

Temporary Emergency Generation Power Plant West Offaly Power Station Shannonbridge

Environmental Report

February 2023

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Electricity Supply Board (ESB)

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1. Introduction

1.1 Background

This Environmental Report has been prepared by AECOM Ireland Ltd. (refer to **Appendix A**) on behalf of the Electricity Supply Board (ESB) ('the Applicant or ESB') in relation to the application to the Minister for the Environment, Climate and Communications ('the Minister') for approval to carry out the development of Temporary Emergency Generation (TEG) ('the Designated Development') within the boundary of the West Offaly Power (WOP) Station, Shannonbridge, Co. Offaly. The environmental assessment of the Designated Development will be carried out by An Bord Pleanála ('the Board') to ensure that the objectives of the Environmental Impact Assessment (EIA) Directive are met.

The Environmental Report is provided as part of the application for approval for the Designated Development which will involve construction works, installation and operation and eventual decommissioning of eight Open Cycle Gas Turbines (OCGT) with a total operational output capacity (net output) of 264 MWe approximately on 9.22 hectares (ha) of land ('the Site') within the existing WOP Station site boundary. Dismantling / demolition of some existing equipment and structures will be required to facilitate these works, refer to **Section 3**.

The Site is one of the Sites that has been designated for Temporary Emergency Generation (TEG) development by the Irish Legislature under new legislation 'Development (*Emergency Electricity Generation*) Act 2022¹'. Refer to **Section 1.2**.

For the purposes of this Environmental Report, the following terms are used to describe the Designated Development and its wider parts:

- **'Designated Development'** - relates to the eight Open Cycle Gas Turbine (OCGT) units including flue gas stacks (and balance of plant); liquid fuel storage and offloading facility; connection equipment; and connection to the electrical substation.
- **'the Site'** - relates to the area where the Designated Development will be located.
- **'West Offaly Power (WOP) Station site'** - relates to the entire power station site (blue line boundary) where the existing power station is located and operational, and within which the Designated Development will be located.

This Environmental Report is supported by the following figures which detail the Designated Development layout and design:

- **Figure 1: Site Location Map**
- **Figure 2: Site Layout Map**
- **Figure 3: Dismantling and Demolition Plan**
- **Figure 4: GE Generator Equipment**

¹ Available at: <https://www.irishstatutebook.ie/eli/2022/act/35/enacted/en/print#sec2>

- **Figure 5: Parking, Offices and Laydown Areas.**

1.2 Legislative Framework

Given the urgent need for temporary emergency electricity generation over the next number of years due to exceptional circumstances, the *Development (Emergency Electricity Generation) Act 2022* ('the Act') has recently been enacted to provide for emergency measures for electricity generation development.

The Act allows for the disapplication of the Planning and Development Act 2000 for the purpose of such development. The Act also allows for such development to be exempt from the provisions of Directive No. 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU ('the EIA Directive'), in accordance with Article 2(4) of that Directive. The European Commission has published guidance (2019/C 386/05) regarding application of exemptions under the EIA Directive (Directive 2011/92/EU of the European Parliament and of the Council, as amended by Directive 2014/52/EU) - Articles 1(3), 2(4) and 2(5). The guidance indicates that the need to ensure security of supply in electricity could amount to an 'exceptional case' s to exempt a specific project from the requirements of the EIA Directive.

The Act provides for the application of arrangements for the alternative assessment of such development for the purposes of ensuring the objectives of that Directive are met. Article 2.4(a) also requires member states to consider whether another form of assessment would be appropriate. The Act also provides for the coordination of this assessment with the appropriate assessment of such development for the purposes of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, as amended.

The *Development (Emergency Electricity Generation) Regulations 2022* (S.I. No. 719 of 2022) made on 21 December 2022 establishes, *inter alia*, the procedure for making an application to the Minister for Approval under the Act, content and arrangements for publication of the Newspaper Notice, provision of application documents by the Minister to the Board, Public consultation, scope of the Environmental Report, Assessment by the Board and Recommendations to the Minister.

Regulation 3 (Application to the Minister) sets down the scope and format of the application under Section 4 of the Act of 2022 for an approval under Section 7 of that Act. The checklist in **Appendix D** to this Report provides a roadmap describing where each requirement under Regulation 3 is addressed in this application.

1.2.1 Environmental Report

The Designated Development is exempt from the provisions of the EIA Directive² on the basis that it is an exceptional case for the purposes of Article 2(4) of the EIA Directive and the application of those provisions would adversely affect the purpose of the Designated Development. The Minister will arrange for an environmental assessment of the Designated Development to be carried out by the Board to ensure that the objectives of the EIA Directive are met.

² In accordance with Section 5(1) of the *Development (Emergency Electricity Generation) Act 2022*.

This Environmental Report has been prepared for the purposes of an environmental assessment by the Board under section 5(2) of the Act and Article 4.2(a) of the EIA Directive.

Table 1.1: Environmental Report for the Purposes of an Assessment of the Designated Development under section 7(2) of the Act

Information to be Contained in an Environmental Report³	Report Section Where Information is Presented
<i>A description of the designated development including information on the site, design, size and other relevant features of the development;</i>	Section 2: Description of the Designated Development
<i>A description of the relevant aspects of the current state of the environment (baseline scenario);</i>	Section 4: Environmental Effects and Management
<i>A description of the approach taken for the purposes of describing the likely main effects on the environment at the construction and operational phases of the designated development;</i>	Section 1: Introduction
<i>A description of the likely main effects of the designated development on the factors referred to in Regulation 8(2);</i>	Section 2: Description of the Designated Development; Section 3: Description of Works; and Section 4: Environmental Effects and Management
<i>A description of the features of the designated development and measures envisaged in order to avoid, prevent or reduce and, if possible, offset the likely main effects on the environment;</i>	Section 2: Description of the Designated Development
<i>Any other information or document that the applicant considers would be of assistance to the Board in carrying out an assessment under section 5(2) of the Act (of 2022).</i>	Section 4: Environmental Effects and Management Section 5: Summary

The main likely direct and indirect effects of the Designated Development on the factors referred to in Regulation 8(2) of the Regulations (S.I. No. 719 of 2022)⁴, are identified, described and assessed within Section 4 of this document.

1.3 The Applicant

ESB was established in 1927 as a statutory corporation in the Republic of Ireland, under the Electricity (Supply) Act 1927. ESB operates across the electricity market; from generation, through transmission and distribution to supply.

In accordance with the provisions of the *Development (Emergency Electricity Generation) Act 2022*, ESB will apply to the Minister for approval under Section 7 of the Act to carry out the Designated Development.

ESB has entered into an agreement with EirGrid to progress certain time-sensitive works which includes the preparation of application documents to seek approval from the Minister for the Designated Development under the above legislation.

³ In accordance with Article 7 of the *Development (Emergency Electricity Generation) Regulations 2022*.

⁴ S.I. No. 719 of 2022. *Development (Emergency Electricity Generation) Regulations 2022*.

1.4 Need for the Development and Alternatives

1.4.1 Need for the Development

EirGrid's *All-Island Generation Capacity Statement (GCS)*⁵, published in September 2021, set out a potential generation capacity shortfall in the short and medium term. This potential capacity shortfall could arise in periods of peak demand coinciding with low renewable and interconnector availability, and it arises largely due to non-delivery of previously contracted capacity, increasing electricity demand and the increasing unreliability of existing plants. The Legislature has determined that this is an electricity emergency and has therefore introduced emergency powers to address it under the *Development (Emergency Electricity Generation) Act 2022*.

The Commission for Regulation of Utilities (CRU) has statutory responsibility to monitor and take measures necessary to ensure the security of electricity supply. The CRU has published an Information note in this regard, titled *Security of Electricity Supply – Programme of Actions*⁶. The report summarised EirGrid's assessment of an electricity supply deficit over the next several winters. 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.

CRU is assisted in this role by EirGrid, Ireland's electricity transmission system operator (TSO). On 7 June 2022, the CRU directed EirGrid to procure, using the most expeditious means available, approximately 450MW of additional generation capacity from winter 2023-24 to winter 2025-26 to ensure a secure electricity supply. This temporary generation capacity will be in place until 2027 at the earliest, with provision in the legislation to extend to 2028. This procurement process was provided for in the *EirGrid, Electricity and Turf (Amendment) Act 2022*⁷. EirGrid has commenced the process and they are working towards this 450MW of additional generation capacity, comprising two emergency generation projects, details of which are addressed below, being delivered by winter 2023-24.

This capacity will remain available until 2027 at the earliest, with provision in the legislation to extend to 2028 if required by the order of the Minister in accordance with the provisions of the *EirGrid, Electricity and Turf (Amendment) Act 2022*. The temporary generation will be used only when needed and will be used as a backup in addition to generation capacity in the electricity market.

1.4.2 Alternatives Considered

1.4.2.1 Do Nothing Scenario

The capacity auction for the period 1st October 2024 to 30th September 2025 was held at the end of January 2021. It is understood that the withdrawal of previously procured capacity and the failure of the recent auction to clear sufficient capacity mean there is a significant capacity shortfall against security standards for Ireland in the coming years.

⁵ EirGrid and SONI Ltd. (2021). *All-Island Generation Capacity Statement 2021-2023*.

⁶ CRU (2021). *Security of Electricity Supply – Programme of Actions*.

⁷ House of the Oireachtas (2022). *Eirgrid, Electricity and Turf (Amendment) Act 2022*.

EirGrid identified a potential generation gap of 700MW for the winter of 2023 / 2024, in the absence of any mitigation measures being implemented. The *Security of Electricity Supply – Programme of Actions* contains a number of both demand and supply-side mitigation measures that are anticipated to address this gap.

Many of these mitigation measures, already underway, are more closely aligned to Ireland's longer term decarbonisation objectives and are preferable options to further increased installation of temporary generation capacity. European legislation also requires that all market-based measures are exhausted, prior to implementing non-market-based measures such as temporary emergency generation.

Notwithstanding, the CRU considers the impact of the current mitigation measures will have the effect of reducing the generation gap for winter 2023 / 2024 but not to the extent of the potential generation gap identified. Therefore, having exhausted all measures, the CRU advised the Minister that up to 450MW ("TEG 2") of additional temporary emergency generation should be sought to address the remainder of this gap in addition to the 200MW ("TEG 1") currently in the process of being procured.

If the proposed emergency generation does not proceed, there is a clear risk that power outages could occur due to the forecasted system demand and shortfall forecasted system generation identified in the EirGrid Generation Capacity Statement. This would have a significant adverse effect in terms of energy requirements and supply at home, at work, for commercial developments and industry.

The assessment of alternatives for the Designated Development was undertaken in this context and influenced by the emergency context and need for the development.

1.4.2.2 Technology Selection

The CRU issued a direction to EirGrid to procure 450MW of temporary emergency generation. Under the EirGrid, Electricity and Turf (Amendment) Act 2022, EirGrid can, subject to approval, procure the necessary temporary Electricity Generation Plant and auxiliaries (including generation and similar equipment) EirGrid engaged with and obtained proposals from Original Equipment Manufacturers (OEM's) based on the supply of distillate or Gas Turbine Generator (GTG) Unit equipment.

EirGrid confirmed that they considered it appropriate and reasonable to prescribe the technology alternatives given the context of the electricity emergency situation and the requirement to meet a specific technical need. They also noted that there is currently an increase in demand for GTGs globally and there are limited options, in the context of this emergency to, to place orders of plant that would be installed rapidly and be operational within the time constraints. In considering this issue they also examined floating or barge technology in addition to typical land-based technology solutions.

The range of technology EirGrid considered reasonable was limited to generation technologies which can be installed quickly, generate significant amounts of electricity, and comply with environmental emission controls and legislation. This limited the technology selection to Dispatchable Generation. EirGrid confirmed that the technology type was limited to plant that it considered temporary in nature, as opposed to permanent. Dispatchable Generation are sources of electricity that can be used on demand and dispatched at the request of power grid operators, according to system needs. It does not include wind and solar generation for example which are considered non-dispatchable generation. EirGrid noted that the emergency power plant needs 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.

Other factors which EirGrid considered in the selection of technology type:

- capability and commitment to secure procurement of the temporary Electricity Generation Plant;
- capability and commitment to commence as soon as practicable;
- capability and commitment to work with and support the Site Owners to:
 - meet the completion timescale; and
 - expedited commencement and execution of the project(s).

Based on the above, EirGrid identified that an OEM demonstrated a timeline which can potentially achieve delivery by the target date, therefore EirGrid proceeded to negotiate with that OEM as the preferred supplier of the electricity generation plant technology.

1.4.2.3 Site Selection by EirGrid

The specific electricity generation of up to 450MW of temporary emergency generation and ancillary works is intended to be located on two separate sites one at WOP Station, Shannonbridge and one at Tarbert Generating Station. EirGrid confirmed that these two sites were arrived at following a site selection process which, overall, considered approximately 18 potential sites.

EirGrid has advised that the potential sites were identified based on four main criteria, that they set out as a pre-requisite requirement in order to reasonably achieve the projects in an emergency context with challenging timelines for delivery. These included:

1. Grid Connection and ability to export.
2. Fuel Connection (Gas or Distillate).
3. Land suitable for generation equipment is available and currently owned by the site owner.
4. Ability to obtain an EPA licence or in process of acquiring one.

EirGrid confirmed that the criteria were designed to maximise the use of existing generation sites which was facilitated through a review of existing generation licence holders in Ireland and avoid development of new generation sites. EirGrid advised that criteria design ensures the Designated Development will not require the acquisition or development of any greenfield areas, mitigating potential environmental impacts by avoidance and that it is reasonable in the context of an emergency situation and facilitated a sieving approach in considering reasonable alternatives sites.

Once suitable potential sites were identified by EirGrid, they confirmed that the site owners were notified and requested to participate and that following engagement with the site owners sub-criteria were identified in addition to the main criteria above. These included additional criteria with which the participant sites were considered and further sieved. This included at a high level:

- details of existing Connection Agreements and other Market Obligations;
- details of future potential Connection Agreements and other potential Market Obligations;

- details of the Generation that can be expected from each site;
- ability to meet the target date energisation date of 1 October 2023 and operate for a minimum 3-year duration;
- details of Environmental Reporting and Monitoring on Site;
- details of the sites existing IPCC licensed site;
- details of network constraints, that may restrict full export of power; and
- feasibility of making the required transmission connections without adverse impact on the existing generation plant output.

EirGrid then assessed each participant site against the main and sub-criteria. The outcome of this assessment produced three site classification types:

- **Red:** Site does not satisfy main and sub criteria - Further Information Required.
- **Amber:** Site may not satisfy main and sub criteria - Further Information Required.
- **Green:** Site satisfied main and sub-criteria.

EirGrid confirmed that the participant sites which were considered in the red and amber classification were further engaged with and asked to respond, where necessary, to clarify / address any points raised regarding their sites and that following this engagement, the site participants were once again assessed against the criteria on basis of any new information received. Once this was completed EirGrid made a recommendation to CRU that Shannonbridge and Tarbert generation stations should be selected.

1.4.2.4 Summary of Technology and Site Selection by EirGrid

EirGrid confirmed that the potential technologies and sites were considered in the earliest possible time in the process and in the context of an electricity emergency.

EirGrid advised that the potential alternative technologies considered, on the basis of procurement exercise, were reasonable, credible, and technically feasible to meet the precise emergency need arising.

EirGrid advised that the potential alternative sites considered, on the basis of a sieving approach with a defined multi-criteria analysis, were reasonable, credible, and technically feasible to meet the precise emergency need arising.

1.5 Existing Site and Conditions

The WOP Station is located in the townland of Clonifeen, Shannonbridge, Co. Offaly. The WOP Station site comprises industrial and brownfield lands, reflecting its long-established use for power generation activity, including fuel management and electricity transmission infrastructure. The boundary of the West Offaly Power Station (the blue line boundary) covers c. 35.5 ha, refer to **Figure 1 Site Location Map** (submitted with this application). The Site encloses an area of approximately 9.22 ha.

There has been continuous production of electricity at the WOP site since 1964. The Shannonbridge Power Station was replaced by the existing WOP Station, which was commissioned in 2004. The WOP Station ceased operations on the 11 December 2020.

The WOP Station is owned by ESB and is separated into what were the two operational areas:

- the power station, associated buildings and infrastructure which were operated by ESB; and
- the fuel handling area which was operated by Bord na Móna.

The WOP Station site accommodates structures and activities typical of a power station including fuel (peat) storage, handling areas and associated plant, the power station - including exhaust gas treatment; filter house, stack and a range of ancillary services including water treatment and management systems, offices and administration areas. Refer to **Figure 1.1** below.

The WOP Station site lies on the eastern banks of the River Shannon, downstream of its confluence with the River Suck, refer to **Figure 1 Site Location Map** (submitted with this application).

The WOP Station site is located south 850m south of the village of Shannonbridge and approximately 17km south-west of Athlone town. The WOP Station site has its main access from the Regional Road R357 (Cloghan Rd.).

The WOP Station site is generally surrounded by agricultural land, with an Industrial Machinery business, Shannonbridge village to the north, St. Kieran's Park residential estate to the north-east. A Battery Energy Storage facility is located to the east, a high voltage electrical substation to the south, the Dalton Centre to the south-east, and single one - off isolated farmhouses in the surrounding countryside.

Further south-west and north-east are two large, harvested bogs and to the south is a disused railway line that connects the two bogs with the WOP Station site.

The WOP Station is an EPA licensed site, managed in accordance with its EPA Industrial Emissions (IE) Licence, refer to **Section 1.7**. The IE Licence is still held by ESB.



Figure 1.1: Location of the Designated Development and Surroundings⁸

1.6 Description of the Designated Development

Refer to **Section 2** for full details on the Designated Development.

1.6.1 Location of the Designated Development

The Site is located within the boundary of the existing WOP Station. Refer to **Figure 1 Site Location Map** (submitted with this application).

The entire Site is located within the administrative area of Offaly County Council (Offaly Co. Co.). The WOP Station site has its main access from the Regional Road R357 (Cloghan Rd.). The development Site boundary (red line) encloses an area of approximately 9.22 ha.

1.6.2 Site History

Since the 1960's, electricity generation has been undertaken at the WOP site. Initially generating 40 MW from peat, the original station (Shannonbridge Power Station) was extended twice (in 1977 and 1982), to an installed electrical capacity of 125 MWe. The original station was decommissioned in 2003 and the site was remediated to the satisfaction of the EPA.

The Shannonbridge Power Station was replaced by the existing WOP Station, which was commissioned in 2004, in accordance with the *Electricity Regulation Act 1999 (Public Service Obligations) Order 2002 (S.I. No. 217 of 2002)*. The WOP Station was constructed adjacent to the original station which was

⁸ Source: OpenStreetMap (2022).

demolished in parallel with the construction of the new station. In January 2023, ESB received Notification from Offaly Co. Co. of Decision to Grant planning permission (Ref. 22223) for Demolition of the WOP Station and the development of a Battery Energy Storage System (BESS) (inside the development Site boundary (red line)) and a Synchronous Condenser (outside the development Site boundary).

The development under permission Ref. 22223 is entirely independent of the Designated Development which is the subject of this application under the *Development (Emergency Electricity Generation) Act 2022*.

Table 1.2: Planning History of the Site

Planning Reference	Date	Summary	Applicant	Status
OCC 22223	05/05/2022 (Notification of Decision 18/01/2023)	Description The Demolition of the Existing WOP Station (As approved under Offaly County Council Ref. 01/187/ An Bord Pleanála Ref. PI 19.125575 and all subsequent permissions); and the development and operation of electricity grid services — namely a Battery Energy Storage System (BESS) and a Synchronous Condenser (Sync Con). The Proposed Development comprises two distinct phases of activity. Phase I comprises the demolition of existing site structures (with a total footprint of c. 13,124 sq.m. and a total gross floor area of c. 28,000 sq.m.) including the former WOP Station. The Intermediate Peat Storage Building and Associated Fuel Management System; and ancillary buildings including: Electrical Building, Tippler Building and associated Control Room and Office, Screening Building, Lorry Unloading Building, Water Treatment Plant Building, Offices Building, Laboratory Building, Workshop and Maintenance Buildings, Oil Pumphouse, Electrics Rooms, Railway / Locomotive Service Building, Cooling Water Pump House and Sewage / Foul Water Treatment Facility.	Electricity Supply Board (ESB)	Granted (Conditional)
OCC 22156	01/04/2022	The Demolition of the Existing WOP Station (As approved under Offaly County Council Ref. 01/187 / An Bord Pleanála Ref. PI 19.125575 and all subsequent permissions); and the development and operation of electricity grid services - namely a Battery Energy Storage System (BESS) and a Synchronous Condenser (Sync Con). The Proposed Development comprises two distinct phases of activity. Phase I comprises the demolition of existing site structures (with a total footprint of c. 13,124 sq.m. and a total gross floor area of c. 28,000 sq.m.) including the former WOP Station, The Intermediate Peat Storage Building and Associated Fuel Management System; and ancillary buildings including: Electrical Building, Tippler Building and associated Control Room and Office, Screening Building, Lorry Unloading Building, Water Treatment Plant Building, Offices Building, Laboratory Building, Workshop and Maintenance Buildings, Oil Pumphouse, Electrics Rooms, Railway / Locomotive Service Building, Cooling Water Pump House and Sewage / Foul Water Treatment Facility.	ESB	Incomplete Application
	2020	West Offaly Power Station closed	ESB	
PA19. 303108	26/11/2018	Continued operation of peat-fuelled power station to facilitate the phased transition to exclusive firing with biomass and associated development works.	ESB	Denied
OCC 1254	13/03/2012	Alterations to the existing 110/220 kV station consisting of new road, upgrade existing track road to hardcore road, new weld-mesh gates and boundary fence, new post and rail boundary fence, new site drainage to include oil interceptor and foul holding tank and associated site works. A Natura	ESB	Granted (Conditional)

Planning Reference	Date	Summary	Applicant	Status
		Impact Statement is being submitted as part of this planning application.		
011199	23/11/2001	110 KV Station Control Building	ESB	Granted (conditional)
OCC 01187	01/03/2001	West Offaly Power (WOP) Station Peat Fired Electrical Power Generation Plant (135 MWe) & Ash Disposal Facility.	ESB	Application Finalised
OCC 9379	02/03/1993	New 100m high multi flue concrete chimney and associated ductwork.	ESB	Granted (conditional)
	1982	Peat Fired Unit 3 (45 MWe) boiler, turbine and generator.	Inactive	1982
	1976	Peat Fired Unit 2 (40 MWe) boiler, turbine and generator.	Inactive	1976
P4583	1965	Shannonbridge Peat Fired station Unit 1 (40 MWe) boiler, turbine and generator.	Inactive	1965

1.7 Industrial Emissions Licence

The existing WOP Station and ash disposal facility (ADF) are specified industrial activities listed in the *First Schedule to the EPA Act 1992* (as amended). The WOP Station and ADF are managed in accordance with its IE Licence P0611-02 and in accordance with the EU Emission Trading System (ETS) and associated Greenhouse Gas Permit as administered by the EPA.

The Designated Development will be licensed by the EPA under the industrial emissions licensing process. An application will be made to the EPA to either review the existing IE Licence or for a new IE Licence for the operation of the Designated Development. Pre-application discussion have been held with ESB and the EPA regarding the information required to support the application.

1.8 Methodology and Approach

The likely main environmental effects potentially arising from the demolition, construction, operation and decommissioning of the Designated Development are described in this report. The assessments undertaken have used the best available information at the time of writing this report and more details are provided within the relevant sections as appropriate.

1.8.1 Scope of this Report

This Environmental Report is prepared for the purposes of an environmental assessment by the Board of the Designated Development under section 5(2) of the Act of 2022 Designated Development at the WOP Station site. This document considers potential environmental effects associated with the Designated Development.

This report will have regard to the likely main environmental effects arising from the Designated Development and how any such effects would be mitigated. The following environmental aspects will be addressed:

- Description of the Designated Development
- Population and Human Health

- Biodiversity, with particular attention to species and habitats protected under Council Directive 92/43/EEC of 21 May 1992 and Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009
- Land and Soils
- Water
- Air Quality
- Climate
- Noise and Vibration
- Materials Assets
- Cultural Heritage
- Landscape and Visual
- Traffic and Transportation
- Waste Management.

This report contains a description of the features of the Designated Development and the baseline environmental conditions and includes an assessment of potential main environmental effects. This assessment has been used to define the measures envisaged in order to avoid, prevent or reduce and, if possible, offset the likely main effects on the environment.

1.9 Appropriate Assessment

A statement of information for the purposes of the carrying out by the Board of a screening for Appropriate Assessment (an Appropriate Assessment (AA) Screening Report) has been prepared to enable the Competent Authority to assess, in view of best scientific knowledge, if the Designated Development, individually or in-combination with another plan or project is likely to have a significant effect on any European site.

The Appropriate Assessment (AA) Screening Report has been prepared in accordance with the European Commission (EC) guidance document *Assessment of Plans and Projects Significantly affecting Natura 2000 Sites: Methodological Guidance on the provisions of Article 6(3) and 6(4) of the Habitats Directive 92/43/EEC* (EC, 2021).

It also accords with the guidance provided in the Office of the Planning Regulator (OPR) document on *Appropriate Assessment Screening for Development Management* (OPR, 2021).

ANIS report (APEM, 2023) has also been prepared as part of this application.

The NIS concluded that, subject to identified mitigation measures, the Designated Development would have no adverse effect on the integrity of any European site, either alone or in-combination with other plans or projects.

1.10 COMAH and Major Accidents

The European Communities, Control of Major-Accident Hazards involving Hazardous Substances (COMAH) Regulations under Directive 2012/18/EU were transposed into Irish legislation through *S.I. No. 209 of 2015 Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015*.

The regulations require operators of establishments where specified substances are present, in quantities equal to or in excess of defined threshold, to take all measures necessary to prevent major accidents, limit their consequences and ensure a high level of protection for man and the environment.

Establishments which store more than 2,500 tonnes of distillate oil on-site fall under the remit of the COMAH Regulations and are classified as 'lower tier' unless the amount stored exceeds 25,000 tonnes when they become 'upper tier' sites.

The quantity of distillate oil to be stored on the Site is 5,770 tonnes (three circular oil storage tanks, capacity to store approximately 1,690 tonnes and ten rectangular steel double-skin storage tanks, capacity to store approximately 70 tonnes of oil). As such under the COMAH Regulations, the Site will be classified as a 'lower tier' site.

As per the COMAH Regulations ESB will notify the Central Competent Authority (The Health and Safety Authority (HSA)) no later than three months prior to start of construction of the distillate oil storage tanks. As per Regulation 10 of the COMAH Regulations ESB will prepare a Major Accident Prevention Policy (MAPP) document and submit it to the Health and Safety Authority (HSA) no later than one month prior to when the COMAH Regulations apply on-site.

In accordance with the Regulations the MAPP shall:

- be designed to guarantee a high level of protection of human health and the environment;
- include ESB's overall aims and principles of action, including a commitment to ensure a high level of protection of human health and the environment;
- include the role and responsibility of site management in ensuring its proper implementation;
and
- include a commitment towards continuously improving the control of major accident hazards.

A Major Accident to the Environment (MATTE) assessment will be undertaken and provided to the Health and Safety Authority (HSA) with the notification above.

2. Description of the Designated Development

2.1 Introduction

This section of the Environmental Report provides a detailed description of the Designated Development, which will consist of eight open cycle gas turbine (OCGT) and ancillary infrastructure and development, site works and services at the West Offaly Power (WOP) Station, Co. Offaly.

The Designated Development consists of the installation of eight OCGT units (LM2500Xpress units) which will collectively have the capacity to generate 264 MWe (net output) approximately of temporary emergency electricity, site development and associated ancillary works required for the operation of the plant. The plant will operate as an emergency plant, with a maximum running time of 500 hours per annum, spending the majority of time on standby, and will be run to meet emergency of supply needs while complementing renewable power generation sources.

The objective of the project is to facilitate and ensure security of supply and provide support to the electricity network during periods when there is insufficient power generation to meet the power demand.

The eight OCGT units (LM2500Xpress units) (a typical unit is shown in **Figure 2.1**) have been selected for the development as they are able to respond to changes in electricity demand by starting up quickly and achieving full output within a short period of time.

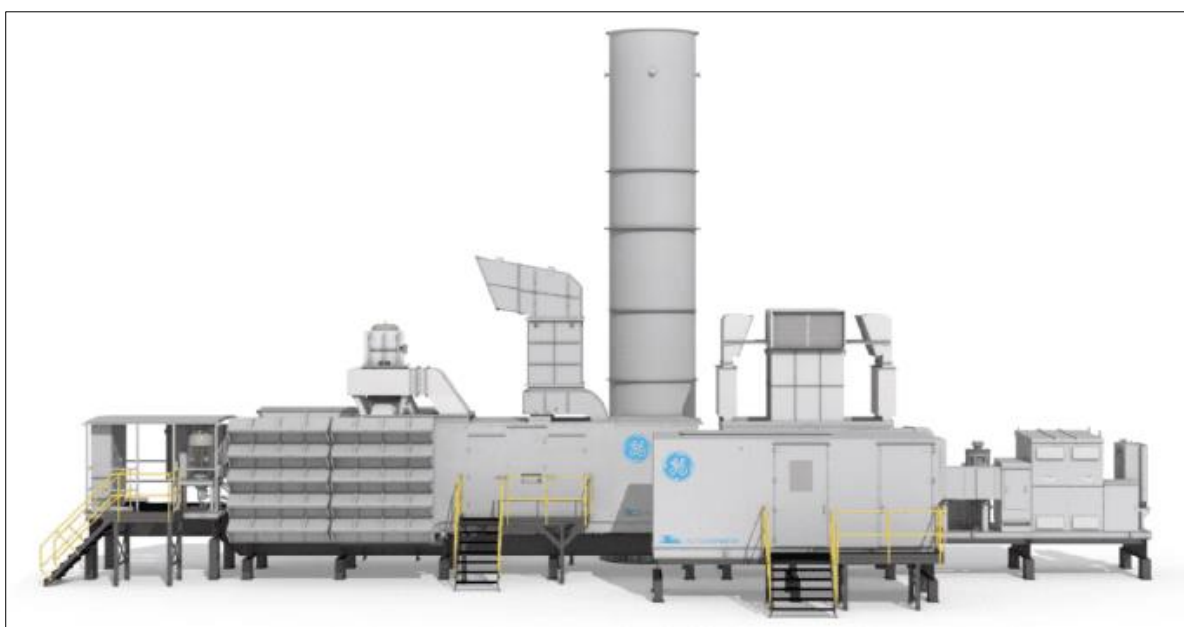


Figure 2.1: Proposed LM2500Xpress Gas Turbine⁹

⁹ Note stack height is not necessarily to scale *i.e.*, for illustration only

With regard to the operational phase, it is envisaged that the Designated Development will have to be temporarily operational at the WOP Station site for approximately five years. At the end of the temporary period, the Designated Development will be decommissioned, dismantled, and removed from this Site. Decommissioning would therefore be expected to commence at the end of 2028.

