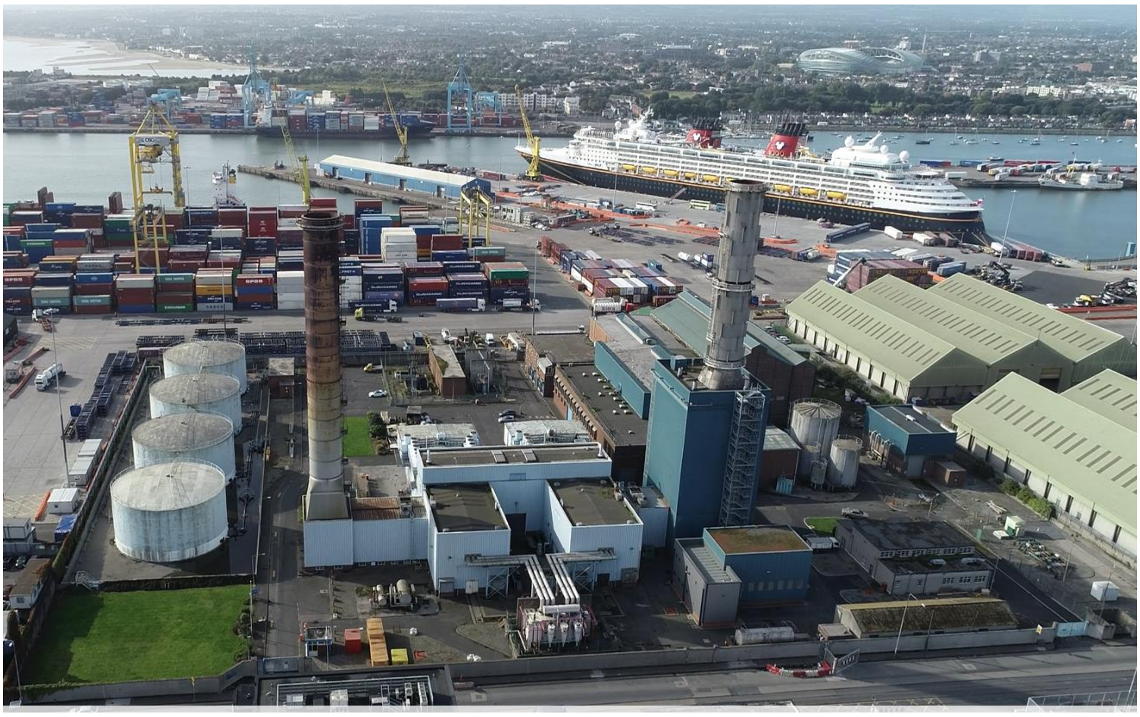
Source: GE

Figure 1.2: Site Location



Source: Mott MacDonald (©Ordnance Survey Ireland/Government of Ireland. Ordnance Survey Ireland Licence No. EN0034520)

Figure 1.3: North Wall Power Station looking south towards the River Liffey Estuary



Source: ESB Drone Image 2019

1.2 Purpose of this CRWMP

This Construction Resource Waste Management Plan (CRWMP) has been prepared in accordance with waste management guidance and principles as outlined in *Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects* (EPA, 2021).

The 2021 EPA guidelines replace the *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects (DoEHLG), June 2006.*

This CRWMP will evolve in agreement with the planning authority, in the context of matters such as Conditions of the Statutory Approval, and as detailed design of the development emerges, to ensure that optimum levels of waste prevention, reduction, re-use, recycling, and recovery are achieved throughout the duration of the proposed development. Litter management will also be included. This is because at this point in time – the commencement of the statutory consenting process, exact quantities and volumes of waste material cannot be determined, particularly in the absence of any Conditions of the Consent Approval.

The requirement to develop, maintain and operate this CRWMP will form part of the contract documents for the project and will be updated by the appointed Contractor in advance of the commencement of construction activities on site. Waste sent off site for recovery or disposal will only be conveyed by an authorised waste contractor and transported from the proposed development site to an authorised site of recovery/disposal in a manner which will not adversely affect the environment. All employees will be required to comply with the obligations under this CRWMP.

On commencement of the project, the Contractor appointed to undertake the works will be responsible for the further development of this CRWMP and the implementation of all necessary protocols and measures to ensure regulatory compliance, including the provision of data to

Dublin City Council to enable fulfilment of reporting obligations. The CRWMP will be developed and agreed in line with the process presented in Figure 1.4 Process Lifecycle of Resource Waste Management Plan.

The Contractor will be required to regularly revisit this CRWMP throughout the lifecycle of the project so that opportunities to maximise waste reduction / efficiencies are exploited throughout, and to ensure that that data is collected on an ongoing basis so that it is as accurate as possible.

The Contractor will be required to:

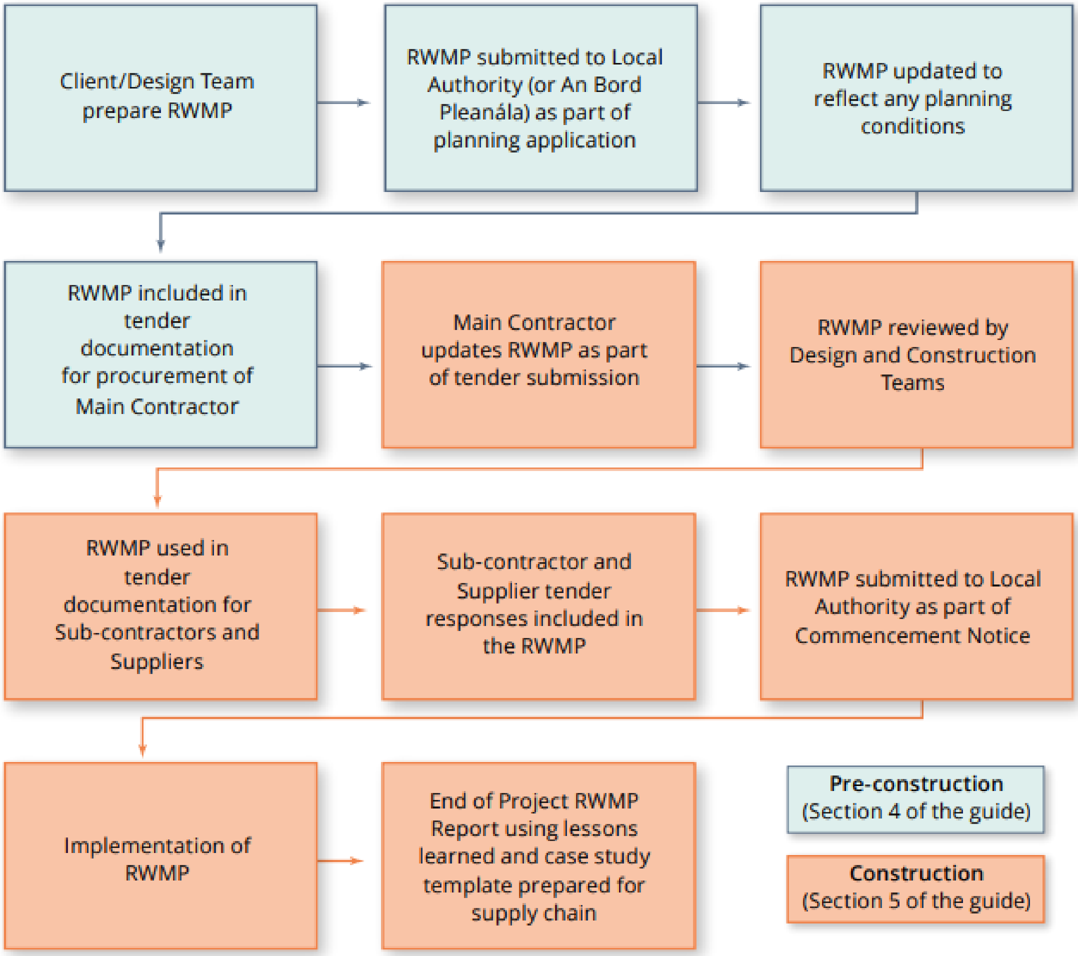
- Reduce the use of virgin resources
- Keeping materials in the economy as long as possible
- Maintain their intrinsic value/quality as high as possible; and
- Reduce hazardous substances in products and waste.

This CRWMP has been prepared for the proposed development as there is potential for the project to exceed the specified Tier 2 construction waste threshold limits set out in the above referenced guidelines, namely Demolition projects generating in total less than 100m^3 in volume of C&D waste.

This CRWMP has been prepared with reference to, and taking account of, the following legislation, plans and waste management guidance documents:

- The Waste Management Act 1996 – 2008, Amendments & Associated Regulations;
- Construction Industry Research and Information Association (CIRIA) document 133 Waste Minimisation in Construction;
- Design Out Waste: A design team guide to waste reduction in construction and demolition projects (EPA, 2015) The Litter Pollution Act 1997;
- The Waste Management Plan for the Southern Region 2015 – 2021; and
- Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects (EPA, 2021).

Figure 1.4: Process Lifecycle of Resource Waste Management Plan



Source: Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects (EPA, 2021)

1.3 Structure of this CRWMP

Design Out Waste (EPA, 2015) notes that the preparation of a Waste Management Plan within the early design and feasibility phases provides a framework to carry out design reviews, and should be used as an implementation, benchmarking, monitoring and reporting tool throughout the overall construction process.

This CRWMP has been prepared in line with the recommendations of the *Best Practice Guidelines* (EPA, 2021) for Tier 2 projects and consequently addresses the following:

- Introduction
- Project description.
- Roles and Responsibilities
- Design Approach
- Key Materials, Quantities and Costs
  - Waste forecasting: Analysis of the waste arising / materials surpluses.
  - Specific waste management objectives for the project.

  - Proposed strategies and associated costs: Methods proposed for prevention, reuse and recycling of wastes.
  - Materials logistics.
- Site Management
  - Monitoring procedures: Auditing and record keeping; and
  - Proposals for education of workforce and plan dissemination programme.
- Site Infrastructure

1.4 Irish Waste Management Targets

The EU Waste Framework Directive (Directive 2008/98/EC) set the basic concepts and definitions related to waste management, such as definitions of waste, recycling and recovery. It also included definitions for when waste ceases to be waste and becomes a secondary raw material (end-of-waste criteria) and how to distinguish between waste and by-product. The Directive was enacted in Ireland under the Waste Directive Regulations 2011 (S.I. No. 126 of 2011).

The EU Waste Framework Directive (2008/98/EC) requires Member States to take the necessary measures to achieve the minimum recycling/recovery target of 70% by weight for non-hazardous construction and demolition (C&D) waste, excluding naturally occurring materials. The Directive specifies that such a target should be achieved by preparing for reuse, recycling and other material recovery, including backfilling operations using waste to substitute other material.

Ireland is required to meet the waste re-use and recycling targets presented in Table 1.1.

Table 1.1: Targets

Target Specifics	Reference Year	Rate	Indicator
Preparing for re-use, recycling and other material recovery (incl. beneficial backfilling operations using waste as a substitute) of 70% by weight of C&D non-hazardous waste (excluding natural soils & stone)	2019	84%	On Track

Source: http://www.epa.ie/nationalwastestatistics/constructiondemolition/, EPA Waste Data Release, 1 December 2021 (*Accessed: 11/03/2022*)

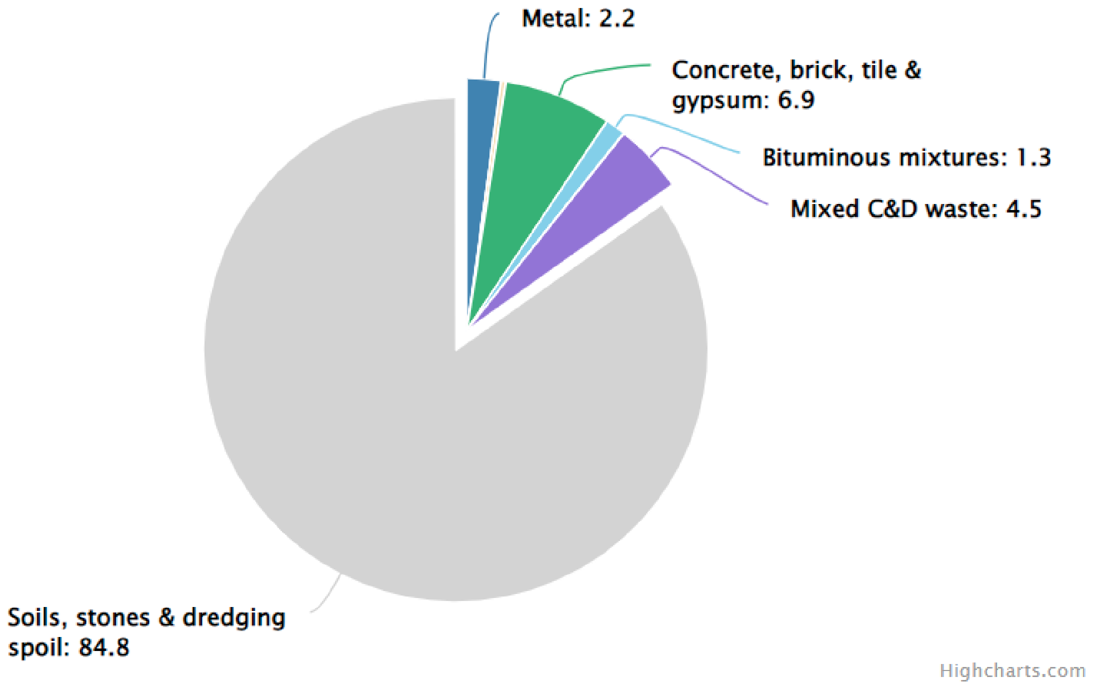
Ireland is currently on-track to meet the EU waste targets for C&D waste. It should be noted, however, that soil and stones waste are excluded from the calculation of the Waste Framework Directive targets.

The EPA[1] notes that just over 8.8 million tonnes C&D waste was generated in Ireland in 2019.This represents an increase of 2.6 million tonnes on the 6.2 million tonnes of C&D waste generated in 2018. This increase in C&D waste corresponded with an increase in construction activity nationally.

The composition of C&D waste in Ireland in 2019 is illustrated in Figure 1.5.

[1] Construction & Demolition | Environmental Protection Agency (epa.ie)

Figure 1.5: Composition of C&D waste material collected in Ireland, 2019



Source: www.epa.ie

The vast majority (96%) of C&D waste underwent final treatment in Ireland in 2019; only four per cent (359,812 tonnes) was exported abroad for final treatment. Soil and stones made up the large majority (85%) of C&D waste collected in 2019. The next largest C&D waste types in 2019 were concrete, brick, tile and gypsum waste (7%) and mixed C&D waste (4%).