2.2 Site Information

2.2.1 Site Location

The Site on which the Designated Development will be located is in the northern part of the existing WOP Station site. The development Site boundary (red line) encloses an area of approximately 9.22 ha. Refer to **Figure 2.2** below and **Figure 1 Site Location Map** (submitted with this application). This red line boundary encompasses the area required for the construction of the Designated Development as well as construction laydown areas, compounds and access routes in and around the existing WOP Station infrastructure. Also refer to **Sections 1.5** and **1.6** of this Report.



Figure 2.2: Site of the Designated Development ¹⁰

¹⁰ Source: AECOM (2022).

2.3 Main Features of the Designated Development

The purpose of this section is to provide further detail on the various components of the Designated Development including structures and infrastructure. All of the various components which make up the Designated Development are shown on **Figure 2 Site Layout Map** (submitted with this application) and are described or encompassed within the description of the Designated Development.

There will be eight OCGT units located at the WOP Station site, each with the nominal capacity of 35 MWe (33 MWe net output approximately) which will run on distillate fuel. The Designated Development will comprise the following main components:

- 8 No. LM2500Xpress gas turbine generators, using distillate oil only
- 8 No. Steel Exhaust Stacks, each 3.3m diameter, 30m tall
- 2 No. 110kV Generator Step-up Transformers (GSUT)
- 2 No. Hypact compact switchgear units and associated surge arrestors
- 2 No. GSUT protection relay panels
- 2 No. BOP Power Control Modules (BOP-PCM), each including:
 - 11.5 kV Medium Voltage Switchgear / Fuse Disconnecter
 - Low Voltage Auxiliary transformer
 - 400 V Low Voltage Switchgear
 - 125 V DC System
 - Fire detection and extinguishers.
- 1 No. Plant Common Controller Module
- 2 No. Control Module LVRT
- 2 No. instrument compressors
- 2 No. CCW fin fan coolers
- Electrical Bulk Material (cable, cable trays, earthing and lightning protection material, conduit, lighting and small power)
- 2 No. Fuel Oil Unloading Modules
- Fuel Oil Forwarding and filtration system (with fuel oil, forwarding pump and fuel filters)
- Fuel oil heating system
- Fire protection system including fire water pumps
- 3 No. Circular distillate oil storage tanks, concrete bunded, each with capacity of 1,690 tonnes (2,060m³)
- 10 No. Double-skin distillate oil storage tanks, each with capacity of 70 tonnes

- Water storage tank
- Plant wastewater system with oily water separator
- Administration building
- Acoustic screens.

Demolition and removal of existing structures (including removal of the overhead rising conveyor, disconnecting the existing foul sewer network (above and below ground) and removal of the septic tank (underground) and demolition of buildings), will be required to facilitate the installation of the Designated Development, details of which are provided **Section 3** and **Figure 3 Dismantling and Demolition Plan** (submitted with this application).

The construction phase of the Designated Development will comprise:

- temporary construction and laydown areas comprising hardstanding, laydown, and open storage areas;
- temporary facilities and stores;
- materials and plant storage;
- contractor compound and construction staff office and welfare facilities;
- temporary vehicle parking facilities; and
- signage.

In connection with and in addition to the above, the following infrastructure will be included:

- internal roads;
- lighting columns;
- security fencing and gates; and
- utilities, pipes, cables and connection to surface water drainage systems, oil-water separators, including channelling, culverting, crossings and works to existing drainage systems.

The Designated Development elements are described in detail in the following sections. Refer to **Figure 4 GE Generator Equipment** (submitted with this application).

2.3.1 Gas Turbine Units

The Designated Development will include eight (8 no.) gas turbine units, each comprising a single gas turbine and a single alternating current (AC) generator. The generators and gas turbines will be equipped with weatherproof, acoustic enclosures with dedicated ventilation systems.

The net power output of the gas turbines will be up to 264 MWe approximately. Power export will be facilitated via:

- the grid connection agreement having the maximum gross generation capacity (*i.e.*, 280 MWe combined total);

- the electrical systems will be sized to the maximum export load (*i.e.*, transformers, generator, and cables); and
- the gas turbines will be designed, installed, and controlled to deliver the specific energy output that is proposed. This is an essential part of maximising the efficiency and performance of the machine.

The turbines and ancillary plant elements will have a containerised control module which will house the turbine controls and a containerised electrical module which will supply power to the turbines and their associated auxiliary systems.

The turbines will use forced air-cooling radiators to dissipate heat from the lubrication oil and other essential systems when operational. No wet cooling system is required.

The turbines will fire distillate fuel to generate power (transported to site via heavy goods vehicle (HGV) tanker and stored on Site in above ground tanks). The configuration allows the turbine to respond with full power output within 20 minutes of being instructed to do so. This fast response allows the turbine to provide essential balancing services to the grid.

The gas turbine units have been specified to generally comply with the emissions requirements of the BAT requirements (2021)¹¹ without supplemental emissions abatement, through the use of primary means and using dry low-NOx burner technology (DLN). Consequently, the flue gases generated will pass directly from the gas turbine unit to a flue stack structure.

2.3.1.1 Turbine Module

A typical LM2500Xpress gas turbine generator is provided in **Figure 2.1**. 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 TEG Plant 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 with 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

¹¹COMMISSION IMPLEMENTING DECISION (EU) 2021/2326 of 30 November 2021 establishing best available techniques (BAT) conclusions, under Directive 2010/75/EU of the European Parliament and of the Council, for large combustion plants

- Air Inlet Silencer with enclosure
- Inlet Air Filter System
- Turbine Exhaust
- High Speed Coupling Shaft
- Ventilation Fan Assembly skid
- Alignment System.

2.3.1.2 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.

2.3.1.3 Control House Modules

The 2 No. control house modules will be inter-connected electrically to the turbine and generator modules on-site. The control house modules include a lighted and insulated control house. The control house is equipped with an access door and air conditioner / heater. The control house modules each consists of the following components:

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

2.3.2 Distillate Oil Storage and Associated Equipment

Distillate oil will be delivered to the Site by road tanker and offloaded via either of two unloading modules. Road tankers will park up in an offloading bay designed to contain any spillages that may occur during offloading.

Distillate oil will be stored in three circular oil storage tanks, each with capacity to store approximately 1,690 tonnes (2,060m³). These tanks will be concrete bund, designed to store 110% single tank volume, expected tank dimension is 13.5m diameter x 14.4m height. Ten rectangular steel double-skin storage tanks, each with capacity to store approximately 70 tonnes of oil, will also be used along with the circular

tanks (i.e., total ultimate storage capacity is 5,770 tonnes). Distillate oil will be treated to remove moisture and filtered to remove deposits before it is pumped to each generator unit. The main components are as follows:

- 2 No. Fuel Oil Unloading Modules.
- Fuel Oil Forwarding and (with fuel oil, forwarding pump and fuel filters).
- Fuel oil heating system.
- 3 No. Circular distillate oil storage tanks, concrete bunded, each 1,690 tonnes (2,060m³) capacity.
- 10 No. Steel double-skin storage tanks, each 70-tonne capacity approximately.

2.3.3 Electricity Transmission Connection

The eight gas turbine generator units (LM2500Xpress units) will be connected to one of the two Generator Step-up Transformers (GSUT), 110 kV, which will export to the grid through cable connection (325m long approximately running on elevated pipe / cable racks) to the existing 110 kV substation, located within the boundary of the WOP Station site. A Hypact switchgear unit and surge arrestors will be associated with each transformer. Minor works may be required on the transmission bay in the 110kV substation to facilitate this proposed electrical power export.

2.3.4 Emissions Monitoring

The exhaust gases from each gas turbine will be discharged to atmosphere through a 30m high stack. The 8 No. 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.

2.3.5 Water Demand

Water supply will be provided from the existing connection to Irish Water public watermain. Water will be used for the following purposes during the construction and operation phases

- potable water for general purposes - drinking water, toilets etc.; and
- water for fire-fighting purposes.

The number of workers on site during the construction phase is expected to peak at approximately 100 persons. Up to five operational staff will be on site during the daytime 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.

The water supply arrangements will be carried out to the requirements of Irish Water.

Mains water will be stored in a common firewater / storage tank of approximately 1,600m³ in volume and will be used by the fire water system and for non-potable general domestic supplies.

2.3.6 Wastewater Drainage

2.3.6.1 Surface Water Drainage

The existing drainage network collects runoff from building roofs, hardstanding / paved areas and discharges from bunds and storage tanks. Drainage arising from paved road surfaces and buildings, such as the boiler house and turbine house, are conveyed to the existing surface water drainage network on-site and existing settlement pond prior to discharging to the River Shannon.

The extensive drainage network incorporates hydrocarbon interceptors (2 no.), peat interceptors (6 no.) and a suspended solids settlement pond prior to discharging to the River Shannon¹². There are no designated attenuation storage systems or flow control devices associated with the existing development¹³.

For the Designated Development surface water generated on existing impermeable surfaces will continue to be collected in a slightly modified underground pipe network. The surface water runoff will be conveyed by the existing drainage network to the settlement pond prior to discharging to the River Shannon.

Rainwater collected in the bund containing the 110 kV transformers will be inspected prior to discharge to the River Shannon via the oil water interceptor in accordance with the existing IE licence. Treated water from the plant wastewater system incorporating oily water separator will be discharged to the surface water drain.

In the event of an incident, firewater runoff would be retained on site through kerbing, bunding and closure of drainage systems in accordance with the requirements of the IE Licence and COMAH.

2.3.6.2 Foul Wastewater Drainage

The existing WOP Station has a foul Water Treatment Plant (WTP) which was used in the treatment of domestic foul water discharged from the WOP Station site. The existing foul WTP plant will be disconnected and removed as part of the proposed demolition phase (above and below ground structure), refer to **Section 3.3** and **Figure 3 Dismantling and Demolition Plan** (submitted with this application).

An existing septic tank (below ground) on the Site, will also be removed, refer to **Section 3.3**.

Welfare facilities will be provided for the Contractor on-site during the construction phase. Foul water from welfare facilities during the construction and operation phases will be collected in a sump and periodically removed from the Site by road tanker.

2.3.7 Firefighting Systems and Controls

A fire water storage tank of approximately 1,600m³ will be installed on-site. Water supply to this tank will be towns water via an existing Irish Water connection.

2.3.8 Chemical and Lubricant Storage

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

¹² Awn Consulting Ltd. (2022). *EIAR Chapter 11 Material Assets*.

¹³ ESB (2022). *Drainage & Services Report - West Offaly Power Station. Document No.: QP-000047-02-R460-006-000*.

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

All chemicals and oils will be stored in suitably bunded areas and with weather protection.

3. Description of Works

3.1 Introduction

This section of the Environmental Report provides a description of the proposed pre-construction works, dismantling / demolition and construction / equipment installation activities, associated with the Designated Development at the WOP Station.

To address the urgent need to install the temporary emergency generation (TEG) power plant, pre-construction works, dismantling / demolition activities and construction / equipment installation works described below will take place over a minimum of two eight hour shifts per day and on occasions, three eight hour shifts per day, seven days a week, acting in full compliance with Irish labour and Health & Safety laws.

3.2 Pre-Construction Works

The pre-construction phase of the development includes preparatory works and consultation with statutory bodies (Health and Safety Authority (HSA), EPA etc.). 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. Pre-construction activities will extend over 1.5 months approximately and will include the following works within the Site:

- Site levelling and removal of ornamental earthen mounds.
- Removal of landscaping trees and shrubs, including roots.
- Removal of lighting masts, street furniture etc.
- Filling of all underground voids, tanks, manholes, chambers etc.
- Removal of redundant underground cables, pipes and other services.
- Removal of concrete footpaths, internal roads and rail-tracks.
- Preparation / installation of Contractor's offices / welfare facilities.
- Connection of services / facilities to contractor's offices.
- Site perimeter fencing.

During the pre-construction works period, assessment of buildings proposed for demolition will be undertaken to determine they are clear of hazardous materials and to identify the demolition method and sequencing. The Site has been in use for electricity generation for many years 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 previous studies carried out, 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 Dismantling / Demolition Phase

The dismantling / demolition phase for the Designated Development will extend over approximately 1.5 months and will comprise:

- Dismantling and demolition of existing equipment and structures and associated foundations.
- Disconnection, removal and rerouting of existing underground services.

The WOP Station site has its main access from the R357 (Cloghan Rd.). The main Site access for demolition and construction phase traffic will be available via existing retained entrances to the existing WOP Station. The existing entrances have wide gates and a clear approach and will be controlled by the Contractor's security personnel positioned at the entrance. Direct access to the Site will be via a site gate and the existing internal roadways.

3.3.1 Existing Structures and Plant

Figure 3 Dismantling and Demolition Plan (submitted with this application) shows the existing structures and plant to be dismantled / demolished. The list of existing structures and plant (including associated concrete foundations) which are intended to be dismantled / demolished include:

1. Rising Conveyor and associated reinforced concrete plinth supports (Blocks 1 & 8) (above and below ground structure).
2. Sewage Treatment System (Block 2) (above and below ground structure).
3. Septic Tank (Block 3) (Below Ground Structure).
4. Electrical Room (Block 4) (Steel Frame on Ground Bearing RC Slab).
5. Contractor's Office Building (Block 5).
6. First Aid Room Building (Block 6).
7. Maintenance Building (Block 7).
8. Entrance Gate, Fencing and Road (Block 9).
9. Laboratory / Office Building (Block 10).
10. Railway Service Building (Block 11).

3.3.2 Proposed Demolition Methodology

The overarching demolition concept for the plant is to minimise the generation of waste, and to maximize the recycling of appropriate waste products. In this regard it is envisaged that certain plant / equipment, primary structural steelwork and secondary steelwork and cladding are items which will be dismantled / demolished using appropriate techniques to maximize recycling.

The overarching principles applied during the dismantling / demolition phase will be developed further and planned by the Contractor. The demolition works will be undertaken by the Contractor in accordance with relevant applicable industry standards, such as BS 6187:2011 Code of practice for full and partial demolition or equivalent.

All structures and buildings to be demolished will be removed to ground level. The existing hard standing surfaces (building ground floor concrete slabs, tarmac surfaces, concrete footpaths, road kerbs) and foundations are intended to remain in place. Below ground structural voids and pits are intended to be filled and / or be capped.

Dismantling / demolition of structures and plant can be summarised as per the following categories:

Category A - High rise structures such as the conveyor. Soft strip as necessary. Creation of local access points into the structure. Appropriate removal, stripping down, sorting, segregation, and disposal of plant / equipment. Removal of roof build-up systems and wall cladding elements and generally the top-down dismantling (ensuring structure stability of primary frame and secondary elements) to ground level, together with the use of planned pre-weakening technologies or equivalent. Such structures will require specialist technical planning and appropriate Safety Management to ensure that they are safe against premature structural instability or collapse.

The introduction of localised failure mechanisms can be carried out in a number of ways. All items removed will be brought to the ground in a safe and controlled manner, controlling any noise or ground vibration impacts to within tolerable levels and to maintain proper health and safety on-site.

Category B - Low rise single storey buildings. Soft strip as necessary. Appropriate removal of plant and equipment. A conventional demolition approach may be adopted, e.g., the removal of roof cladding, wall cladding elements and the demolition of main frame elements to ground level.

Category C - Above Ground Level Reinforced Concrete foundation structures. Appropriate removal of plant and equipment. Break up using excavator mounted nibbler and crushing of environmentally clean above ground plinths and above ground foundations.

Category D - Below Grade Voids. Below grade structural voids and pits are to be filled with approved aggregates and or / be capped.

3.3.3 Summary Description of Structures to be Demolished

Refer to **Figure 3 Dismantling and Demolition Plan** (submitted with this application).

- 1. Rising Conveyor (overhead structure only) (Block 1) (Category A & C):** Rising conveyor structures are steel framed gantry structures with metal cladding. They are supported on braced steel column frames which are supported on rising reinforced concrete foundations.
- 2. Sewage Treatment System (Block 2) (Category D):** Sewage Treatment System contains a reinforced concrete below ground tank, which is supported on a reinforced concrete raft foundation. As a result of sloping ground levels, the tank is level with the ground at the upstream end and is partially exposed on the downstream end. The tank formed part of the treatment process of foul water prior to discharge from the power generation station. The structure is to be backfilled using clean, imported stone aggregates, free from pyrites, marcasite, and any other contaminants.
- 3. Septic Tank (Block 3) (Category D):** Consists of a reinforced concrete below ground tank divided into three compartments by concrete cross walls. The tank formed part of the treatment process for foul water prior to discharge to the on-site sewage treatment system.

4. **Electrical Room (Block 4) (Category B):** The Electrical Room is a small single storey building in the vicinity of the intermediate peat storage building. It is a steel frame structure with metal cladding and is supported on a raft base.
5. **Contractor's Office Building (Block 5) (Category B):** The Contractor's Office Building is a single storey building and will be demolished to slab level.
6. **First Aid Room Building (Block 6) (Category B):** The First Aid Room Building is a single storey building and will be demolished to slab level.
7. **Maintenance Building (Block 7) (Category B):** The Maintenance Building is a single storey building, framed with structural steelwork and with masonry walls.
8. **Rising Conveyor (above and below ground structure) (Block 8) (Category B & D):** On one side of the Intermediate Peat Storage Building (IPS) there is a 5m deep basement. This accommodates the tail end of the rising conveyor structure and houses the heads of two belt conveyors. Rising conveyor structures are steel framed gantry structures with metal cladding.
9. **Entrance Gate, Fencing and Road (Block 9) (Category C):** Excavation and removal of paving material and above ground lighting columns etc.
10. **Laboratory / Office Building (Block 10) (Category B):** The Laboratory Building is a standalone single storey building supported on conventional but deep strip foundations. The structure is steel framed with masonry walls and has a lightweight metal roof.
11. **Railway Service Building (Block 11) (Category B):** The Railway Service Building is a structural steelwork single storey building with profiled metal cladding. The structure is a standalone building and is supported on conventional strip foundations with lean mix to stable ground.

3.4 Construction of the Development

Construction activities will progress from site set up and preparation, to construction and modular assembly works of the various components, followed by commissioning and testing of the Designated Development.

The preliminary works are scheduled to commence in May 2023, with initial site access and set up, pre-construction works, ground works and construction of plant equipment. The construction programme and commissioning are expected to be completed within approximately eight months.

3.4.1 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 have a depth up to 1200mm, with up to 200mm of this above existing ground level.

Existing foundations or buried structures will be removed, refer to **Section 3.3**.

It is anticipated that foundations will be raft type ground bearing foundations.

3.4.2 Plant Construction Works

The Contractor will be responsible 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 (distillate oil, fire water etc) and cables (power cables, control cables etc) which will have to be fabricated on-site.

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

In-situ concrete casting will be fully controlled to ensure that cement bound materials are confined within the formwork. The proposed new equipment is set out in **Table 3.1**.

Table 3.1: Proposed New Equipment

Equipment	Construction Method
LM2500Xpress gas turbine generators	Delivered to Site in Prefabricated Modules to be connected together on-site
BOP Power Control Modules	Delivered to Site Prefabricated
Generator Step-up Transformers	Delivered to Site Prefabricated
GSUT protection relay panels	Delivered to Site Prefabricated
Plant Common Controller Module	Delivered to Site Prefabricated
Fuel Oil Unloading Modules	Delivered to Site Prefabricated
Fuel Oil Forwarding and Filtration Skids	Delivered to Site Prefabricated
Circular oil storage tanks	Delivered to Site Part Prefabricated (final assembly on-site)
Double-skin distillate oil storage tanks	Delivered to Site Prefabricated
Water storage tank	Delivered to Site Prefabricated
Gas-insulated Switchgear	Delivered to Site Part Prefabricated (final assembly on-site)
Surge Arrestors	Delivered to Site Prefabricated

3.5 Construction Activities and Programme

Construction of the Designated Development will extend over approximately 5 months, with the projected completion of the Designated Development to enable the first emergency generator to commence operation in winter 2023-2024. On completion of pre-construction and demolition works, the following development activities, which are necessary to facilitate the construction phase of the Designated Development, will comprise:

- Ground excavation and construction of concrete foundations and bases.
- Assembly and erection of equipment.

- Ancillary and associated works.

The Contractor's Construction Environmental Management Plan (CEMP) will detail the Contractor's overall management and administration of the works. The CEMP will also include any commitments required under the Development Approval. The Contractor's CEMP will be treated as a live document throughout the lifecycle of the Designated Development, requiring regular review and update as necessary but always as a minimum meeting the obligations set out in the Framework CEMP in **Appendix B**.

Construction activities will gradually phase from pre-construction site preparation and demolition of redundant structures to predominantly construction and modular assembly works followed by commissioning and testing of the Designated Development.

The construction programme and phasing works are outlined in **Table 3.2**.

Table 3.2: Duration of Phasing (indicative)

Phase	Timetable
Pre-construction works	1.5 months
Demolition works	1.5 months
Plant construction works (including installation)	5 months
Total	8 months

3.5.1 Site Management - Construction Hours, Staffing, Access and Parking

The Contractor will indicate the duration and phasing of construction works in the Contractor's CEMP.

Construction Hours

To address the urgent need to install the temporary emergency generation power plant, construction phase works will take place over a minimum of two eight hour shifts per day and on occasions, three eight hour shifts per day, seven days a week, during construction and commissioning phases, acting in full compliance with Irish labour and Health & Safety laws.

Staffing / Employment

Levels of employment will vary throughout the construction phase, with peak levels of employment likely to be approximately 100 persons. Staff will comprise engineering, management, skilled and semi-skilled workers during the construction phase.

Site Access

As noted in **Section 3.3**, access for construction phase traffic will be available via existing retained entrances to the existing WOP Station. Direct access to the Site will be via a site gate and the existing internal roadways.

Security

As noted in **Section 3.3**, the existing entrances have wide gates and a clear approach and will be controlled by the Contractor's security personnel positioned at the entrance. The Site will be securely fenced and monitored at all times by CCTV surveillance.

Parking

Employment levels will vary throughout the construction phase. Parking will be provided using existing parking facilities and open areas of the WOP Station site for construction personnel and construction vehicles.

3.5.2 Construction Compounds

The construction compounds and laydown areas will be located entirely within the WOP Station site. The Contractor will be responsible for securing the area with temporary fencing, set up initial site accommodation and welfare facilities. Access to the construction compounds will be security controlled and all Site visitors will be required to sign in on arrival and sign out on departure. Refer to **Figure 5 Parking, Office and Laydown Areas** (submitted with this application).

The construction compounds will not be for long-term storage of materials and storage but will be for the duration of the construction phase only. The Contractor's administration office will be located centrally on the Site.

Foul water from welfare facilities during the construction phase will be collected and periodically removed from the Site by road tanker.

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

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

Lighting

Construction work outside daylight hours will be undertaken using adequate site lighting to ensure safe working conditions. Site lighting during construction will be designed to avoid light spill and will be pointed down at a 45-degree angle and away from sensitive receptors.

The Site compound will have external lights for safety and security. These lights will be pointed down at a 45-degree angle and away from sensitive receptors.

3.5.3 Construction Traffic

It is expected that the extent of HGV movements will vary at different stages of the construction works in response to the activities taking place at any given time.

The demolition phase which will see material being removed from site and being disposed of at one or more licenced waste recycling and 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 underground structures.

The majority of construction traffic is expected to be generated during Q3 and Q4 of 2023, and it is estimated that at peak, up to 38 Heavy Good Vehicles (HGVs) movements per day. An average of 15 HGV loads daily (30 HGV movements) is anticipated.

The temporary emergency plant is designed in modular format to be transportable by road on standard HGV vehicles and therefore no abnormal load deliveries are anticipated.

As noted in **Section 3.3**, access for construction phase traffic will be available via existing retained entrances to the existing WOP Station. Direct access to the Site will be via existing site entrances and the existing internal roadways. Traffic controls will be used to and from the Site as required and will consist of an allocated member of the construction team.

Levels of employment will vary throughout the construction phase, with peak levels of employment likely to be approximately 100 persons. Staff are expected to travel to the Site via a combination of car sharing and private passenger vehicles.

Mobile cranes will be required on-site on occasion during the construction works.

A Framework Construction Traffic Management Plan (CTMP) has been prepared, refer to **Appendix C**.

3.5.4 Construction Waste

Construction and demolition waste will be directed to recycling locations. There are a number of licensed waste reception facilities located in the Eastern-Midlands Region¹⁴ for the management of waste from the construction industry.

To comply with the requirements of Industrial Emissions Licence P0611-02, Construction waste type and quantity will be reported at regular intervals to the EPA via the EDEN on-line reporting system.

During the construction phase, the Designated Development will generate a range of inert and non-hazardous materials although volumes are expected to be limited. Waste materials will be temporarily stored on-site pending classification testing and collection by a waste contractor. The Contractor will ensure that material is reused or recovered offsite insofar as is reasonably practicable or disposed of at an authorised facility.

As part of the CEMP, the Contractor will be required to develop a detailed Resource and Waste Management Plan (RWMP) that complies with the requirements of waste management plan in accordance with the EPA *'Best Practice Guidelines for the Preparation of Resource Management Plans for Construction and Demolition Waste Projects'*¹⁵.

The Contractor will regularly review and update where required the assumptions on waste arisings and management and record and implement procedures for assessing, managing and recording waste arising on-site. Opportunities for on-site and offsite reuse, recycling and recovery of excavated material and waste will be identified where feasible.

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

¹⁴ Eastern-Midlands Region Waste Management Plan 2015-2021.

¹⁵ EPA (2021).

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

Refer to **Section 4.13** for further information regarding waste management.

3.5.5 Health and Safety

All works shall be carried out in a safe manner and in compliance with all the requirements of the Safety and Health at Work Act 2005, Health and Welfare at Work (Construction) Regulations (S.I. No. 291 of 2013) and any other subsequent Health and Safety regulations, amendments, publications and legislation and any other guidance notes issued by the Health and Safety Authority (HSA).

3.5.6 Excavations

3.5.6.1 Ground Conditions

Site investigations at the WOP Station site (Causeway, 2017) indicates that the typical ground build-up is predominantly made-ground underlain by a peat layer overlaying a limestone bedding.

Site preparation may require the removal of some spoil although where possible cut and fill volumes will be balanced as far as possible to minimise waste arisings. Uncontaminated material will largely be retained on site and used for bunding and landscaping purposes. Should any excavated material be required to be removed from the Site, this material will first be tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled '*Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous*' using the HazWasteOnline application (or similar approved classification method). The material will then need to be classified as clean, inert, non-hazardous or hazardous in accordance with the *EC Council Decision 2003/33/EC*, which establishes the criteria for the acceptance of waste at landfills.

In the event that asbestos-containing materials (ACMs) are found, the removal will only be carried out by a suitably permitted waste contractor, in accordance with *S.I. No. 386 of 2006 Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010*. All asbestos will be taken to a suitably licensed or permitted facility.

In the event that hazardous soil, or historically deposited waste is encountered during the construction phase, the Contractor will provide a *Hazardous / Contaminated Soil Management Plan*, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal / treatment, in addition to information on the authorised waste collector(s). Refer to **Section 4.13** for further information regarding waste management.

3.5.7 Removal / Rerouting Underground Services

Underground services such as surface water and foul water pipes, electrical cables and other services currently exist on the Site of the Designated Development. Redundant pipework will be disconnected and capped at each end or removed where it may coincide with foundation construction and other development works.

Surface water pipework will be rerouted where it coincides with development work and is required to continue in service to drain existing site areas.

Redundant buried cables and other services will be isolated before disconnection.

3.5.8 Asbestos

The 2022 *Engineering Report for Demolition - Planning Submission for the West Offaly Power Station*¹⁶ submitted with as part of the planning application, indicated that a number of Asbestos Surveys were conducted on the WOP site.

The fuel handling plant was surveyed in its entirety and all asbestos containing material was removed. Asbestos is known to be present in a defined area on the site, on lands associated with a former landfill which was used during the lifetime of the former power station. While most of the former landfill was successfully remediated, buried waste material including material containing asbestos (ACM) is still known to be present. No demolition or construction works will take place on this part of the Site for the Designated Development.

3.5.9 General Mitigation Measures

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

- CIRIA¹⁷ (2001). *Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532)*.
- CIRIA (2006). *Control of water pollution from linear construction projects. Technical guidance (C648)*.
- CIRIA (2016). *Environmental Good Practice on site pocketbook (C762)*.
- EPA (2021). *Best Practice Guidelines for The Preparation of Resource Management Plans for Construction & Demolition Projects*.

3.6 Testing and Commissioning

Construction activities will gradually phase from pre-construction site preparation and demolition of redundant structures to predominantly construction and modular assembly works followed by commissioning and testing of the Designated Development.

¹⁶ ESB (2022).

¹⁷ Construction Industry Research and Information Association.

The Contractor will be appointed to the role of Project Supervisor Design Process (PSDP) for the installation, commissioning and testing of all equipment including the gas turbines.

3.7 Operational Phase

Industrial Emissions (IE) Licence

Refer to **Section 1.7**.

Fuel

As noted in **Section 2.3.2**, distillate oil will be delivered to the Site by road tanker and offloaded via the unloading modules using standard operating procedures. Road tankers will park up in an offloading bay designed to contain any spillages that may occur during offloading.

Distillate oil will be stored in three circular oil storage tanks, each with capacity to store approximately 1,690 tonnes (2,060m³). Refer to **Section 2.3.2**.

Operational Phase Staff

During the operational phase, the Designated Development will be operated, maintained and managed by ESB personnel or contractors acting on its behalf.

Operational Phase Maintenance

Routine maintenance will be carried out in accordance with the maintenance procedures provided by the contractor and manufacturer. The Designated Development will be required to undertake regular inspections, in line with the manufacturer's requirements. During inspection and maintenance of each emergency generator, the individual generating unit will be taken out of operation for a short period to allow the inspection to be completed and maintenance to be undertaken.

Inspection and maintenance works will generally take place during the summer months, when demand for the Designated Development is at its likely to be lowest.

Health and Safety - Emergency Planning

A site-specific Health and Safety (H&S) Plan will be included in the Contractor's CEMP and will include commissioning procedures to ensure compliance with relevant health and safety legislation.

Measures to prevent the risk of fires, spillages and other major incidents will be embedded in the design of the Designated Development.

Operational procedures will be in place that will clearly outline responsibilities and the appropriate communication channels for operational staff / site personnel. Operational phase employees will receive the appropriate training required for their role, including responding to emergency events such as fires and floods etc. These operational measures will be included in the Environment Management System (EMS) and regulated by EPA through the IE Licence.

Operational Phase Traffic

It is anticipated that minimal operational phase traffic will be generated to the Site each year. HGV movements will be associated primarily with delivery of fuel by road tanker. Other HGV movements may arise associated with the delivery of other consumables for maintenance. These HGV movements are

expected to be infrequent and when they arise, are not expected to exceed two per day (*i.e.*, arrival and departure of a single delivery vehicle).

Up to five operational staff will be on site during the daytime and up to two staff will be on-site in the evening time seven days a week, giving rise to passenger car movements up to 14 movements per day.

3.8 Decommissioning

The operational life of the Designated Development will be up to five years. After this time, the temporary emergency generating (TEG) plant will be disconnected, dismantled, and removed from the Site.

Prior to removal from the Site, equipment will be securely stored under appropriate conditions. All lubricating oils and other potentially polluting materials will be removed from the Site.

Waste materials generated during the decommissioning phase will be removed from the Site.

The activities associated with the decommissioning phase of the Designated Development will be similar to those associated with the construction phase, while not separately assessed in this report, decommissioning effects are considered to be similar or less than those associated with construction phase and will be controlled through the use of a Decommissioning Environmental Management Plan (DEMP)).

4. Environment - Effects and Management

4.1 Introduction

Article 7(2)(d) of the *Development (Emergency Electricity Generation) Regulations 2022* requires the Environmental Report, in respect of the Designated Development, to include "a description of the likely main effects of the Designated Development on the factors referred to in Regulation 8(2). This section of the Environmental Report presents environmental information describing the effects on each of the relevant technical topics and does so in respect of the potential environmental effects associated with the demolition, construction, and operational activities which are necessary to facilitate the Designated Development. As noted in Section 3.8, the decommissioning phase of the Designated Development will be similar to those associated with the construction phase, while not separately assessed in this section.

This report includes relevant environmental information to the extent that this information was reasonably available to the applicant at the time of the application and within the reporting timeframe available in the context of the Designated Development. Given the nature of the Designated Development, air quality and noise effects are considered to be those that require more detailed analysis and are addressed first within this report.

All mitigation measures outlined within this Environmental Report will be implemented in full. The mitigation measures outlined in this report should be read in conjunction with the other reports produced for the Designated Development, including the Framework CEMP (refer to **Appendix B**), the Framework CTMP (**Appendix C**) and the Natura Impact Statement (NIS). Other operational control and mitigation measures will be managed through the IE Licence required for the operation of the Designated Development.

Any updates will be in accordance with any relevant conditions which apply to the Designated Development.

4.2 Air Quality

4.2.1 Introduction

This section reports the assessment of the impact of emissions to air from the construction and operation of eight 35 MWe (nominal capacity) TEG units at WOP Station. It considers the impact of emissions on sensitive nature conservation habitats and selected human health receptors within a 15km radius of the Site in accordance with air modelling guidance. The section includes dispersion modelling of the predicted emissions in order to demonstrate that appropriate stack heights are to be employed.

It is anticipated that during the demolition and construction phases of the Designated Development, construction activities will have the potential to generate dust and finer particulate (PM₁₀) emissions that could have an impact on and effect sensitive receptors located close to the Site boundary, and receptors located close to public roads used by construction traffic. The assessment briefly considers the potential for impacts from emissions to air during the construction phase, based on the assumption that

demolition and construction dust can be appropriately controlled by the application of best practice dust mitigation, which will be implemented, which is standard practice on all well managed construction site across the county. It is also assumed that demolition and construction vehicle movements will be of a frequency and duration that such emissions are unlikely to put an Air Quality Standard (AQS) or Environmental Assessment Level (EAL) at risk of an exceedance.

During the operational phase, the Designated Development will be a source of nitrogen oxides (NO_x), nitrogen dioxide (NO₂), sulphur dioxide (SO₂), carbon monoxide (CO), particulate matter with an aerodynamic diameter of <10 µm in diameter (PM₁₀) and particulate matter with an aerodynamic diameter of <2.5 µm in diameter (PM_{2.5}) emissions, which have the potential to harm species of flora at nearby habitats and nearby human health receptors. Dispersion modelling of emissions is therefore required to predict the contribution of site emissions to annual mean NO_x, annual mean and hourly mean (99.79th percentile) concentrations of NO₂, hourly mean, 24-hour mean and annual mean SO₂, 8-hour rolling CO concentration, annual mean and 24-hour mean of PM₁₀, and annual mean of PM_{2.5}. This assessment also considers the annual rate of nitrogen deposition at the nearest relevant sensitive ecological receptors within 15km of the Site.

The predicted pollutant contribution and total concentrations at selected receptors have been compared with relevant Air Quality Standards (AQSs) and environmental assessment levels (EALs) to determine the magnitude of impact and subsequent effects.

4.2.2 Legislation and Policy

National Air Quality Standard

The National Air Quality Standards¹⁸ were transcribed from the following EU legislation:

- European Union (EU) air quality legislation is provided within Directive 2008/50/EC (Clean Air for Europe (CAFE))¹⁹, which came into force on 11th June 2008. This Directive consolidated previous legislation which was designed to deal with specific pollutants in a consistent manner and provided new air quality objectives for particulate matter with an aerodynamic diameter of less than 2.5 µm (PM_{2.5}). The consolidated Directives include:
 - Directive 99/30/EC - the First Air Quality 'Daughter' Directive - sets ambient Air Quality Limit Values (AQLVs) for NO₂, oxides of nitrogen (NO_x), sulphur dioxide, lead and particulate matter with an aerodynamic diameter of less than 10 µm (PM₁₀);
 - Directive 2000/69/EC - the Second Air Quality 'Daughter' Directive - sets ambient AQLVs for benzene and carbon monoxide; and
 - Directive 2002/3/EC - the Third Air Quality 'Daughter' Directive - seeks to establish long term objectives, target values, an alert threshold and an information threshold for concentrations of ozone in ambient air.
- The fourth daughter Directive was not included within the consolidation and is described as Directive 2004/107/EC. This sets health-based limits on polycyclic aromatic hydrocarbons,

¹⁸ Government of Ireland (2011). *Air Quality Standards Regulations*.

¹⁹ Council for European Communities (2008) *Ambient air quality and cleaner air for Europe Directive, 2008/50/EC*

cadmium, arsenic, nickel and mercury, for which there is a requirement to reduce exposure to as low as reasonably achievable.

- Directive 2008/50/EC has been implemented through the Air Quality Standards Regulations 2011. These regulations set out upper and lower assessment thresholds for the pollutants of concern. The Air Quality Standards include thresholds to encourage a higher standard of air quality where possible.

The EU Limit Values and National Air Quality Standards that are of relevance to this assessment are presented in **Table 4.1**.

Table 4.1: Relevant Air Quality Standards (AQS)

Averaging Period	Air Quality Standard ($\mu\text{g}/\text{m}^3$)
Annual mean NO ₂ concentration	40
Annual mean NO _x concentration	30 ¹
1-hour NO ₂ concentration	200
Annual mean SO ₂ concentration	20 ¹
1-hour SO ₂ concentration	350
24-hours SO ₂ concentration	125
Max 8-hours CO concentration	10,000
Annual PM ₁₀ concentration	40
24-hours PM ₁₀ concentration	50
Annual PM _{2.5} concentration	25

¹Applicable only at ecologically sensitive receptors.

In addition to the relevant AQSs outlined in **Table 4.1**, the impacts at ecological receptors within this assessment have also been assessed against appropriate Environmental Assessment Levels (EALs) for nitrogen deposition, referred to as Critical Loads (CL). The CLs reported in **Table 4.2** have been sourced from the Air Pollution Information System (APIS)²⁰ based on habitats identified within the relevant Conservation Objective Reports^{21,22}.

Table 4.2: Relevant Environmental Assessment Levels

Habitat	Critical Nitrogen load (kg/N/hr/yr)
Meadows	10
Grassland	15
Bog	5
Geyer's Whorl Snail	15
Woodland	10
Turlough	3

²⁰ APIS (2016). *Habitat/species pollutant impacts database*.

²¹ NPWS (2022). *Special Protection Areas (SPA)*.

²² NPWS (2022). *Special Areas of Conservation (SAC)*.

Relevant Environmental Legislation

Other national legislation that relates to air quality and are of relevance to this assessment are listed as follows:

- European Union (Environmental Impact Assessment) (Environmental Protection Agency Act 1992) (Amendment) Regulations 2020, S.I. No. 191 of 2020²³;
- European Communities (Birds and Natural Habitats) (Amendment) Regulations 2015²⁴;
- European Union (Industrial Emissions) Regulations 2013 S.I. 138 of 2013²⁵;
- Environmental Protection Agency (Industrial Emissions) (Licensing) Regulations 2013 S.I. 137 of 2013²⁶; and
- European Communities (Birds and Natural Habitats) Regulations 2011²⁷.

National Planning Policy

Project Ireland 2040 is the Government's long-term overarching strategy for future development and infrastructure in Ireland. It consists of several documents, including the National Planning Framework (NPF)²⁸, which is the Government's high-level strategic Plan for shaping the future growth and development of Ireland up to 2040.

The NPF includes the following overarching aim that is relevant to this assessment:

'Creating a Clean Environment for a Healthy Society:

...Promoting Cleaner Air: Addressing air quality problems in urban and rural areas through better planning and design.'

The NPF includes National Policy Objective 64, which stresses the importance of improving ambient air quality:

'National Policy Objective 64: Improve air quality and help prevent people being exposed to unacceptable levels of pollution in our urban and rural areas through integrated land use and spatial planning that supports public transport, walking and cycling as more favourable modes of transport to the private car, the promotion of energy efficient buildings and homes, heating systems with zero local emissions, green infrastructure planning and innovative design solutions.'

Project Ireland 2040 also includes the Government's National Development Plan (NDP)²⁹. This document is focused on Ireland's long-term economic, environmental, and social progress up to 2027, and references improvements in air quality as an additional benefit to improving energy efficiency for the primary purpose of reducing carbon emissions.

²³ EU (EIA) (Environmental Protection Agency Act 1992) (Amendment) Regulations 2020.

²⁴ EC (Birds and Natural Habitats) (Amendment) Regulations 2015.

²⁵ EU (Industrial Emissions) Regulations 2013.

²⁶ EPA (Industrial Emissions) (Licensing) Regulations 2013.

²⁷ EC (Birds and Natural Habitats) Regulations 2011.

²⁸ GOI (2019). *National Planning Framework*.

²⁹ GOI (2021). *National Development Plan (2021-2030)*.

Local Planning Policy

The Offaly County Development Plan (CDP) 2021-2027³⁰ states that it is the “*approach of the Council to integrate land use planning and transport and promote measures which seek a reduction in fossil fuel based energy sources*”. The focus, therefore, is on reducing such emissions from road transport. It also states that “*Local authorities... can also help minimise the adverse effects of air pollution associated with... projects through conditions attached to planning permissions*”.

The Offaly CDP sets out the following policies with regards to local air quality:

- **ENVP-17:** It is Council policy to manage air quality in accordance with relevant legislation and policy.
- **ENVP-18:** It is Council policy to promote the preservation of best ambient air quality compatible with sustainable development in accordance with the EU ambient Air Quality and Cleaner Air for Europe (CAFE) Directive (2008/50/EC) and ensure that all air emissions associated with new developments are within Environmental Quality Standards as set out in the Air Quality Standards Regulations 2011, or any updated/superseding documents
- **ENVP-19:** It is Council policy to require activities likely to give rise to air emissions to implement measures to control such emissions and to undertake air quality monitoring. Application of this policy will take into account instances whereby activities are licensed by other bodies through other processes (such as Integrated Pollution Control Licensing or Industrial Emissions Licensing).

4.2.3 Methodology

4.2.3.1 Demolition and Construction Phase Emissions

The demolition and construction work proposed has the potential to generate emissions from construction activities and construction site plant and non-road mobile machinery.

A qualitative assessment has been undertaken in line with Institute of Air Quality Management (IAQM) guidance³¹. The approach set out in the guidance is to identify the level of mitigation required, based on the likely magnitude of emissions generated by the work and the sensitivity of the area to the impact of such emissions, to ensure that that effect of emissions is not significant.

4.2.3.2 Operational Phase Emissions

The assessment of operational phase emissions has made use of the current version of the Atmospheric Dispersion Modelling System ADMS 5 (version 5.2.4), published by Cambridge Environmental Research Consultancy (CERC). ADMS 5 is software approved for use by the EPA and has been subject to successful validation studies undertaken by CERC and other entities independent from CERC. The general model parameters are discussed in detail in the sections below.

Source Emissions Data

Source characteristics and emissions data has been obtained from information provided by the client's design team. Information provided has included proposed stack emissions monitoring reports. This

³⁰ Offaly County Council (2021). *Offaly County Development Plan (CDP) (2021-2027)*.

³¹ Holman *et al.*, (IAQM) (2014). *IAQM Guidance on the assessment of dust from demolition and construction*.

information has been scrutinized and data relevant to the dispersion modelling assessment extracted and used as model input data, as listed in **Table 4.3**. Stack locations are illustrated on **Figure 4.1**.

Table 4.3: ADMS 5 Model Source Input Data

Source	Generator							
	1	2	3	4	5	6	7	8
Stack location X	597287	597311	597336	597192	597215	597237	597171	597193
Stack location Y	724947	724931	724914	724914	724894	724874	724883	724863
Release height (m)	30	30	30	30	30	30	30	30
Stack diameter (m)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Temperature (°C)	528.6	528.6	528.6	528.6	528.6	528.6	528.6	528.6
Exhaust Mass Flow (kg/s)	91.3	91.3	91.3	91.3	91.3	91.3	91.3	91.3
Exhaust Volume Flow (Nm ³ /h)	255069	255069	255069	255069	255069	255069	255069	255069
NO _x Emission conc. (mg/Nm ³)	199.2	199.2	199.2	199.2	199.2	199.2	199.2	199.2
SO ₂ Emission conc. (mg/Nm ³)	56.6	56.6	56.6	56.6	56.6	56.6	56.6	56.6
CO Emission conc. (mg/Nm ³)	31.3	31.3	31.3	31.3	31.3	31.3	31.3	31.3
PM ₁₀ Emission conc. (mg/Nm ³)	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
NO _x Emission rate (g/s)	14.11	14.11	14.11	14.11	14.11	14.11	14.11	14.11
SO ₂ Emission rate (g/s)	4.01	4.01	4.01	4.01	4.01	4.01	4.01	4.01
CO Emission rate (g/s)	2.21	2.21	2.21	2.21	2.21	2.21	2.21	2.21
PM ₁₀ Emission rate (g/s)	1.20	1.20	1.20	1.20	1.20	1.20	1.20	1.20



Notes: generator stacks (emission release points) shown as numbered red points

Figure 4.1: The Site of the Designated Development and Location of the Eight Stacks

Model Receptors

The model predicts the contribution of emissions of NO_x, SO₂, CO, PM₁₀ and PM_{2.5} to annual mean concentrations at the discrete receptors listed in **Table 4.4** and **Table 4.5**. The receptor locations are also shown in **Figure 4.2** and **Figure 4.3**.

Within 15km of the Designated Development a total of 48 No. sensitive nature conservation site receptors have been selected to adequately represent various habitats across the Special Areas of Conservation (SAC) areas and sections of the Special Protection Area (SPA), including various habitats within the River Shannon Callows SAC.

For SACs and SPAs, specific sensitive habitats to air quality impacts were identified using data and mapping made available by the National Parks and Wildlife Service (NPWS). Receptor points were modelled at air quality sensitive habitat at the closest point to the Designated Development. Ecological receptors have been modelled at a height of 0m above the ground.

Within 15km of the Designated Development, a total of 55 No. human health receptors have been selected to represent the potential impacts across this area. These receptors include residential properties, schools, and nursing homes.

The human health receptor points were selected to represent worst-case exposure at locations where there is relevant sensitivity and represent other receptors on their vicinity. For example, in a cluster of houses, only one discrete receptor point has been modelled. The human health points were placed on

the closest point of a property to the Designated Development (e.g., on the façade of a residential property).

Table 4.4: Modelled Human Health Receptors

Receptor ID	X	Y	Receptor Description
R1	597457	725196	Residential Property
R2	597614	725254	Residential Property
R3	597174	725462	Residential Property
R4	597793	725009	Residential Property
R5	596956	725461	Residential Property
R6	597562	725462	Residential Property
R7	598777	726415	Residential Property
R8	599301	727646	Residential Property
R9	599413	728134	Residential Property
R10	599431	724057	Residential Property
R11	598196	724504	Residential Property
R12	597857	724403	Residential Property
R13	595501	720269	Residential Property
R14	596442	721303	Residential Property
R15	596038	725462	Residential Property
R16	595545	725186	Residential Property
R17	594448	726712	Residential Property
R18	597762	724793	Residential Property
R19	597874	724890	Residential Property
R20	595984	725301	Residential Property
R21	594091	726415	Residential Property
R22	593156	727163	Residential Property
R23	600142	729585	Residential Property
R24	602863	730150	Residential Property
R25	607626	730571	Residential Property
R26	609664	732924	Residential Property
R27	610621	731197	Residential Property
R28	603734	722893	Residential Property
R29	606841	722715	Residential Property
R30	609712	724269	Residential Property
R31	609132	722295	Residential Property
R32	607232	719499	Residential Property
R33	609992	719440	Residential Property
R34	608241	717783	Residential Property
R35	606890	717463	Residential Property
R36	604547	712074	Residential Property
R37	600662	715709	Residential Property
R38	591296	716890	Residential Property
R39	589338	729077	Residential Property

Receptor ID	X	Y	Receptor Description
R40	593274	730667	Residential Property
R41	589597	734625	Residential Property
R42	593179	720966	Residential Property
R43	589585	722072	Residential Property
R44	591815	721456	Residential Property
R45	598349	718982	Residential Property
S1	600794	730454	Clonmacnoise National School
S2	605492	722446	High Street National School
S3	611254	724670	St. Cynocs Junior National School
S4	600847	715186	Banagher College
S5	595166	719408	Clonfert National School
S6	587379	730251	Little Rascals School
S7	587287	731285	The village creche & preschool
S8	583588	730206	Ardscoil Mhuire Ballinasloe School
S9	595919	733383	Camcloon National School
N1	603447	713606	Eliza Lodge Nursing Home

Notes: R = residential, S = school, N = nursing home.



Notes: Location of Designated Development (red point), 15km buffer (yellow boundary).

Figure 4.2: Human Health Receptors

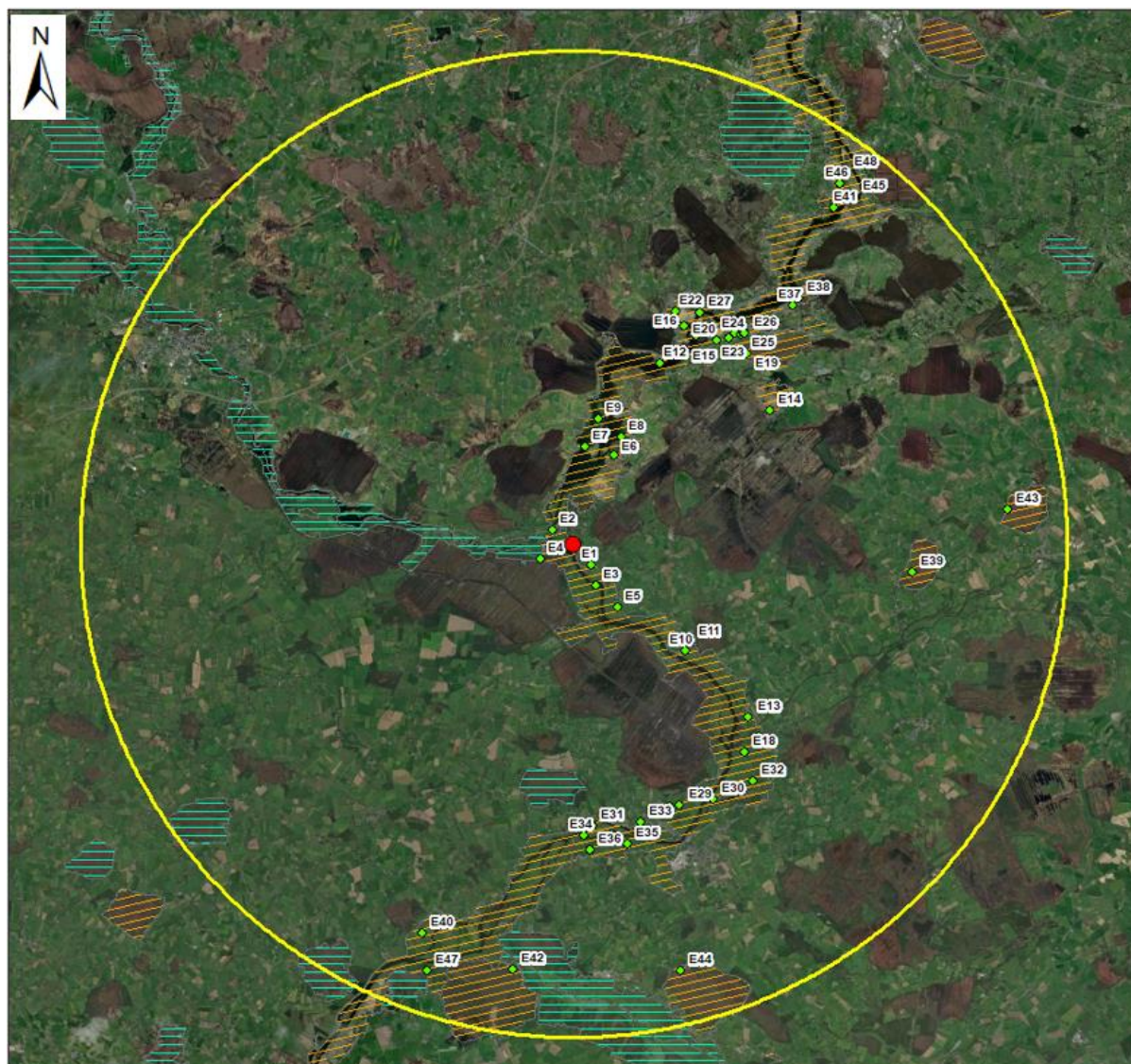
Table 4.5: Modelled Ecological Receptors

Receptor ID	X	Y	Receptor Description	Habitat ¹
E1	597724	724249	River Shannon Callows SAC	6510 Lowland hay meadows
E2	596554	725316	River Shannon Callows SAC	6510 Lowland hay meadows
E3	597889	723632	River Shannon Callows SAC	6510 Lowland hay meadows
E4	596179	724453	Suck River Callows NHA (within SPA)	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils
E5	598543	722965	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils & 6510 Lowland hay meadows ²
E6	598425	727603	Clorhane Wood pNHA (within SPA)	91D0 Bog Woodland
E7	597550	727836	River Shannon Callows SAC	6510 Lowland hay meadows
E8	598640	728141	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils
E9	597960	728691	River Shannon Callows SAC	6510 Lowland hay meadows
E10	600577	721645	River Shannon Callows SAC	6510 Lowland hay meadows
E11	600743	721918	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils
E12	599814	730389	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils
E13	602522	719620	River Shannon Callows SAC	6510 Lowland hay meadows
E14	603172	728945	Fin Lough (Offaly) SAC	1013 Vertigo geyeri Geyer's Whorl Snail
E15	600938	731210	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils
E16	600552	731526	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils
E17	602845	719043	Grand Canal pNHA (within SPA)	Potential 7110 Active Raised Bogs ²
E18	602377	718575	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils & 6510 Lowland hay meadows ²
E19	602461	730693	Mongan Bog SAC	Potential 7110 Active Raised Bogs
E20	601547	731077	River Shannon Callows SAC	6510 Lowland hay meadows
E21	601910	731149	Pilgrim's Road Esker SAC	6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates
E22	600317	731963	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils
E23	602083	731304	Pilgrim's Road Esker SAC	6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates
E24	602267	731249	Pilgrim's Road Esker SAC	6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates
E25	602340	731312	Pilgrim's Road Esker SAC	6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates
E26	602408	731314	Pilgrim's Road Esker SAC	6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates
E27	601025	731941	River Shannon Callows SAC	6510 Lowland hay meadows
E28	600103	716906	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils
E29	600425	716958	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils
E30	601428	717150	River Shannon Callows SAC	6510 Lowland hay meadows

Receptor ID	X	Y	Receptor Description	Habitat ¹
E31	597780	716337	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils
E32	602658	717692	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils & 6510 Lowland hay meadows ²
E33	599219	716438	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils
E34	597522	716032	River Shannon Callows SAC	6510 Lowland hay meadows
E35	598845	715775	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils & 6510 Lowland hay meadows ²
E36	597691	715589	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils
E37	603863	732157	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils & 6510 Lowland hay meadows
E38	604042	732373	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils
E39	607504	724051	Moyclare Bog SAC	Potential 7110 Active Raised Bog
E40	592586	713050	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils
E41	605099	735101	River Shannon Callows SAC	6510 Lowland hay meadows
E42	595347	711940	Redwood Bog SAC	Potential 7110 Active Raised Bogs
E43	610396	725932	Ferbane Bog SAC	Potential 7110 Active Raised Bogs
E44	600444	711932	All Saints Bog and Esker SAC	Potential 7110 Active Raised Bogs
E45	605734	735437	River Shannon Callows SAC	6510 Lowland hay meadows
E46	605308	735863	River Shannon Callows SAC	6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils
E47	592722	711905	Ballymacegan Bog NHA (within SPA)	Potential 7110 Active Raised Bogs
E48	605480	736181	River Shannon Callows SAC	6510 Lowland hay meadows

¹Critical Nitrogen Load as presented in Table 4.2 Molinia Meadows 10 kg/N/ha/yr | Lowland Hay Meadow 20 kgN/ha/yr | Grassland 15 kg/N/ha/yr | Bog 5 kg/N/ha/yr | Greyer's Whorl Snail 15 kg/N/ha/yr | Woodland 10 kg/N/ha/yr | Turlough 3 kg/N/ha/yr

²Multiple habitats present and worst case selected in terms of Critical Load.



Notes: Location of Designated Development (red point), 15km buffer (yellow boundary), Special Areas of Conservation (SACs) (yellow hatched areas) and Special Protection Areas (SPAs) (blue hatched areas).

Figure 4.3: Ecological Receptors

Background Pollutant Concentrations

Background pollutant data is added to the modelled pollutant concentrations and deposition rates to estimate total pollutant concentrations and deposition rates, which can then be compared against the relevant AQs and EALs.

Background concentrations were sourced from EPA monitoring data for monitoring locations included EPA Zone D, which is used to represent rural locations. The relevant background concentrations used to inform this assessment are summarised in **Table 4.6**.

Table 4.6: EPA Zone D Background Concentrations and Deposition Rate

Pollutant	Averaging Period	Concentration ($\mu\text{g}/\text{m}^3$) or Deposition Rate ($\text{kg}/\text{ha}/\text{yr}$)
NO_x³	Annual mean	14.2
NO₂³	Annual mean	7.5
	1-hr	15.0
SO₂	Annual mean	4.2
	1-hr	8.4
	24-hr	8.4
N deposition⁴	Annual rate	12.1
CO	8-hr rolling	0.3
PM₁₀	Annual mean	11.9
	24-hr	23.8
PM_{2.5}	Annual mean	8.7

¹ Average across Zone D monitoring sites taken from summary tables that informed the Air quality in Ireland 2021 report.

² Short-term background concentrations are double the annual mean concentrations.

³ Includes elevated NO_x concentrations monitored at Birr due to proximity to N52.

⁴ National average reported in EPA Research – Development of Critical Loads for Ireland: Simulating Impacts on Systems (SIOS) Author: Julian Aherne, Jason Henry and Marta Wolniewicz.

Meteorological Data

Hourly sequential wind speed, wind direction, precipitation, temperature, and relative humidity data has been sourced from the meteorological station at Gurteen College, to inform the dispersion modelling. The station at Gurteen does not include data on cloud cover and missing hours of that parameter were taken from the meteorological station at Shannon Airport for the same years. Wind rose plots are discussed in **Section 4.2.3.3** and illustrated in **Figure 4.6**. Gurteen College data was selected as being the most representative site to the study area for which data capture (with the exception of cloud cover) was sufficient.

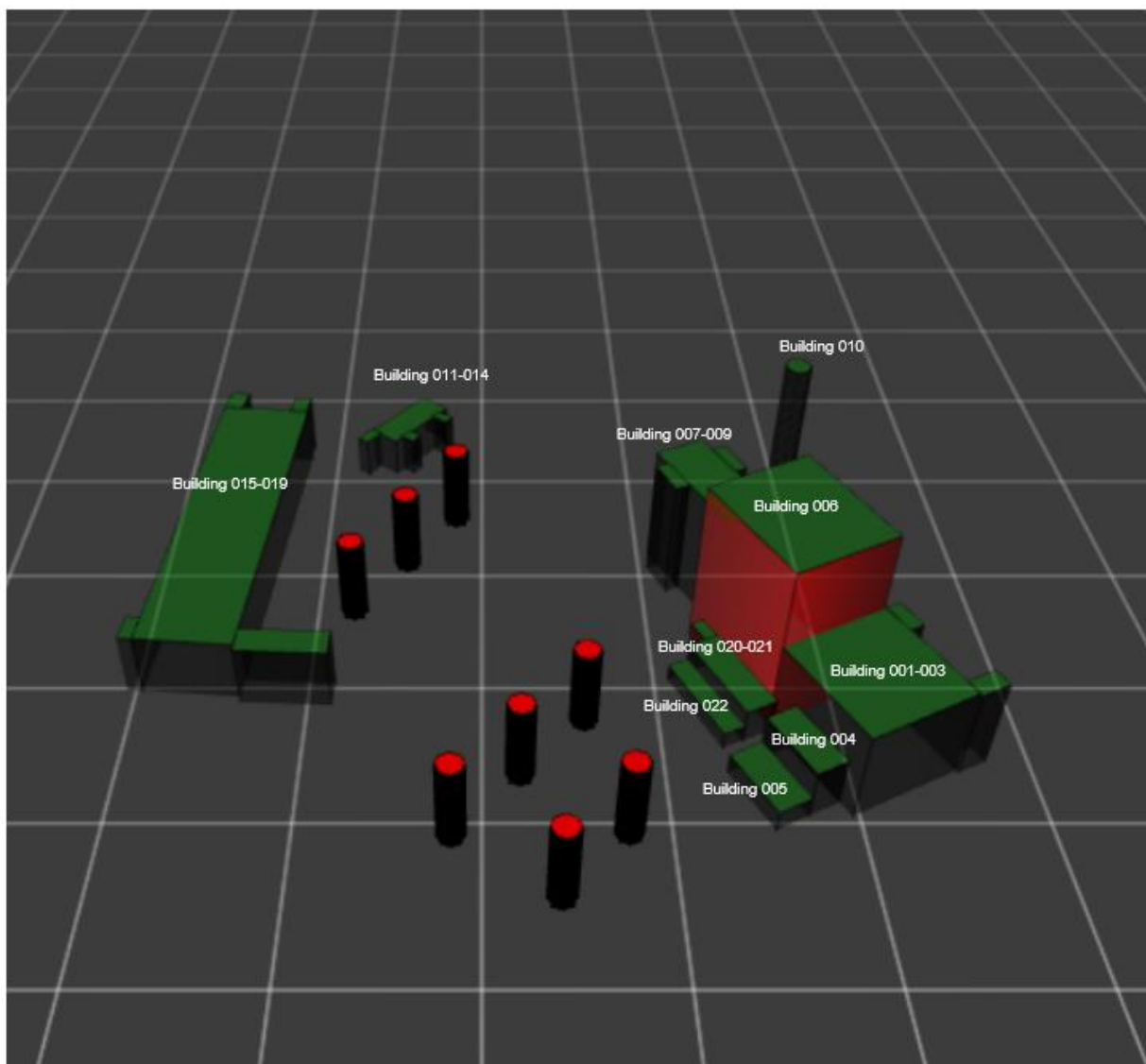
The use of five years of data allows the assessment to consider inter-annual variation. The contribution of emissions to pollutant concentrations and deposition rates reported at each receptor location is the worst-case value calculated at that location over the five years modelled.