Most of the C&D waste finally treated in Ireland (82%) was backfilled in 2019, while ten per cent went for disposal and only seven per cent 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. Recycling was the main treatment operation for the smaller fractions of metal, plastic, glass and wood.

The Contractor will be obliged to aim for an overall recycling rate of 70% of C&D material, in accordance with EU targets under Waste Framework Directive (2008/98/EC) as well as regional waste management targets.

1.5 Waste Management Regulatory and Policy Requirements

The Eastern and Midlands Region Waste Management Plan 2015-2021[2], which includes County Dublin, outlines the strategy for waste management in the northern and midlands regions. The Plan notes the following:

"To date the European Commission has not developed specific regulations governing the end of waste criteria for C&D waste, therefore the EPA is allowed to decide on a case by case basis."

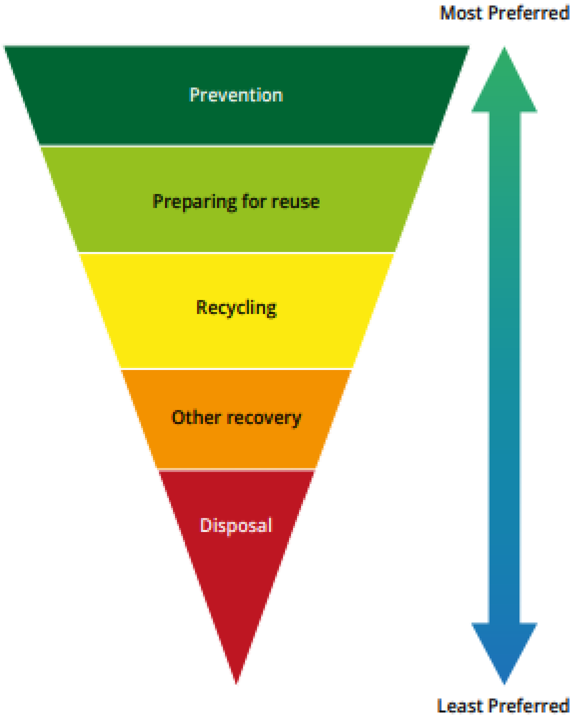
[2] Our Waste Plan | Eastern Midlands Western Region (emwr.ie)

"Given the sharp decrease in the number of operational landfills nationally, which have been a significant outlet for C&D waste in the past, alternative recovery options will be required in future years".

The Waste Framework Directive 2008/98/EC defines waste as *"any substance or object that the holder discards or intends to or is required to discard".*

The Waste Hierarchy described in the framework prioritises prevention over re-use, recycling recovery and disposal, as illustrated in Figure 1.6.

Figure 1.6: Waste Hierarchy



Source: EPA, 2021

The primary legislative instruments that govern waste management in Ireland relevant to the proposed Temporary Emergency Generation Plant Project are as follows:

- Waste Management Act 1996 (S.I. No. 10 of 1996), as amended. Sub-ordinate legislation to this Act includes:
  - European Communities (Waste Directive) Regulations 2011 (SI 126 of 2011) as amended 2011 (S.I. No. 323 of 2011)
  - Waste Management (Collection Permit) Regulations S.I No. 820 of 2007 as amended 2008 (S.I No 87 of 2008)
  - Waste Management (Facility Permit and Registration) Regulations, S.I No. 821 of 2007 as amended 2008 (S.I No. 86 of 2008)
  - Waste Management (Licensing) Regulations 2000 (S.I No. 185 of 2000) as amended 2004 (S.I. No. 395 of 2004), 2010 and (S.I. No. 350 of 2010)
  - Waste Management (Packaging) Regulations 2003 (S.I. No. 61 of 2003) as amended 2004 (S.I. No. 871 of 2004), 2006 (S.I. No. 308 of 2006) and 2007 (S.I. No. 798 of 2007)
  - Waste Management (Planning) Regulations 1997 (S.I. No. 137 of 1997)

- Waste Management (Landfill Levy) (Amendment) Regulations 2012 (S.I. No. 221 of 2012), as amended 2015 (S.I. No. 189 of 2015)
- European Communities (Waste Electrical and Electronic Equipment) Regulations 2011
- Waste Management (Registration of Brokers and Dealers) Regulations 2008 (S.I. 113 of 2008)
- Waste Management (Food Waste) Regulations 2009 (S.I. No. 508 of 2009), as amended 2015 (S.I. 190 of 2015)

- Protection of the Environment Act 2003 (S.I. No. 413 of 2003) ·
- Litter Pollution Act 1997 (S.I. No. 12 of 1997)

1.6 ESB Environment and Waste Policies

The ESB Group Policy for Environmental Management and Sustainability[3] sets out the high-level principles and context for the management and oversight of environmental and sustainability issues in the ESB Group. The Policy is a statement of the commitment of the ESB Group to conducting their activities and those of subsidiary companies in an environmentally responsible manner. Their policy statement commits ESB Group statutory and regulatory environmental legislation pertaining to their business operations.

1.7 ESB Industrial Emissions licence P0579

The North Wall Generating Station site operates, and will continue to operate, under the existing Industrial Emissions licence, IEL, (Registration Number: P0579), regulated by the Environmental Protection Agency (EPA) and Environmental Management System, which is certified to ISO 14001 Standard.

ESB will continue to comply with the following Conditions of the IEL during the construction and operational phases of the proposed development.

- Condition 7.3 The licensee shall undertake an assessment of the efficiency of use of raw materials in all processes, having particular regard to the reduction in wastes generated. The assessment should take account of best international practice for this type of activity. Where improvements are identified, these shall be incorporated into the Schedule of Environmental Objectives and Targets.
- Condition 8.1 Disposal or recovery of waste on-site shall only take place in accordance with the conditions of this licence and in accordance with the appropriate National and European legislation and protocols.
- Condition 8.2 Waste sent off-site for recovery or disposal shall be transported only by an authorised waste contractor. The waste shall be transported from the site of the activity to the site of recovery/disposal only in a manner that will not adversely affect the environment and in accordance with the appropriate National and European legislation and protocols.
- Condition 8.3 The licensee shall ensure that, in advance of transfer to another person, waste shall be classified, packaged and labelled in accordance with National, European and any other standards which are in force in relation to such labelling
- Condition 8.4 The loading and unloading of materials shall be carried out in designated areas protected against spillage and leachate run-off
- Condition 8.5 Waste shall be stored in designated areas, protected as may be appropriate against spillage and leachate run-off. The waste shall be clearly labelled and appropriately segregated

[3] Clickable PDF V7 (esb.ie)

- Condition 8.6 No waste classified as green list waste in accordance with the EU Shipment of Waste Regulations (Council Regulation EEC No. 1013/2006 as may be amended) shall be consigned for recovery without the agreement of the Agency.
- Condition 8.7 Waste for disposal/recovery off-site shall be analysed in accordance with Schedule C: Control & Monitoring, of the licence
- Condition 8.8 Unless approved in writing, in advance, by the Agency the licensee is prohibited from mixing a hazardous waste of one category with a hazardous waste of another category or with any other non-hazardous waste
- Condition 8.9 The licensee shall neither import waste into the State nor export waste out of the State except in accordance with the relevant provisions of Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14th June 2006 on shipments of waste and associated national regulations

2 Roles and Responsibilities

2.1 About the ESB

The Electricity Supply Board (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.

ESB will procure and oversee the engineering, design, installation and commissioning of the equipment and ensure that the Emergency Power Generation Plant meets all the legislations, regulations, licences, standards and codes applicable to allow for flexible, safe and reliable operation.

2.2 About EirGrid

EirGrid is the state-owned independent Transmission System Operator (TSO) and developer of Ireland's national high voltage electricity grid (also called the "Transmission System"). The European Communities (Internal Market in Electricity) Regulations 2000 (SI 445 of 2000) sets out the role and responsibilities of the TSO in particular Article 8(1) (a) gives EirGrid, as TSO, the exclusive function:

"To operate and ensure the maintenance of and, if necessary, develop a safe, secure, reliable, economical, and efficient electricity transmission system, and to explore and develop opportunities for interconnection of its system with other systems, in all cases with a view to ensuring that all reasonable demands for electricity are met *having due regard for the environment*."

EirGrid has contracted ESB to install the Emergency Generating Plant at North Wall Generating Station to meet an expected shortfall in generation capacity (Ref: EirGrid ENQEIR778).

2.3 Land Ownership

Dublin Port Company (DPC) are the freehold owners of the North Wall Generating Station site; ESB has operated a power station at North Wall since the late 1940's from which time ESB has been the leaseholders of the site. ESB and DPC are in the process of negotiating a new long-term lease, which will commence directly following the expiry of the current lease at the end 2023. The continuing use of the site for electricity generation is reflected in the inclusion of the site within the Dublin Port 2040 Masterplan which allocates the site as a power generating site.

2.4 Description and Role of the Client and Key Personnel

ESB is the Employer and the Engineer with the following responsibilities:

- Manages the process towards construction including liaison with stakeholders.
- Undertakes a Client Engineering function, including inspections, to ensure that detailed designs, plant, materials and works including scheduling meet the requirements of outline designs and the proposal requirements.
- Employs an independent Environmental Clerk of Works (EnCoW) to assess the construction of the Proposed Development, and advise the Contractor on the implementation of the agreed Contractor's CRWMP.

An organogram of the Design Team is provided in Figure 1.1 *Overview of the Design Team*. The following sections provide further detail on roles and responsibilities.

2.5 Description and Role of the Resource Manager

The Resource Manager will be appointed by the Contractor who will ensure that the objectives and measures contained within this CRWMP are incorporated into the project specific CRWMP to achieve the associated target re-use / recycling rates.

2.5.1 Nominated Resource Manager

The Resource Manager will be responsible for all aspects of waste management at the different stages of the proposed development, and overall implementation of this CRWMP and associated procedures.

The Resource Manager, as appointed by the Contractor, will be technically competent and appropriately trained.

The Resource Manager will facilitate effective communication of the waste management objectives with all operatives associated with the project (including site staff, external contractors and suppliers).

Another key objective of the Resource Manager will be the maintenance of accurate records on the quantities of waste / surplus materials generated and the real cost (including purchasing) associated with waste generation and management. The recording of summary information will further assist the implementation of the plan.

The Resource Manager will keep records of the quantities of waste / surplus materials generated and the costs associated with waste generation and management.

The Resource Manager will ensure that reporting and recording requirements are met, and all necessary resources are in place to support the implementation of the plan.

2.6 Description of the future role of the Contractor

A Contractor will be appointed following a tendering process and will be responsible for the Health and Safety of site workers and the completion of the works to the satisfaction of the Employer.

2.7 Description and role of other parties and key personnel

2.7.1 Project Supervisor Design Process / Project Supervisor Construction Stage

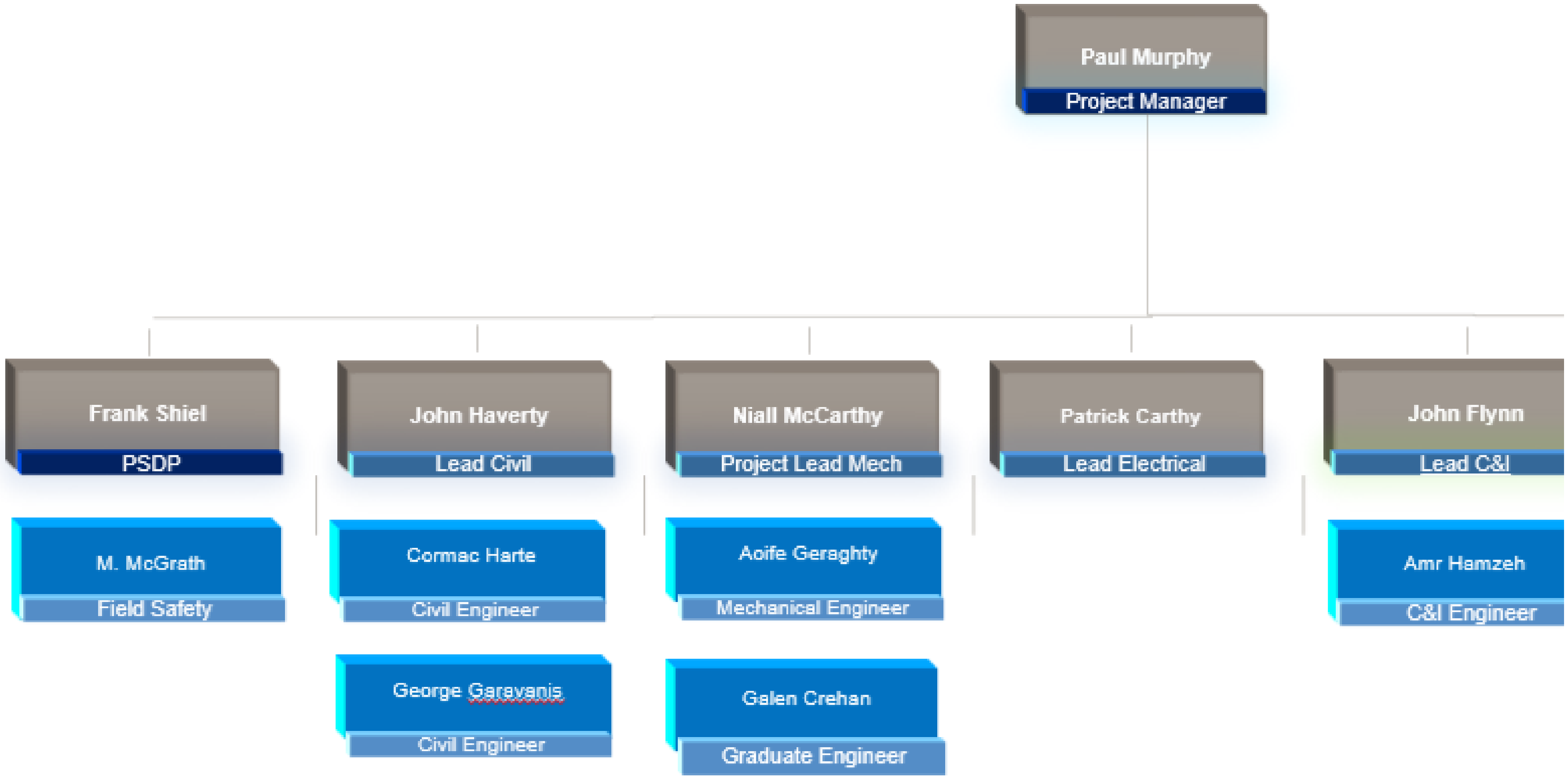
- ESB will be appointed PSDP for the initial design phase of this project.