In terms of how the dispersion model utilises the meteorological data, the latitude of the study area was set at 53°, the surface roughness of the study area set at 0.3m, to account for the fact that the study area is a combination of the estuary waterbody and swathes of open countryside with limited urban areas. The minimum Monin-Obukhov length set at 10m, to represent small towns and rural areas. For the meteorological site, the surface roughness was set at 0.2m to represent a typical meteorological site, which should be distanced well away from nearby buildings and structures.

Modelled Buildings

The buildings and structures that make up the existing power station have the potential to affect the dispersion of emissions from the exhaust stacks. The ADMS 5 buildings effect module has therefore been used to incorporate building downwash effects as part of the modelling procedure. Site buildings of a height of greater than or equal to 12m and in close proximity of the exhaust stacks have been

included within the dispersion model, as illustrated below in **Figure 4.4**. The dimensions of the buildings are provided in **Table 4.7**.



Notes: Looking east and showing generator stack and Power Station building locations, with the 'main building' shaded in red for the 5-stack cluster. Building 015 was classed as the 'main building' for the three stacks clustered to the east. Note that the diameter of the stacks is not to scale.

Figure 4.4: Modelled Buildings (facing east)

Table 4.7: Building Dimensions

Building	X	Y	Z (m)	Length / Diameter (m)	Width (m)	Angle (°)
Main Building 006	597263	724810	60	44	37	63
Building 001-003	597226	724791	32	38	41	153
Building 004	597212	724812	17.45	11	24	153
Building 005	597207	724822	7.25	12	24	153
Building 020-021	597245	724828	12	11	32	154
Building 022	597241	724836	5.8	7	32	155
Building 007-009	597302	724830	43	41	17	63
Building 010	597310	724807	80	8	8	0

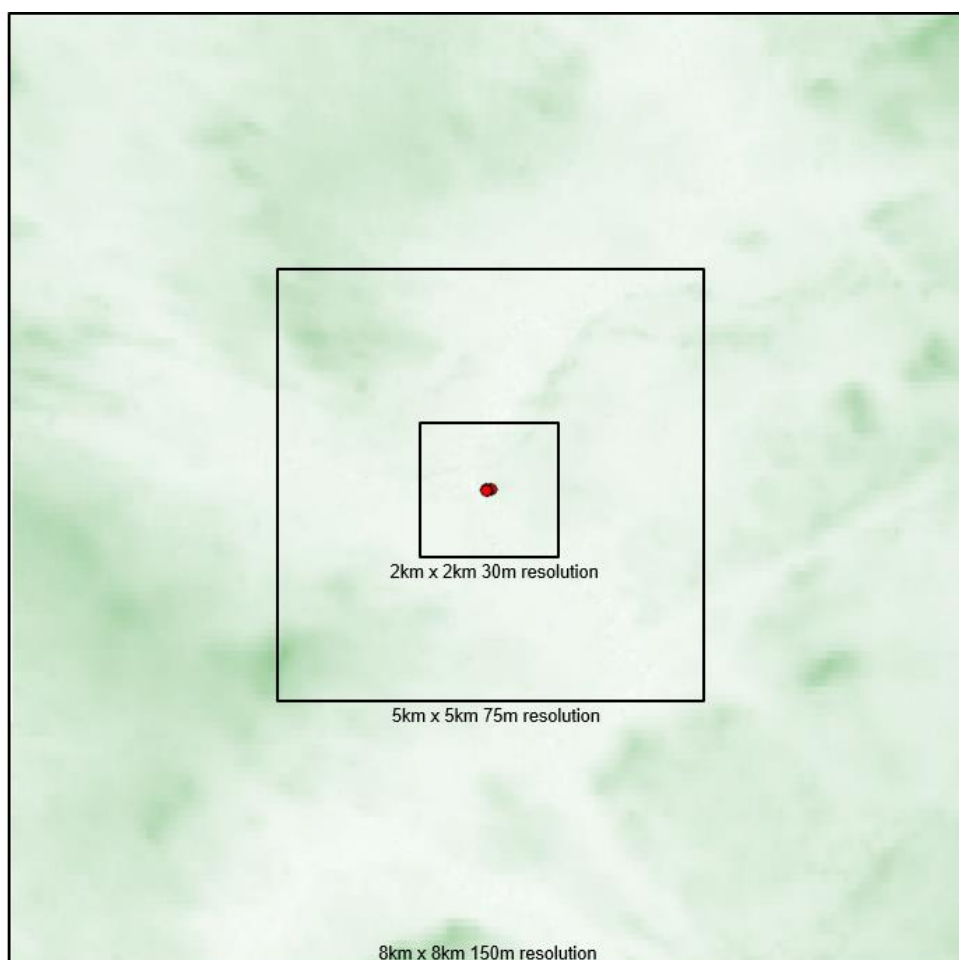
Building	X	Y	Z (m)	Length / Diameter (m)	Width (m)	Angle (°)
Building 011-014	597378	724932	14.5	11	28	220
Building 015-019	597311	724990	22	126	31	95

Note: For some buildings multiple buildings were required to match the layout of the building in ADMS 5. For these building groups the details of the biggest building are provided.

Terrain Data

Terrain data was sourced from the U.S. Geological Survey, which provides data with a 30m resolution. ADMS 5 is limited to 66,000 terrain points in a model run. Using terrain data with a resolution of 30m, it could not be used to cover the full 15km area that was required for this assessment. Therefore, the terrain data was processed to provide a nested resolution of 30m, 75m and 150m, allowing for the consideration of terrain over a wider area whilst maintaining a suitable resolution for dispersion modelling. This nested grid had an inner 2km area, a central 5km area and an outer 8 km area.

The terrain data used to inform the dispersion modelling assessment is visualised in **Figure 4.5**, with the site location shown as the red dot. The south-western extent of the terrain data is at ITM 581167, 708849 and it extends 8km to the east and 8km to the north. The terrain data points were nested in a cartesian grid, centred on the Site, as illustrated in **Figure 4.6**.



Notes: Light green areas represent the lowest terrain across the study area with graduating dark green areas representing increase ground elevation. Low point is 18m above sea level and occurs 250m west of the Designated Development. High point is 123 above sea level and occurs 9km southwest. Red dots represent model sources.

Figure 4.5: Visualisation of modelled Terrain

Pollutant Conversions

NO_x to NO₂

To quantify annual mean NO₂, it was assumed that 100% of NO_x emissions released from the stack are converted to NO₂ in the atmosphere. This represents a precautionary approach in that in reality, this conversion is ozone-limited and not all NO_x emissions will be converted.

Nitrogen deposition was calculated from annual mean NO₂ concentrations.

To quantify 1-hour NO₂, it was assumed that 50% of NO_x emissions released from the stack are converted to NO₂ in the atmosphere.

NO₂ to N Deposition

Annual mean NO₂ concentrations are converted to N deposition using the following factors as set out in EPA guidance:

- Deposition flux (as µg/m²/s) is calculated by applying a deposition velocity factor of 0.0015 m/s to the annual mean NO₂ contribution as (µg/m³) at habitats with short vegetation (non-woodland) and a deposition velocity factor of 0.003 m/s to annual mean NO₂ as (µg/m³) contribution at habitats with tall vegetation (woodland); and
- Deposition rate (as kgN/ha/yr) is then calculated by applying a unit conversion factor of 95.9 to the calculated deposition flux (as µg/m²/s).

4.2.3.3 Describing Significant Effects

The *EPA Guidelines*³² does contain a method to determine and describe the effect of a development, but that approach is not wholly appropriate for air quality. This is because the relationship between magnitude of change in air quality conditions and receptor sensitivity is not linear. Receptor sensitivity to air quality impacts does not have a graded scale and instead, receptors are considered either sensitive to air quality impacts or not sensitive. Furthermore, the impact description of a change in pollutant concentration is not based on the magnitude of change alone, but that change relative to the pollutant concentration experienced at a receptor once the Designated Development is in operation. The reason for this is to take account that smaller changes in air quality conditions can constitute a greater level of impact than a large change in conditions, where they occur at receptors that are predicted to experience pollutant concentrations close to or in excess of an Air Quality Standard or Environmental Assessment Level.

EPA AG4 Approach

The EPA AG4 guidance document on dispersion modelling does not include the specific means by which to describe the significance of effect on local air quality as a result of new emissions, with regards to determining the suitability of a development from a planning perspective. It does, however, provide criteria that Environmental Licence applicants should aim to achieve in terms of the maximum allowable air quality impacts from an Environmental Licencing perspective.

In its section on *model accuracy and sensitivity studies*, AG4 guidance state that “the process contribution (PC) should be less than 75% of the ambient air quality standard and less than this where

³² EPA (2022). *Guidelines on the information to be contained in Environmental Impact Assessment Reports*.

background levels account for a significant fraction of the ambient air quality standard based on the formula³³:

- Maximum Allowable PC = $0.75 \times (\text{AQS})$ where there is no significant background concentration;
or
- Maximum Allowable PC = $0.75 \times (\text{AQS} - \text{BC})$ where there is a significant background concentration

Alternative Approaches

In the UK, the Environment Agency (EA) and IAQM / Environmental Protection UK have both developed guidance to determine whether or not an air quality effect can be screened as insignificant or not by the regulator³³, or significant or not by the planning authority³⁴, respectively.

The UK EA and IAQM/EPUK Guidance provide an alternative and more precautionary approach to determining whether the impact of a Designated Development has an effect that is potentially significant or not. Although, it should be noted that the UK Guidance is intended for use in areas of the UK where pollutant concentrations are often elevated close to or above the Air Quality Standards. For application in rural Ireland, it can be considered a conservative means of determining potential significance. It should also be noted that the IAQM guidance is predominantly for urban development projects where road traffic emissions are often the biggest contributor to air quality impacts, rather than industrial installations, although there is no reason why the significance criteria described within it cannot be adopted for industrial sites also.

The approaches described in these documents have been considered and utilised alongside the EPA AG4 guidance in this assessment. Where possible, the approaches described in the air quality specific guidance have been reported in a manner that is compatible with the requirements of the *EPA Guidelines*.

UK EA Approach

According to the UK EA Guidance, an impact on human health sensitive receptors may be considered insignificant where:

- The short-term Process Contribution (PC - impact) is $\leq 10\%$ of the Air Quality Standard or Environmental Assessment Level; and
- The long-term Process Contribution (impact) is $\leq 1\%$ of the Air Quality Standard or Environmental Assessment Level.

Where an impact on human health sensitive receptors cannot be screened out at this stage, additional criteria is provided, including consideration of the Predicted Environmental Concentration (PEC – total pollutant concentration), where the PC is added to the background (or ambient) concentrations. The impact may be considered insignificant where:

- The short-term PC is $< 20\%$ of the Air Quality Standard or Environmental Assessment Level minus the short-term background; and

³³ UK EA (2016). *Air Emissions Risk Assessment for your Environmental Permit Guidance – Updated 2022*.

³⁴ Moorcroft and Barrowcliffe. *et al.*, (2017). *Land-use Planning & Development Control: Planning for Air Quality*. v1.2.

- The long-term PEC is <70% of the Air Quality Standard or Environmental Assessment Level.

Where an impact on human health sensitive receptors still cannot be screened as insignificant at this stage, it does not necessarily mean that the effect is now significant. At this stage, model inputs are reviewed, and detail enhanced where it can be. The predicted PC and PEC are then reviewed relative to the appropriate Air Quality Standards and Environmental Assessment Levels and the headroom (gap between the PEC and the Standards and Assessment Levels) that remains once the Designated Development is in operation - *i.e.*, is there a risk of an exceedance of an Air Quality Standard and Environmental Assessment Level and/ or does the operation of the Designated Development constrain future development of the area.

For this assessment, the 'insignificant' terminology used in the UK EA guidance³⁵ applies to effects that can be described as 'Imperceptible' to 'Slight' in the *EPA Guidelines*³⁶. It may also apply to effects that can be described as 'Moderate' in the *EPA Guidelines*, where such effects relate to a limited number of sensitive receptors and / or the Air Quality Standards and Environmental Assessment Levels remain not at risk of any exceedance.

For impacts in nature conservation receptors, the UK EA Guidance states that they may be considered insignificant ('not significant') where:

- the short-term PC is less than 10% of the short-term environmental standard for protected conservation areas; and
- the long-term PC is less than 1% of the long-term environmental standard for protected conservation areas.

Where the long-term process contribution exceeds this criteria, ecologically sensitive receptors may also be considered insignificant ('not significant') where:

- The long-term PEC is <70% of the Air Quality Standard, Environmental Assessment Level or Critical Load.

Where an impact on nature conservation sensitive receptors still cannot be screened as insignificant at this stage, again it does not necessarily mean that the effect is now significant. Model inputs and assumptions shall be reviewed, and detail enhanced where it can be. The predicted PC and PEC are then reviewed relative to the appropriate Air Quality Standards and Environmental Assessment Levels and the headroom that remains once the Designated Development is in operation - *i.e.*, is there a risk of an exceedance of an Air Quality Standard and Environmental Assessment Level and / or does the operation of the Designated Development constrain future development of the area.

Again, the 'insignificant' terminology used in the UK EA Guidance applies to effects that can be described as 'Imperceptible' to 'Slight' in the *EPA Guidelines*. It may also apply to effects that can be described as 'Moderate' in the *EPA Guidelines*, where such effects relate to a limited number of sensitive receptors and/or the Air Quality Standards and Environmental Assessment Levels remain not at risk of

³⁵ UK EA (2016). *Air Emissions Risk Assessment for your Environmental Permit Guidance - Updated 2022*.

³⁶ EPA (2022).

any exceedance. Ultimately, the significance of air quality impacts on nature conservation sites shall be determined by a professional ecologist.

IAQM / EPUK Approach

Like the UK EA Guidance, the IAQM / EPUK approach does not define a graduating scale of human health receptor sensitivity. Instead, human health receptors are considered either sensitive or not, depending on the period of time for which they are exposed to emissions. The absolute magnitude of change in pollutant concentrations between the baseline and operational phase scenarios, in relation to the Air Quality Standards and Environmental Assessment Levels, is described and this is used to consider the risk of those Standards and Levels being exceeded.

For a change in annual mean concentrations of a given magnitude, IAQM have published recommendations for describing the impacts at individual receptors, as set out in the table below.

Table 4.8: The Description of Impacts Referred to in the IAQM / EPUK Guidance

Long term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)				
	<1 (Imperceptible) ¹	1 (Very Low) ¹	2 to 5 (Low) ¹	6 to 10 (Medium) ¹	>10 (Large) ¹
75% or less of AQAL	Negligible ²	Negligible ²	Negligible ²	Slight ²	Moderate ²
76% - 94% of AQAL	Negligible ²	Negligible ²	Slight ²	Moderate ²	Moderate ²
95% - 102% of AQAL	Negligible ²	Slight ²	Moderate ²	Moderate ²	Substantial ²
103% - 109% of AQAL	Negligible ²	Moderate ²	Moderate ²	Substantial ²	Substantial ²
110% or more of AQAL	Negligible ²	Moderate ²	Substantial ²	Substantial ²	Substantial ²

Notes:

¹ For this assessment, IAQM magnitude of change, descriptions are now aligned with EPA Guidelines as magnitude of effect as follows: Imperceptible = Negligible; Very Low = Low; Low = Low; Medium = Medium; and Large = High.

² For this assessment, IAQM effect descriptions are aligned with EPA Guidelines as follows: Negligible = Imperceptible; Slight = Not Significant to Slight; Moderate = Moderate; and Substantial = Significant to Profound

The IAQM / EPUK Guidance states that the descriptors are for individual receptors only and that overall significance is determined using professional judgement. It also states that it is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the objective value. For a given year in the future, it is impossible to define the new total concentration without recognising the inherent uncertainty, which is why there is a category that has a range around the objective value, rather than being exactly equal to it.

A change in predicted long-term (annual mean) concentrations of less than 0.5% of an Air Quality Standard or Environmental Assessment Level is considered to be 'imperceptible'. A PC (impact) that is 'Negligible', given normal bounds of variation, will not be capable of having a direct effect on local air quality that could be considered to be significant.

The guidance suggests the potential for 'Low' air quality impacts as a result of changes in pollutant concentrations between 2% and 5% of relevant Air Quality Standards and Environmental Assessment Levels. For example, for long-term NO₂ concentrations, this relates to changes in concentrations ranging from 0.6 - 2.1 µg/m³. In practice, changes in concentration of this magnitude, and in particular changes at the lower end of this band are likely to be very difficult to distinguish due to the inter-annual

effects of varying meteorological conditions. Therefore, in the overall evaluation of significance the potential for impacts to have significant air quality effect within this band will be considered in this context and will not be capable of having a direct effect on local air quality that can be considered to be significant.

Changes in concentration of more than 5% ('Medium' and 'High', the two highest bands) are considered to be of a magnitude which is far more likely to be discernible above the natural variation in baseline conditions and, as such, carry additional weight within the overall evaluation of significance for air quality. 'Moderate' impacts do not necessarily constitute a significant effect, where they do not contribute to an exceedance or risk of an exceedance of an Air Quality Standard or Environmental Assessment Level, particularly where such impacts relate to a small minority of receptors with the majority experiencing lesser impacts. A 'significant' to 'Profound' impact will almost certainly constitute a significant effect that will require additional mitigation to address.

The IAQM / EPUK Guidance also provides thresholds for determining whether short-term impacts on human health sensitive receptors have the potential to cause a significant effect or not. Again, it is noted that the IAQM guidance is not specific to industrial facilities, but still provides a useful guide to scale the severity of impacts. This guidance deviates from the UK EA Guidance in that the criteria it provides does not take account of background concentrations, although the guidance does state that this is not intended to play down the importance of total short-term concentrations; the IAQM Guidance indicates that severity of peak short-term concentrations can be described without the need to reference background concentrations as the PC is used to measure impact, not the overall concentration at a receptor. The peak short-term PC from an elevated source has been adopted for this assessment as follows:

- PC \leq 10% of the Air Quality Standard or Environmental Assessment Level represents an impact that is 'Imperceptible' to 'Not significant';
- PC 11-20% of the Air Quality Standard or Environmental Assessment Level is small in magnitude representing a 'Slight' impact;
- PC 21-50% of the Air Quality Standard or Environmental Assessment Level is medium in magnitude representing a 'Moderate' impact; and
- PC $>$ 51% of the Air Quality Standard or Environmental Assessment Level is large in magnitude representing a 'Significant' to 'Profound' impact.

Overall Significance

Following the assessment of each individual air quality effect (construction dust, traffic and operational plant), the significance of all of the reported effects is then considered for the Designated Development in overall terms. The potential for the Designated Development to contribute to or interfere with the successful implementation of policies and strategies for the management of local air quality are considered if relevant, but the principal focus is any change to the likelihood of future achievement of the Air Quality Standards and Environmental Assessment Levels (which also relate to compliance with Council goals for local air quality management and objectives are set for the protection of human health).

In terms of the significance of the effects (consequences) of any adverse impacts, an effect is reported as being either significant or not. If the overall effect of the Designated Development on local air quality or on amenity is found to be 'Moderate' (where a large proportion of sensitive receptors are affected and / or there is risk of Air Quality Standards and Environmental Assessment Levels being exceeded) or 'Significant' to 'Profound', this is deemed to be significant for assessment purposes. Effects found to be 'Moderate' (where limited sensitive receptors are affected and there is no risk of exceedance of an Air Quality Standard or Environmental Assessment Level) to 'Imperceptible' are not considered to be significant.

4.2.4 Baseline Conditions

Monitored Baseline

The existing environment has been described with reference to the most recently published EPA Air Quality Report and supplementary data.

The EPA manages the national ambient air quality network, which consists of over 100 monitoring stations located across the country that monitor a range of pollutants, including some of those of relevance to this assessment. The EPA data used to inform this assessment was gathered in 2021 and earlier.

EU legislation on air quality requires that Member States divide their territory into zones for the assessment and management of air quality. The zones in place in Ireland during the most recently available report of monitoring are:

- Zone A: Dublin conurbation;
- Zone B: Cork conurbation;
- Zone C: large towns with a population >15,000; and
- Zone D: the remaining area of Ireland.

Data gathered across monitoring sites in Zone D over the past few years are summarised in **Table 4.9** to **Table 4.14** as well as the yearly average across all sites. Any elevated concentrations are due to the proximity of a monitoring station to a local source of the pollutant being monitored. For example, the highest annual mean NO₂ measurement in 2021 was gathered in Birr. The monitoring station in Birr is located at a roadside location in the middle of the town centre.

The data demonstrates that air quality in Zone D locations is well below the relevant AQSs.

Table 4.9: Annual Mean NO₂ Zone D Monitoring Data

Year	Emo Court	Birr	Castlebar	Carrick-on-Shannon	Kilkitt	Edenderry	Yearly Average
2021	3.6	12.8	6.3	11.2	2.4	8.8	7.5
2020	4	9	6	17	2	-	7.6
2019	4	-	8	-	5	-	5.7
Site Average	3.9	10.9	6.8	14.1	3.1	8.8	6.9

Table 4.10: Annual Mean NO_x Zone D Monitoring Data

Year	Emo Court	Birr	Castlebar	Carrick-on-Shannon	Kilkitt	Edenderry	Yearly Average
2021	5.2	31.5	10.9	21.9	3.1	12.3	14.2
2020	4.7	23.2	8.9	40.1	2.5	-	15.9
2019	4.8	-	11.1	-	7.6	-	7.8
Site Average	4.9	27.4	10.3	31.0	4.4	12.3	12.6

Table 4.11: Annual Mean PM₁₀ Monitoring Data

Year	Tipperary Town	Carrick-on-Shannon	Enniscorthy	Birr	Askeaton	Macroom	Castlebar	Cobh Carrignafay	Claremorris	Kilkitt	Cavan	Roscommon Town	Edenderry	Mallow	Longford	Cobh Cork Harbour	Yearly Average
2021	12.7	9.4	13.7	12.2	8.7	14.6	9.8	12.0	9.5	7.8	10.6	10.3	17.8	14.7	13.9	13.4	11.9
2020	12	10	15	10	7	15	14	13	10	8	9	11	-	-	-	-	11.2
2019	9	-	18	-	-	28	16	13	11	7	-	12	-	-	-	-	14.3
Site Ave.	11.2	9.7	15.6	11.1	7.9	19.2	13.3	12.7	10.2	7.6	9.8	11.1	17.8	14.7	13.9	13.4	12.5

Table 4.12: Annual Mean PM_{2.5} Zone D Monitoring Data

Year	Tipperary Town	Carrick-on-Shannon	Mallow	Enniscorthy	Birr	Askeaton	Macroom	Longford	Cobh Carrignafay	Claremorris	Cavan	Roscommon Town	Edenderry	Yearly Average
2021	8.6	5.9	7.9	9.8	7.9	5.7	10.1	9.4	7.4	8.2	7.4	7.1	17.8	8.7
2020	8	7	10	12	6	4	11	9	8	5	6	7	-	7.8
2019	6	-	-	14	-	-	15	9	8	4	-	9	-	9.3
Site Ave.	7.5	6.5	9.0	11.9	7.0	4.9	12.0	9.1	7.8	5.7	6.7	7.7	17.8	8.6

Table 4.13: Annual Mean SO₂ Zone D Monitoring Data

Year	Kilkitt	Letterkenny	Cork Harbour	Askeaton	Edenderry	Yearly Average
2021	1.7	10.2	5.5	1.6	1.8	4.2
2020	1.4	11.8	1.8	1.6	-	4.2
2019	0.7	6.8	-	1.8	-	3.1
Site Average	1.3	9.6	3.7	1.7	1.8	3.8

Table 4.14: Annual Mean CO Zone D Monitoring Data

Year	Birr
2021	0.3
2020	0.4
2019	-
Site Average	0.4

4.2.4.1 Local Meteorological Data

The closest and most representative site of hourly sequential meteorological data to the Designated Development, with adequate data capture for wind speed and wind direction, is the meteorological station at Gurteen College. This station is approximately 26km to the south of the Designated Development. This station was however missing cloud cover data between 2017 and 2021. This missing cloud cover data was taken from Shannon Airport, approximately 86km to the south-west of the Designated Development.

Figure 4.6 illustrates wind rose plots from the five most recent calendar years monitored at Gurteen College. Wind rose plots show the frequency of winds blown from specific sectors and wind speeds. **Figure 4.6** shows that over the five years presented, winds most frequently blow from the south-west quadrant, which is typical of much of Ireland. However, it is also noted that winds do blow from other directions over the course of each year.

Figure 4.6 also demonstrates the inter-annual variation in meteorological conditions. Whilst the predominant wind direction from the southwest is consistent across all five years considered, we can see that winds blowing from the south-west are more frequent in 2019 and 2021 and winds blowing from the north-east are more frequent in 2018 and 2020.

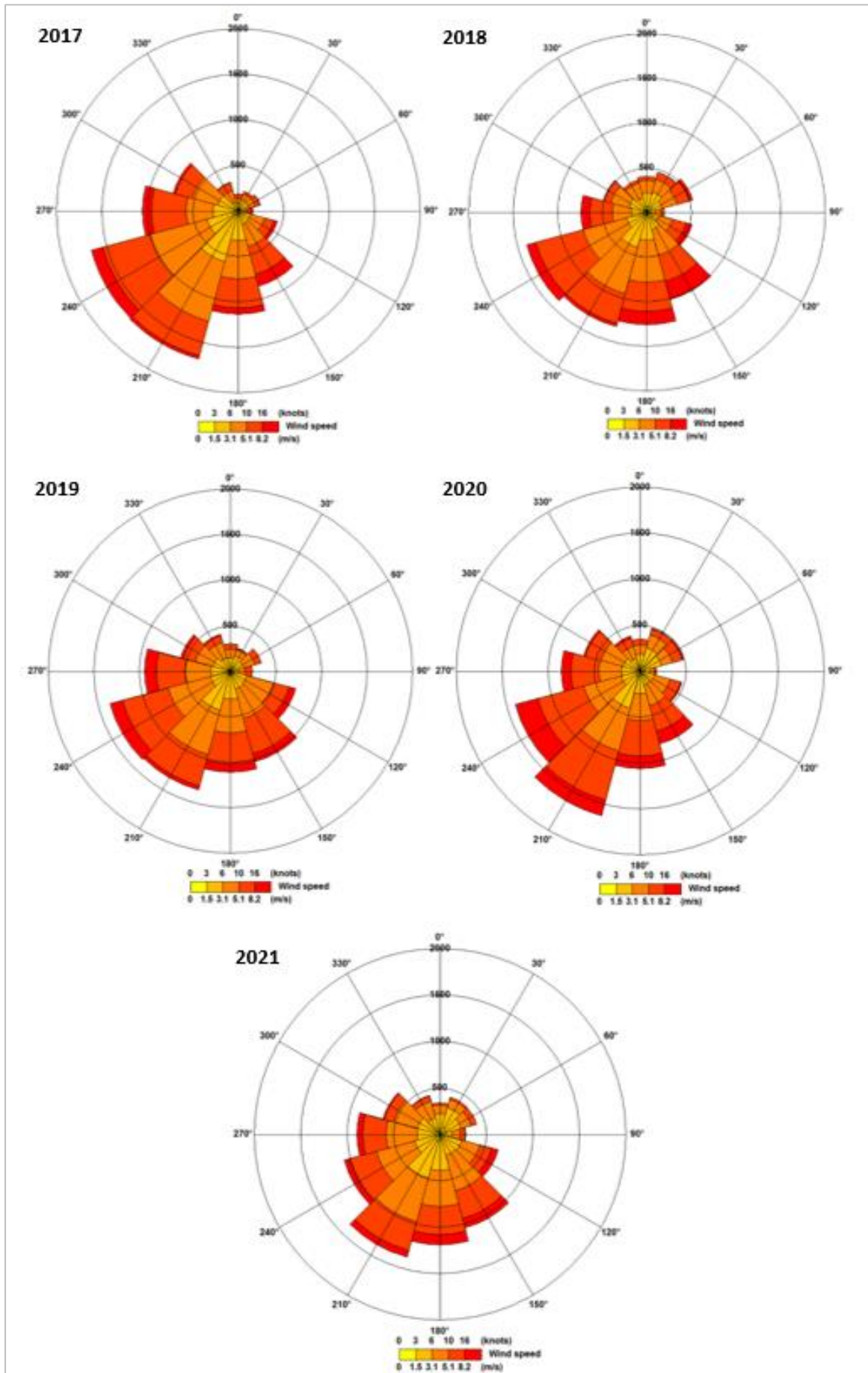


Figure 4.6: Wind Rose Plots

4.2.5 Predicted Impacts

This assessment has quantified the contribution of emissions from the eight emergency generators to pollutant concentrations at 55 No. human health sensitive receptors and pollutant concentrations and deposition rates at 48 No. ecological sensitive receptors. The contribution has been compared to relevant AQSs and EALs to determine the magnitude of impact. The pollutant contribution to pollutant concentrations and deposition rates has been added to the background contribution to provide an estimate of total pollutant concentrations and deposition rates. These values can then be directly compared to the relevant AQSs and EALs.

The results of the assessment are presented in **Table 4.15** and **Table 4.16**. **Table 4.15** shows the modelled emissions at the six worst impacted human health receptor locations. **Table 4.16** shows the modelled emissions at all ecological receptor locations. In the tables, the contribution of emergency generator emissions is referred to as the Process Contribution (PC). The total pollutant concentrations, once the PC had been added to the background contribution (BC), is referred to as the Predicted Environmental Concentration (PEC). The PC reported in the **Table 4.15** and **Table 4.16**, and subsequent PEC, is based on the maximum impact at each receptor over the five meteorological years modelled.