- Upon their appointment the specialist Demolition Contractor will be appointed to the role of PSDP and will take on the role of PSCS as the demolition works move to their execution phase.
- Following completion of the demolition works on site, the Main Contractor will be appointed to the role of PSDP and PSCS for the installation, commissioning and testing of all equipment including the gas turbines.

2.7.2 Site Manager

The Site Manager will be responsible for the day to day running of the site and will direct and oversee the activities of the Contractor and subcontractors throughout the works. The Site Manager will be responsible for programming of the works, will consult regularly with the Employer and will maintain site safety.

Figure 2.1: Overview of the Design Team



Source: ESB

2.8 Contact Details

As detailed previously, the requirement to develop, maintain and operate this CRWMP will form part of the contract documents for the project and will be updated by the appointed Contractor in advance of the commencement of construction activities on site. At that time that table below will be updated to provide the description and roles of key personnel for the design phase.

Table 2.1: Contact details of site personnel and their roles

Organisation	Role	Name	Contact Number	Email
ESB	Client/Engineer	Paul Feely	To be advised	paul.john.feely@esb.ie

3 Design Approach

3.1 Proposals for Managing Waste Arisings

Waste arisings will be managed in accordance with the principles outlined in the Waste Management Hierarchy as illustrated in Figure 1.6.

In order of priority, the Waste Management Hierarchy sets out the most desirable approaches to waste management in the following order:

1. Prevention
2. Reduction / Minimisation
3. Re-use
4. Recycle
5. Other Recovery (including energy recovery)
6. Disposal

3.1.1 Opportunity for Prevention and Reduction

Opportunities for the prevention of waste will be considered throughout all stages of the project. Contractors will plan the construction process to eliminate / reduce waste; specifically, careful planning will minimise the volume arising on-site, facilitate the use of reclaimed materials in the works, and influence wastage caused by poor materials handling.

Design Out Waste (EPA, 2015) notes that 33% of all on-site waste is due to a failure to implement waste reduction measures during the design stages. Materials logistics, specifically the avoidance of overstocking of materials, is a critical factor for material optimisation in preventing wasted material. A review assessment of this plan and detailed design plans will inform the appropriate quantities of materials required for the project thereby minimising, and potentially preventing, the generation of certain waste streams. In accordance with *Best Practice Guidelines* (EPA, 2021) and *Design Out Waste,* the following measures will be implemented at a minimum:

- Materials will be ordered on an 'as needed' basis to prevent over-supply to site;
- Materials required will be purchased in shape, dimensions, and form that minimise the creation of excessive scrap waste on-site;
- Storage and handling procedures and systems will be introduced to minimise generation of damaged materials / waste e.g. deliveries will remain unpacked until ready for use, sufficient space will be made available for manoeuvring of machinery etc.;
- The correct sequence of operations will be determined and implemented;
- Agreements will be made with suppliers, where possible, to ensure take back / buy back of surplus and sub-standard / rejected materials; and
- The primary Contractor will assign individual responsibility (through appropriate contractual arrangements) to sub-contractors for the purchase of raw materials and for the management of wastes arising from their activities.

Waste generated during the project will be re-used on-site, where practicable. Opportunities for recycling will be employed for any waste that cannot be re-used. Waste will only be sent for disposal if no other reasonable economically or technically feasible alternative can be found.

All wastes will be handled in a responsible manner with due regard to relevant legislation, codes and best practice guidelines.

Only authorised waste contractors with appropriate waste collection permits will be authorised to collect waste streams from the facility. Waste will only be transferred to facilities authorised to treat or dispose of the material in accordance with the requirements of the Waste Management Act 1996 (as amended) and associated Regulations.

Copies of all permits and licences will be retained with other waste-related documentation. Comprehensive waste descriptions will be provided on all documentation.

Appropriate and adequate waste segregation areas will be provided at secure locations on site. The number and size of containers and the number of uplifts required will be determined at a later stage in the project. The Contractor will ensure that containers are not filled beyond the maximum loading capacity of the collection vehicle. Effective inspection, containment and control measures will be implemented to ensure that no litter escapes from the construction site. Litter pickers will be employed within the construction site as required.

3.1.2 Opportunity for Re-use/Recycling

Material that is generated will be reused on site or salvaged for subsequent reuse to the greatest extent possible or recycled. Disposal will only be considered as a last resort. Initiatives will be put in place to maximise the efficient use/reuse of materials.

3.1.2.1 Concrete

The contractor will be encouraged to process excavated concrete to be reused as general fill.

3.1.2.2 Soil

All material will be tested and in the event that contaminated material is encountered and subsequently classified as hazardous, this material will be stored separately to any non-hazardous material and disposed of appropriately. Soil will be reused where possible.

3.1.2.3 Hazardous Waste Arisings

Waste fuel and oil and nominally empty containers will be appropriately contained and stored in designated areas on drip trays to prevent loss through drips and spills. Paints will be stored in appropriate containers in designated areas on drip trays, where practicable, non-hazardous paints will be used.

Hazardous wastes will be collected by appropriately authorised waste contractors for recovery or disposal as appropriate. Nominally empty containers will not be sent for disposal unless a determination can be made that the residual content does not exhibit any of the hazardous characteristics associated with hazardous waste.

3.1.2.4 Scrap Metal

Scrap metal will be sent to an appropriately authorised waste contractor for recycling.

3.1.2.5 Bitumen/Tarmacadam

Opportunities for bitumen / tarmacadam recycling will be investigated. If no alternatives are available, the waste arising will be sent for disposal.

3.1.2.6 Miscellaneous Waste Arisings

Small volumes of a variety of waste streams will be generated including packaging waste, plastic pipe and cable cut-offs, green, and mixed municipal type waste. The generation of surplus waste streams will be minimised through careful planning; however, it will not be possible to eliminate all surplus waste arisings e.g. cable and pipe cut-offs.

- Cardboard will be flattened while paper and cardboard containers will be covered to prevent ingress of water.
- Plastic will be segregated at source and kept as clean as possible prior to placement in a covered container.
- Paper, cardboard and plastics will be recycled whereas mixed municipal waste arising will be sent for disposal.

3.1.3 Green Procurement

Use of off-site manufacturing has been shown to reduce residual wastes by up to 90% (volumetric building versus traditional). The modular nature of the proposed development is expected to prevent the generation of particular waste streams such as concrete and the resource losses associated with concrete blocks such as broken blocks, mortars, etc. In addition, volumes of off-cuts and on-site breakages and the likelihood of over-ordering and wasting of materials will be reduced

Tender specifications, selection and award criteria and contract conditions will require procurement of products and services that prevent and reduce waste.

4 Key Materials, Quantities and Cost

4.1 Analysis of Waste Arisings

The main waste stream arisings (including surplus materials) which are likely to be generated during the demolition and construction phase, are presented in Table 4.1 hereunder.

Table 4.1: Waste Types and Associated EWC codes

Waste Type	European Waste Classification (EWC) Code[4]	Waste Classification
Concrete	17 01 01	Non-hazardous
Bricks	17 01 012	Non-hazardous
Tiles and ceramics	17 01 03	Non-hazardous
Soil and Stones	17 05 04	Non-hazardous
Nominally Empty Containers containing residues of or contaminated by dangerous substances	15 01 10*	Hazardous
Waste Diesel and Oil	13 07 01*	Hazardous
Waste Fuels (Miscellaneous)	13 07 03*	Hazardous
Scrap Metal	17 04 07	Non-hazardous
Bitumen / Tarmacadam	17 03 02	Non-hazardous
Surplus Bitumen / Tarmacadam	17 03 02	Non-hazardous
Gypsum-based construction material	17 08 02	Non-hazardous
Mixed construction and demolition waste	17 09 04	Non-hazardous
Electrical and electronic components	20 01 35*	Hazardous
Electrical and electronic components	20 01 36	Non-hazardous
Batteries and accumulators	20 01 33*	Hazardous
Batteries and accumulators	20 01 34	Non-hazardous
Insulation materials and asbestos-containing construction materials*	17 06 04*	Hazardous
Surplus Cabling	17 04 11	Non-hazardous
Plastic Pipe Cut-offs	17 02 03	Non-hazardous
Plastic Packaging	15 01 02	Non-hazardous
Paper and Cardboard Packaging	15 01 01	Non-hazardous

4 The selected European Waste Classification (EWC) codes provided are provisional only. In a number of instances more than one EWC may be considered appropriate. Care should be taken to ensure that the waste collectors permit includes all EWC codes specified in the appropriate documentation. In addition, there will be a requirement for a technically competent person to assess waste as it arises and to make a determination as to the classification of the material in accordance with the Hazardous Waste List.

4.2 Waste Management Targets

The Contractor will be obliged to aim for an overall recycling rate of 70% of C&D material, in accordance with EU targets under Waste Framework Directive (2008/98/EC) as well as regional waste management targets as set out in Section 1.3. Waste management targets for anticipated waste arisings regarding reuse / recycling / recovery and disposal rates are presented in Table 4.2 below.

Table 4.2: Waste Management Targets

Waste Type	Reuse/Recovery %	Recycling %	Disposal %
Concrete	85	-	15
Non-hazardous Soils	100		0
Nominally Empty Containers containing residues of or contaminated by dangerous substances	100	-	-
Waste Diesel and Oil	80	20	-
Waste Fuels (Miscellaneous)	80	20	-
Scrap Metal	85	10	5
Bitumen / Tarmacadam	20	50	30
Surplus Bitumen / Tarmacadam	20	50	30
Surplus Cabling	-	-	100
Plastic Pipe Cut-offs	-	85	15
Plastic Packaging	-	85	15
Paper and Cardboard Packaging	15	85	-

4.3 Waste Management Costs

4.3.1 Financial Cost Associated with Waste

An outline of the costs associated with different aspects of waste management is provided below.

The total cost of implementing the CRWMP will have to take into account handling costs, storage costs, transportation costs, revenue from rebates and disposal costs.

4.3.2 Re-use / Recovery

Reusing of materials on site will reduce disposal costs. Clean and inert soils, gravel, stones etc. which cannot be reused on site may be classified as a by-product (under Article 27 of the 2011 Waste Directive Regulations). This material may be used as capping material for landfill sites, or for the reinstatement of quarries etc. subject to approvals by the EPA. This material is often taken free of charge for such purposes, or when used as capping in landfills will not attract the landfill tax levy, thereby reducing final waste disposal costs.

4.3.3 Recycling

All metals are salvable and can earn a rebate which can offset collection and transportation costs. Clean, uncontaminated cardboard and certain hard plastics can be recycled. Waste contractors will charge considerably less to take segregated wastes such as recyclable waste from a site than mixed waste. Timber can be recycled as chipboard. If wastes are segregated, waste contractors will charge considerably less as sorting and processing of waste reduces.

4.3.4 Disposal Charge

The total cost of waste management associated with the proposed development will be calculated in regard to the purchase costs of materials, handling costs, storage costs, transportation costs, revenue from sales, disposal costs etc. Costs will be recorded for the range of C&D materials and waste arising. At this stage, it is difficult to determine indicative total waste management costs as the CRWMP is preliminary in nature. When exact quantities and volumes of waste material cannot be determined the full disposal costs can be calculated.

A template for the recording of costs is provided in Table 4.3. This record will be live and will be developed as the project progresses.

Table 4.3: Indicative Costs Breakdown for Waste Management

Waste Type	Estimated Quantity (Tonnes)	Estimated Cost (€)
Quantity of Material	To be confirmed	To be confirmed
Purchase Cost	To be confirmed	To be confirmed
Materials Handling Costs	To be confirmed	To be confirmed
Material Storage Costs	To be confirmed	To be confirmed
Material Transportation Costs	To be confirmed	To be confirmed
Material Treatment Costs	To be confirmed	To be confirmed
Total Waste Management Cost	To be confirmed	To be confirmed
Unit Waste Management Cost	To be confirmed	To be confirmed

5 Site Management

5.1 Resource Manager

A "Resource Manager" will be nominated to take responsibility for all aspects of waste management at the different stages of the proposed development and overall implementation of the CRWMP and associated procedures.

The Resource Manager, as appointed by the Contractor, will be technically competent and appropriately trained, and will take responsibility to ensure that the objectives and measures contained within this CRWMP are transposed into the detailed CRWMP, and are subsequently implemented including associated target re-use / recycling rates). The Resource Manager will also facilitate effective communication of the waste management objectives with all operatives associated with the project (including site staff, external contractors and suppliers).

Another key objective of the Resource Manager will be the maintenance of accurate records on the quantities of waste / surplus materials generated and the real cost (including purchasing) associated with waste generation and management. The recording of summary information will further assist the implementation of the plan.

The Resource Manager will ensure that reporting and recording requirements are met, and all necessary resources are in place to support the implementation of the plan.

5.2 Site Personnel

All site personnel will be instructed about the objectives of the CRWMP and informed of the responsibilities to effectively implement the plan. Where waste prevention, source segregation, material reuse techniques, and best practice guidelines apply, each member of staff will be given instructions on how to comply with the CRWMP.

5.3 Training

Copies of the CRWMP will be made available to all relevant personnel on site. The Resource Manager will arrange for all site personnel to receive training on the objectives of the plan and materials management. The topics to be covered will include:

- Project programme and requirements;
- Project commitments and targets;
- Health and safety requirements;
- Materials to be segregated;
- Segregation systems and protocols;
- Arrangements for the storage and handling of reusable materials and recyclables;
- Instruction on hazardous wastes and the dangers of each hazardous waste; and
- Document control requirements.

Toolbox talks on resource management will be provided on a regular basis to ensure that site personnel are aware of the resource management practices associated with their work and the appropriate control measures that are required to carry out their work in compliance with this CRWMP.

5.4 Record Keeping and Communications

A system will be developed to ensure that all details of generation, movement and treatment of C&D waste is recorded. Where practicable, a computerised monitoring tool will be employed to assist in facilitating waste reduction via benchmarking. As such, this system will enable the Contractor to measure and record the quantity of waste generated and identify wastage more readily as well as identify successes or failures as measured against performance targets. An indicative template is provided in Appendix A *Tracking Template*.

Verifiable and validated tracking and authorisation documentation will be maintained for all wastes destined for re-use, recovery, recycling, other recovery (including energy recovery), or disposal. Justification will also be provided where a disposal option has been employed.

In addition, a record will be kept of all materials as they arrive on site detailing the assignment of specific uses within the works. This will enable the monitoring of the quantity and type of waste produced at various stages throughout the project.

All waste material will be managed in accordance with the Waste Management Act 1996 (as amended) and associated Regulations e.g. all hauliers will hold waste licences and/or Certificates of Registration (COR) for the specified EWC and the appropriate local authority at the final destination. Waste will only be sent to facilities authorised to accept, treat and / or dispose of the material. Copies of all waste accreditations relevant to the waste treatment / collection will be retained with other waste records.

5.5 Communications

The Resource Manager will be responsible for internal reporting of resource statistics to ESB and the Contractor management. This will include performance relative to agreed targets and objectives which will be included as an agenda item at site meetings.

The Resource Manager will engage with Dublin City Council and the EPA on any site inspection or enforcement audits undertaken at the site. All follow-up actions and corrective actions will be logged and reported to Dublin City Council.

The Resource Manager will engage with other stakeholders (the public, etc.) as appropriate in relation to the resource management on site.

Upon completion of construction, the Resource Manager will prepare a final report summarising the outcomes of resource management processes adopted, the total reuse and recovery figures and the final destinations of all resources taken off-site. This report will be issued to ESB, Contractor management and Dublin City Council.

5.6 Waste Auditing

The effectiveness of the plan, and its implementation, will be subject to regular audits by the Resource Manager throughout the duration of the project. The purpose of the waste audit is to highlight the problems that waste can cause and the benefits of prevention and minimisation.

The audits will focus on material inputs to the project (assignment of materials to specific uses within the works) and the waste outputs for each operation, identifying additional opportunities for waste reduction, re-use and recycling. The audits will also investigate the operational factors and management policies that contribute to the generation of waste and identify appropriate corrective actions, where necessary.

The audit findings will reflect the success or failure of reaching performance targets and subsequent Action Plans will be developed to address any issues and highlight corrective actions that may be taken in relation to management policies or site practices in order to bring about further waste reductions. Inspections of the waste storage areas will be undertaken on a weekly basis, issues relating to housekeeping, inappropriate storage and / or segregation will be actioned at the earliest practicable opportunity.

6 Site Infrastructure

This section relates to on-site signage, separation, and storage for handling and managing of waste and resources.

1. Prior to construction, the site layout will be reviewed by ESB to ensure that the proposed Waste Storage Areas (WSAs) have adequate space for storage and handling.
2. WSAs include stockpiles, skips or secure containers for hazardous materials. All WSAs will be assessed as fit for purpose and suitably contained, or bunded as required.
3. The WSA will be set out to reduce any potential impact on sensitive human or natural environments and a suitable buffer will be applied to mitigate any impact.
4. Labelling and signage will be used onsite to inform personnel of key WSA requirements and restrictions, with clear signage provided on all WSAs.
5. Signage will provide information to assist good resource practice across the site.

Appendices

A. Tracking Template

Table A.1: Waste Tracking Template

EWC Code	Waste Description	Collection Data	Destination	Container Type	Container Size	Reg. #	Haulage Company	Weight (tonnes)	Weighbridge	Documents Received	Documents on File	Reference #

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8. Air and Climate

8.1 Construction Dust

Table 8.2: Determination of Dust Raising Magnitude (IAQM)

Source	Large	Medium	Small
Demolition	Total building volume > 50,000m3, potentially dusty construction material (e.g. concrete), on site crushing and screening, demolition activities > 20m above ground	Total building volume 20,000m3 - 50,000m3, potentially dusty construction material, demolition activities 10-20m above ground level	Total building volume <20,000m3, construction material with low potential for dust release (e.g .metal cladding or timber), demolition activities <10m above ground, demolition during wetter months
Earthworks	Total site area >10,000m2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry to due small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8m in height, total material moved >100,000 tonnes	Total site area 2,500m2 – 10,000m2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4m – 8m in height, total material moved 20,000 tonne – 100,000 tonne	Total site area <2,500m2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4m in height, total material moved <10,000tonne, earthworks during wetter months
Construction	Total building volume >100,000m3, piling, on site concrete batching; sandblasting	Total building volume 25,000m3 – 100,000m3, potentially dusty construction material (e.g. concrete), piling, on site concrete batching	Total building volume <25,000m3, construction material with low potential for dust release (e.g. metal cladding or timber)
Track out	>100 HDV (>3.5t) trips in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m	25-100 HDV (>3.5t) trips in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m	<25 HDV (>3.5t) trips in any one day, surface material with low potential for dust release, unpaved road length <50m

Table 8.3: Receptor Sensitivity

Source	High	Medium	Low
Sensitivities of people to dust soiling effects	Users can reasonably expect an enjoyment of a high level of amenity; or The appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. Indicative examples include dwellings, museums and other culturally important collections, medium and long term car parks (See note B) and car showrooms.	Users would expect a to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or The appearance, aesthetics or value of their property could be diminished by soiling; or The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. Indicative examples include parks and places of work.	The enjoyment of amenity would not reasonably be expected (See note A); or Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or There is transient exposure, where the people or Property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. Indicative examples include playing fields, farmland (unless commercially-sensitive horticultural),

Source	High	Medium	Low
			footpaths, short term car parks (See note B) and roads.
Sensitivities of people to the health effects of PM10	Locations where members of the public are exposed over a time period relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day - See note C) Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	Locations where the people exposed are workers (See note D), and exposure is over a time period relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). Indicative examples include office and shop workers, but will generally not include workers occupationally exposed to PM10, as protection is covered by Health and Safety at Work legislation.	Locations where human exposure is transient (See note E) Indicative examples include public footpaths, playing fields, parks and shopping streets.
Sensitivities of receptors to ecological effects (See note F)	Locations with an international or national designation and the designated features may be affected by dust soiling; or Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain (See note G). Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or • Locations with a national designation where the features may be affected by dust deposition. • Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.	Locations with a local designation where the features may be affected by dust deposition. Indicative example is a local Nature Reserve with dust sensitive features.

1. The public's expectations will vary depending on the existing dust deposition in the area
2. Car parks can have a range of sensitivities depending on the duration and frequency that people would be expected to park their cars there, and the level of amenity they could reasonably expect whilst doing so. Car parks associated with work place or residential parking might have a high level of sensitivity compared to car parks used less frequently and for shorter durations, such as those associated with shopping. Cases should be examined on their own merits.
3. This follows Defra guidance as set out in LAQM.TG(16).
4. Notwithstanding the fact that the air quality objectives and limit values do not apply to people in the workplace, such people can be affected to exposure of PM10. However, they are considered to be less sensitive than the general public as a whole because those most sensitive to the effects of air pollution, such as young children are not normally workers. For this reason workers have been included in the medium sensitivity category.
5. There are no standards that apply to short-term exposure, e.g. one or two hours, but there is still a risk of health effects, albeit less certain.
6. A Habitat Regulation Assessment of the site may be required as part of the planning process, if the site lies close to an internationally designated site i.e. Special Conservation

Areas (SACs), Special Protection Areas (SPAs) designated under the Habitats Directive (92/43/EEC) and RAMSAR sites.

7. Cheffing C. M. & Farrell L. (Editors) (2005), The Vascular Plant. Red Data List for Great Britain, Joint Nature Conservation Committee.

Table 8.4: Sensitivity of the area to dust soiling effects on people and property

Receptor Sensitivity	Number of Receptors	Distance from the source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 8.5: Sensitivity of the area to human health effects

Receptor Sensitivity	Annual Mean PM10 Concentration	Number of Receptors	Distance from the source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m3	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24µg/m3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32 µg/m3	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32 µg/m3	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28 µg/m3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24µg/m3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table 8.6: Sensitivity of the area to ecological effects

Receptor Sensitivity	Distance from the source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Table 8.7: Risk of Dust Effects - Demolition

Sensitivity of Area	Dust Emissions Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Low Risk

Table 8.8: Risk of Dust Effects - Earthworks

Sensitivity of Area	Dust Emissions Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 8.9: Risk of Dust Effects - Construction

Sensitivity of Area	Dust Emissions Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 8.10: Risk of Dust Effects – Trackout

Sensitivity of Area	Dust Emissions Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

8.2 Building Dimensions

ID	Name	Height (m)	Diameter (m)	X Length (m)	Y Length (m)	Rotation Angle (°)
1	Doyle Ship 1	15		73.8	83.0	0
2	Doyle Ship 2	15		72.3	77.3	0
3	DSG	16		25.0	14.1	358
4	Office	5		38.7	12.4	358
5	Warehouse	7		19.8	46.0	358
6	Lagan Port	9		56.6	56.6	358
7	Lagan Tank 1	15	22.2			
8	Lagan Tank 2	15	15.4			
9	Lagan Tank 3	15	15.7			
10	Refill Tanks	12		21.7	13.6	0.0
11	Turbine Hall 1	12		17.0	44.0	358
12	Turbine Hall 2	12		17.0	44.0	358
13	Turbine Hall 3	16		40.6	10.1	358
14	Turbine Hall 4	8		17.1	6.0	358
15	Turbine Hall 5	8		17.1	6.0	358
16	CT5	10		20.4	11.5	358
17	NW Warehouse 1	10		19.0	49.7	358
18	NW Warehouse 3	16		23.1	65.6	358
19	NW Warehouse 4	22		26.6	55.1	358
20	NW Tank 1	10	23.9			
21	NW Tank 2	10	23.9			
22	NW Tank 3	10	23.9			
23	NW Tank 4	10	23.9			
24	NW Warehouse 5	10		15.8	10.7	358
25	NW Warehouse 6	8		7.4	17.5	358
26	NW Pipes	7		11.2	18.2	358
27	Gas Compressor	3		15.0	45.0	358
28	Exhaust Gas Ducts	11		21.1	10.8	359
29	NW Water Tank	9.75	10.3			
30	OCGT 1	4		3.0	28.0	0
31	OCGT 2	4		3.0	28.0	0
32	OCGT 3	4		3.0	28.0	0
33	OCGT 4	4		3.0	28.0	0
34	OCGT 5	4		3.0	28.0	0
35	OCGT 6	4		3.0	28.0	0

11. Biodiversity

11.1 Bat Survey Report

ESB North Wall Power Station Alterations Project

Bat Survey Report

20 February 2020

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ESB North Wall Power Station Alterations Project

Bat Survey Report

20 February 2020

Issue and Revision Record

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Contents

1 Introduction

Electricity Supply Board (ESB) is proposing some alterations the generating plant and associated equipment within the existing North Wall Power Generating Station, Alexandra Road, Dublin.

The proposed alterations will consist of the replacement of existing gas turbines, generators and ancillary equipment within the generating station. The works will also include the replacement of one of the chimney stacks removal of a small number of redundant buildings/structures to accommodate the installation of the new equipment and infrastructure and improve the overall layout of the station.

Mott MacDonald Ireland has been commissioned by the ESB to undertake a bat habitat assessment and investigative survey to identify potential roost features within structures identified for removal or refurbishment within the North Wall power station, and to determine the presence or likely presence of bats in said structures. The report is to inform the EIAR which is being prepared in support of the planning application for these works.

1.1 Legislative Obligations

Annex IV of the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora lists "*Animal and Plant Species of Community Interest in Need of Strict Protection*". All bat species present in the Republic of Ireland are included in this list. Acts prohibited by the legislation include;

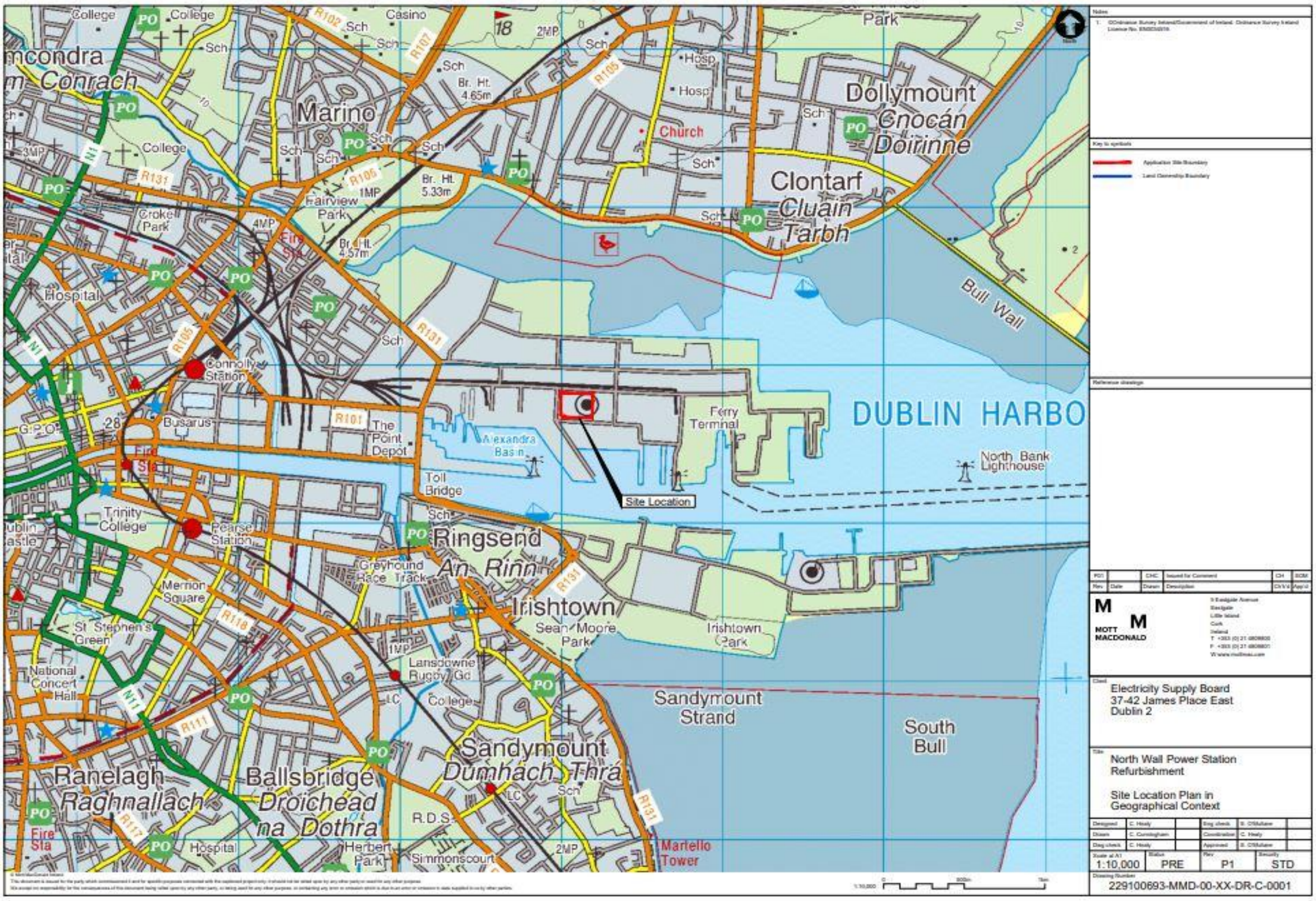
- all forms of deliberate capture or killing of specimens of these species in the wild;
- deliberate disturbance of these species, particularly during the period of breeding, rearing, hibernation and migration
- deterioration or destruction of breeding sites or resting places.