Table 4.15: Modelled Emissions at Human Health Receptor Locations

Receptor ID	Averaging Period	EAL ($\mu\text{g}/\text{m}^3$)	PC ($\mu\text{g}/\text{m}^3$)	PC/AQS (%)	BC ^{1,2} ($\mu\text{g}/\text{m}^3$)	PEC ($\mu\text{g}/\text{m}^3$)	PEC/AQS (%)
Receptor ID R1							
NO ₂	Annual Mean	40	0.6	1.4	7.5	8.1	20.1
	1-hr	200	150.0	75.0	15.0	165.0	82.5
SO ₂	1-hr	350	79.2	22.6	8.4	87.6	25.0
	24-hr	125	32.2	25.7	8.4	40.6	32.5
CO	8-hour Rolling	10,000	44.5	0.4	0.3	44.8	0.4
PM ₁₀	Annual mean	40	0.1	0.1	11.9	12.0	29.9
	24-hr mean	50	2.6	5.2	23.8	26.4	52.8
PM _{2.5}	Annual mean	25	0.1	0.2	8.7	8.8	35.0
Receptor ID R2							
NO ₂	Annual Mean	40	0.6	1.6	7.5	8.1	20.4
	1-hr	200	147.5	73.8	15.0	162.5	81.3
SO ₂	1-hr	350	83.2	23.8	8.4	91.6	26.2
	24-hr	125	32.8	26.3	8.4	41.2	33.0
CO	8-hour Rolling	10,000	44.5	0.4	0.3	44.8	0.4
PM ₁₀	Annual mean	40	0.1	0.1	11.9	12.0	29.9
	24-hr mean	50	3.2	6.5	23.8	27.0	54.1
PM _{2.5}	Annual mean	25	0.1	0.2	8.7	8.8	35.0
Receptor ID R3							
NO ₂	Annual Mean	40	0.6	1.6	7.5	8.1	20.3
	1-hr	200	97.5	48.7	15.0	112.5	56.2
SO ₂	1-hr	350	54.4	15.5	8.4	62.8	17.9
	24-hr	125	27.9	22.3	8.4	36.3	29.0
CO	8-hour Rolling	10,000	27.1	0.3	0.3	27.4	0.3
PM ₁₀	Annual mean	40	0.1	0.1	11.9	12.0	29.9
	24-hr mean	50	3.8	7.6	23.8	27.6	55.2
PM _{2.5}	Annual mean	25	0.1	0.2	8.7	8.8	35.0
Receptor ID R4							

Receptor ID	Averaging Period	EAL (µg/m ³)	PC (µg/m ³)	PC/ AQS (%)	BC ^{1,2} (µg/m ³)	PEC (µg/m ³)	PEC/ AQS (%)
NO ₂	Annual Mean	40	0.4	1.1	7.5	7.9	19.8
	1-hr	200	98.4	49.2	15.0	113.4	56.7
SO ₂	1-hr	350	54.6	15.6	8.4	63.0	18.0
	24-hr	125	25.3	20.2	8.4	33.7	27.0
CO	8-hour Rolling	10,000	28.11	0.3	0.3	28.4	0.3
PM ₁₀	Annual mean	40	<0.1	0.1	11.9	11.9	29.8
	24-hr mean	50	2.2	4.4	23.8	26.0	52.0
PM _{2.5}	Annual mean	25	<0.1	0.1	8.7	8.7	34.9
Receptor ID R5							
NO ₂	Annual Mean	40	0.7	1.8	7.5	8.2	20.6
	1-hr	200	91.4	45.7	15.0	106.4	53.2
SO ₂	1-hr	350	51.8	14.8	8.4	60.2	17.2
	24-hr	125	32.9	26.3	8.4	41.3	33.0
CO	8-hour Rolling	10,000	26.3	0.3	0.3	26.6	0.3
PM ₁₀	Annual mean	40	0.1	0.2	11.9	12.0	29.9
	24-hr mean	50	3.91	7.8	23.8	27.7	55.4
PM _{2.5}	Annual mean	25	0.1	0.2	8.7	8.8	35.0
Receptor ID R6							
NO ₂	Annual Mean	40	0.5	1.3	7.5	8.0	20.1
	1-hr	200	105.7	52.9	15.0	120.7	60.4
SO ₂	1-hr	350	58.6	16.7	8.4	67.0	19.1
	24-hr	125	25.4	20.3	8.4	33.8	27.0
CO	8-hour Rolling	10,000	29.7	0.3	0.3	30.0	0.3
PM ₁₀	Annual mean	40	0.1	0.1	11.9	12.0	29.9
	24-hr mean	50	2.8	5.5	23.8	26.6	53.1
PM _{2.5}	Annual mean	25	0.1	0.2	8.7	8.8	35.0

¹ Average across Zone D monitoring sites taken from summary tables that informed the Air quality in Ireland 2021 report.
² Short-term background concentrations are double the annual mean concentrations.

Table 4.16: Modelled Emissions at Ecological Receptor Locations

Rec ID	NO _x					SO ₂					N Deposition				
	PC (µg/m ³)	PC/ AQS (%)	BC ^{1,2} (µg/m ³)	PEC (µg/m ³)	PEC/ AQS (%)	PC (µg/m ³)	PC/ AQS (%)	BC ¹ (µg/m ³)	PEC (µg/m ³)	PEC/ AQS (%)	PC (µg/m ³)	PC/ AQS (%)	BC ³ (µg/m ³)	PEC (µg/m ³)	PEC/ EAL (%)
E1	0.20	0.7	14.2	14.40	48.0	0.06	0.3	4.2	4.26	21.3	0.03	0.1	12.1	12.13	60.6
E2	0.49	1.6	14.2	14.69	49.0	0.14	0.7	4.2	4.34	21.7	0.07	0.4	12.1	12.17	60.9
E3	0.07	0.2	14.2	14.27	47.6	0.02	0.1	4.2	4.22	21.1	0.01	0.1	12.1	12.11	60.6
E4	0.08	0.3	14.2	14.28	47.6	0.02	0.1	4.2	4.22	21.1	0.02	0.2	12.1	12.12	121.2
E5	0.05	0.2	14.2	14.25	47.5	0.01	0.1	4.2	4.21	21.1	0.01	0.1	12.1	12.11	121.1
E6	0.12	0.4	14.2	14.32	47.7	0.03	0.2	4.2	4.23	21.2	0.03	0.3	12.1	12.13	121.3
E7	0.09	0.3	14.2	14.29	47.6	0.03	0.1	4.2	4.23	21.1	0.01	0.1	12.1	12.11	60.6
E8	0.11	0.4	14.2	14.31	47.7	0.03	0.2	4.2	4.23	21.2	0.02	0.2	12.1	12.12	121.2
E9	0.08	0.3	14.2	14.28	47.6	0.02	0.1	4.2	4.22	21.1	0.01	0.1	12.1	12.11	60.6
E10	0.03	0.1	14.2	14.23	47.4	0.01	<0.1	4.2	4.21	21.0	0.00	<0.1	12.1	12.10	60.5
E11	0.03	0.1	14.2	14.23	47.4	0.01	<0.1	4.2	4.21	21.0	0.00	<0.1	12.1	12.10	121.0
E12	0.07	0.2	14.2	14.27	47.6	0.02	0.1	4.2	4.22	21.1	0.01	0.1	12.1	12.11	121.1
E13	0.02	0.1	14.2	14.22	47.4	0.01	<0.1	4.2	4.21	21.0	0.00	<0.1	12.1	12.10	60.5
E14	0.06	0.2	14.2	14.26	47.5	0.02	0.1	4.2	4.22	21.1	0.01	0.1	12.1	12.11	80.7
E15	0.06	0.2	14.2	14.26	47.5	0.02	0.1	4.2	4.22	21.1	0.01	0.1	12.1	12.11	121.1
E16	0.06	0.2	14.2	14.26	47.5	0.02	0.1	4.2	4.22	21.1	0.01	0.1	12.1	12.11	121.1
E17	0.02	0.1	14.2	14.22	47.4	0.01	<0.1	4.2	4.21	21.0	0.01	0.1	12.1	12.11	121.1
E18	0.02	0.1	14.2	14.22	47.4	0.00	<0.1	4.2	4.20	21.0	0.00	<0.1	12.1	12.10	121.0
E19	0.05	0.2	14.2	14.25	47.5	0.01	0.1	4.2	4.21	21.1	0.01	0.1	12.1	12.11	242.1
E20	0.06	0.2	14.2	14.26	47.5	0.02	0.1	4.2	4.22	21.1	0.01	<0.1	12.1	12.11	60.5
E21	0.05	0.2	14.2	14.25	47.5	0.01	0.1	4.2	4.21	21.1	0.01	0.1	12.1	12.11	80.7
E22	0.06	0.2	14.2	14.26	47.5	0.02	0.1	4.2	4.22	21.1	0.01	0.1	12.1	12.11	121.1
E23	0.05	0.2	14.2	14.25	47.5	0.01	0.1	4.2	4.21	21.1	0.01	<0.1	12.1	12.11	80.7
E24	0.05	0.2	14.2	14.25	47.5	0.01	0.1	4.2	4.21	21.1	0.01	<0.1	12.1	12.11	80.7
E25	0.05	0.2	14.2	14.25	47.5	0.01	0.1	4.2	4.21	21.1	0.01	<0.1	12.1	12.11	80.7

Rec ID	NO _x					SO ₂					N Deposition				
	PC (µg/m ³)	PC/ AQS (%)	BC ^{1,2} (µg/m ³)	PEC (µg/m ³)	PEC/ AQS (%)	PC (µg/m ³)	PC/ AQS (%)	BC ¹ (µg/m ³)	PEC (µg/m ³)	PEC/ AQS (%)	PC (µg/m ³)	PC/ AQS (%)	BC ³ (µg/m ³)	PEC (µg/m ³)	PEC/ EAL (%)
E26	0.05	0.2	14.2	14.25	47.5	0.01	0.1	4.2	4.21	21.1	0.01	<0.1	12.1	12.11	80.7
E27	0.06	0.2	14.2	14.26	47.5	0.02	0.1	4.2	4.22	21.1	0.01	<0.1	12.1	12.11	60.5
E28	0.02	0.1	14.2	14.22	47.4	0.00	<0.1	4.2	4.20	21.0	0.00	<0.1	12.1	12.10	121.0
E29	0.02	0.1	14.2	14.22	47.4	0.00	<0.1	4.2	4.20	21.0	0.00	<0.1	12.1	12.10	121.0
E30	0.02	0.1	14.2	14.22	47.4	0.00	<0.1	4.2	4.20	21.0	0.00	<0.1	12.1	12.10	60.5
E31	0.01	<0.1	14.2	14.21	47.4	0.00	<0.1	4.2	4.20	21.0	0.00	<0.1	12.1	12.10	121.0
E32	0.01	<0.1	14.2	14.21	47.4	0.00	<0.1	4.2	4.20	21.0	0.00	<0.1	12.1	12.10	121.0
E33	0.01	<0.1	14.2	14.21	47.4	0.00	<0.1	4.2	4.20	21.0	0.00	<0.1	12.1	12.10	121.0
E34	0.01	<0.1	14.2	14.21	47.4	0.00	<0.1	4.2	4.20	21.0	0.00	<0.1	12.1	12.10	60.5
E35	0.01	<0.1	14.2	14.21	47.4	0.00	<0.1	4.2	4.20	21.0	0.00	<0.1	12.1	12.10	121.0
E36	0.01	<0.1	14.2	14.21	47.4	0.00	<0.1	4.2	4.20	21.0	0.00	<0.1	12.1	12.10	121.0
E37	0.04	0.1	14.2	14.24	47.5	0.01	0.1	4.2	4.21	21.1	0.01	0.1	12.1	12.11	121.1
E38	0.04	0.1	14.2	14.24	47.5	0.01	0.1	4.2	4.21	21.1	0.01	0.1	12.1	12.11	121.1
E39	0.03	0.1	14.2	14.23	47.4	0.01	<0.1	4.2	4.21	21.0	0.00	0.1	12.1	12.10	242.1
E40	0.01	<0.1	14.2	14.21	47.4	0.00	<0.1	4.2	4.20	21.0	0.00	<0.1	12.1	12.10	121.0
E41	0.03	0.1	14.2	14.23	47.4	0.01	<0.1	4.2	4.21	21.0	0.00	<0.1	12.1	12.10	60.5
E42	0.01	<0.1	14.2	14.21	47.4	0.00	<0.1	4.2	4.20	21.0	0.00	<0.1	12.1	12.10	242.0
E43	0.02	0.1	14.2	14.22	47.4	0.01	<0.1	4.2	4.21	21.0	0.00	0.1	12.1	12.10	242.1
E44	0.01	<0.1	14.2	14.21	47.4	0.00	<0.1	4.2	4.20	21.0	0.00	<0.1	12.1	12.10	242.0
E45	0.03	0.1	14.2	14.23	47.4	0.01	<0.1	4.2	4.21	21.0	0.00	<0.1	12.1	12.10	60.5
E46	0.03	0.1	14.2	14.23	47.4	0.01	<0.1	4.2	4.21	21.0	0.00	<0.1	12.1	12.10	121.0
E47	0.01	<0.1	14.2	14.21	47.4	0.00	<0.1	4.2	4.20	21.0	0.00	<0.1	12.1	12.10	242.0
E48	0.03	0.1	14.2	14.23	47.4	0.01	<0.1	4.2	4.21	21.0	0.00	<0.1	12.1	12.10	60.5

The results of the human health assessment provided in **Table 4.15** demonstrate the following:

- The results demonstrate that the PC to annual mean PM₁₀ and PM_{2.5}, and 8-hour CO is less than 1% of the relevant AQSs at the worst affected receptors. The PC to annual mean NO₂ is less than 2% of the AQS and to 24-hour PM₁₀ it is less than 8% of the AQS. The PC to 1-hour SO₂ is less than 24% of the AQS and 24-hour SO₂ is less than 27% of the standard.
- With the addition of the BC, the PEC for annual mean NO₂, PM₁₀ and PM_{2.5}, 24-hour mean PM₁₀ and SO₂, 8-hour CO and 1-hour SO₂ are well below their respective AQS to the extent that the effect of impacts is not considered significant following EPA AG4, UK EA and IAQM / EPUK guidance.
- The PC for 1-hour NO₂ peaks at 75% of the AQS at receptor R1. With the addition of the BC, the PEC accounts for 83% of the AQS. Such a PC and PEC cannot be screened as insignificant in line with EPA AG4, UK EA and IAQM / EPUK guidance, based on these reported values alone. However, as noted previously, the proposed development will only operate for a maximum of 500 hours per year. The AQS for 1-hour NO₂ is based on a 200 µg/m³ concentration not being exceeded more than 18 times in a calendar year. In this assessment, it has been assumed that the 500 hours of operation could occur on any hour of the calendar year and therefore coincide with the worst hourly meteorological conditions at each receptor. In reality, 500 hours accounts for around 6% of the year and the coincidence of operation occurring during the worst meteorological hours of the year at each receptor is highly unlikely. Hypergeometric analysis of the 1-hour PC for every hour of the worst meteorological year at R1 has been undertaken to better understand the likely impact. That analysis has demonstrated that on the 19th worst hour of the year, the probability of the PC being 50% or more of the AQS is <0.000001% and the probability of the PEC being 50% or more of the AQS is <0.06%. This demonstrates that there is very little likelihood of a PC and PEC occurring to the extent that the effect would be significant.
- The impacts at human health receptors can therefore be screened as insignificant.

The results of the ecological assessment provided in **Table 4.16** demonstrate the following:

- For the vast majority of ecological receptors, the impacts are less than 1% of the AQSs and EALs and can be screened as insignificant.
- The exception to this is experienced at receptor E2 for NO_x concentrations.
- Receptor E2, lowland hay meadows within the River Shannon SAC, to the north-west of the site experiences annual mean NO_x PC of 1.6% of the AQSs. As the PEC for NO_x remains well below the AQSs (49%), in accordance with the guidance the impact of this pollutant can be screened as insignificant.
- It is clear from the PEC across the range of habitats reported in **Table 4.16** that those most sensitive to N deposition are constrained by the background contribution. In terms of N deposition, the site has no perceptible impacts (<1%) at any SAC or SPA designated habitat.

Do Nothing Scenario

In the absence of the Designated Development, air quality will remain similar to that described in **Section 4.2.4**.

4.2.6 Demolition & Construction Phase - Mitigation Measures

Mitigation measures will be undertaken so that construction works are carried out in such a manner that emissions of dust and other pollutants are limited, and that best practicable means are employed to minimise disruption, risks to human health, and to avoid unnecessary impacts on ecological habitats. The location of human and ecological receptors to air quality are sensitive habitats within the nearby SAC and SPAs. These control measures will be reflected within the Contractor's Dust Management Plan. The mitigation that will need to be included is outlined in **Table 4.17**.

Table 4.17: Likely Site Operations & Appropriate Methods of Controlling Dust

Activity	Dust Control Methods
Communication	<ul style="list-style-type: none"> Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions. The level of detail will depend on the risk, and should include, as a minimum, the highly recommended measures in this document. The desirable measures should be included as appropriate for the site.
Site Management	<ul style="list-style-type: none"> Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner and record the measures taken. Make the complaints log available to the local authority when asked. Record any exceptional incidents that cause dust and / or air emissions, either on or off site and the action taken to resolve the situation in the logbook.
Monitoring	<ul style="list-style-type: none"> Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results and make the log available to the local authority when asked. Carry out regular site inspections, record inspection results and make an inspection log available to the local authority when asked. 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. If required, agree dust deposition, dust flux or real-time PM₁₀ continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
Preparing and maintaining the Site	<ul style="list-style-type: none"> 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 that are at least as high as any stockpiles on site. Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period, where possible. Avoid site runoff, or 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. Cover, seed or fence stockpiles to prevent wind whipping.
Operating vehicle / machinery and sustainable travel	<ul style="list-style-type: none"> 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. Impose and signpost a maximum speed limit of 20 km/hr on surfaced and 15 km/hr on unsurfaced haul roads and work area. Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.

Activity	Dust Control Methods
	<ul style="list-style-type: none"> Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking and car-sharing).
Operations	<ul style="list-style-type: none"> Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays. Ensure an adequate water supply on the site for effective dust/particulate matter suppression / mitigation. Use enclosed chutes and conveyors and covered skips. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste Management	<ul style="list-style-type: none"> Avoid bonfires and burning of waste materials.
Demolition	<ul style="list-style-type: none"> Soft strip inside any buildings before demolition (retaining walls and windows in the building where possible, to provide a screen against dust). Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground. Avoid explosive blasting, using appropriate manual or mechanical alternatives. Bag and remove any biological debris or damp down such material before demolition.
Earthworks	<ul style="list-style-type: none"> Re-vegetate earthworks and exposed areas / soil stockpiles to stabilise surfaces as soon as practicable. Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. Only remove the cover in small areas during work and not all at once.
Construction	<ul style="list-style-type: none"> Avoid scabbling (roughening of concrete surfaces) if possible. 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 control measures are in place.
Track-out	<ul style="list-style-type: none"> Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. Avoid dry sweeping of large areas. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. Record all inspections of haul routes and any subsequent action in a site logbook. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site when reasonably practicable).

4.2.7 Summary

A dispersion modelling assessment has been undertaken on emissions associated with the operation of eight 35 MWe emergency generators operating for up to 500 hours per year on air quality sensitive SAC and SPA habitats and selected human health receptors within 15km.

A dispersion modelling assessment has been undertaken with reference to EPA AG4 guidance. The assessment method has accounted for generator emissions data, five years of representative meteorological data, variation of local terrain, the effect of building downwash from the neighbouring West Offaly Power Station buildings, and representative air quality sensitive receptors.

For human health receptors, the assessment has determined that the impact of the Designated Development (PC) and subsequent total pollutant concentrations (PEC) does not result in a significant

effect on local air quality. The assessment did identify an elevated PC and PEC for 1-hour NO₂ at a couple of receptors, but this was due to the precautionary nature of that assessment. Further analysis demonstrated that probability of a significant effect occurring was very low.

For ecological receptors, the assessment has determined that impacts of 1% or more of the relevant AQSs for annual mean NO_x and SO₂ will only occur at the nearest sensitive habitat. Where these impacts occur, the total NO_x and SO₂ concentrations remain well below the relevant air quality objectives and the operation of the Designated Development does not put these objectives at risk of an exceedance. The assessment has determined that N deposition rate impacts are below 1% of the EAL at all habitats considered.

It is therefore concluded that the air quality impact of the Designated Development can be screened as insignificant at all air quality sensitive SAC and SPA habitats and selected sensitive human health receptors.

4.3 Noise and Vibration

4.3.1 Introduction

This section provides information in relation to noise associated with the Designated Development. Noise and vibration emissions can potentially occur during the demolition, construction, operational and decommissioning phases of the Designated Development.

Potential noise and vibration sources during the construction phase comprise mobile plant and construction processes such as earthworks which can give rise to elevated sound and vibration levels.

Potential noise sources during the operational phase comprise plant and equipment associated with the operation of the power plant. No significant ground borne vibration sources are identified during the operational phase.

4.3.2 Legislation and Policy

The following outlines the main relevant legislation, policy and guidance that has been referred to in this section:

- **EPA Guidelines 2022:** The Environmental Protection Agency (EPA) *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA,2022) are Guidelines written to facilitate the implementation of Directive 2011/92/EU as amended by EU Directive 2014/52/EU in Ireland. This document covers the Assessment and description of environmental impacts.
- **NG4:** *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities* (EPA 2016).
- **NRA Guidelines:** *Guidelines for the Treatment of Noise and Vibration in National Road Schemes* (NRA 2004).
- **BS5228:** *BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites' BS5228.*

Additional references are provided at the end of the report.

4.3.3 Methodology

Study Area

The study area for Assessment of on-site construction noise and vibration and operational noise is defined as an area extending from the Site up to and including the nearest most exposed sensitive receptor locations. For a given direction, if compliant levels of noise and vibration are predicted at the nearest most exposed sensitive receptor locations, it follows that compliant levels will be achieved at more distant locations.

The study area for offsite traffic noise is the same as identified in the transport, detailed in **Section 4.12** (Traffic and Transportation).

Determination of the Baseline Environment

The baseline acoustic environment has been determined from previously undertaken annual permit compliance monitoring around the Site. These surveys are listed in **Section 4.3.4**.

Describing Potential Effects

As per the 2022 *EPA Guidelines*³⁷, effects are described under various headings, including Quality, Significance, Extent and Context, Probability, Duration and Frequency.

Significance of Effects³⁷

- **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:** An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
- **Moderate:** An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
- **Significant:** 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:** An effect which obliterates sensitive characteristics.

Duration of Effects³⁷

- **Momentary:** Effects lasting from seconds to minutes.
- **Brief:** Effects lasting less than a day.
- **Temporary:** Effects lasting less than a year.

³⁷ EPA (2022). *Guidelines on the information to be contained in Environmental Impact Assessment Reports*.

- **Short-Term:** Effects lasting from one to seven years.
- **Medium-Term:** Effects lasting from seven to 15 years.
- **Long-Term:** Effects lasting from 15 to 60 years.
- **Permanent:** Effects lasting over 60 years.
- **Frequency:** Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).

Significance of Effects: Construction Phase

To determine potential temporary noise and vibration impacts and effects during the construction phase of the Designated Development, the following matters have been considered:

- noise and vibration caused by construction site activities; and
- noise and vibration caused by increases in traffic on existing roads.

Criteria: Noise from On-site Construction Activities

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the demolition / construction phase of an industrial project. Control is primarily implemented by constraining construction activities by limiting the hours of operation and authorities may consider noise limits at their discretion.

Transport Infrastructure Ireland (TII)³⁸ is the only government body in Ireland to publish construction noise limits, which are presented in the *Guidelines for the Treatment of Noise and Vibration in National Road Schemes*³⁹ (the “NRA Guidelines”).

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

The criteria presented in the NRA Guidelines are presented in **Table 4.18**.

Table 4.18: Maximum Permissible Noise Levels at the Façade of Dwellings During Construction⁴⁰

Period	L _{Aeq,1hr} dB	L _{p(max) slow} dB
Monday to Friday - 07:00 to 19:00	70	80
Monday to Friday - 19:00 to 22:00	60 ¹	65 ¹
Saturday - 08:00 to 16:30	65	75
Sundays and Bank Holidays - 08:00 to 16:30	60 ¹	65 ¹

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

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

³⁸ formerly the National Roads Authority (NRA)

³⁹ NRA (2004).

⁴⁰ NRA (2004).

The 'ABC' method (detailed in BS5228 Section E.3.2) has been used to develop criteria. Using this method, the construction noise limits for the Designated Development are determined by rounding the ambient noise levels ($L_{Aeq,T}$) to the nearest 5 dB and then comparing this level to the Threshold Values in Category A, B and C given in BS5228, as reproduced in **Table 4.19**.

Table 4.19: BS5228 Construction Noise Criteria

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

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

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

NOTE 3: Applies to residential receptors only.

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

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

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

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

For the purposes of this Assessment, the criteria given in both the NRA Guidelines and BS5228 will be considered. Where the criteria differ, the more stringent of the two will be adopted. Where the adopted criterion is predicted to be exceeded a significant effect at the residential NSR is predicted, and where the criterion is met no significant effect at the residential NSR is predicted, subject to context considerations.

Criteria: Vibration from Onsite Construction Activities

There are two types of construction vibration criteria: those dealing with human perception and those dealing with structural damage to buildings. Both criterion types are considered relevant to the Designated Development.

Table B.1 of BS5228 presents vibration criteria with regards human perception. These are presented in **Table 4.20** with descriptions of likely reactions.

Table 4.20: BS5228 Vibration Criteria: Human Perception

Magnitude of impact	Peak Particle Velocity (PPV)	Description
Major	≥ 10 mm/s	Vibration is likely to be intolerable for any more than a very brief exposure to this level.
Moderate	>1.0 mm/s	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.
Minor	>0.3 mm/s	Vibration might be just perceptible in residential environments.

Magnitude of impact	Peak Particle Velocity (PPV)	Description
Negligible	>0.14 mm/s	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.

Table 2 of the NRA Guidelines provide construction vibration criteria identified to ensure there is no potential for vibration damage during construction. These criteria are presented in **Table 4.21**.

Table 4.21: NRA Guidelines Vibration Criteria: Structural Damage

Allowable vibration velocity (peak Particle Velocity) at the closest part of any sensitive property to the source of vibration, at a frequency of

Less than 10Hz	10 to 50 Hz	50 to 100Hz (and above)
8 mm/s	12.5 mm/s	20 mm/s

Criteria: Noise from Increased Traffic Flows on Existing Roads during the Construction Period

The potential increase in noise levels resulting from changes to road traffic flows during the construction period may be determined in accordance with the NRA Guidelines which refer to the Calculation of Road Traffic Noise (CRTN) methodology.

The change in noise level for relevant links has been predicted based on the CRTN⁴¹, Basic Noise Level (BNL) methodology. BNL predictions have been undertaken for both “with” and “without” construction traffic scenarios, for each road link in the construction traffic model, using 18-hour Annual Average Weekly Traffic (AAWT) flows provided by the Project Transport Consultants. However, the CRTN methodology is not accurate for very low traffic flows (below 1000 AAWT), and therefore road links with flows lower than this have not been assessed.

No specific Irish guidance containing criteria for Assessment of the noise effects from construction traffic changes has been published. The criteria for the Assessment of noise changes arising from construction road traffic have therefore been taken from Table 3.17 of the *Design Manual for Roads and Bridges (DMRB) LA 111 Revision 2*⁴², as presented in **Table 4.22**.

Table 4.22: Magnitude of Impact: Construction Phase Traffic⁴³

Magnitude of Impact	Increase in BNL (LA _{10,18hr} dB) on Closest Public Roads used for Construction
No Change	0
Negligible	0.1 to 0.9
Minor	1.0 to 2.9
Moderate	3.0 to 4.9
Major	5+

⁴¹ Department of Transport (1998).

⁴² Highways England (2020).

⁴³ Highways England (2020).

Construction Phase: Special Areas of Conservation (SAC), Special Protection Areas (SPAs) and Other Ecological Receptors

The impact of construction phase noise and vibration emissions on habitats and species of Special Areas of Conservation (SAC) and Special Protection Areas (SPAs) other ecological receptor positions are discussed in **Section 4.4** (Biodiversity), and AA Screening and NIS report (APEM, 2023), submitted with this application.

Significance of Effects: Operational Phase

To determine the potential noise and vibration impacts during the operational phase, the following matters have been considered:

- noise caused by site operations; and
- noise caused by increases in traffic on existing roads.

Criteria: Operational Phase Site Noise Emissions

The WOP Station and ash disposal facility (ADF) are managed in accordance with its IE Licence P0611-02 and in accordance with the EU Emission Trading Scheme (ETS) and associated Greenhouse Gas Permit as administered by the EPA.

The Designated Development will be licensed by the EPA under the industrial emissions licensing process. An application to review the existing IE licence will be made to the EPA to reflect the changes to power generation introduced by the Designated Development.

Guidance on permissible noise emission limits for licensed facilities is contained in *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)*⁴⁴. NG4 refers to Best Available Techniques as a form of noise mitigation which is defined in Section 7 of the *Protection of the Environment Act (2003)* as:

'The most effective and advanced stage in the development of an activity and its methods of operation, which indicate the practical suitability of particular techniques for providing, in principle, the basis for emission limit values designed to prevent or eliminate or, where that is not practicable, generally to reduce an emission and its impact on the environment as a whole.'

NG4 states that:

'All reasonably practicable measures should be adopted at licensed facilities to minimise the noise impact of the activity, and BAT should be used in the selection and implementation of appropriate noise mitigation measures and controls.'

NG4 also provides criteria for use in noise Assessments, which vary depending on whether the location of the development is in a 'Quiet Area' or an 'Area of Low Background Noise'.

A 'Quiet Area' is defined as a location that meets the following criteria:

- At least 3km from urban areas with a population >1,000 people;
- At least 10km from any urban areas with a population >5,000 people;

⁴⁴ EPA (2016). *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities*.

- At least 15km from any urban areas with a population >10,000 people;
- At least 3km from any local industry;
- At least 10km from any major industry centre;
- At least 5km from any National Primary Route; and
- At least 7.5km from any Motorway or Dual Carriageway.

An 'Area of Low Background Noise' is a location that meets the following criteria:

- Average Daytime Background Noise Level ≤ 40 dB LAF90;
- Average Evening Background Noise Level ≤ 35 dB LAF90, and
- Average Night-time Background Noise Level ≤ 30 dB LAF90.

The criteria presented in NG4 are detailed in **Table 4.23**.

Table 4.23: Recommended Operational Noise Limit Criteria⁴⁵

Scenario	Daytime Noise Criterion dB $L_{ar,T}$ (0700 to 1900 hours)	Evening Noise Criterion dB $L_{ar,T}$ (1900 to 2300 hours)	Night-time Noise Criterion dB $L_{aeq,T}$ (2300 to 0700 hours)
Quiet Area	Noise from the licensed site to be at least 10 dB below the average daytime background noise level measured during the baseline survey.	Noise from the licensed site to be at least 10 dB below the average evening background noise level measured during the baseline survey.	Noise from the licensed site to be at least 10 dB below the average night-time background noise level measured during the baseline survey.
Areas of Low Background Noise	45 dB	40 dB	35 dB
All other Areas	55 dB	50 dB	45 dB

The criteria are given in terms of a Rated Noise Level ($L_{ar,T}$) which is defined in NG4 as:

The Rated Noise Level, equal to the L_{Aeq} during a specified time interval (T), plus specified adjustments for tonal character and/ or impulsiveness of the sound.

The method for applying adjustments for tonal and / or impulsive characteristics are described in NG4 and have been considered in this Assessment.

The criteria adopted for this operational Assessment is discussed in **Section 4.3.5** (Criteria).

Noise from Increased Traffic Flows on Existing Roads during the Operational Phase

The potential increase in noise levels resulting from changes to road traffic flows during the operational phase have been considered. However, it understood operations will not require a large daily workforce or daily deliveries as such we have scoped out a detailed operational phase traffic Assessment due to the minimal operational traffic associated with the Designated Development.

⁴⁵ EPA (2016). *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities*.

Given the low number of Designated Development related vehicle movements on existing roads during the operational phase, noise impacts are likely to be *negligible* or less in both the short-term and long-term and therefore no further Assessment has been undertaken.

Operational Phase: SAC, SPAs and other Ecological Receptors

The impacts of the operational phase noise emissions on the SAC, SPAs and other ecological receptors are discussed in **Section 4.4** (Biodiversity) AA Screening and NIS report (APEM, 2023), submitted with this application.