As such any interference to bats or bat roosts is illegal unless under prior agreement with the National Parks and Wildlife Service.

1.2 Location

North Wall Power Station is located within Dublin Port on the North of the River Liffey. The area is highly developed, and the site is bordered to the north by Alexandra Road, to the west by two warehousing structures and to the east and south by hardstanding associated with Dublin Port. The location of North Wall in relation to the surrounding areas is presented in Figure 1.1.

Figure 1.1: North Wall Power Station Location



1.3 Aims and Objectives

This report summarises the findings of a preliminary roost assessments of structures proposed for removal/refurbishment within the North Wall Power Station site.

The aim of the survey is to:

- Identify features that have the potential to support roosting and assess the ecological value of the buildings for bats
- Determine the presence/likely presence of roosting bats
- Determine the likely effects on bats from the proposed removal/refurbishment of the buildings and assess the significance of any such effects
- To identify any constraints to the proposed development and to provide recommendations for any further surveys, avoidance, mitigation or enhancement measures that are needed (as appropriate)

2 Methodology

2.1 Desktop Assessment

An initial desktop survey was undertaken. This included examining aerial photography to determine the potential for habitat connectivity to the wider landscape and examining databases for historic records of bats in the vicinity of the power station.

Desktop survey results are provided below in section 3.

2.2 Preliminary Roosts Assessment Methodology

A survey was carried out by Mott MacDonald Ecologists in November and December 2019. The survey was carried out as per *Bat Surveys for Professional Ecologists, Good Practice Guidelines* (Collins, 2016) which outlines a staged approach to surveys as follows:

"*Roost surveys of structures generally take a staged approach with the first step being a preliminary roost assessment (possibly preceded by a preliminary ecological appraisal – see Chapter 4), which may be followed up by winter hibernation, presence/absence and/or roost characterisation surveys*."

Survey Method

The survey method included the systematic examination of potential/actual entry and exit points for bats, potential/actual roosting locations, and evidence of bats for all affected structures. Evidence of bats may include the following:

- Live or dead specimens
- Bat droppings
- Urine splashes
- Fur oil staining
- Squeaking from bats in roosts
- Feeding remains
- Odour

The structures were examined externally, and where safe internally for any evidence of bats. The external examination was undertaken from ground level. This involved identifying:

- Potential access points for bats to the building
- Evidence of connectivity to the wider landscape (e.g. through treelines or hedgerows) that might be used by foraging bats
- Evidence of external lighting that might deter bats from utilising suitable features
- Evidence of bats on the external face of the building, or on the ground near potential access points
- Inspection of any voids accessible with torch or endoscope

The internal examination took place working upwards from the entrance of the building and ending with any basement/cellar spaces. Within buildings features inspected included;

- Floors and surfaces of any furniture or equipment for any signs of bat droppings or urine splashes or stains

- Features within rooms which could contain a roosting bat, for example: pictures, posters, lifted plaster, inside cupboards, and chimneys
- Roof voids (where accessible), with a focus on entry points, surfaces which might contain evidence of bats, insulation which might have bats roosting beneath, or internal cavities
- Light spill which might indicate entry points, and/or deter bats from utilising the area as a roost
- Inspection of any voids accessible with torch or endoscope

Following the inspections of each of the structures, an assessment of the suitability of the structure for bats (carried out as per Collins 2016 and outlined in Table 2.1) was carried out. The survey results are presented in section 3 below.

Table 2.1: Assessment of Potential Development Sites for Bats Based on Habitat Features for Roosting Habitats

Suitability	Description
Negligible	Negligible habitat features on site likely to be used by roosting bats
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions (e.g. in terms of temperature, humidity, height above ground level, light level, or levels of disturbance) and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions, and surrounding habitat.

Source: Collins (2016)

2.3 Equipment Used

Equipment used to carry out the inspection included high powered torches, ladders, camera, and endoscope (Explorer premium wireless inspection camera).

The inspection was carried out under license from the National Parks and Wildlife Service (License number 111/2019).

2.4 Constraints to the Survey

Several the structures i.e. the Townswater and Demins Tanks, and the HRSG and Exhaust Stack CT4 could not be entered for health and safety reasons. However, as described in the sections below these structures did not show any suitable access points for bats.

3 Desktop Survey Results

North Wall Power Station is in a location surrounded by highly developed and heavily utilised and disturbed land. The edges of the dockland by the water may provide some foraging habitat for bats, however the power station is set back approximately 200m from the water's edge. No suitable linear features with connectivity to the power station were identified.

An examination of records of bats from the National Biodiversity Data Centre was undertaken within the 10km and the 2km grid squares in which the power station is located.

Within the 10km grid square (O13) the following bat species were recorded:

- Brown long-eared bat (*Plecotus auritus*)
- Daubenton's bat (*Myotis daubentonii*)
- Lesser noctule (*Nyctalus leisleri*)
- Nathusius's pipistrelle (*Pipistrellus nathusii*)
- Natterer's bat (*Myotis nattereri*)
- Pipistrelle (*Pipistrellus sensu lato*)
- Soprano pipistrelle (*Pipistrellus pygmaeus*)
- Whiskered bat (*Myotis mystacinus*)

Within the 2km grid square (O13X) there were no records of bats.

The National Biodiversity Data Centre mapping includes a "bat landscape" feature. This feature identifies a habitat suitability index for "All bats" and for each individual species. The index ranges from 0 to 100, with 100 being most suitable for bats. The index for O13X in which North Wall is located is listed as being 17.44, which puts in the second lowest suitability range listed (17-28).

These results indicate that the area surrounding North Wall has a relatively low suitability for bats.

4 Preliminary Roost Assessment Results

4.1 Gas Compressor Room

External Inspection

The gas compressor room consists of a tall building with the lower half of brick, and the upper half of the building constructed of corrugated cladding (see Figure. 3.1).

Upon inspection, the building was noted to be very well sealed with no gaps observed at the roof edge, around the windows, or along the face of the building that would afford entry to bats.

No evidence of bats was recorded during the external inspection.

Figure 4.1: External view of the Gas Compressor Building

Source: Mott MacDonald, 2019

Internal Inspection

Internally the roof consists of a steel frame with purlins and a roof bracing profiled with steel cladding. (Figure 3.2). There was no roof void apparent. The windows allowed a great deal of light into the building.

It was not possible to inspect the edges of the roof internally due to the height of the building. A clear view, however, was afforded from ground level. The roof, internal walls, windows and tops of the equipment were inspected with a high-power torch for evidence of entry points, droppings or staining. No evidence of bats was recorded during the internal inspection.

Figure 4.2: Internal view of Gas Compressor Building

Source: Mott MacDonald, 2019

Suitability for Bat Roost

The building is located within a well-lit site. This, coupled with the high light levels within the building, significantly reduces the suitability of this building to contain bats. Further, there were no signs of bats internally or externally. As such the Gas Compressor Room is assessed as being of “*negligible*” suitability to contain roosting bats.

4.2 Canteen

Exterior Inspection

The canteen building consists of a flat roofed (split level, comprised of concrete) brick building with a smooth finish on the exterior (Figure 3.3). Small gaps were present in the soffit and fascia of the building. In addition, a number of windows were open, and vents were present. These features had potential to act as entry points for bats utilising the building. Ivy growth was present on the face of the building; however, it was not of sufficient maturity to support opportunistically roosting bats. No signs of bats were observed on the exterior of the building.

In addition, the area surrounding the building was heavily lit. This acts as a deterrent to bats.

Figure 4.3: Canteen exterior

Source: Mott MacDonald, 2019

Interior Inspection

Within the Canteen a void was present between the flat roof, and ceiling tiles. The voids contained air vents and wiring. In various places throughout the building these ceiling tiles were missing. In some places, windows were present which lit up the void (Figure 3.4). The top joint of the building, where the wall met the roof was well sealed with no evidence of gaps to allow entry for bats into the building recorded. No evidence of bats was recorded within the roof void.

The internal rooms were examined for features which may support roosting bats, for example behind pictures or posters.

There was no evidence of bats in the interior of the building.

Suitability for Bat Roost

The building has numerous light sources surrounding it. This, coupled with the light levels within the internal building and the void in places, significantly reduces the suitability of this building to contain bats. Further, there were no signs of bats internally or externally. As such the Canteen Building is assessed as being of "*negligible*" suitability to contain bats.

Figure 4.4: Interior of Canteen showing void

Source: Mott MacDonald, 2019

4.3 Store House Number 2

External Inspection

The storehouse consisted of a single storey brick building with a pitched asbestos roof (Figure 3.5). A number of potential entry points were recorded externally. These included gaps in the fascia and soffit, and a vent to the rear of the building. These features had potential to act as entry points for bats utilising the building. No signs of bats were observed on the exterior of the building. Street lighting was present adjacent to the building indicating that the building is well lit at night, thereby deterring bats.

Figure 4.5: External view of storehouse number 2

Source: Mott MacDonald, 2019

Internal Inspection

Internally the store house was open plan (Figure 3.6). The sloped ceiling consisted of boards with some fibrous lagging behind it. The ceiling had become degraded in places where there was water leaking from the roof. The building appeared to be in use. Lighting within the storehouse consisted of that from the windows, the vent to the rear, and lights within the building itself, reducing the suitability of this building for roosting bats.

No signs of bats were recorded within the storehouse.

Figure 4.6: Internal View of Storehouse

Source: Mott MacDonald, 2019

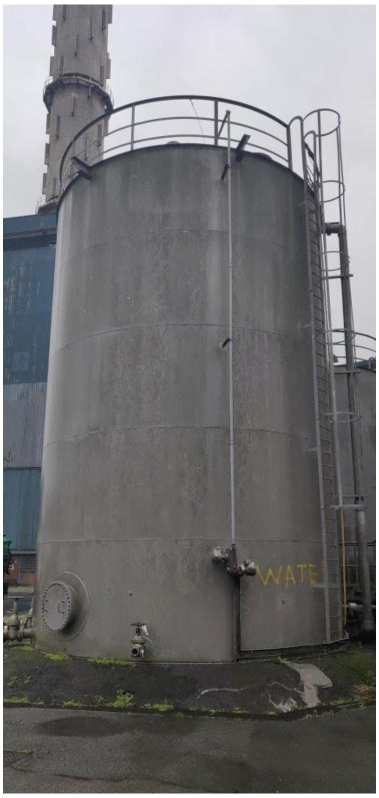
Suitability for Bat Roost

The building has numerous light sources surrounding it. This significantly reduces the suitability of this building to contain bats. Further, there were no signs of bats internally or externally. As such the building is assessed as being of "*negligible*" suitability to contain bats.

4.4 Townswater and Demins Tanks

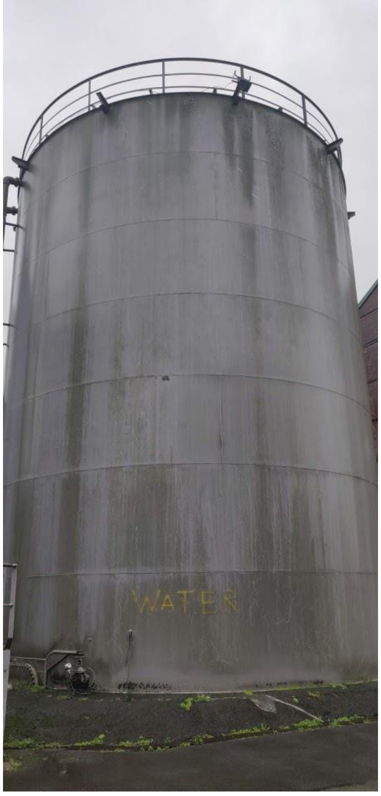
These tanks consisted of entirely sealed carbon steel units (Figures 3.7 and 3.8). As such they were not surveyed internally and were not deemed to have potential to support roosting bats.

Figure 4.7: Example of sealed tanks



Source: Mott MacDonald, 2019

Figure 4.8: Second view of sealed tank



Source: Mott MacDonald, 2019

Suitability for Bat Roost

Given that the tanks were entirely sealed, they are assessed as being of "*negligible*" suitability to contain bats.

4.5 Water Treatment Building

External inspection

The water treatment building consists of bricked walls with concrete columns and a corrugated roof. The building appears to be very well sealed. No gaps were observed at the roof edge, or along the face of the building that would afford entry to bats. No evidence of bats was observed. External security lights mounted to the face of the building are present (Figure 3.9). As such, the building is well-lit at night.

Figure 4.9: External view of water treatment building with security light

Source: Mott MacDonald, 2019

Internal inspection

Internally, the roof consists of corrugated Iron, with transparent plastic panels, and steel beams (Figure 3.10). There was no roof void apparent. The plastic panels allowed a great deal of light into the building. The joint between the roof and the walls appeared to be very well sealed with no evidence of any gaps. No staining or droppings were observed within the building.