Limitations and Assumptions

The following limitations and assumptions apply to the Assessment:

- The sound levels measured as part of the annual permit compliance testing for the site prior to closure remain in December 2020 is representative of the baseline acoustic environment generally.
- The precise size, configuration, performance, and layout of the equipment will be finalized by General Electronic (GE), the appointed supplier. For the purposes of this report, GE have provided predicted operational levels at NSRs based on the working design at the time of application.
- The calculated noise levels presented in the report have been established using CadnaA 3D noise modelling software which adopts the calculation methodologies detailed in *ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation*, *BS 5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction* and open sites and the *Calculation of Road Traffic Noise*⁴⁶. The Assessment is therefore subject to the assumptions and limitations detailed within these standards.

4.3.4 Baseline

4.3.4.1 Existing Receptors

The approximate distance of the closest approach to the redline boundary from the closest NSR have been provided in **Table 4.24**. The locations of these receptors are also shown in **Figure 4.7**.

Table 4.24: Definition of Receptor Locations and Assessment Height

Receptor	Height	Coordinates		Distance to Red Line Boundary (m)
	(m)	X (m)	Y (m)	
NSR 1	1.5 & 4	597463	725191	188
NSR 2	1.5 & 4	597081	725418	392
NSR 3	1.5 & 4	597789	724783	255
NSR 4	1.5 & 4	597810	725004	326

⁴⁶ Department of Transport Welsh Office (1988).



Figure 4.7: Nearby Sensitive Receptor (NSR) Locations and Site Layout

4.3.4.2 Baseline Measurements

Baseline sound measurement data has been collected by a third party at three locations, two of which coincide with NSR considered in this assessment, namely NSR 1 and NSR 2. The data has been collected and submitted to Environmental Protection Agency (EPA) as part of the annual compliance measurements for the WOP Station which was operational at the time and the information is summarised in **Table 4.25** for the location representative of NSR 1 the nearest human receptor and NSR 2.

Table 4.25: Short-term Measured Baseline Sound Levels at NSR 1 and NSR 2

Location	Period	Year	Start Time	L _{Aeq,30min} (dB)	L _{A90,30min} (dB)	L _{A10,30min} (dB)	L _{Amax} (dB)	L _{Amin} (dB)
NSR1	Day	2015	17:15	56	41	52	91	35
			15:03	51	43	54	68	37
		2016	16:54	49	43	52	67	37
			2017	16:47	46	40	49	66
		2018	17:13	49	44	52	67	39
		2019	17:07	48	38	52	62	35
	2020	14:10	48	43	51	68	34	
	Evening	2015	20:12	38	33	42	55	33

Location	Period	Year	Start Time	L _{Aeq,30min} (dB)	L _{A90,30min} (dB)	L _{A10,30min} (dB)	L _{Amax} (dB)	L _{Amin} (dB)		
NSR2		2016	19:01	49	42	51	67	36		
		2017	19:01	45	37	46	70	39		
		2018	20:55	45	40	48	61	35		
		2019	20:09	45	38	46	62	33		
		2020	22:30	42	36	43	66	29		
	Night	2015	23:00	36	32	37	54	26		
			2016	23:00	39	29	41	62	26	
		2016	00:43	36	38	28	57	36		
			2017	00:39	42	39	44	58	36	
			2018	00:16	44	41	46	56	38	
			2019	23:06	43	35	44	63	32	
			2020	23:05	41	37	42	58	33	
			Day	2015	17:48	62	41	62	85	36
					2016	15:37	58	44	56	83
				2016	17:27	56	43	54	82	38
	2017	17:28			55	45	58	78	41	
	2018	17:57			57	45	61	77	42	
	2019	17:44	62	41	64	85	37			
	2020	14:47	64	41	66	96	37			
	Evening	2015	19:37	53	37	54	76	31		
2016			19:38	58	43	57	84	38		
2016		19:37	52	43	54	77	40			
		2018	20:18	55	42	58	78	39		
		2019	19:34	57	35	57	80	32		
		2020	21:59	57	39	50	84	36		
		Night	2015	23:33	45	32	42	70	28	
				2016	23:35	43	32	42	65	30
			2016	01:16	41	33	38	68	31	
				2017	00:06	48	43	50	69	41
2018	23:38			48	40	47	70	38		
2019	00:18	45	33	40	70	30				
2020	23:40	54	36	45	77	33				

Previous subjective observations of sound sources are presented in **Table 4.26**.

Table 4.26: Previous Survey Observations and Sound Sources

Previous Observations (prior December 2020 when WOP Station closed)	
NSR 1	This monitoring location represents a noise sensitive residential location. This location is situated to the rear of a residence in St. Kieran's Park; a housing estate adjacent to the R357 regional route. The dominant noise source at this location was observed to be traffic from the adjacent R357 and the surrounding road network. Additional noise sources included birdsong and a lawnmower operating in the distance. A low-level hum was audible from the Power Station during lulls in traffic.
NSR 2	This location is situated at a Church, at the junction between the R357 and the road leading up to the entrance to the Power Plant. The dominant noise source at this location was observed to be traffic from the adjacent R357, HGV's and cars along the access road to the Power Station and traffic from the surrounding road network. Additional noise sources included birdsong. The Power Station was audible as a low-level hum during lulls in traffic.

The most recent survey was undertaken in November 2021 as was reported in the *Chapter 9 of the ESB WOP Demolition & Grid Services EIAR*, the most relevant monitoring location are reproduced in **Table 4.27**. This survey did not include monitoring at the nearest sensitive receptor to the Designated Development, but did include a location on the WOP station east boundary (at approximately ITM 597401 725000) and near NSR 2. The levels reported from this 2021 survey are relevant because they are the most recent available and they were undertaken after the WOP Station closed in December 2020 meaning that contribution of operational noise at the receptor can be ruled out.

Table 4.27: November 2021 Baseline Survey

Location	Date	Period	L _{Aeq,30min} (dB)	L _{A90,30min} (dB)
NSR 2	12/11/2021	Day	45	36
			50	36
			43	35
			53	38
		Average	49	36
WOP Station East Boundary Approx. ITM X: 597401 Y: 725000	12/11/2021	Day	42	31
		Evening	33	24
	13/11/2021	Night	29	19
		Day	44	30
	14/11/2021	Evening	32	21
		Night	32	18
15/11/2021	Day	Day	45	39
		Evening	43	36
	Night	Day	45	36
		Evening	43	36
Average	Day	49	45	
	Evening	46	36	
	Night	39	27	
		Night	40	24

The levels at the east boundary are relatively low even in the reported day-time period compared to the historic levels at NSR 1. The boundary location is much further from away from any passing road traffic using the R357 than the NSR 1 location and is less likely to contain any significant noise contribution created at the residential receptors. Historic surveys did report than low level hum could be heard a

times and therefore it is expected that baseline levels may now be slightly lower overall. This is most apparent in the evening and night-time as the recent measured $L_{A90,T}$ can be as low as 18 dB, yet as high as 36 dB, such differences can be attributed to the prevailing weather conditions.

4.3.5 Predicted Effects

Noise emissions from the Designated Development will occur in three distinct phases: demolition / construction, operation and decommissioning.

During the construction phase, noise levels are expected to vary depending on the work being carried out. Noise levels will likely be highest during the initial enabling period whilst louder activities such as earthworks take place. As the construction phase develops, noise levels are expected to reduce as less noisy works (plant installation, internal works within structures) take over.

Noise levels during the operational phase will include the venting of gases from the top of the 30m tall chimney stacks. Sound emissions are not expected to exceed current ambient sound levels or present distinctive characteristics such as tonality or impulsiveness. Emissions during the operational phase will be subject to fixed permitted limits, which are more stringent during the night-time.

As outlined in **Section 3.8**, during decommissioning, measures will be undertaken by the Applicant to ensure that there would be no significant, negative environmental effects. As a result, additional potential impacts and associated effects arising during the decommissioning phase are not anticipated above and beyond those already assessed during the construction phase.

Do Nothing Scenario

If the Designated Development were to not go ahead, the *short-term* noise sources would not be introduced into the area and the prevailing acoustic environment would continue.

4.3.5.1 Demolition / Construction Phase: Site Operations

A construction Contractor has not yet been appointed, to address the urgent need to install the TEG power plant, construction phase works will take place over a minimum of two eight hour shifts per day and on occasions, three eight hour shifts per day, seven days a week, during construction and commissioning phases, acting in full compliance with Irish labour and Health & Safety laws.

By comparison of the measured baseline day-time sound levels presented in **Table 4.25** and **Table 4.27**, the construction noise threshold at NSR in the vicinity of the Designated Development can be determined.

From the 2020 noise survey the daytime L_{Aeq} noise level at the nearest NSR to the Site is 48 dBA. From the 2021 noise survey the averaged day-time level is 46 dBA while the lowest day-time level was 42 dBA although these are at a location at the WOP Station east boundary. All of these would place the nearest NSR in threshold in 'Category A' with regards to the BS5228 ABC criteria presented in **Table 4.28** with an assessment value of 65dBA. This is the most stringent category in BS 5228.

The applicable construction noise criteria is subsequently derived from BS 5228 Category A as it is more stringent than those presented in the NRA Guidelines. The construction Assessment criteria applied in this Assessment are presented in **Table 4.27**. The criteria apply at one metre from the façade of sensitive receptor positions.

Table 4.28: Relevant Construction Noise Criteria

Period	Time	BS 5228 Criteria Category A
Night-time	23:00 - 07:00	45
Evenings and weekends	19:00 - 23:00 Weekdays	55
	13:00 - 23:00 Saturdays	
	07:00 - 23:00 Sundays	
Daytime	07:00 - 19:00 Weekdays	65
	07:00 - 13:00 Saturdays	

The construction phase of the Designated Development will be up to eight months starting in May 2023. An indicative list of mechanical plant operating on-site during this period have been provided by the Project Team and will be reviewed by the Contractor and updated if necessary.

Construction Noise Sources

Sound power levels for each plant item present have subsequently been assigned from archive data presented in BS5228. The plant and associated sound power levels (L_{WA}) for main construction are presented in **Table 4.29**, **Table 4.30** and **Table 4.31** below. This Assessment has assumed that

- all items of construction plant will be required in the Daytime, Evening and Weekend periods as they are defined in **Table 4.28**.

This assumption is taken as a conservative approach in the absence of a Contractor.

Table 4.29 lists the sound power levels of individual construction plant items that have been used in the Assessment.

Table 4.30 provides details of the quantity of each item, their estimated percentage on-time and the resulting corrected sound power levels associated with each type of plant item.

Table 4.29: Plant and Associated Sound Power Levels - Main Construction

Phase	Construction Activity	Plant	Quantity	Sound Power Level (dBA)	BS 5228 Table Ref No.	% on time
Demolition	Clearing Site	Tracked excavator 22 t	1	106	C.2.3	50
	Breaking up concrete	Pulverizer mounted on excavator 147 30	2	107	C.1.4	50
	Distribution of Materials	Articulated dump truck 25 t	1	109	C.4.1	50
	Breaking up concrete	Hand-held hydraulic breaker 20 kg	1	121	C.1.7	25
Construction	Formwork	Angle grinder	1	108	C.1.93	50
	Concrete Pour	Concrete pump	1	106	C.3.25	50
		Vibrating poker	1	106	C.4.33	50
	Distribution of Materials	Articulated dump truck 25 t	1	109	C.4.1	50

Table 4.30: Plant Sound Power Levels accounting for Quantity and On Time

Phase	Plant	BS5228 Reference	L _w dB(A)	Quantity	% On time	Total L _w dB(A)
Demolition	Tracked excavator 22 t	C.2.3	103	1	50	103
	Pulverizer mounted on excavator 147 30	C.1.4	104	2	50	106
	Articulated dump truck 25 t	C.4.1	106	1	50	106
	Hand-held hydraulic breaker 20 kg	C.1.7	115	1	25	115
Construction	Angle grinder	C.4.93	105	1	50	105
	Concrete pump	C.3.25	103	1	50	103
	Vibrating poker	C.4.33	103	1	50	103
	Articulated dump truck 25 t	C.4.1	106	1	50	106

Table 4.31 presents, for each stage, the total sound power level and spectrum of all construction equipment used in this Assessment to predict noise levels at receptors.

Table 4.31: Assumed Sound Power Level for All Construction Phases Combined

	Octave Band Sound Power Levels (dB)							L _w dB(A)	
	63	125	250	500	1k	2k	4k		8k
Demolition	89.6	97.7	101.8	107.5	110.6	109.9	106.6	107.8	116
Construction	90.0	96.7	98.2	102.1	103.2	106.2	101.6	97.7	110

Noise Modelling

Specialist environmental noise level modelling software CadnaA was used to predict construction noise levels at receptors.

Prediction for demolition and construction phases were represented in the model by an area source with an extent covering the main construction area. The broadband sound power level (L_{wA}) in **Table 4.31** was assigned to the area source and therefore sound energy was distributed evenly over this area, representing an average L_{Aeq}. This has been repeated for both the demolition and construction phases.

Construction vehicles moving between the main access road between R357 and the construction area were represented by a line source. The line source was configured using a representative Heavy Good Vehicle (HGV) spectrum and maximum pass-by sound power level taken from BS 5228 reference C.2.34. An on-time correction was applied to account for the non-continuous nature of these vehicle movements based on the peak number of HGV expected 38 per day.

The contribution of the area source and line source **Table 4.31** was then used to determine a combined sound pressure level at the sensitive receptors. The following assumptions and CadnaA settings were used:

- All land is assumed to be flat; ground topography information was not available for this assessment.
- Ground absorption = 1.0 (Soft) - for grass areas around power station boundary;

- Ground absorption = 0.0 (Hard) - for the plant area;
- Reflection order = 3; and
- Sound level calculations have been undertaken in accordance with *ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation*.

Predicted Construction Phase Noise Levels

Based upon the above plant data and noise modelling setup, construction noise levels have been calculated at NSRs. The predicted construction noise levels for each receptor are presented in **Table 4.32**.

Table 4.32: Predicted Construction Noise Level at Receptors for each Construction Phase

Receptor	Approximate Distance (m) to Closest Red Line Boundary	Predicted Demolition Noise Level	Predicted Construction Noise Level	Predicted Demolition Noise Level	Predicted Construction Noise Level
		$L_{Aeq,T}$ dB (1.5m)	$L_{Aeq,T}$ dB (1.5m)	$L_{Aeq,T}$ dB (4m)	$L_{Aeq,T}$ dB (4m)
NSR 1	188	53	48	54	49
NSR 2	392	47	43	49	44
NSR 3	255	47	42	49	43
NSR 4	326	47	42	49	44

Table 4.32 indicates that the highest predicted construction levels are associated with the Demolition resulting in a prediction of 53 dB at 1.5m and 54 dB at 4m $L_{Aeq,T}$ at NSR 1. The predicted levels in each construction stage at each receptor were compared against the BS 5228 Category A criteria.

Table 4.33 indicates if the BS 5228 Category A and *NRA Guideline* limits are met at NSR 1 after predicted levels are rounded to the nearest whole decibel. The 4m levels are relevant in the night-time only.

Table 4.33: Compliance of Unmitigated Construction Activities at Nearest Noise Sensitive Receptor NSR 1

	Daytime		Evening and Weekend		Night-time	
	Below BS 5228 Cat A Limit?	Below NRA Guidelines?	Below BS 5228 Cat A Limit?	Below NRA Guidelines?	Below BS 5228 Cat A Limit?	Below NRA Guidelines?
Reference Value	65 dB $L_{Aeq,T}$	70 dB $L_{Aeq,T}$	55 dB $L_{Aeq,T}$	60-65 dB $L_{Aeq,T}$	45 dB $L_{Aeq,T}$	NA
Phase						
Demolition	Yes	Yes	Yes	Yes	No	-
Construction	Yes	Yes	Yes	Yes	No	-

BS 5228 Daytime: 0700 to 1900 hours

BS 5228 Evenings and Weekends: 1900 – 2300 Weekday Evenings 13:00 – 23:00 Saturdays 07:00 – 23:00 Sundays.

BS 5228 Night-time: 2300 to 0700 hours

Table 4.33 relates to NSR 1 the nearest noise sensitive receptor only, however in this context, it follows that compliance at the nearest sensitive receptor indicates compliance at more distance receptors due to the additional reduction of the noise levels over the additional distance travelled.

Table 4.33 shows that predicted construction levels are compliant with the more stringent BS 5228 criteria in the Daytime, Evening and Weekend periods which cover the two eight hour shifts that works will be undertaken,

With respect to night-time, construction activities during the 3rd shift (the occasional over-night shift) will be confined to low noise construction activities e.g., assembly of equipment.

On this basis *no significant adverse effects* are expected at residential NSR positions with regards construction phase noise levels generated by on-site activities. In accordance with 2022 *EPA Guidelines*⁴⁷, the impacts would be defined as *not significant* and *short-term*.

4.3.5.2 Construction Phase: Traffic on Existing Roads

Construction vehicles will approach WOP Station via the R357. Traffic flows on the R357 are only from the previous AWN Consulting EIAR (2022)⁴⁸ which was limited to a single day of traffic counts. It is taken in this assessment to represent the baseline flows for the R357 recorded as 1918 18hr AAWT, of which 164 (6%) were Heavy Goods Vehicles (HGV).

Peak construction traffic associated with the Designated Development is expected to total 38 two-way HGV movements per day. This equates to a 2% increase in total flows per day on R357 over the baseline, although the overall the % HGVs is forecast to increase (to 8% HGV).

For context, an increase in traffic flows of 25% would result in a 1 dB(A) increase in road traffic noise and a 100% increase would result in a 3 dB(A) increase, assuming average speeds and the percentage of HGVs remains unchanged. Therefore, on the basis that average traffic speed on R357 remains unchanged during construction, the predicted change in road traffic noise levels at the front façade of properties on R357 resulting from a 2% increase in total flow, together with an increase % HGV component, would be <0.6 dB(A).

This magnitude of noise change would be considered a *negligible impact (not significant)*. In accordance with the 2022 *EPA Guidelines*⁴⁹, these increases would be defined as *imperceptible* and *short-term*.

4.3.5.3 Operational Phase: Site Operations

Criteria

The location of the Designated Development does not meet the definition of a 'Quiet Area'. The available baseline sound levels ($L_{A90,T}$) have therefore been checked against the three qualifying criteria for a Low Background Noise Area listed in **Section 4.3.3** (Criteria: Operational Phase Site Noise Emissions).

NSR1: Analysis of the measured baseline levels presented in **Table 4.25** are the most relevant and best data available for NSR 1, as the more recent 2021 survey does not include a monitoring location representative of the sensitive receptors near NSR 1. The background sound levels can be classed as 'All other Areas' as, some or all of the qualifying criteria have not been met, however the measurement typically undertaken for annual compliance monitoring can be very short and would not represent the full variability in sound levels at a location over each period.

⁴⁷ EPA (2022). *Guidelines on the information to be contained in Environmental Impact Assessment Reports*.

⁴⁸ AWN Consulting Ltd. (2022). *EIAR Volume 1*.

⁴⁹ EPA (2022). *Guidelines on the information to be contained in Environmental Impact Assessment Reports*.

NSR2: The 2021 survey does represent levels at NSR 2 and while the averaged $L_{A90,T}$ is reported as 36 dB in the day-time which is less than the 40 dB criteria, it is important to note that the 36 dB is determined from a very limited number of measurements in a single day-time period. In addition there is no evening or night-time measured levels available from the 2021 survey at that location and so it is reasonable to refer to the measured baseline levels presented in **Table 4.25**. The measured levels at NSR2 in the evening and night-time periods generally do not meet one or all the qualifying criteria depending on the year compared against.

NSR3 and NSR4: These locations are likely to be most comparable to NSR1 as they are a similar distance from the main road.

Furthermore, the previous EPA licence condition for the site adopted the 'All other Areas' assessment criteria and it is reasonable to assume that this would continue for the Designated Development.

Therefore, to assess the impact of the Designated Development with regard to operational noise, the 'All other Areas' criteria have been adopted from **Table 4.23**. It is understood that operations are of a 24/7 nature *i.e.*, the Assessment is based on the Emergency Plant operating at any time throughout the day, evening or night. Therefore, the noise criterion of 45 dB $L_{Aeq,T}$ for the night-time at the nearest NSR location has been adopted. Compliance with this night-time criterion will therefore ensure compliance with the higher criteria for daytime and evening periods.

Temporary Emergency Generator Plant Proposed Construction

The Designated Development will be limited to operating 500 hours a year. The precise size, configuration, performance, and layout of the equipment will be finalized at a later detailed design stage in conjunction with the appointed equipment supplier. However, this will not adversely affect the design of the buildings or emissions as described in this report. An indicative layout for the plant area is provided in **Figure 4.8** (drawing reference SHA/00/E/001b---003/GA/208 dated 9th January 2023).

It worth noting here that the operational equipment designer / supplier, General Electric (GE) have defined the plant list separate to this report along with predicted operational sound levels.

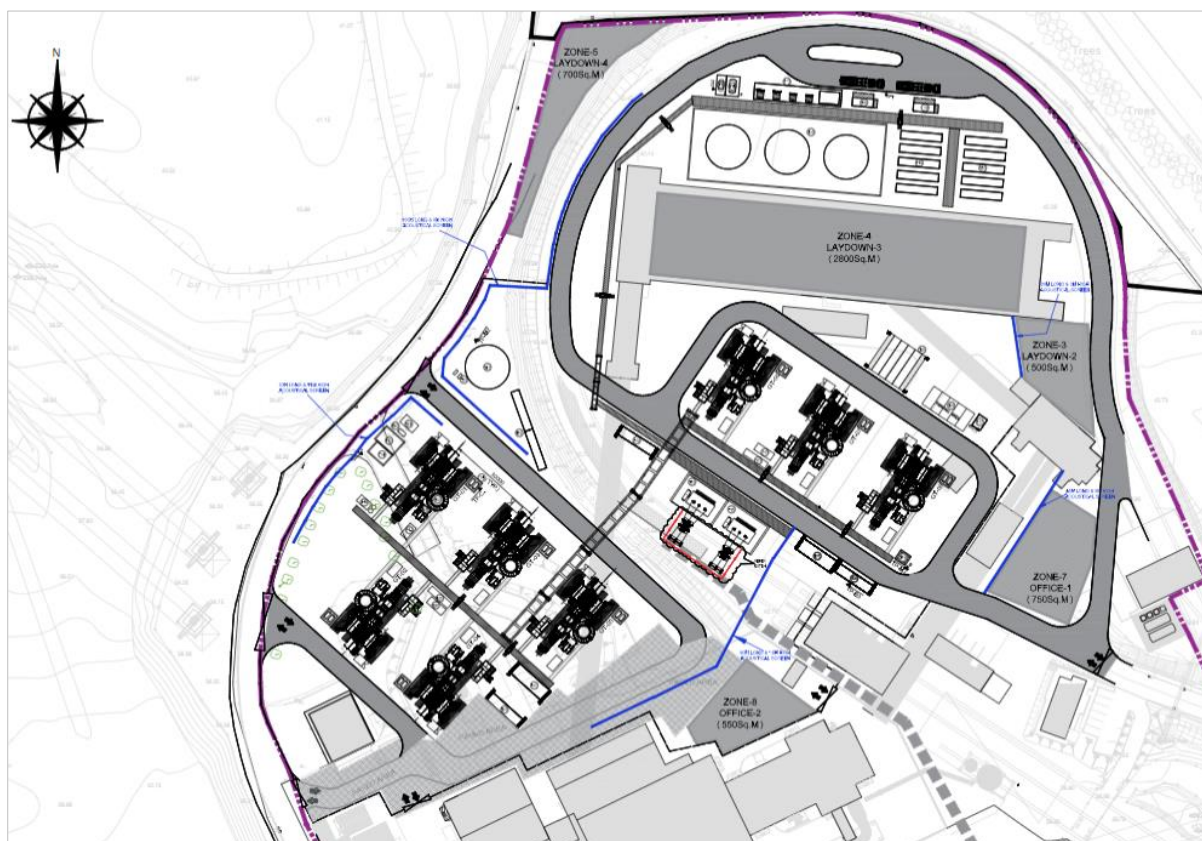


Figure 4.8: Indicative Preliminary Plant Area Layout including the Location of Acoustic Screens (Blue) [from drawing reference SHA/00/E/001b---003/GA/208 dated 9th January 2023]

4.3.5.4 Assessment

To determine the potential noise impact of the Designated Development on the NSR locations identified, all significant operational noise sources have been included in a 3D noise model. Operational noise modelling has been undertaken by GE.

Section 5 of *NG4* details the Assessment of noise sources with tonal or impulsive elements and the appropriate penalties / corrections to apply where sources present these characteristics. In this instance, it is assumed that all sources can be designed such that they do not present tonal or impulsive characteristics at the location of nearby receptor positions. Therefore, no corrections have been applied.

The 3D noise model has been used to calculate operational phase noise levels at the NSR locations identified in an iterative approach where the site layout, operational plant items and any noise reducing interventions have been considered as whole in order to meet the *NG4* Assessment criteria in the night time 45 dB $L_{Aeq,T}$ at NSR 1. Acoustic screen / barrier mitigation has been incorporated as part of the operational design (refer to **Figure 4.8**) which are:

- 8m high, 155m long acoustic barrier to the northwest boundary near the generators;
- 11m high, 70m long acoustic barrier also on the northwest boundary;
- 3m high, 20m long to the west of the site adjacent zone 3 laydown;
- 9m high, 45m long adjacent to zone 7 office-1 area; and

- 12m high, 90m long south of the emergency generators.

Therefore, compliance at NSR 1, which is the nearest sensitive receptor, is predicted on this basis and therefore compliance at the more distant receptors NSR 2 to NSR 4 is also predicted, because operations will generally be quieter at more distant locations.

It is worth noting some additional contextual factors which are:

- *BS 8233:2014 Guidance on Sound Insulation and Noise Reduction for Buildings* defines acceptable internal levels within bedrooms as being 30 dB $L_{Aeq,T}$ during the night-time. It also states that a façade with an open window will provide approximately 15 dB of sound attenuation.
- With windows shut it is likely that noise from the Designated Development will be inaudible within bedrooms at NSR 1. With windows open noise levels from the Designated Development are predicted to meet the BS8233 criterion. It is noted that the BS8233 criterion is applicable to anonymous sources only, however it is used in this context for reference.
- NG4 makes significant reference to the application of Best Available Techniques (BAT). This Assessment has been undertaken iteratively to reach an operational design that would meet the more stringent NG4 night-time operational criteria, although the site will only operate for a limited number of hours (500) in a year. The noise mitigation strategy proposed by GE is considered to be an application of BAT.

Considering operational plant has been iteratively modelled to meet the numerical limits, the adoption of in-built mitigation and contextual factors, significant impacts associated with operational phase noise levels resulting are not expected at nearby NSR. In accordance with *2022 EPA Guidelines*⁵⁰, the impacts would be defined as *not significant* and *short-term*.

4.3.5.5 Operational Phase: Traffic on Existing Roads

A negligible increase in traffic noise levels during operations is expected and therefore, in accordance with *2022 EPA Guidelines*⁵¹, the impacts would be defined as *not significant* and *short-term*.

4.3.6 Demolition & Construction Phases - Mitigation Measures

The Assessment of construction noise detailed above indicated that no significant adverse effects would be caused as a result of the construction activities.

Noise will also be minimised through the adoption of BPM as standard working practices across the Designated Development to ensure that noise is reduced whenever practicable. The following provisions, although not exhaustive, will be adhered to where practicable throughout the construction programme:

- vehicles and mechanical plant used for the purpose of the works will be fitted with effective exhaust silencers, maintained in good and efficient working order, and operated in such a manner as to minimise noise emissions. The contractor will ensure that all plant complies with the relevant statutory requirements;

⁵⁰ EPA (2022). *Guidelines on the information to be contained in Environmental Impact Assessment Reports*.

⁵¹ EPA (2022). *Guidelines on the information to be contained in Environmental Impact Assessment Reports*.

- machines in intermittent use will be shut down or throttled down to a minimum when not in use;
- pneumatic percussive tools will be fitted with mufflers or silencers;
- all compressors and generators will be “sound reduced” models fitted with properly lined and sealed acoustic covers or enclosures, which shall remain closed whenever the machines are in use;
- equipment which breaks concrete, brickwork or masonry by bending, bursting or “nibbling” shall be used in preference to percussive tools. Where possible, the use of impact tools will be avoided where the site is close to occupied premises;
- wherever possible, equipment powered by mains electricity will be used in preference to equipment powered by internal combustion engine or locally generated electricity;
- no part of the works nor any maintenance of plant will be carried out in such a manner as to cause unnecessary noise except in the case of an emergency when the work is absolutely necessary for the saving of life or property or the safety of the works;
- plant will be maintained in good working order so that extraneous noise from mechanical vibration, creaking and squeaking is kept to a minimum;
- all vehicles, plant and machinery used during the operations shall be fitted with effective exhaust silencers and all parts of such vehicles, plant or machinery shall be maintained in good order;
- vehicles associated with works shall not wait or queue on the public highway or on the worksite with engines running;
- the contractor shall carry out regular site inspections, specialist BPM checks, random senior management tours and unannounced audits to confirm noise levels are acceptable and if required take steps to reduce them and to ensure all BPM mitigation measures have been implemented as required;
- careful handling of tools / equipment, placement and handling of materials, and control of raised voices on site shall be covered in activity plans, briefings and ‘toolbox talks’ as appropriate;
- all site personnel will be instructed on Best Practicable Means (‘BPM’) measures to limit noise and vibration as part of their induction training and as required prior to specific work activities;
- training, briefings and ‘tool-box talks’ shall be delivered to the site personnel to inform them of noise and vibration issues and the location of nearby receptors; and
- suitable areas within the Site compound have been provided for employees *i.e.*, designated smoking areas, to reduce disruption around the Site boundary.

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

Construction activities such as groundworks have the potential to result in ground borne vibration. However significant effects due to vibration is normally limited to within 20m of the construction works.

As the nearest NSR is approximately 180m from the site boundary, ground borne vibration is not considered to be an issue and consequently no specific mitigation measures are proposed.

4.3.7 Operational Phase - Mitigation Measures

A commitment is made to adopt the operational noise limits detailed in this Assessment as requirements of the final design, including the need to address distinctive acoustic characteristics and / or adjust the noise limits accordingly. Mitigation measures are anticipated to include the following, although measures may be adopted as required:

- Silencers;
- Attenuators;
- Specification of low noise plant wherever possible; and
- Inclusion of acoustic barriers where required.

Through the use of such measures no significant effects are predicted at any noise sensitive receptors. If any substantial design changes are undertaken at the detailed design stage, an update will be made to this assessment to confirm compliance with the 45 dB $L_{Aeq,T}$ criterion. Furthermore, compliance with the nominated criteria will be confirmed via long-term noise monitoring.

The Designated Development will be licensed by the EPA under the industrial emissions licensing process. An application to review the existing IE licence will be made to the EPA to reflect the changes to power generation introduced by the Designated Development. It is expected that the ESB WOP Station IE Licence will adopt the 'All other Areas' noise criteria for all receptors. The terms and conditions of which are anticipated to be requiring a noise monitoring protocol to be adopted.

4.3.8 Residual Effects

No significant residual impacts are expected.