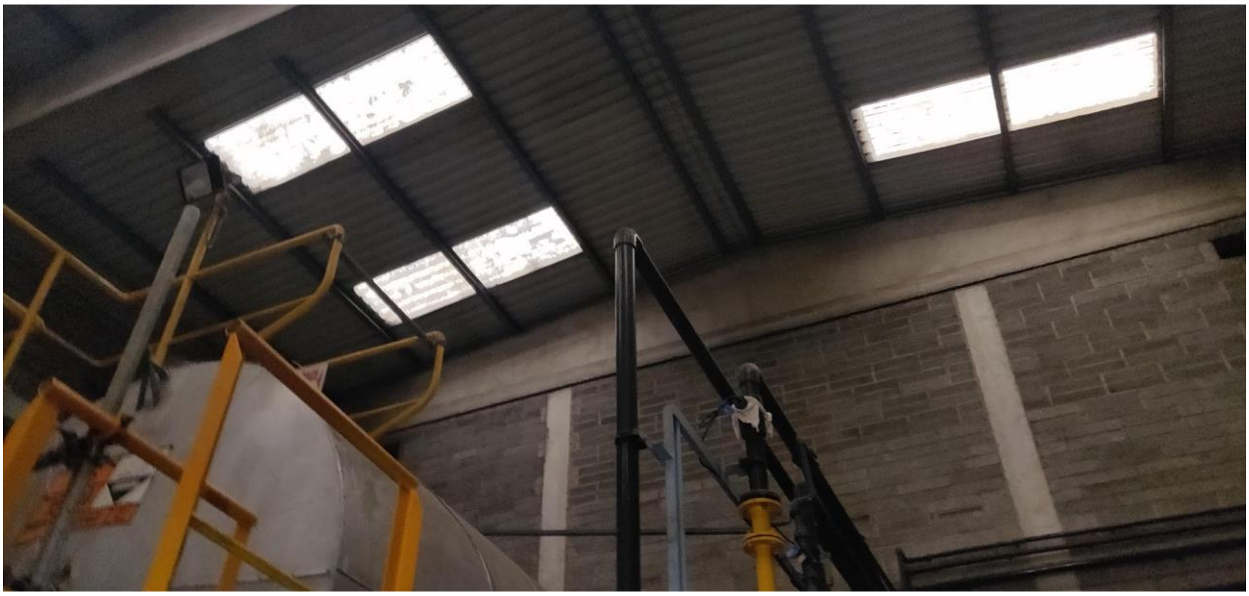
A small internal office was inspected for any features which may support roosting bats. No signs of bats were recorded within the office.

A small basement room was also recorded. This was inspected last. There was no sign of any bats making use of this basement for roosting.

Suitability for Bat Roost

The building has numerous light sources surrounding it. The lack of a roof void, the lighting levels externally, and light levels within the internal building, significantly reduces the suitability of this building to contain bats. Further, there were no signs of bats internally or externally. As such the building is assessed as being of "*negligible*" suitability to contain bats.

Figure 4.10: Internal view of water treatment building



Source: Mott MacDonald, 2019

4.6 The Stores

External Inspection

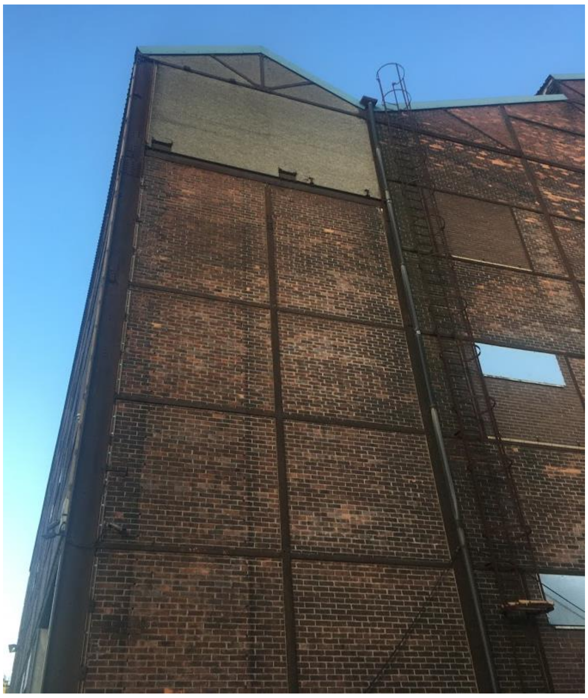
The Stores consists of a large single-story building which is comprised entirely of brick with a corrugated roof (Figures 3.11 and 3.12). The brick walls are well sealed with the exception of a northern section of the southern external wall which has a number of small voids present. A number of pigeons were noted using the voids to access the interior of the building. No other suitable access points for bats were noted around the building.

Steel beams are welded to the outside of the building. There were no gaps or crevices between the beams and the walls which could provide suitable roost features.

A number of external security lights are attached to the walls. In addition, a number of lighting poles occur in proximity to building, both of which significantly illuminates the building and surrounding area.

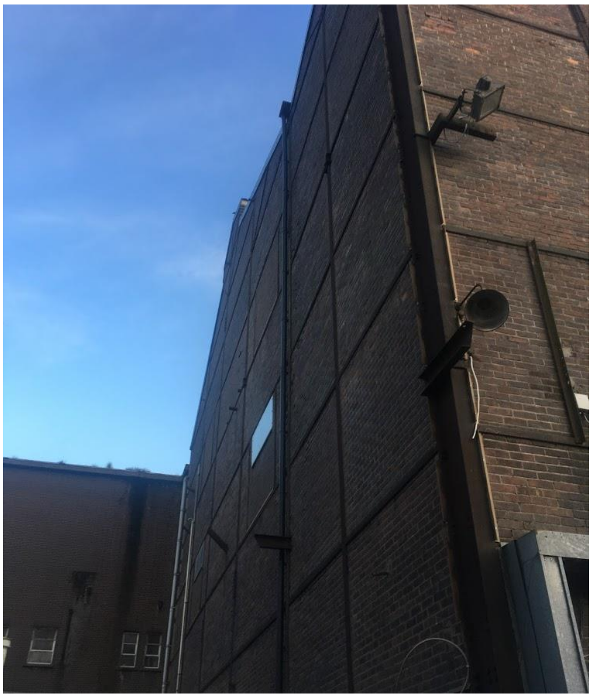
No evidence of bats was noted around the external boundary of the building or on the walls.

Figure 4.11: External view of the southern side of the Stores building



Source: Mott MacDonald, 2019

Figure 4.12: External view of the northern side of the Stores Building



Source: Mott MacDonald, 2019

Internal Inspection

An internal inspection was undertaken within the building. The building was historically in use as a large storage area; however, the building is no longer in use due to the presence of asbestos.

The roof of the building comprises corrugated metal sheets and steel beams. The corrugated roof is well sealed and provides no suitable roosting features for bats. Steel beams occur vertically along the boundaries of the walls. The beams are well sealed with no crevices present between the wall and beams. A number of windows occur around the building; however, all windows are sealed shut. Small voids on the southern wall were noted and are currently being used by pigeons to access the interior of the building.

The building is significantly illuminated by internal security lighting which are switched on 24 hours a day.

The floor and walls of the building were thoroughly searched for evidence of bat activity. No evidence was recorded.

Figure 4.13: Internal view facing southern wall

Source: Mott MacDonald, 2019

Figure 4.14: Internal view facing northern wall

Source: Mott MacDonald, 2019

Suitability for Bats

The small voids noted on the southern wall may provide an entry point for bats. However, considering the lack of suitable roost features within the building, coupled within the internal and external security lighting which significantly illuminates the building, the bat roost potential of the building was assessed as '*Negligible'*.

4.7 Steam Turbine Hall

External Inspection

The Steam Turbine Hall is a large two-story building comprising entirely of brick with a corrugated sheet roof (Figure 3.13). The brick walls are well sealed, and no crevices or voids were noted on the external walls. Drainpipes are attached vertically to the building. There are no gaps or crevices between the drainpipes and the wall which could provide suitable roost features for bats. A number of security lights are attached to the external wall, in addition tall lighting poles occur in close proximity to the building which results in illumination of the building at night.

No evidence of bats was recorded around the external boundary of the building or on the external walls.

Figure 4.15: External view of southern boundary of The Steam Turbine Hall

Source: Mott MacDonald, 2019

Internal Inspection

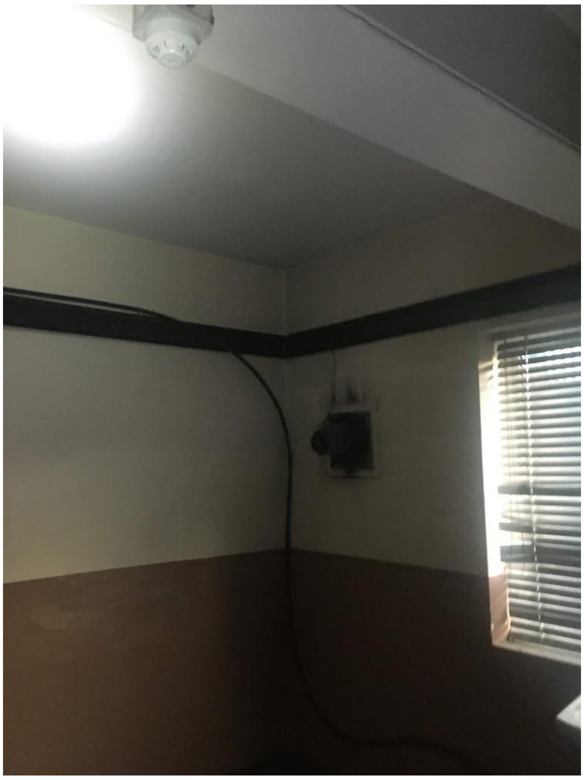
The building comprises a large central area with a number of small side rooms on the ground floor (Figures 3.16 and 3.17). The large main area houses elements of the substation. The roof of the main area comprises corrugated metal sheets and iron beams. No suitable entry points for bats were identified within the building. The interior of the building is permanently illuminated by security lighting which is switched on 24 hours a day. No evidence of bats was recorded within the building.

As noted, a number of small side rooms occur along the eastern boundary of the building. The small rooms comprised of plastered walls and sealings with no suitable entry or roost features present. The rooms are well lit with artificial and natural lighting. No evidence of bats was recorded in any of the small side rooms.

Figure 4.16: Internal view of main central area of the Steam Turbine Hall

Source: Mott MacDonald, 2019

Figure 4.17: Internal view of one of the small side rooms within the Steam Turbine Hall



Source: Mott MacDonald, 2019

Suitability for Bats

No suitable entry points or suitable bat roost features were identified within the steam turbine hall. In addition, the building is significantly illuminated by artificially lighting both internally and externally. The building was therefore assessed as having "*Negligible*" bat roost potential.

4.8 Administration building & stores

External Inspection

The building consisted of a flat roofed, 3 storey brick and concrete slab building, with a smooth finish on the exterior (Figure 3.18). The roof is constructed of concrete with integrated skylights. The building is relatively modern and actively used. No suitable entry points were observed, and no signs of bats were recorded. External lighting is in use on the edge of the roof and surrounding the building. This significantly illuminates the building at night.

Figure 4.18: External view of the administration & stores building

Source: Mott MacDonald, 2019

Internal Inspection

Within the building a void was present between the flat roof, and ceiling tiles. The voids contained air vents and wiring. The top joint of the building, where the wall met the roof appeared to be well sealed. There was no evidence of gaps to allow entry for bats into the building recorded. No evidence of bats was recorded within the roof void. The building itself is actively used with a high level of disturbance inside.

There was no evidence of bats recorded in the interior of the building.

Suitability for Bats

No suitable entry points or suitable bat roost features were identified within the administration building. In addition, the building is significantly illuminated by artificial lighting both internally and externally. The building is also currently in use. No signs of bats were observed internally or externally. The building was therefore assessed as having “*Negligible*” bat roost potential.

4.9 HRSG and Exhaust Stack CT4

The HRSG and Exhaust Stack CT4 building is comprised of a mixture of steel columns and beams, with brick walls and steel cladding (Figure 3.19). The stack had been in use up until October 2019. No signs of bats were recorded externally

It was not possible to survey the internal area of the building for health and safety reasons.

Figure 4.19: External View of the HRSG and Exhaust Stack CT4

Suitability for Bats

Given the location of the building, the lack of signs of bats or suitable access points, and that the stack was in operation until October, it is assessed as having "*negligible*" suitability to contain roosting bats.

5 Conclusion

The buildings were all located within a highly disturbed, well lit, urban environment. All of the structures surveyed within the site were assessed has having negligible potential to support roosting bats.

Given the location of North Wall within a highly developed, heavily disturbed, and highly lit area, and the lack of potential for roosting bats there is no requirement for further surveys or mitigation for bats.

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12. Archaeology and Cultural Heritage

12.1 Cultural Heritage Assets within the Study Area

ID No	50060592
Location	Alexandra Road
Parish	East Wall – North Strand
Barony	Dublin
I.T.M	719024, 734740
Classification	Building miscellaneous
Distance from Development	Within the proposed development
Description	Detached multiple-bay multi-storey industrial building, built c.1920, with narrow wing to west. Pitched roofs with replacement steel sheeting and raised central section with timber louvres to sides. Redbrick walls laid in stretcher bond on riveted iron frame. Randomly placed tripartite timber framed windows inserted at later date. Located at west end of Dublin Port, in area largely comprising recent industrial and maritime buildings, interspersed with patches of wasteland. Abutted by two-storey red brick building to east. This industrial building has an early twentieth-century appearance and may be one of the earliest of its type in the port. The exoskeleton design and richly textured red brick give this building a distinct appeal as a good example of early steel-frame construction, contributing to the architectural history of Dublin Port and its rich industrial heritage.
Reference	https://www.buildingsofireland.ie

ID No	50060590
Location	Alexandra Road
Parish	East Wall – North Strand
Barony	Dublin
I.T.M	718632, 734811
Classification	Odlum's Mills - Granary
Distance from Development	c.355-420m west
Description	Detached eleven-bay six-storey reinforced concrete grain silo, built c.1920, with four-bay short elevations, and with further multi-storey concrete tower and collection of single and two-storey flat-roofed accretions to north. Flat roof not visible, with some visible cast-iron box-profile down-pipes. Reinforced concrete walls arranged in vertical recessed panels, four to north elevation and eleven to west, each framed by giant panelled pilasters. Over-sailing concrete crown cornice below attic storey. Square-headed window openings arranged in pairs to west elevation (window details not visible) blocked up with grey brick to north elevation. Three blind vertical panels to all north, east and south elevations of tower with attic storey having continuous glazing. West elevation has stepped façade with glazed breakfront having continuous vertical glazing. Located at west end of Dublin Port, in area largely comprising modern industrial and maritime buildings, interspersed with patches of wasteland. Complemented by associated silo to west, of similar period and style. The main block within this group exhibits restrained classical proportions including full-height pilasters and crown cornice. The building appears to be out of use while the remaining structures are less noteworthy. As an early twentieth-century example of industrial architecture, the main building represents one of a small collection of grain-associated buildings that adds significant architectural interest to Dublin Port.
Reference	https://www.buildingsofireland.ie

ID No	**50060591**
Location	Alexandra Road
Parish	East Wall – North Strand
Barony	Dublin
I.T.M	718625, 734739
Classification	Odlum's Mills - Granary
Distance from Development	c. 360m west
Description	Detached multiple-bay multi-storey reinforced concrete grain silo, built c.1935, abutted by further two-bay wing and steel grain silo drums to east and west. Flat roof and rainwater goods not visible. Reinforced concrete walls to tower and lower structure. Riveted cylindrical grain silo drums on concrete base. Square-headed window openings with steel casement windows. To north and south elevations of tower is single vertical glazed panel with horizontal windows visible to attic storey. Lower section has steel casement windows. Some silo drums have had aluminium windows inserted. Two-storey block abutting base of south elevation has steel windows and timber loading doors. Located at west end of Dublin Port, in area largely comprising modern industrial and maritime buildings, interspersed with patches of wasteland. Complemented by associated silo to west, of similar period and style. This composition appears to date from the 1930s, suggested by the vertical emphasis of the tower with its strip glazing. The silo drums are purely utilitarian while the abutting south block appears to have been truncated. Together they form an austere industrial composition with traces of the Art Deco style. As an early twentieth-century example of industrial architecture, the group is one of a small collection of grain associated buildings that add architectural interest to Dublin Port.
Reference	https://www.buildingsofireland.ie

ID No	**50011171**
Location	Alexandra Road
Parish	East Wall – North Strand
Barony	Dublin
I.T.M	718563, 734873
Classification	Electricity substation
Distance from Development	c. 430m west
Description	Attached single-bay single-storey electricity substation, built c.1900. Flat roof hidden behind brick parapet wall with granite coping and central pediment rising above pediment with granite capstones to centre and either side. Red brick walls laid in Flemish bond with brick plinth course, brick pilasters to either end, moulded brick string course and moulded brick cornice to base of parapet. Central square-headed door opening with replacement steel doors and chamfered granite lintel. Open pediment to door opening with applied Dublin City coat of arms to tympanum and dentillated brick detail to raking cornice of pediment. This diminutive structure was built as a utilitarian piece of infrastructure in an industrial docklands area. The inclusion of a pedimented door surround shows the remarkable attention to aesthetic detail that was employed in all civic projects up to the early twentieth century.
Reference	https://www.buildingsofireland.ie

ID No	**50060589**
Location	Alexandra Road
Parish	East Wall – North Strand
Barony	Dublin
I.T.M	718498, 734789
Classification	R. & H. Hall - Granary
Distance from Development	c. 490m west
Description	Detached nine-bay fifteen- to twenty-storey reinforced concrete grain silo, built 1915-20, with attached steel bin silo added c.1932 to north, and further reinforced concrete silo attached to north 1938. Three six-storey single-bay projections to front elevation. Flat roof and rainwater goods not visible. Reinforced concrete walls arranged in vertical recessed panels, nine to front elevation with five to side elevation. Heavy cornice to older part, with mutules and heavy plat-band to storey below. Above cornice is three- to four-storey attic section with further central head-house floor. Square-headed window openings with wrought-iron multiple-pane windows and splayed concrete sills. Square-headed carriage-arch openings to west and east elevations to allow for loading, with granite wheel-guards and diorite setts to west opening. Located to west end of Dublin Port, area largely comprising modern industrial and maritime buildings, interspersed with patches of wasteland. Dry dock situated to west. Complemented by associated silos to east, of similar period and style. An enormous and architecturally impressive representative of large-scale early-twentieth-century industrial architecture, this grain silo, designed by Frederick G. Hicks, constitutes the most elaborate in Ireland in terms of both scale and design. The application of a cornice to this symmetrical façade gives the structure a formal aspect not usually found in this building type. When viewed from Ringsend, on the opposite side of the River Liffey, the composition and scale can be well appreciated and stands out as the most monumental structure in the district.
Reference	https://www.buildingsofireland.ie

ID No	**IH 1**
Location	Alexandra Road
Parish	East Wall – North Strand
Barony	Dublin
I.T.M	718751, 734820
Classification	Transit depot
Distance from Development	c. 236m west
Description	The structure currently occupying the site appears to be largely modern though it is possible that it retains some fabric from the original factory. Function at time of survey: Transit depot Site
Reference	Dublin City Industrial Heritage Record

ID No	IH 2
Location	Alexandra Road
Parish	East Wall – North Strand
Barony	Dublin
I.T.M	718776, 734640
Classification	Railway Bridge
Distance from Development	c. 359m west southwest
Description	Single-span railway bridge, built c.1877 carrying the Great Southern and Western Railway line over pedestrian access at Strandville Avenue. Purple-brick piers with rock-faced limestone dressings supporting a cast-iron deck with replacement corrugated-iron parapet railing having terminating piers of purple brick with limestone cap stones. Limestone bollard to east of pedestrian access. Despite being of modest scale and design this railway bridge exhibits high quality construction and detailing with red brick construction and limestone dressings. The limestone bollard to the pedestrian access adds interest to the structure.
Reference	Dublin City Industrial Heritage Record

ID No	IH 3
Location	Alexandra Road
Parish	East Wall – North Strand
Barony	Dublin
I.T.M	718630, 734673
Classification	Alexandra Quay
Distance from Development	c. 220m southwest
Description	Unable to gain access to quay area so uncertain of nature of surviving remains.
Reference	Dublin City Industrial Heritage Record

ID No	IH 4
Location	Alexandra Road
Parish	East Wall – North Strand
Barony	Dublin
I.T.M	718573, 734568
Classification	Alexandra Basin
Distance from Development	c. 220m southwest
Description	Alexandra Basin, functioning as a wet dock, was formed by the construction of the North Wall Quay extension (see 18 12 084) between 1871-85 under the direction of Bindon Blood Stoney, chief engineer of Dublin Port and Docks Board and incorporated the North Wall Basin (Halpin's Pond), excavated under the direction of George Halpin to accommodate steam vessel traffic c.1836 with an earthen embankment to its east forming a breakwater. The construction method for the quay consisted of using precast large-mass concrete wall units to form the lower sections, the first example of this construction method in Ireland. The 70- acre basin had an average depth of 38 feet at high tide and 26 feet at low tide which allowed ships of the largest class to dock. Northern embankment incorporates graving dock (18 08 081) and was developed as Alexandra Quay by 1931. Following the Second World War the port complex was continued eastwards with the formation of Alexandra Quay East and Alexandra Basin East.
Reference	Dublin City Industrial Heritage Record

ID No	IH 5
Location	East of East Wall Road
Parish	East Wall – North Strand
Barony	Dublin
I.T.M	718731, 734331
Classification	North Wall Lighthouse
Distance from Development	c. 470m southwest
Description	Original lighthouse replaced by modern lighthouse to east. No trace of original site survives.
Reference	Dublin City Industrial Heritage Record

ID No	IH 6
Location	Breakwater Road North
Parish	East Wall – North Strand
Barony	Dublin
I.T.M	719672, 734893
Classification	Breakwater
Distance from Development	c. 480m east northeast
Description	Breakwater now incorporated into later land reclamation extending eastwards but some traces may survive beneath the current ground surface.
Reference	Dublin City Industrial Heritage Record

ID No	IH 7
Location	Breakwater Road North
Parish	East Wall – North Strand
Barony	Dublin
I.T.M	719160, 734925
Classification	Oil tanks
Distance from Development	c. 70m north
Description	Oil tanks replaced by modern installations, while others have been completely removed and sites now occupied by car parks
Reference	Dublin City Industrial Heritage Record

ID No	IH 8
Location	Breakwater Road North
Parish	East Wall – North Strand
Barony	Dublin
I.T.M	719107, 734990
Classification	Tolka Quay
Distance from Development	c. 135m north
Description	Quay now incorporated into land reclamation extending northward but some traces of the original quay wall may survive beneath the current ground surface.
Reference	Dublin City Industrial Heritage Record

12.2 Legislation Protecting the Archaeological Resource

Protection of Cultural Heritage

The cultural heritage in Ireland is safeguarded through national and international policy designed to secure the protection of the cultural heritage resource to the fullest possible extent (Department of Arts, Heritage, Gaeltacht and the Islands 1999, 35). This is undertaken in accordance with the provisions of the European Convention on the Protection of the Archaeological Heritage (Valletta Convention), ratified by Ireland in 1997.

The Archaeological Resource

The National Monuments Act 1930 to 2014 and relevant provisions of the National Cultural Institutions Act 1997 are the primary means of ensuring the satisfactory protection of archaeological remains, which includes all man-made structures of whatever form or date except buildings habitually used for ecclesiastical purposes. A National Monument is described as 'a monument or the remains of a monument the preservation of which is a matter of national importance by reason of the historical, architectural, traditional, artistic or archaeological interest attaching thereto' (National Monuments Act 1930 Section 2). A number of mechanisms under the National Monuments Act are applied to secure the protection of archaeological monuments. These include the Register of Historic Monuments, the Record of Monuments and Places, and the placing of Preservation Orders and Temporary Preservation Orders on endangered sites.

Ownership and Guardianship of National Monuments

The Minister may acquire national monuments by agreement or by compulsory order. The state or local authority may assume guardianship of any national monument (other than dwellings). The owners of national monuments (other than dwellings) may also appoint the Minister or the local authority as guardian of that monument if the state or local authority agrees. Once the site is in ownership or guardianship of the state, it may not be interfered with without the written consent of the Minister.

Register of Historic Monuments

Section 5 of the 1987 Act requires the Minister to establish and maintain a Register of Historic Monuments. Historic monuments and archaeological areas present on the register are afforded statutory protection under the 1987 Act. Any interference with sites recorded on the register is illegal without the permission of the Minister. Two months' notice in writing is required prior to any work being undertaken on or in the vicinity of a registered monument. The register also includes sites under Preservation Orders and Temporary Preservation Orders. All registered monuments are included in the Record of Monuments and Places.

Preservation Orders and Temporary Preservation Orders

Sites deemed to be in danger of injury or destruction can be allocated Preservation Orders under the 1930 Act. Preservation Orders make any interference with the site illegal. Temporary Preservation Orders can be attached under the 1954 Act. These perform the same function as a Preservation Order but have a time limit of six months, after which the situation must be reviewed. Work may only be undertaken on or in the vicinity of sites under Preservation Orders with the written consent, and at the discretion, of the Minister.

Record of Monuments and Places

Section 12(1) of the 1994 Act requires the Minister for Arts, Heritage, Gaeltacht and the Islands (now the Minister for the Department of Culture, Heritage and the Gaeltacht) to establish and maintain a record of monuments and places where the Minister believes that such monuments exist. The record comprises a list of monuments and relevant places and a map/s showing each monument and relevant place in respect of each county in the state. All sites recorded on the Record of Monuments and Places receive statutory protection under the National Monuments

Act 1994. All recorded monuments on the proposed development site are represented on the accompanying maps.

Section 12(3) of the 1994 Act provides that 'where the owner or occupier (other than the Minister for Arts, Heritage, Gaeltacht and the Islands) of a monument or place included in the Record, or any other person, proposes to carry out, or to cause or permit the carrying out of, any work at or in relation to such a monument or place, he or she shall give notice in writing to the Minister of Arts, Heritage, Gaeltacht and the Islands to carry out work and shall not, except in case of urgent necessity and with the consent of the Minister, commence the work until two months after giving of notice'.

Under the National Monuments (Amendment) Act 2004, anyone who demolishes or in any way interferes with a recorded site is liable to a fine not exceeding €3,000 or imprisonment for up to six months. On summary conviction and on conviction of indictment, a fine not exceeding €10,000 or imprisonment for up to five years is the penalty. In addition, they are liable for costs for the repair of the damage caused.

In addition to this, under the European Communities (Environmental Impact Assessment) Regulations 1989, Environmental Impact Statements (EIS) are required for various classes and sizes of development project to assess the impact the proposed development will have on the existing environment, which includes the cultural, archaeological and built heritage resources. These document's recommendations are typically incorporated into the conditions under which the proposed development must proceed, and thus offer an additional layer of protection for monuments which have not been listed on the RMP.

The Planning and Development Act 2000

Under planning legislation, each local authority is obliged to draw up a Development Plan setting out their aims and policies with regard to the growth of the area over a five-year period. They cover a range of issues including archaeology and built heritage, setting out their policies and objectives with regard to the protection and enhancement of both. These policies can vary from county to county. The Planning and Development Act 2000 recognises that proper planning and sustainable development includes the protection of the archaeological heritage. Conditions relating to archaeology may be attached to individual planning permissions.

Dublin City Council Development Plan 2016-2022

It is the policy of Dublin City Council

CHC9: To protect and preserve National Monuments.

1. To protect archaeological material in situ by ensuring that only minimal impact on archaeological layers is allowed, by way of the re-use of buildings, light buildings, foundation design or the omission of basements in the Zones of Archaeological Interest.
2. That where preservation in situ is not feasible, sites of archaeological interest shall be subject to 'preservation by record' according to best practice in advance of re-development.
3. That sites within Zones of Archaeological Interest will be subject to consultation with the City Archaeologist and archaeological assessment prior to a planning application being lodged.
4. That the National Monuments Service will be consulted in assessing proposals for development which relate to Monuments and Zones of Archaeological Interest.

5. To preserve known burial grounds and disused historic graveyards, where appropriate, to ensure that human remain are re-interred, except where otherwise agreed with the National Museum of Ireland.

6. That in evaluating proposals for development in the vicinity of the surviving sections of the city wall that due recognition be given to their national significance and their special character.

7. To have regard to the Shipwreck inventory maintained by the DAHG. Proposed developments that may have potential to impact on riverine, inter-tidal and sub-tidal environments shall be subject to an underwater archaeological assessment in advance of works.

8. To have regard to DAHG policy documents and guidelines relating to archaeology.

It is an Objective of Dublin City Council:

CHCO10:

1. To implement the archaeological actions of the Dublin City Heritage Plan 2002-6 in light of the Dublin City Heritage Plan Review 2012.

2. To prepare and implement conservation plans for National Monuments and Monuments in DCC care (City Walls, St Luke's Church, St James's Graveyard, St. Thomas's Abbey, St Canice's Graveyard etc).

3. To maintain, develop and promote the Dublin City Archaeological Archive (DCAA) at Pearse Street Library and Archives.

4. To ensure the public dissemination of the findings of licensed archaeological activity in Dublin through the Dublin County Archaeology GIS.

5. To develop a long-term management plan to promote the conservation, management and interpretation of archaeological sites and monuments and to identify areas for strategic research.

6. To have regard to the city's industrial heritage and Dublin City Industrial Heritage Record (DCIHR) in the preparation of Local Area Plans (LAPs) and the assessment of planning applications and to publish the DCIHR online. To review the DCIHR in accordance with Ministerial recommendations arising from the national Inventory of Architectural Heritage (NIAH) survey of Dublin City and in accordance with the Strategic Approach set out in Section 11.1.4 of this Chapter

7. To promote awareness of, and access to, the city's archaeological inheritance and foster high-quality public archaeology.

8. To promote archaeological best practice in Dublin city.

9. To promote the awareness of the international significance of Viking Dublin and to support post-excavation research into the Wood Quay excavations 1962-81.