4.3.9 Summary

The Designated Development has been assessed with regard to the following areas:

- Short-term impacts during the construction phase, including:
 - Noise generated by onsite construction activities; and
 - Noise generated by changes to traffic flows on existing roads.
- Long-term impacts during the operational phase, including:
 - Noise generated by the Designated Development once complete; and
 - Noise generated by changes to traffic flows on existing roads.

Subject to the adoption of the mitigation measures detailed in this section, all effects are defined in accordance with EPA Guidelines, as either *imperceptible* or *not significant*. Construction effects would be defined as *temporary*, whilst operational effects would be *short-term*.

4.4 Biodiversity

4.4.1 Introduction

This section identifies and describes the potential effects of the Designated Development on biodiversity and nature conservation with particular attention to species and habitats protected under the Habitats Directive and the Birds Directive.

This section also describes the mitigation measures necessary for the Contractor to implement in order to prevent or reduce adverse effects upon ecological features. It takes into account the legal requirements associated with statutory protected sites and species and describes the mitigation measures which should be implemented. This section also describes detailed mitigation measures which the Developer and the Contractor will adhere to in order to avoid, prevent or reduce and, if possible, offset the likely main effects on the environment.

Effects upon ecological features arising from the process of decommissioning of the Designated Development are of a similar or lesser nature and duration to those arising from the construction process and therefore have not been considered separately in this document. Where this assessment refers to potential construction effects, these are also representative of predicted decommissioning effects.

4.4.2 Baseline

A desk-based review of available information supplemented by field surveys including a habitat and protected species surveys and non-breeding bird surveys by AECOM ecologists has informed an appraisal of the ecological baseline conditions of the Site and surrounds.

Furthermore, available sources and background ecological information which has been reviewed include:

- Temporary Emergency Electricity Generation Power Plant West Offaly Power Station, Shannonbridge Appropriate Assessment Screening & Natura Impact Statement (APEM, 2023);
- West Offaly Power Plant Demolition & Grid Services: Environmental Impact Assessment Report (EIAR) Volume 1 Chapter 6: Biodiversity (AWN Consulting Ltd., March 2022);
- Project Omega: West Offaly Power Station Appropriate Assessment (AA) Screening and Natura Impact Statement (ESB, March 2022); and
- Temporary Emergency Generation (TEG) Power Plant: Appropriate Assessment (AA) Screening and Natura Impact Statement (NIS) (APEM on behalf of ESB, 2023).

Ecological desk study data (designated sites, protected and notable species) sources:

- National Biodiversity Data Centre (NBDC). Available at: <https://biodiversityireland.ie/> accessed 04/11/2022.
- National Parks & Wildlife Services (NPWS). Available at: <https://www.npws.ie/> accessed 04/11/2022.
- Google earth aerial mapping. Available at: <https://earth.google.co.uk/>

4.4.2.1 Statutory Designations

Four statutory designated sites are located (partially) within 2km of the Site, refer to **Table 4.34**. This 2km radius desk study area is deemed sufficiently wide in context of the ecological appraisal conducted and aligns with guidance by Chartered Institute of Ecology and Environmental Management (CIEEM). In Ireland, the habitats and / or species which are the reason(s) for designation of an SAC are referred to as ‘Qualifying Interests’ (QI). In relation to SPAs, the bird species for which a particular site is designated are referred to as the ‘Special Conservation Interests’ (SCI). Several additional statutory designated sites are located within a wider Zone of Influence⁵² distance up to 20km from the Site which are detailed and considered within the NIS (APEM, 2023).

Table 4.34: Statutory Designated Nature Conservation Sites

Site Name [Site Code]	Approximate distance from the Designated Development	Summary of Qualifying Interests (QI) / Special Conservation Interests (SCI)
River Shannon Callows SAC [000216]	Boundary of SAC approximately 120m west of Site boundary.	<ul style="list-style-type: none"> • Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) • Lowland hay meadows (<i>Alopecurus pratensis</i>, <i>Sanguisorba officinalis</i>) • Alkaline fens • Limestone pavements • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) • Otter (<i>Lutra lutra</i>)
Middle Shannon Callows SPA [004096]	Boundary of SPA approximately 120m west of Site boundary.	<ul style="list-style-type: none"> • Whooper Swan (<i>Cygnus cygnus</i>) • Wigeon (<i>Anas penelope</i>) • Corncrake (<i>Crex crex</i>) • Golden Plover (<i>Pluvialis apricaria</i>) • Lapwing (<i>Vanellus vanellus</i>) • Black-tailed Godwit (<i>Limosa limosa</i>) • Black-headed Gull (<i>Chroicocephalus ridibundus</i>) • Wetland and Waterbirds
River Suck Callows SPA [004097]	Boundary of SPA approximately 650m west of Site boundary.	<ul style="list-style-type: none"> • Whooper Swan (<i>Cygnus cygnus</i>) • Wigeon (<i>Anas penelope</i>) • Golden Plover (<i>Pluvialis apricaria</i>) • Lapwing (<i>Vanellus vanellus</i>) • Greenland White-fronted Goose (<i>Anser albifrons flavirostris</i>) • Wetland and Waterbirds
Suck River Callows NHA [000222]	Boundary of NHA approximately 855m west of Site boundary.	<ul style="list-style-type: none"> • Suck River Callows NHA [000222]

4.4.2.2 Non-Statutory Designations

There is one non-statutory designation for nature conservation within 2km of the Site, refer to **Table 4.35**. There are no National Parks, NPWS listed Nature Reserves, Ancient and Long-Established Woodland or other wildfowl sanctuaries within 2km of the Site.

⁵² The ‘zone of influence’ for a project is “the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities.

Table 4.35: Non-Statutory Designated Nature Conservation Sites

Site Name [Site Code]	Approximate distance from the Designated Development	Site Type	Summary of Qualifying Interests (QI)
Bishop's Island	Approximately 240m south of the Site	Birdwatch Ireland Nature Reserve	NA

4.4.2.3 Protected and Notable Species Records

An NBDC and NPWS database search (excluding records more than 50 years old) returned a number of protected and notable species records from within 2km of the Site. Records for the Site itself will be subject to the lack of general accessibility for recording. In summary records of the following species were identified:

- Badger *Meles meles*;
- Irish hare *Lepus timidus hibernicus*; and
- Birds - sand martin *Riparia riparia*.

Further details of records of SCI species of the River Shannon Callows, Middle Shannon Shallows and River Suck Callows SPA are provided in Section 4 of the NIS for the Designated Development (APEM, 2023).

4.4.2.4 Site Description

Habitats

The Site comprises one area within the boundary of the existing WOP Station as shown on **Figure 2 Site Layout** (submitted with this application). A Site visit was conducted by AECOM in November 2022, to identify the habitat types within the Site. The Site comprises a mixture of existing infrastructure (roads, hardstanding and auxiliary buildings) with limited natural habitat present; comprising several small areas of landscape planting / grassland with young / immature planted trees. The Site is bordered by the local access roads to the north and west and by wider extents of the Power Station and associated former storage and infrastructure areas to the east and south. Some areas of recolonising bare ground are present. The proposed laydown areas (Zones 1-8 as shown on **Figure 5 Parking, Office and Laydown Areas**) comprise predominately areas of existing hard-standing. Some limited ephemeral habitats are present within Zone 1 and 5 although sparse and of no notable ecological value. The Site walkover conducted by AECOM did not identify any habitats of specific botanical interest. Whilst it is recognised the survey was conducted outside the preferred survey window, this is considered unlikely to have significantly limited the identification of habitat categories or likely habitats of note as sufficient vegetation was present to determine habitats and evidence of land use / disturbance levels recognisable.

The 2018 EIAR (Biodiversity chapter for the 2018 EIAR⁵³) concluded that the only important ecological habitats which required consideration were the River Shannon and mixed / broadleaved areas of woodland which are all located outside the Site boundary and will not be affected by the Designated Development.

⁵³ ESB (2018). *West Offaly Power Station - Transition to Biomass*.

Zone 2 (an existing car park) will be used as a 'Parking Area', which is located directly east of the woodland habitat. Zone 2 is currently entirely established as hard-standing / parking. No additional habitats outside the extent of the existing fenced car park / hard-standing will be affected by the Designated Development.

Bats

Several buildings and structures which are present within the Site, require dismantling / demolition as part of the Designated Development. The majority of these were subject to a bat roost assessment survey in December 2021 and January 2022 (APEM, 2022) Appendix 6.4 of the 2022 EIAR⁵⁴). A further visual exterior inspection conducted as part of the Site walkover undertaken by AECOM in November and December 2022. This assessment sought to reaffirm the potential of the building or other potential structure/feature to support bat roost based upon the Bat Conservation Trust survey guidelines⁵⁵. None of the buildings or trees located within the Site boundary were recorded as having more than Negligible potential to support roosting bats due to absence of suitable roosting features. The ornamental lines of trees located along the north-west perimeter of the Site will be removed to facilitate the initial ground investigation work, and in turn the Designated Development, were assessed for their suitability to support roosting bats. These trees are young and small, and are unsuitable to support roosting bats.

Consideration of bat roosting potential of buildings located outside the Site was undertaken. The Dalton building (located to the east of Zone 1 / Laydown 1 Area) and the pumphouse located on the banks of the River Shannon, approximately 20m and 175m, respectively, from the Site, were identified by APEM to have potential to support bats or were confirmed as small night roost used by low numbers of common species of bats (common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and brown long-eared *Plecotus auritus*). Neither of these buildings will be demolished as part of the Designated Development. Indirect effects of disturbance are considered to be negligible as demolition activities (likely to be most noisy) within the Site is due to be conducted outside the summer roosting period and neither the Dalton building or pumphouse were considered to have potential for hibernation roosting.

Otter

Otter are legally protected from disturbance in addition to direct effects upon breeding and resting sites. Habitat suitable to support breeding / resting otter is not present within the Site and no evidence of otter or suitable features to support resting site were identified within the Site during the survey. . Whilst the River Shannon and associated riparian woodland habitat located to the west of the Site is suitable for use by transient and foraging otter, this habitat will not be impacted by the Designated Development. Potential indirect disturbance effects will be addressed by measures outlined below.

Birds

Targeted surveys for non-breeding waterbirds⁵⁶ have been carried out within the Site of the Designated Development plus a 500m buffer (termed as the survey area) in November and December 2022. All parts of the survey area containing suitable habitat for non-breeding waterbirds were visible during the

⁵⁴ AWN Consulting Ltd. (2022). *EIAR Chapter 6 Biodiversity*.

⁵⁵ BCT (2016).

⁵⁶ The term 'waterbird' here refers to all wildfowl (ducks, geese and swans), waders, rails, divers, grebes, cormorants, herons, gulls and terns.

surveys. A 500m buffer was used as beyond this distance, disturbance of non-breeding waterbirds from noise and/or visual stimuli is unlikely. The survey adopted the method used for the Irish Wetland Bird Survey (I-WeBS), as described in the *Counter Manual* for the scheme (BirdWatch Ireland and NPWS, undated), which itself is based on the 'look-see' method described by Bibby *et al.*, (2000). These involved surveys conducted either side of low and high tide.

None of the named SCI species of SPAs were recorded roosting / feeding or loafing within the Site of the Designated Development, including the construction laydown area during the surveys conducted to date. Notable birds recorded flying over the Site include two whooper swans *Cygnus cygnus* (SCI species of Middle Shannon Callows SPA and the River Suck Callows SPA). Whooper swan and black-headed gull *Crioicocephalus ridibundus* (both SCI species of Middle Shannon Callows SPA) were also recorded flying over the River Shannon. Kestrel *Falco tinununculus* (included on the red-list of Birds of Conservation Concern Ireland⁵⁷) was recorded flying over and hunting above the scrub / woodland habitat along the western side of the Site.

Potential nesting habitat for birds (trees / scrub and buildings / structures) is present on-site. Whilst breeding bird surveys have not been conducted, it is unlikely that potential nesting habitat which will be affected by the Designated Development would be suitable to support nesting species other than those which are common and widespread.

Other Species

Species interest recorded by previous surveys (AWN Consulting Ltd. 2021 / 2022) extended to potential habitats to support nesting and foraging birds, common frog *Rana temporaria* (ditches and drain around perimeter of site), otter habitat provided by the River Shannon located 130m west of the Site and buildings with potential to support roosting bats.

Suitable open water habitat to support breeding frog appears to be absent from with the Site. Whilst underground tanks or small drainage features may be present these were not likely to be suitable for supporting breeding common frog (or other amphibians). Terrestrial habitats which may support amphibians are limited within the Site however measures to address potential effects upon these species have been included on a precautionary basis.

No other habitats or features were identified by previous studies or the Site walkover in November 2022 which are suitable to support protected or notable species.

4.4.3 Predicted Effects

Within the context of the baseline ecological conditions summarised, likely main ecological effects of the construction and operation of the Designated Development are predicted.

Potentially, the most significant ecological constraint to the Designated Development is the Site's location close to the River Shannon Callows SAC, Middle Shannon Callows SPA and River Suck Callows SPA designations. Whilst there will be no direct effects (loss or damage to designated habitats or features) upon the SPA or SAC (the Designated Development boundary is separated from the SPA and SAC boundaries, also be presence of woodland alongside the river which will be entirely retained

⁵⁷ Available at: <https://birdwatchireland.ie/birds-of-conservation-concern-in-ireland/>

and protected), indirect effects upon the designated features (habitats and species) could occur. The AA Screening Report (Section 4, APEM (2023)) concluded that likely significant effects on the qualifying features of these European sites, from at least one source of impact of the Designated Development, and in the absence of mitigation measures, could not be excluded at the screening stage on the basis of objective scientific information and therefore an Appropriate Assessment was undertaken as outlined in the NIS (APEM, 2023).

In summary the following likely main effects could occur as a result of the Designated Development upon ecological features (designated site, habitats and species).

Do Nothing Scenario

If the Designated Development were to not go ahead, then the ecological baseline would likely remain much the same.

Demolition / Construction Phases

- Middle Shannon Callows SPA and River Suck Callows SPA - Potential loss of functionally linked habitat (habitat which could support SPA SCI species).
- Potential indirect effects upon River Shannon Callows SAC due to air - or waterborne pollution; changes in hydrological conditions (quantity and quality) which could not be entirely screened out at the AA Screening stage.
- Loss and disturbance to other notable habitats within the Site.
- Disturbance effects upon SCI / protected / notable species from increased / changes to noise, lighting or changes in site conditions influencing species movements / dispersal / foraging.

Operational Phase

- Disturbance to species (including those which are QI / SCI species) and habitats from the operation of the Designated Development.

The magnitude of predicted effects upon ecological features has been considered based upon the information available at the time of writing. The potential likely significant effects upon the SPA and SAC designations (including those located more than 2km from the Site) were subject to a dedicated Appropriate Assessment (AA) as set out in the NIS (APEM, 2023). The NIS concludes that, based on the best scientific knowledge in the field, the Designated Development will not, itself or in combination with any other plans or projects, adversely affect the integrity of any European sites in light of those Sites' conservational objectives.

4.4.4 Demolition & Construction Phases - Mitigation Measures

General mitigation measures that will be adhered to during the dismantling / demolition, construction and decommission phases as follows:

- The Contractor will consult and comply with the requirements of CEMP with respect to any sites or species protected by law, which are likely to be affected by the construction, establishment and maintenance of the Site. There will be no works directly within the boundary of any European site.

- The Contractor will comply with requirements of *The Wildlife Acts of 1976 and 2000* (“*The Wildlife Act*”) and the *Flora (Protection) Order, 2015* by giving protection to a wider range of plants, animals and birds, and providing additional enforcement powers and increased penalties for wildlife-related offences) when undertaking any works which will affect protected species.
- Where required, the Contractor will provide more detailed method statements (including programming of activities) within the parameters set by the outline statements approved by NPWS. These will be prepared by the Contractor’s Environmental Clerk of Works (ECoW) in association with other contractor staff. The method statements will be approved by the Project Ecologist prior to works commencing. Works will not start without agreed method statements in place.
- The Developer will be responsible for obtaining any relevant licences, such as for the management of protected species.
- The Contractor will be responsible for ensuring all site workers are briefed on the ecological sensitivities of the Site and its environs through ‘toolbox talks’ and provision of clear information about protected species and restricted areas and activities if required. All staff (including sub-contractors) will receive regular updated talks and briefings.
- All Site clearance works will comply with current legislative requirements and best practice.
- During the works, the Contractor will provide a fence between the Site including the temporary construction area, and the adjacent areas. This will limit construction works within the confines of the Site. All re-fuelling of plant, equipment and vehicles will be carried out within the construction Site boundary.
- All fuels, chemicals, liquid and solid waste will be stored in areas bunded in accordance with established best practice guidelines at the construction compound and spill kits will be used.

4.4.4.1 Protection of Amphibians

- As far as possible, any works within drainage ditches or waterbodies will be carried out outside of the main amphibian breeding season (February-June).
- If works are required within this season, drainage ditches / waterbodies will be inspected by a suitably qualified ecologists prior to work being carried out. Should frogs or newts be found at that time they will be captured under licence from NPWS and translocated to suitable alternative habitat within the Site. Captured amphibians will be relocated to areas of standing water that are not likely to quickly dry out and will not be affected by activities associated with the Designated Development. The ecologist will be required to have obtained a licence from NPWS prior to carrying out the inspection.

4.4.4.2 Protection of Birds

- Mitigation measures detailed in the NIS (APEM, 2023) will be implemented in full in order to address potential effects upon SPA SCI species.

- Temporary acoustical screens will be erected around the area where noisy equipment is proposed during the demolition / construction phase to reduce noise disturbance effects upon SAC and SPA species (and also non-SCI species).
- It is proposed that all structures and buildings present within the Site with potential to support nesting birds, will be demolished before 1st March and therefore outside of the breeding bird season (1 March - 31 August inclusive). Where this is not possible, demolition can take place within this season provided that the structures or buildings are inspected in advance by a suitably qualified ecologist, and it is confirmed that there is no evidence of nesting. On a review of photographs of the buildings and structures proposed to be demolished (shown as structures 1-11 on **Figure 3 Dismantling and Demolition Plan** (submitted with this application) none appears to provide more than limited potential for nesting by common species such as feral pigeon or corvid species (e.g., crows, rooks, jackdaws). There is sufficient alternative nesting habitat in the surrounding area to mitigate the loss of the structures and buildings which have low potential for nesting.
- As far as possible, all required vegetation clearance will be carried out outside the nesting bird period, before 1st March and / or after 31st August inclusive to avoid direct effect upon nesting bird. The habitats within the Site appear to be limited to ephemeral and ornamental landscaped habitats e.g., amenity grassland, formal shrub planting, with several small or immature trees present.
- If clearance cannot be undertaken outside of the breeding bird season, then the Site will be checked for breeding birds by the ECoW immediately before clearance commences, any identified active nests will be left until the hatchlings have fledged.
- All cleared material of bird nesting potential will be moved and stored off-site to ensure that birds do not use the cleared material for nesting during the bird breeding season. Similarly, stockpiles of earth (particularly sandy material) will be left without vertical faces during the spring and summer period.
- The Contractor's programme will clearly indicate any areas to be removed and their programmed schedule for removal.

4.4.4.3 Protection of Bats

- If demolition of buildings and structures within the Site is conducted within 18 months (*i.e.*, by April 2024) then no additional specific mitigation measures are required.
- If temporary construction lighting is required, it will consist of the lowest lumen lighting possible while also maintaining a safe working environment. The temporary lighting will be fitted with directional cowls to prevent light spill to the surrounding area, particularly also to the east of Zone 1 alongside the Dalton Building. The temporary lighting will only be directed at the works area ensuring no light overspill to suitable commuting and foraging habitat such as the River Shannon, woodland or scrub.
- Construction lighting will be designed so as to be sensitive to the potential presence of bats and will adhere to the following guidance:

- *Bats & Lighting: Guidance Notes for Planners, Engineers, Architects and Developers* (Bat Conservation Trust (2010)).
- *Guidance Notes for the Reduction of Obtrusive Light GN01* (Institute of Lighting Professionals (2011)).
- *Bats and Lighting in the UK - Bats and the Built Environment Series* (Bat Conservation Trust UK (2008)).

4.4.4.4 Protection of Otter

- Mitigation measures specific to water quality and biosecurity within the River Shannon are detailed in **Section 4.7** Water. These measures are focused on surface water management, pollution prevention, sediment barrier and biosecurity. These measures will protect water quality and ensure there is no effects on prey availability for otter.
- Furthermore, any excavations will be left with a method of escape for any animal that may enter overnight and will be checked at the start of each working day to ensure no animals are trapped within them.
- Any pipes will be capped or otherwise blocked at the end of each working day, or if left for extended periods of time, to ensure no animals become trapped.
- Within the Site, all vehicles will be restricted to a maximum speed of 20km/hr. This will help to minimise the risk of collision with mammals, including otter.

4.4.4.5 Protection of Aquatic Habitats

Refer to **Section 4.7** for details on surface water management during the dismantling / demolition and construction phase.

4.4.5 Operational Phase - Mitigation Measures

Operational mitigation measures to reduce disturbance effects upon SCI and notable species will be adopted as follows:

- Lighting - As detailed in Section 5 of the NIS (APEM, 2023), permanent lighting required during the operational phase will be restricted to the absolute minimum required for security and safety purposes, to reduce operational disturbance effects upon SCI species associated with the SPA and SAC designations. The Site will not be lit at night (with the exception of security and low-level switchable safety lighting).
- All lighting systems will be designed to minimise nuisance through light spillage. Shielded, downward directed lighting will be used wherever possible, and all non-essential lighting will be switched off during the hours of darkness.
- Noise - Short-term⁵⁸ (c. 5 years) noise attenuation walls (acoustical screens) will be erected around the boundary of the Site (as shown on **Figure 2 Site Layout Map** (submitted with this application)) for the duration of the operational phase of the Designated Development. The walls

⁵⁸ EPA Guidelines terminology (2022).

will range between 3m and 12m in height and be sited in accordance with the noise assessment (refer to NIS, APEM (2023)).

No other operational ecological mitigation measures are proposed.

4.4.6 Residual Effects

Based upon the assessment of the information available as outlined above, with the embedding of design mitigation and project specific construction and operational mitigation, *no residual significant adverse effects* on ecological features are predicted.

In particular, the NIS concluded that there will be *no adverse effects on the integrity of any European site from the Designated Development, either alone or in-combination with other plans or projects* (Section 5.7 of the NIS, APEM, 2022).

4.5 Population and Human Health

4.5.1 Introduction

This section presents information on the potential effect of the Designated Development on population and human health.

Due to the historical and existing industrial nature of this Site, the Designated Development will be homogeneous within the Site.

The potential population and human health effects as a result of the Designated Development will arise from air quality, climate noise and vibration, visual and traffic effects.

4.5.2 Baseline

The study area for the population and human health assessment has considered the area of land that encompasses the likely effects of the Designated Development. The area used for the baseline comprises the electoral division (ED) of Shannonbridge, as this is where the majority of population and human health effects are likely to occur. Where possible, baseline data is presented at the ED level with a comparison to County Offaly and State level also provided.

4.5.2.1 Population and Demographics

The most recent census was carried out by the Central Statistics Office (CSO) in April 2022⁵⁹. However, only preliminary 2022 Census data has been released and the full results are not expected until April 2023. The 2016 Census was carried out in April 2016⁶⁰.

To inform the baseline profile, data from the 2022 Census has been analysed where possible. Where 2022 data is not available, 2016 data has been used.

According to the 2022 Census, there are 284 persons in the study area of Shannonbridge ED, a very slight increase from the 2016 Census, from 267 persons (17 people). This represented a 6.4% increase in the local population from the previous 2016 Census. Similarly, the County Offaly population increased between 2016 and 2022. The population increased from 77,961 persons in 2016 to 82,658 in 2022 (a

⁵⁹ CSO (2022). *Census of Population. Preliminary Results*

⁶⁰ CSO (2017). *Census 2016*.

6.0% increase). The total population of Ireland also increased from 4,761,865 to 5,123,536 (7.6%) over the same period. This is the first time that a census has recorded a population of over five million people in over 170 years.

According to the 2016 Census, of the population of Shannonbridge ED, 13.11% were aged 12 and under, this is lower than the national average of 18.48%. By contrast, 27.34% of people in Shannonbridge ED in 2016 were aged 65 and over. This is significantly higher than the proportion in Ireland who were aged 65 and over (13.39%).

4.5.2.2 Socio-Economics

Census data (from 2016) presenting the highest level of education attained by those aged 15 and over in Shannonbridge ED indicates that 13.9%⁶¹ of the population hold an undergraduate degree level qualification or higher⁶². This is lower than the proportion in County Offaly (19.2%) and much lower than the proportion across Ireland as a whole (28.5%). However, only 1.4% of the population of Shannonbridge ED had no formal education compared to 2.1% in County Offaly and 1.7% in Ireland as a whole.

A breakdown of the population of Shannonbridge ED by occupation group (in the 2016 Census), indicates that, 17.8% of the population in employment were Managers, Directors and Senior Officials, or work in Professional Occupations. This is a lower proportion than County Offaly as a whole (18.6%) as well as the national proportion recorded across Ireland (24.8%).

In 2016, the median gross annual household income in Shannonbridge ED was €42,101 which was slightly higher than the median for Offaly of €41,271 but below the median for Ireland as a whole €45,256⁶³.

4.5.2.3 Deprivation

Deprivation data is published by the Pobal HP Deprivation Index using 2016 Census data⁶⁴. A score of 0 represents a mean level of deprivation, while a Relative Index Score of <-30 or >30 represent extreme levels of relative deprivation and extreme levels of relative affluence respectively.

Shannonbridge ED has a Relative Index Score of -7.72, and therefore is considered to be marginally more deprived than the average for Ireland.

4.5.2.4 Health

The 2016 Census asked respondents to rate their physical health on a scale from 'very good' to 'very bad'. In Shannonbridge ED, 80.5%⁶⁵ of the population rated their health as being 'very good' or 'good'. This was a lower proportion than County Offaly (86.4%) and Ireland as a whole (87.0%).

In 2016, male residents in the Midlands Region were expected to live to 80.0 years whilst female residents were expected to live to 83.2 years⁶⁶. The region's life expectancies in 2016 are broadly in line with the country's averages (79.6 years for males and 83.4 years for females).

⁶¹ Ibid

⁶² This includes, Ordinary bachelor's degrees, Honours bachelor's degrees, professional qualifications and Postgraduate degrees including PHDs.

⁶³ CSO (2017). *Census 2016*.

⁶⁴ Pobal HP (2017). *Probal HP Deprivation Index*.

⁶⁵ CSO (2017). *Census 2016*.

⁶⁶ CSO (2017). *Irish Life Tables*.

4.5.2.5 Social Infrastructure

The nearest settlement to the Designated Development is the village of Shannonbridge, approximately 850m to the north of the Site, which also contains a number of businesses. There are also a number of residential properties located approximately 170m from the Site, to the north-east along St. Kieran's Park.

Shannonbridge Health Centre is also located within the settlement and is the nearest health centre to the Site. The nearest hospital is located in Ballinasloe, in County Galway, approximately 12km from the Site. The nearest school is Clonfert National School (Primary School), approximately 6km to the south of the Designated Development. Other social infrastructure in Shannonbridge includes St. Kieran's Church, Shannonbridge Garda Station and Shannonbridge Playground.

4.5.3 Predicted Effects

Do Nothing Scenario

In the absence of the Designated Development, there would be no changes to the baseline population and human health receptors.

Demolition / Construction Phases

The potential impacts on population and human health during the demolition / construction phases associated with the Designated Development will be in relation to air quality, climate, noise, visual impact and traffic. These potential impacts are addressed in the corresponding sections of this report, as follows:

- Section 4.2 Air Quality
- Section 4.3 Noise and Vibration
- Section 4.8 Climate
- Section 4.11 Landscape and Visual
- Section 4.12 Traffic Management.

During the demolition / construction phases, employment opportunities will be created as a result of the Designated Development. These jobs will be temporary, but will result in a *positive* economic impact.

There will be a potential increase in the population in the area during the demolition / construction phases. However, this will be temporary, and it is considered that there is sufficient accommodation capacity.

During the demolition / construction phases, HGV traffic, general delivery traffic and site operatives will be required to travel to and from the Site. The WOP Station site has its main access from the R357 (Cloghan Rd.). The main Site access for demolition and construction phase traffic will be available via existing retained entrances to the existing WOP Station.

Demolition / construction phase traffic will lead to an increase in the number of vehicles using many of the junctions near Shannonbridge village, however, the increase is not expected to lead to junctions in the area becoming over capacity, therefore congestion is not expected to become an issue, therefore a

negligible impact is expected. A Framework Construction Traffic Management Plan (CTMP) has been prepared, refer to **Appendix C**.

As noted above, the Designated Development has the potential to impact human health as a result of changes in local air quality, climate and noise, during the demolition / construction phases. These impacts are discussed in the relevant sections of this report.

As the study area is predominantly rural with limited public transport available, local residents rely heavily on the local and regional road network to access services, workplaces and local facilities.

The demolition / construction phases have the potential to cause an increase in traffic, although it is not anticipated to be significant.

Operational Phase

During the operational phase, the Designated Development will be operated, maintained and managed by ESB appointed personnel. The Designated Development will undergo scheduled inspections and be subject to planned maintenance visits. As such there is little scope for any influence on either the businesses or residences within the area and there will be *no impacts* to employment during the operational phase.

As noted above, the operational phase of the Designated Development will require a small number of staff to travel to and from the Site, for operation and maintenance visits. The operational phase will also generate traffic with the delivery of distillate oil to generate power, which will be transported to site via HGV tankers. The increase in vehicles on the road network is not expected to lead to any significant impact on the (local) road network.

4.5.4 Demolition & Construction Phase - Mitigation Measures

Dismantling / demolition works will be in accordance with the following guidelines:

- BS 6187:2000: Code of Practice for Demolition.
- Health and Safety Executive Guidance Notes GS 29 / 1, 2, 3 & 4.
- S.I. 504 Safety, Health & Welfare at Work (Construction) Regulations 2013.
- Air Pollution Act 1987.
- Environmental Protection Agency Act 1992.
- BS 5228:2009 Part 1: Noise Control on Construction & Open Sites.

The Contractor will be responsible for the security of the Site and will be required to:

- Install adequate fencing to the Site boundary.
- Maintain Site security staff at all times.
- Ensure restricted access is maintained to the works.
- Operate a Site induction process for all Site staff.
- Ensure all Site staff shall have current 'safe pass' cards.

- Separate pedestrian access from construction at the main Site entrances provide a safe walkway for pedestrians along the site entrances.

The Contractor's CEMP will detail the Contractor's overall management and administration of the works. The CEMP will be implemented during the dismantling / demolition and 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 Developer will establish communications with local community representatives throughout the construction period.

Air quality impacts can arise from many sources during the dismantling / demolition and construction phase. Emissions from the construction phase are transient in nature and will include emissions from vehicles and plant, and dust-raising activities from earthworks and construction processes utilising concrete and aggregates. Dust and air pollution, including odours, can cause disruption to properties and the public adjacent to the construction works, and can also have adverse impacts upon other environmental receptors, including watercourses and ecologically designated sites.