10. To develop a strategy for the former Civic Museum collection and for other collections of civic interest and importance.

11. To investigate the potential for the erection of Columbarium Walls.

12. To support the implementation of the Kilmainham Mill Conservation Plan.

13. Dublin City Council will seek to work with Diageo to undertake a more comprehensive industrial heritage survey of the constituent historic buildings within the Guinness Brewery complex at Saint James's Gate.

14. To implement and promote The Dublin Principles (ICOMOS, 2011) as guiding principles to assist in the documentation, protection, conservation and appreciation of industrial heritage as part of the heritage of Dublin and Ireland.

15. To continue to implement actions of the Saint Luke's Conservation Plan on the basis of funds available to conserve the monument, recover the graveyard, provide visitor access, improve visual amenity and secure an appropriate new use.

12.3 Impact Assessment and the Cultural Heritage Resource

Potential Impacts on Archaeological and Historical Remains

Impacts are defined as 'the degree of change in an environment resulting from a development' (Environmental Protection Agency 2017). They are described as profound, significant or slight impacts on archaeological remains. They may be negative, positive or neutral, direct, indirect or cumulative, temporary or permanent.

Impacts can be identified from detailed information about a project, the nature of the area affected and the range of archaeological and historical resources potentially affected. Development can affect the archaeological and historical resource of a given landscape in a number of ways.

- Permanent and temporary land-take, associated structures, landscape mounding, and their construction may result in damage to or loss of archaeological remains and deposits, or physical loss to the setting of historic monuments and to the physical coherence of the landscape.
- Archaeological sites can be affected adversely in a number of ways: disturbance by excavation, topsoil stripping and the passage of heavy machinery; disturbance by vehicles working in unsuitable conditions; or burial of sites, limiting accessibility for future archaeological investigation.
- Hydrological changes in groundwater or surface water levels can result from construction activities such as de-watering and spoil disposal, or longer-term changes in drainage patterns. These may desiccate archaeological remains and associated deposits.
- Visual impacts on the historic landscape sometimes arise from construction traffic and facilities, built earthworks and structures, landscape mounding and planting, noise, fences and associated works. These features can impinge directly on historic monuments and historic landscape elements as well as their visual amenity value.
- Landscape measures such as tree planting can damage sub-surface archaeological features, due to topsoil stripping and through the root action of trees and shrubs as they grow.
- Ground consolidation by construction activities or the weight of permanent embankments can cause damage to buried archaeological remains, especially in colluviums or peat deposits.
- Disruption due to construction also offers in general the potential for adversely affecting archaeological remains. This can include machinery, site offices, and service trenches.

Although not widely appreciated, positive impacts can accrue from developments. These can include positive resource management policies, improved maintenance and access to archaeological monuments, and the increased level of knowledge of a site or historic landscape as a result of archaeological assessment and fieldwork.

Predicted Impacts

The severity of a given level of land-take or visual intrusion varies with the type of monument, site or landscape features and its existing environment. Severity of impact can be judged taking the following into account:

- The proportion of the feature affected and how far physical characteristics fundamental to the understanding of the feature would be lost;
- Consideration of the type, date, survival/condition, fragility/vulnerability, rarity, potential and amenity value of the feature affected;
- Assessment of the levels of noise, visual and hydrological impacts, either in general or site-specific terms, as may be provided by other specialists.

12.4 Mitigations Measures and the Cultural Heritage Resource

Potential Mitigation Strategies for Cultural Heritage Remains

Mitigation is defined as features of the design or other measures of the proposed development that can be adopted to avoid, prevent, reduce or offset negative effects.

The best opportunities for avoiding damage to archaeological remains or intrusion on their setting and amenity arise when the site options for the development are being considered. Damage to the archaeological resource immediately adjacent to developments may be prevented by the selection of appropriate construction methods. Reducing adverse effects can be achieved by good design, for example by screening historic buildings or upstanding archaeological monuments or by burying archaeological sites undisturbed rather than destroying them. Offsetting adverse effects is probably best illustrated by the full investigation and recording of archaeological sites that cannot be preserved in situ.

Definition of Mitigation Strategies

Archaeological Resource

The ideal mitigation for all archaeological sites is preservation in situ. This is not always a practical solution, however. Therefore, a series of recommendations are offered to provide ameliorative measures where avoidance and preservation in situ are not possible.

Archaeological Test Trenching can be defined as 'a limited programme of intrusive fieldwork which determines the presence or absence of archaeological features, structures, deposits, artefacts or ecofacts within a specified area or site on land, inter-tidal zone or underwater. If such archaeological remains are present field evaluation defines their character, extent, quality and preservation, and enables an assessment of their worth in a local, regional, national or international context as appropriate' (CIfA 2014a).

Full Archaeological Excavation can be defined as 'a programme of controlled, intrusive fieldwork with defined research objectives which examines, records and interprets archaeological deposits, features and structures and, as appropriate, retrieves artefacts, ecofacts and other remains within a specified area or site on land, inter-tidal zone or underwater. The records made and objects gathered during fieldwork are studied and the results of that study published in detail appropriate to the project design' (CIfA 2014b).

Archaeological Monitoring can be defined as 'a formal programme of observation and investigation conducted during any operation carried out for non-archaeological reasons. This will be within a specified area or site on land, inter-tidal zone or underwater, where there is a possibility that archaeological deposits may be disturbed or destroyed. The programme will result in the preparation of a report and ordered archive (CIfA 2014c).

Underwater Archaeological Assessment consists of a programme of works carried out by a specialist underwater archaeologist, which can involve wade surveys, metal detection surveys and the excavation of test pits within the sea or riverbed. These assessments are able to access and assess the potential of an underwater environment to a much higher degree than terrestrial based assessments.

13. The Landscape

The following appendix should be read in conjunction with the Landscape and Visual Impact Assessment (LVIA) that has been prepared in respect of the proposed development.

13.1 Landscape and Visual Impact Assessment Criteria

When assessing the potential impacts on the landscape resulting from a proposed development, the following criteria are considered:

- Landscape character, value and sensitivity;
- Magnitude of likely impacts;
- Significance of landscape effects.

The sensitivity of the landscape to change is the degree to which a particular landscape receptor, Landscape Character Area (LCA) or landscape feature can accommodate changes or new elements, without unacceptable detrimental effects to its essential characteristics. Landscape Value and Sensitivity is classified using the following criteria set out below.

Table 13.11: Landscape Value and Sensitivity

Sensitivity	Description
Very High	Areas where the landscape character exhibits a very low capacity for change in the form of development. Examples of which are high value landscapes, protected at an international or national level (World Heritage Site/National Park), where the principal management objectives are likely to be protection of the existing character.
High	Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national or regional level (Area of Outstanding Natural Beauty), where the principal management objectives are likely to be considered conservation of the existing character.
Medium	Areas where the landscape character exhibits some capacity and scope for development. Examples of which are landscapes, which have a designation of protection at a county level or at non-designated local level where there is evidence of local value and use.
Low	Areas where the landscape character exhibits a higher capacity for change from development. Typically this would include lower value, non-designated landscapes that may also have some elements or features of recognisable quality, where landscape management objectives include, enhancement, repair and restoration.
Negligible	Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value.

The magnitude of a predicted landscape impact is a product of the scale, extent or degree of change that is likely to be experienced as a result of the proposed Development. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape components and/or a change that extends beyond the proposed development site boundary that may have an effect on the landscape character of the area, see overleaf.

Table 13.12: Magnitude of Landscape Impacts

Magnitude of Impact	Description
Very High	Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality.
High	Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality.
Medium	Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to changes in landscape character, and quality.
Low	Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements.
Negligible	Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable.

The significance of a landscape impact is based on a balance between the sensitivity of the landscape receptor and the magnitude of the impact. The significance of landscape impacts is arrived at using the following matrix set out below.

Table 13.13: Impact Significance Matrix

	Sensitivity of Receptor				
Scale/ Magnitude	*Very High*	*High*	*Medium*	*Low*	*Negligible*
Very High	Profound	Profound-substantial	Substantial	Moderate	Minor
High	Profound-substantial	Substantial	Substantial-moderate	Moderate-slight	Slight-imperceptible
Medium	Substantial	Substantial-moderate	Moderate	Slight	Imperceptible
Low	Moderate	Moderate-slight	Slight	Slight-imperceptible	Imperceptible
Negligible	Slight	Slight-imperceptible	Imperceptible	Imperceptible	Imperceptible

Note: The significance matrix provides an indicative framework from which the significance of impact is derived. The significance judgement is ultimately determined by the assessor using professional judgement. Due to nuances within the constituent sensitivity and magnitude judgements, this may be up to one category higher or lower than indicated by the matrix. Judgements indicated in orange are considered to be 'significant impacts' in EIA terms.

Visual Impact Assessment Criteria

As with the landscape impact, the visual impact of the proposed Development will be assessed as a function of sensitivity versus magnitude. In this instance the sensitivity of the visual receptor, weighed against the magnitude of the visual effect.

Sensitivity of Visual Receptors

Unlike landscape sensitivity, the sensitivity of visual receptors has an anthropocentric basis. It considers factors such as the perceived quality and values associated with the view, the landscape context of the viewer, the likely activity they are engaged in and whether this heightens their awareness of the surrounding landscape. A list of the factors considered by the assessor in estimating the level of sensitivity for a particular visual receptor is outlined below and used in **Table 6** below to establish visual receptor sensitivity at each VRP:

8. **Susceptibility of Receptors** - In accordance with the Institute of Environmental Management and Assessment ("IEMA") Guidelines for Landscape and Visual Assessment (3rd edition 2013) visual receptors most susceptible to changes in views and visual amenity are;
   - "Residents at home;
   - People, whether residents or visitors, who are engaged in outdoor recreation, including use of public rights of way, whose attention or interest is likely to be focussed on the landscape and on particular views;
   - Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience;
   - Communities where views contribute to the landscape setting enjoyed by residents in the area; and
   - Travellers on road rail or other transport routes where such travel involves recognised scenic routes and awareness of views is likely to be heightened".

Visual receptors that are less susceptible to changes in views and visual amenity include;

   - "People engaged in outdoor sport or recreation, which does not involve or depend upon appreciation of views of the landscape; and
   - People at their place of work whose attention may be focussed on their work or activity, not their surroundings and where the setting is not important to the quality of working life".

9. **Recognised scenic value of the view** (County Development Plan designations, guidebooks, touring maps, postcards etc). These represent a consensus in terms of which scenic views and routes within an area are strongly valued by the population because in the case of County Developments Plans, for example, a public consultation process is required;
10. **Views from within highly sensitive landscape areas**. Again, highly sensitive landscape designations are usually part of a county's Landscape Character Assessment, which is then incorporated within the County Development Plan and is therefore subject to the public consultation process. Viewers within such areas are likely to be highly attuned to the landscape around them;
11. **Primary views from dwellings**. A proposed development might be seen from anywhere within a particular residential property with varying degrees of sensitivity. Therefore, this category is reserved for those instances in which the design of dwellings or housing estates, has been influenced by the desire to take in a particular view. This might involve the use of a slope or the specific orientation of a house and/or its internal social rooms and exterior spaces;
12. **Intensity of use, popularity**. This relates to the number of viewers likely to experience a view on a regular basis and whether this is significant at county or regional scale;

13. **Connection with the landscape**. This considers whether or not receptors are likely to be highly attuned to views of the landscape i.e. commuters hurriedly driving on busy national route versus hill walkers directly engaged with the landscape enjoying changing sequential views over it;
14. **Provision of elevated panoramic views**. This relates to the extent of the view on offer and the tendency for receptors to become more attuned to the surrounding landscape at locations that afford broad vistas;
15. **Sense of remoteness and/or tranquillity.** Receptors taking in a remote and tranquil scene, which is likely to be fairly static, are likely to be more receptive to changes in the view than those taking in the view of a busy street scene, for example;
16. **Degree of perceived naturalness**. Where a view is valued for the sense of naturalness of the surrounding landscape it is likely to be highly sensitive to visual intrusion by distinctly manmade features;
17. **Presence of striking or noteworthy features.** A view might be strongly valued because it contains a distinctive and memorable landscape feature such as a promontory headland, lough or castle;
18. **Historical, cultural and / or spiritual significance.** Such attributes may be evident or sensed by receptors at certain viewing locations, which may attract visitors for the purposes of contemplation or reflection heightening the sense of their surroundings;
19. **Rarity or uniqueness of the view**. This might include the noteworthy representativeness of a certain landscape type and considers whether the receptor could take in similar views anywhere in the broader region or the country;
20. **Integrity of the landscape character**. This looks at the condition and intactness of the landscape in view and whether the landscape pattern is a regular one of few strongly related components or an irregular one containing a variety of disparate components;
21. **Sense of place**. This considers whether there is special sense of wholeness and harmony at the viewing location; and
22. **Sense of awe**. This considers whether the view inspires an overwhelming sense of scale or the power of nature.

Those locations, which are deemed to satisfy many of the above criteria, are likely to be of higher sensitivity. Overall sensitivity may be a result of a number of these factors or, alternatively, a strong association with one or two in particular.

Visual Impact Magnitude

The magnitude of visual effects is determined on the basis of two factors; the visual presence (relative visual dominance) of the proposal and its effect on visual amenity. The magnitude of visual impacts is classified below.

Table 13.14: Magnitude of Visual Impacts

Criteria	Description
Very High	The proposal intrudes into a large proportion or critical part of the available vista and is without question the most noticeable element. A high degree of visual clutter or disharmony is also generated, strongly reducing the visual amenity of the scene
High	The proposal intrudes into a significant proportion or important part of the available vista and is one of the most noticeable elements. A considerable degree of visual clutter or disharmony is also likely to be generated, appreciably reducing the visual amenity of the scene
Medium	The proposal represents a moderate intrusion into the available vista, is a readily noticeable element and/or it may generate a degree of visual clutter or disharmony, thereby reducing the visual amenity of the scene. Alternatively, it may represent a balance of higher and lower order estimates in relation to visual presence and visual amenity

Criteria	Description
Low	The proposal intrudes to a minor extent into the available vista and may not be noticed by a casual observer and/or the proposal would not have a marked effect on the visual amenity of the scene
Negligible	The proposal would be barely discernible within the available vista and/or it would not detract from, and may even enhance, the visual amenity of the scene

Visual Impact Significance

As stated above, the significance of visual impacts is a function of visual receptor sensitivity and visual impact magnitude. This relationship is expressed in the same significance matrix and applies the same EPA definitions of significance as used in respect of landscape impacts (i.e. Table 14.13).