Air quality mitigation and general control measures are described in **Section 4.2.6**. All construction works will be carried out in such a manner that emissions of dust and other pollutants are limited, and that best practicable means are employed to minimise disruption, risks to human health, and to avoid unnecessary impacts on sensitive ecological habitats.

Noise and vibration impacts may arise from a wide variety of sources during the dismantling / demolition and construction phase and to varying degrees during the course of the works, depending upon the stage of works. Noise and vibration mitigation and general control measures are described in **Section 4.3.6**.

A **Construction Traffic Management Plan** (CTMP) will be prepared and will be updated by the Contractor to mitigate any impact of construction on the surrounding road network. Traffic and transport mitigation and general control measures are described in **Section 4.12**.

4.5.5 Operational Phase - Mitigation Measures

No mitigation measures related to population and human health are proposed during the operational phase. However, mitigation for air quality, noise and vibration, climate, and traffic and transport, are discussed in the relevant sections of this report.

4.5.6 Residual Effects

Following the implementation of the above mitigation measures, and the measures in the Framework CEMP (refer to **Appendix B**), it is unlikely that there will be any residual effects on population and human health during the demolition and construction phases of the Designated Development.

There is the potential for a residual impact on air quality during the demolition and construction phases of the Designated Development, from dust emissions. However, following the implementation of the mitigation measures outlined in **Section 4.2** (Air Quality), it is unlikely that there will be any residual effect.

Following the implementation of the mitigation measures outlined in **Section 4.3** (noise and vibration), it is unlikely that there will be any residual effects on population and human health from noise and vibration impact.

No residual effects are anticipated on population and human health during the operational phase of the Designated Development.

4.6 Land, Soils and Geology

4.6.1 Introduction

This section assesses the potential effect of the Designated Development on land, soil and geological aspects of the Site and surrounding area.

The Shannonbridge Power Station was constructed in three stages between 1964 and 1982 was replaced by the WOP Station (150 MWe) in 2004. The WOP Station ceased operation in December 2020.

The Site is located within the boundary of the existing WOP Station, on the eastern banks of the River Shannon. The Designated Development will be within the northern portion of the WOP Station site.

The WOP Station site is generally surrounded by agricultural land, with an Industrial Machinery business, Shannonbridge village to the north, St. Kieran's Park residential estate to the north-east. Further south-west and north-east are two large, harvested bogs and to the south is a disused railway line that connects the two bogs with the WOP Station site.

4.6.2 Baseline

Ordnance Survey Ireland (OSI) maps show that that historical land use was as agricultural land use prior to the construction of the original Shannonbridge Power Station. No evidence of disposal of waste material was identified in the Site.

Soils / Subsoils

The Geological Survey Ireland (GSI) / Teagasc databases⁶⁷ show that:

- Near-surface soil types include a mix of Mineral Alluvium (river sediments generally composed of sands, silts and gravels) at the Designated Development, with areas of Made Ground (fill material, concrete and tarmac related to the WOP Station), Drained Mineral Soils (clay soils) and limestone till to the south and east on the WOP Station site, and with cut peat further to the east.
- Deeper subsoils are mapped as Alluvium at the Site and generally Glacial Till derived from Limestone beneath the east of the WOP Station site.
- Bedrock underlying the entire WOP Station site and surrounding areas consists of fractured dark limestones and shales of the Lucan Formation.

⁶⁷ GSI (2022). *Data and Maps*. Available at: <https://www.gsi.ie/en-ie/data-and-maps/Pages/default.aspx>

Soils / subsoils are likely to have been removed or reworked in places during the construction of the Shannonbridge Power Station and / or WOP Station. Site investigation at the WOP Station site in 2017 confirmed the presence of made-ground underlain by peat deposits over limestone tills. Limestone bedrock was encountered at varying depths ranging from 3.7 to 11.3m below ground level (mbgl), with groundwater encounter in the subsoils in all but one of the boreholes.

Geology

The GSI mineral database was used to determine whether there were any mineral sites close to the Site. The GSI database indicated the following:

- Five (5 no.) active quarries producing sand and gravels and / or crushed stone, located between 8km and 13km to east and south of the Site:
 - Coolnahinch Sand Pit (OY008)
 - Clonfinlough Pit (OY007)
 - Mahon's Pit (OY011)
 - Daly's Pit (OY007)
 - Lusmagh Quarry (RN 002).
- Two (2 no.) geological heritage sites located greater than 700m to the north and west of the Site: the Suck River Callows and River Shannon Callows (Site Code IGH14 for both) which are long, flat, seasonally-flooded grasslands on the floodplains of the Suck and Shannon.
- There are no recorded landslide events within 10km of the Site and, due to the relatively flat local topography and the underlying strata, there is negligible risk of a landslide event occurring at the Site. The nearest recorded landslide was c. 18km to the east in 1954 (GSI_LS03- 0065).
- There is a very low risk of seismic (earthquake) activity at the Site, as the nearest seismically active areas are the Irish Sea and in County Clare (>50km distant).
- There is no risk from volcanic activity (no active volcanoes in Ireland).

Radon

In terms of other potential geohazards, the EPA data⁶⁸ indicates the Designated Development is not in a High Radon area.

Geological Features

Based on the National Roads Authority (NRA) guidance, *Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*, criteria for rating site importance of geological features, the importance of the bedrock and soil features at the Site is rated as 'Very High importance' due to the presence of the River Suck Callows and River Shannon Callows within 1km of the Site.

⁶⁸ EPA Radon Maps (2023). *Radon Maps*.

4.6.3 Predicted Effects

Do Nothing Scenario

In the absence of the Designated Development, no significant changes to land, soil or geological resource receptors, are anticipated. The Site would remain remains in its current use and no likely significant implications arise in respect of land, soil or geology.

Demolition / Construction Phases

The demolition and construction phases of the Designated Development has the potential to result in different types and durations of impact on soils and geological receptors. The likely predicted impacts are described below.

As outlined in **Section 3.4**, there will be limited below ground works during the construction of the Designated Development, that have the potential to impact on land, soil and geological receptors.

During the demolition and construction phases, the following predicted impacts on land, soil and geological receptors are likely to occur, without the mitigation:

- Temporary impacts on soil structure as a result of soil excavation and compaction.
- Temporary impacts on soil chemistry as a result of spillages of oils, fuels or other construction chemicals, or through the mobilisation of existing contamination following ground disturbance.
- Impacts on surface and groundwater water quality due to deposition or spillage of soils, sediments, oils, fuels, or other construction chemicals / wastewater, or through mobilisation of contamination following disturbance of contaminated ground, sediments, or groundwater, or through uncontrolled site run-off.
- Potential increase in volume and rate of surface water runoff from new impervious areas during construction, leading to an impact on flood risk.
- Increased risk of groundwater flooding or recharge as a result of any below ground excavations.
- Alteration in overland flow paths as a result of works associated with the Designated Development.
- Temporary impacts on off-site receptors through the inhalation of potentially contaminated dust and dermal contact with contaminated soil following ground disturbance.

Construction phase activities such as earthworks, excavations, site preparation, levelling and grading operations, will result in the disturbance of soils. Exposed soils are more vulnerable to erosion during rainfall events, due to loosening and removal of vegetation to bind it, compaction and increased runoff rates. Surface runoff can contain excessive quantities of fine sediment, which may eventually be transported to watercourses where it can result in adverse impacts on water quality and sensitive ecological receptors. This sediment could contain contaminants, particularly in the vicinity of the existing WOP Station and fuels storage tanks. The potential impacts of fine sediment on water quality and ecological receptors are addressed in **Section 4.6**. The potential impacts of soil contaminants on water quality are addressed herein.

During construction, fuel, hydraulic fluids, solvents, grouts, detergents, and other potentially polluting substances will be stored and / or used on site. Spillages of these substances could pollute nearby surface watercourses or underlying aquifers if their use or removal is not carefully controlled, and spillages enter existing flow pathways or waterbodies directly. The potential impacts of spillages on water quality and ecological receptors are addressed in **Section 4.6**. The potential impacts of the migration of these spillages within the subsurface on water quality are addressed herein.

During construction, groundwater may be encountered in excavations and dewatering may be required, however excavations are anticipated to be relatively shallow (generally of the order of 2m deep) and groundwater inflows from the relatively impermeable subsoils are expected to be low, based on the findings of the Site investigations at the WOP Station site (Causeway, 2017). The potential impacts of construction dewatering and subsequent discharging on surface and groundwater receptors are addressed in **Section 4.7.3**.

The potential impacts of construction on ground stability have been scoped out of the impact assessment for the following reasons:

- There are no records of historic mine workings or reported karst features within the Site.
- Therefore, it is very unlikely that ground instability as a result of underlying karst will be an issue during the demolition, construction, operation, or decommissioning phases of the Designated Development.

Operational Phase

During the operational phase of the Designated Development, the following likely predicted impacts on land, soil and geological receptors could occur, without mitigation:

- Impacts on soil chemistry as a result of accidental spillages or leakages from stored distillate fuel into the subsurface.
- Impacts on surface and groundwater quality through the migration of introduced contamination as a result of accidental spillages or leakages from the underground pipework and/ or locally stored distillate fuel into surface and groundwater receptors.
- Impacts on groundwater quality as a result of the removal / treatment / mitigation of any encountered soil contamination.

Decommissioning Phase

It is envisaged that the Designated Development will have to be temporarily operational at the WOP Station site for approximately five years. At the end of the temporary period, the Designated Development will be decommissioned, dismantled, and removed from this Site. Decommissioning would therefore be expected to commence at the end of 2028. This equipment is likely to be transported by the supplier for deployment at another location overseas.

Prior to removal from the Site, equipment will be securely stored under appropriate conditions. All lubricating oils and other potentially polluting materials will be removed from the Site.

Prior to decommissioning, a Decommissioning Plan (including a Decommissioning Environmental Management Plan (DEMP)) will be produced and agreed with the EPA as part of the IE Licence

amendment process. An environmental Baseline Assessment report at time of commencement of operations will be referred to and updated to determine if any contamination has occurred and what, if any, rehabilitation is required prior to IE Licence amendment.

The predicted impacts on land, soil and geological receptors likely to occur during the decommissioning phase are anticipated to be similar to those likely to occur during the construction phase with the exception of the impacts relating to unidentified contamination. The likely predicted impacts are as follows without the proposed mitigation:

- Temporary impacts of soil structure due to soil stripping, smearing and compaction.
- Temporary impacts on soil chemistry as a result of spillages of oils, fuels, or other construction chemicals, or through the mobilisation of contamination following ground disturbance.
- Temporary impacts on surface and groundwater quality through the migration of introduced contaminants as a result of spillages.

4.6.4 Demolition & Construction Phase - Mitigation Measures

It is considered that the demolition and construction phases of the Designated Development will not result in significant impacts on land, soils and geological receptors at the Site. Potential impacts could include increase in surface water run-off and sediment from excavations and potential contamination from spills or leaks.

Mitigation measures details within **Section 4.6** are applicable and relevant for the protection of land and soils during demolition and construction phase activities.

The following mitigation measures have either been incorporated into the design (*i.e.*, embedded mitigation) or are standard construction or operational practices. These measures have, therefore, been taken into account during the impact assessment.

Prior to works commencing on-site, a Final CEMP will be prepared and approved by the planning authority. The Final CEMP will detail the measures necessary to avoid, prevent and reduce adverse effects where possible upon land, soil and geological receptors.

4.6.4.1 Excavation and Control of Water

To minimise the potential for adverse impacts to soil structure and quality during the demolition and construction phases, the following mitigation measures will be in place:

- Soil material will be stored temporarily within the Site in managed stockpiles that will not be allowed to dry out, to avoid generation of wind-blown dust.
- Any stockpiled material will be managed in accordance with best practise guidelines (such as *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites*⁶⁹). When required, pre-earthwork drainage will be put in place to avoid sediment being washed off site and will be included in the CEMP.

⁶⁹ DEFRA (2009). *Construction Code of Practice for the Sustainable Use of Soils on Construction Sites*.

- The Contractor will be required to prepare a Final Construction Traffic Management Plan (CTMP) to minimise Site traffic and, if relevant, damage to soil structure from smearing and compaction, refer to **Appendix C** (Framework CTMP).

To minimise the potential for adverse impacts to soil chemistry and to water quality during construction, the following is an outline of the general mitigation measures that will be in place:

- The construction of the Designated Development will be in accordance with good practice.
- The Contractor will be required to include measures in the CEMP for minimising erosion by reducing disturbance and stabilising exposed materials. The CEMP will also consider control measures to minimise the release of mobilised sediment. The CEMP will also include methods of handling and storing chemicals and fuels, followed by an Emergency Response Plan to be implemented in the event of a spill or leak.

Water quality monitoring will be undertaken pre and during-construction, details of which will be included in the Contractor's CEMP. This will be based on a combination of visual observations, in-situ testing using handheld water quality probes, and periodic sampling for laboratory analysis.

- The Contractor will be required to ensure the safe storage of any hazardous materials or chemicals required onsite. Storage areas for flammable / toxic / corrosive materials will be located in a separate, locked, impermeable bunded and fenced off area. Material data sheets will be available for all these materials and the COSHH (Control of Substances Hazardous to Health) assessments kept within the relevant Risk Assessment for the task, all subject to the Applicant's approval. Storage will not be within 50m of a watercourse and designated storage areas will be bunded to 110% of storage capacity to contain the effects of any spills. These areas will be cleared and re-instated following completion of the Site.
- A site-specific Resource and Waste Management Plan (RWMP) will be prepared by the Contractor, and all relevant contractors will be required to seek to minimise waste arising at source and, where such waste generation is unavoidable, to maximise its recycling and reuse potential. Recycling of materials will primarily take place off-site where noise and dust are more easily managed and less likely to impact on surrounding properties.
- Should significant contamination occur as a result of construction stage activities, Offaly Co. Co. and the EPA will be notified, and corrective actions will be agreed.

If water is encountered during below ground construction, suitable best practice de-watering methods will be used. No significant groundwater dewatering is anticipated.

- Construction works will be carried out in such a way as to prevent, contain, or limit, as far as reasonably practicable, any adverse effects arising from the presence of contaminated land or materials (if encountered). Examples of these measures are as follows:
 - a contamination watching brief / environmental oversight to ensure that any significant contamination not identified during previous site investigations is recorded and dealt with appropriately;

- should ground with significant levels of unknown contamination be encountered during construction, working methods and procedures for handling and disposal of material will be employed to minimise risk in line with the EPA's "*Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites*"⁷⁰. If required, the material will be disposed of at a suitably licensed waste facility;
- 'Clean' and 'dirty' (contaminated) work areas will be divided by internal fencing, if contamination is encountered;
- Personal Protective Equipment (PPE) will be worn by ground workers and other staff; and
- those potentially at risk will be made aware of potential site hazards via site safety induction and toolbox talk procedures.

To minimise the potential for adverse impacts to off-site receptors and construction workers, the following is an outline of general mitigation measures that will be in place:

- The Contractor has a duty under the Safety, Health and Welfare at Work Act 2005 and the Control of Substances Hazardous to Health (COSHH) Regulations 2002 to protect their employees against hazardous substances encountered at work. To that end and in accordance with *CIRIA guidance R132 A Guide for Safe Working on Contaminated Sites*⁷¹, the Contractor will be required undertake a COSHH assessment before any work is carried out at the Site which is likely to expose staff to substances hazardous to health. Even if no hazardous substances are identified during the planned site investigation, it would be best practice for the Contractor to ensure that all employees (construction workers) are issued with PPE appropriate to the hazards identified. PPE could consist of hazard-specific gloves, eye protection and respiratory protective equipment (RPE).
- The Contractor will implement measures to minimise the amount of dust produced during the construction phase, including the preparation of a Dust Management Plan (DMP). There will be a Duty of Care on the E&C Contractor to ensure that dust-raising activities are located away, and upwind where possible, from sensitive receptors as much as feasibly possible, the duration be kept to a minimum when in proximity to a receptor, and the spread of dust be controlled by judicious use of water, the most effective and efficient way being in the form of a fine spray.

Comprehensive Site Investigations (SI) will be undertaken prior to construction to better understand the existing ground conditions and will inform the siting and layout of the Designated Development.

It should be noted that the Designated Development involves limited excavation and will be constructed in accordance with current engineering standards, including an SI and understanding of ground conditions to inform construction works and design.

Mitigation measures for construction works including soil handling are incorporated into the CEMP to be implemented by the E&C Contractor who will conduct the works. Should Offaly Co. Co. consider

⁷⁰ EPA (2013).

⁷¹ CIRIA (1996).

independent supervision of these works to be required at the expense of the developer, the Applicant would be agreeable to this being implemented through an appropriately worded planning condition.

4.6.5 Operational Phase - Mitigation Measures

To minimise the potential for adverse impacts to land, soil and geological receptors, the following mitigation measures will be in place:

- The Designated Development will be licensed by the EPA. An application to review the existing IE licence will be made to the EPA to reflect the changes to power generation and the Designated Development. The IE licence sets out to limit and minimise the impacts to air, soil, surface and groundwater, and the effects on environment and human health.
- The Designated Development will be operated in line with appropriate standards and the operator will implement and maintain an Environment Management System (EMS) which will be certified to International Standards Organisation (ISO) 14001. The EMS will outline requirements and procedures required to ensure that the Designated Development is operating to the appropriate standard.
- If required by IE licence requirements or planning conditions, sampling and analysis of potential pollutants in surface waters and groundwater will occur. This includes monitoring emissions levels in accordance with the IE licence.
- To prevent the risk of spillages, flooding, fire, and other potentially major incidents, several measures will be in place. These include compliance with all relevant health, safety and environmental legislation; design, build and operation in accordance with industry practice; regular maintenance and inspections to reduce the risk of equipment failures; bunded or double skinned storage areas; good and regular housekeeping; and spill kits stored on-site.

Water quality monitoring will be undertaken post-construction, details of which will be included in the IE licence. This will be based on a combination of visual observations, in-situ testing using handheld water quality probes, and periodic sampling for laboratory analysis.

4.6.6 Residual Effects

Construction Phase

Land and Soil Resources

No impact to or removal of land is proposed or to soil resources is envisaged and all works are on Made Ground within the existing WOP Station site.

Designated Sites

There are a number of designated sites within 2km of the Site. **Section 4.4** states that, with the embedding of design mitigation and project specific construction and operational mitigation, *no residual significant adverse effects* on ecological features are predicted.

In particular, the NIS concluded that there will be *no adverse effects* on the integrity of any European site from the Designated Development, either alone or in-combination with other plans or projects (APEM, 2023).

Surface Water

There is a possibility that, if soil contamination is exposed or disturbed during demolition and construction or caused by spillage during construction or operation, it could reach the identified surface water receptors bounding the Designated Development. Given the implementation of the mitigation measures as described in **Section 4.7**, including the implementation of the CEMP, and the fact that there is no direct works to the River Shannon, *no residual significant adverse effects* on geological features or surface waters are predicted.

Groundwater

There is the potential for contamination exposed or disturbed during construction to reach the identified groundwater receptors and for contaminants to be introduced to the subsurface as a result of spillages, and to migrate into groundwater receptors.

With the implementation of embedded mitigation measures outlined in **Section 4.7**, including implementation of the CEMP, *no residual significant adverse effects* on geological features or surface waters are predicted.

Human Health: Construction Workers and Off-Site Receptors

Potential impacts on human receptors may occur via contaminated dust and dermal contact with contaminated soil for the construction workers, and inhalation of contaminated dust for the off-site receptors. With the embedded mitigation measures outlined in **Section 4.7** and in the CEMP in place, *no residual significant adverse effects* on geological features or surface waters are predicted.

Operational Effects

Land and Soil Resources

The Designated Development will not result in a loss of agricultural land or change in land use classification, however, there is a possibility that contaminants could be introduced to the subsurface and soil resources as a result of leakages from fuel storage areas or pipelines. Due to the embedding of design mitigation and project specific demolition, construction and operational phase mitigation, *no residual significant adverse effects* on geological features are predicted.

Designated Sites

There are a number of designated sites within 2km of the Site. **Section 4.4** states that, with the embedding of design mitigation and project specific construction and operational mitigation, *no residual significant adverse effects* on ecological features are predicted. In particular, the NIS concluded that there will be *no adverse effects* on the integrity of any European site from the Designated Development, either alone or in-combination with other plans or projects (APEM, 2023).

Surface Water

There is a possibility that, if soil contamination is exposed or disturbed during demolition and construction or caused by spillage during construction or operation, it could reach the identified surface water receptors bounding the Designated Development. Given the limited excavation depths envisaged and implementation of the mitigation measures as described in **Section 4.7**, including the implementation of the CEMP, and the fact that there is no direct works to the River Shannon, *no residual significant adverse effects* on geological features or surface waters are predicted.

Groundwater

There is a possibility that introduced contaminants in soil, as a result of accidental spillages or leakages of stored distillate fuel, could migrate into groundwater receptors. The protection of groundwater quality during the operational phase will be achieved through utilisation of a surface water management / drainage system, IE Licence provisions and drainage strategy and due to the embedding of design mitigation and project specific operational mitigation, *no residual significant adverse effects* on geological features or groundwaters are predicted.

Human Health

There are no direct or indirect residual impacts anticipated on off-site human health as a result of the Designated Development during the operational phase.

4.7 Water

4.7.1 Introduction

This section assesses the potential effect of the Designated Development on the hydrological aspects of the Site and surrounding area.

The nature of the Designated Development dictates that the greatest potential impact on surface waters associated with the development will be during the construction phase. In order to prevent / minimise potential impacts, mitigation measures will be implemented as part of the construction works on-site. Examples of potential sources of impacts include:

- polluted discharges from the Site;
- discharge of vehicle wash-down water;
- discharge of construction materials, e.g., uncured concrete;
- uncontained spillage of wastewater effluent;
- uncontrolled sediment erosion and contaminated silty runoff; and
- refuelling facilities, chemical and waste storage or handling areas.
- changes to the existing drainage network including interception and redirection of natural and artificial watercourses (e.g., drainage channels); and
- increased runoff from cleared and capped areas (relative to greenfield values).

4.7.2 Baseline

As the Site of the Designated Development lies with the boundary of the existing WOP Station site, the water environment baseline condition for the Site and the wider study area has been informed by the *Hydrology and Lands, Soils, Geology and Hydrogeology* chapters of the EIAR undertaken for the demolition and removal of the existing WOP Station (power plant and other buildings) (AWN Consulting Ltd. 2022).

The following table summarises the principal hydrological and hydrogeological attributes identified and assessed, their current status and the attribute importance assigned.

Table 4.36: Summary of Water Environment Attributes and Baseline Condition

Attribute type	Attribute	Location	Baseline Condition	Data Source	Attribute Importance / Sensitivity
Surface water / Hydrology					
Surface watercourses (and quality)	Island Banragh 25	Within Site boundary	No water quality data available.	EPA Map Viewer	Extremely high (Direct hydrological connection with nearby Natura 2000 sites).
	River Shannon	Along western boundary of Site	<ul style="list-style-type: none"> Moderate (3-4) Q rating at 10km downstream of site (2017, most recent) Good (4) Q rating at 6km upstream of site (2020, most recent). 	EPA Map Viewer	
WFD River Sub Basin	Shannon (Lower)_010 (includes Island Banragh)	Covers site and immediate surrounding area	<i>Moderate</i> WFD status and <i>Under Review</i> for WFD objectives (2021, most recent).	EPA Map Viewer	
Designated sites	River Shannon Callows Special Area of Conservation (SAC)	Along western boundary of Site – direct link to site via existing drainage system	Designated status	NPWS Map Viewer	Scoped out (Appropriate Assessment screening report and Natura Impact Statement concluded there will be no adverse effect on the integrity of these sites)
	Middle Shannon Callows Special Protection Area (SPA)	Along south-western boundary of Site - direct link to Site via existing drainage system			
	River Suck Callows SPA	Approximately 350m to west of Site			
	River Shannon Callows pNHA	Along western boundary of Site – direct link to site via existing drainage system			
	Suck River Callows NHA	Approximately 350m to west of Site			
					Very high
Flood risk	Designated Development site classified as a <i>Highly Vulnerable Development</i> due to use for essential infrastructure	Within Site boundary	<ul style="list-style-type: none"> Flood Zone C, less than 0.1% AEP or 1 in 1000 year probability for river flooding No recorded historic flood events 	OPW Online Database	-

Attribute type	Attribute	Location	Baseline Condition	Data Source	Attribute Importance / Sensitivity
Groundwater / Hydrogeology					
Superficial deposits (and quality)	Alluvium, limestone till and cut peat	Within Site boundary	<ul style="list-style-type: none"> Not an aquifer but contains groundwater Good groundwater quality - minor exceedances of Groundwater Threshold Values (GTVs) or Interim Guideline Values (IGV) for arsenic, aluminium and sodium. 	GSI Map Viewer Causeway GI (2017)	Extremely high (direct hydrogeological connection between site and nearby protected sites)
Aquifers (and quality)	Lucan Formation	Underlying Site and surrounding area	<ul style="list-style-type: none"> Locally important aquifer (LI) Good groundwater quality - no exceedances of GTVs or IGV, except for naturally occurring aluminium and sulphate. 	GSI Map Viewer Causeway GI (2017)	
Groundwater abstractions/ supplies	Onsite abstraction well	Within Site boundary	Poor yielding well (10.9m ³ /d).	GSI Map Viewer	Low
	Public supply borehole	Approximately 800m from site, in Shannonbridge village	Good yield well (163.5m ³ /d) but not active since 1997.	GSI Map Viewer	Medium
Karst landforms	Karst boreholes (2 no.)	Located within 100m of the western Site boundary	Recorded in National Karst Database - karstified bedrock likely to have been encountered during drilling, but no other data available.	GSI Map Viewer	Low
WFD groundwater bodies (GWBs)	Clara GWB	Underlying majority of Site	<i>Good</i> WFD status and <i>Not at Risk</i> of not achieving 'Good' status (2021, most recent).	GSI Map Viewer	Extremely high
	Inny GWB	Northern part of Site			
GWDTEs	River Shannon Callows pNHA	Along western boundary of Site – direct link to site via existing drainage system	Contains Molinia Meadows (EU code 6410) and Alkaline Fens (7230) – both GWDTEs – but at distance from site.	NPWS Online Resources	Very high
	Suck River Callows NHA	Approximately 350m to west of Site	Contains Raised Bog (7110) – GWDTE – but at distance from site.		

4.7.3 Predicted Effects

Do Nothing Scenario

In the absence of the Designated Development, there would be no resulting impacts on the water environment in the vicinity of the Site.

Demolition / Construction Phases

The potential construction effects in relation to water are described in **Table 4.37**. It identifies the source of the impact; potential impact pathways (route by which receptors can become impacted) and potential effects arising from the potential impact. For each of the potential effects identified, the likelihood of an effect has been considered to determine whether an assessment should be undertaken. It is noted that the significance of effect is based on available information at the time of writing.

Table 4.37: Potential Construction Effects

Potential Impact	Potential Impact Pathway	Potential Effect	Potentially Significant Effect if no mitigation is applied?
Construction related activities in the superficial deposits	Mobilisation of contaminants directly to the groundwater or alteration of superficial deposits groundwater flow regime	Pollution of bedrock groundwater or impact on the superficial deposits aquifer flow regime	Significant. Possible interaction during the construction of the Designated Development within superficial deposits. However, the deepest excavation is understood to be to a maximum depth of 2m bgl
Construction activities in vicinity of features of the River Shannon	Direct impact on any features of geomorphological	Damage or loss of features of geomorphological feature	Significant. Features have been identified in the vicinity of the Site
Construction activities in vicinity of features of hydrogeological or geomorphological interest and importance	Direct impact on any features of hydrogeological or geomorphological interest and importance	Damage or loss of features of hydrogeological or geomorphological interest and importance	Significant. Features have been identified in the vicinity of the Site
Temporary Dewatering	Altered drainage regimes, barrier to flow	Reduced groundwater level and flow alteration and or potential groundwater flood risks, diversion of groundwater-dependent receptors	Not significant. No dewatering is anticipated to occur onsite during construction. The 2017 groundwater level data demonstrates the highest groundwater level was 2.82m bgl
Accidental spills and leaks	Introducing contaminants to the water environment	Pollution of surface water and shallow groundwater	Significant. Features have been identified in the vicinity of the Site
Use of natural resources	Consumption of non-renewable natural resource	Depletion of non-renewable natural resource	Not significant. Water demand will typically be limited to domestic water consumption for staff welfare. There is sufficient existing water supply on-site to meet water demand.
Increased water consumption and wastewater generation	Increased water consumption or introducing increased discharge to surface water	Increased demand on water environment and flow to surface water. Assume that mains supplies is available	Not significant. Welfare facilities will be provided for the Contractor on-site. Foul water will be collected in a sump and periodically removed by road tanker.

Operational Phase

The potential operational impacts on water receptors are described in **Table 4.38**.

Table 4.38: Potential Operational Effects

Potential Impact	Potential Impact Pathway	Potential Effect	Potentially Significant Effect if no mitigation is applied?
Increased water consumption and wastewater generation	Increased water consumption or introducing increased discharge to surface water	Increased pressure on water environment. Assume mains sewer is available.	Not significant , no water usage or large increase in runoff anticipated.
Accidental spills and leaks	Introducing contaminants to the subsurface	Pollution of surface water and groundwater	Significant . Features have been identified in the vicinity of the Site.

4.7.4 Flood Risk

Based on the assessment presented in the EIAR undertaken for the demolition and removal of the existing power plant (AWN Consulting Ltd. 2022)⁷², there is no significant risk of flooding to the WOP Station. It has been concluded that the site of the new works lies within Flood Zone C (*i.e.*, where the probability of flooding is less than 0.1% AEP or 1 in 1000 year for river flooding) as defined by the guidelines, *Guidelines for Planning Authorities. The Planning System and Flood Risk Management*⁷³.

4.7.5 Demolition & Construction Phase - Mitigation Measures

Run-off into excavations / earthworks cannot be prevented entirely and is largely a function of prevailing weather conditions.

Care will be taken to ensure that exposed soil surfaces are stable to minimise erosion. All exposed soil surfaces will be within the main excavation site which limits the potential for any offsite impacts. All run-off will be prevented from directly entering into any watercourses as no construction will be undertaken directly adjacent to open water.

No significant dewatering will be required during the construction phase of the Designated Development which would result in the localised lowering of the water table. There may be localised pumping of surface run-off from the excavations during and after heavy rainfall events to ensure that the excavation is kept relatively dry.

Measures to protect the water environment will be formulated in accordance with best practice guidance. The best practice guidelines are as follows:

- IFI (2016). *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*.
- CIRIA C741 *Environmental Good Practice on Site* (3rd edition) (C692).
- CIRIA C532 *Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors*.

⁷² AWN Consulting Ltd. (2022). *West Offaly Power Plant Demolition and Grid Services. EIAR Volume 1*

⁷³ OPW (2009). *Guidelines for Planning Authorities. The Planning System and Flood Risk Management*

4.7.5.1 General Surface Water Management

- The existing surface water management system, such as drains, settlement ponds, outfalls and interceptors / separators, will be inspected and confirmed to be in suitable working order prior to any Designated Development works commencing on the Site.
- Additional new drainage installations will be installed in early stages of construction, alongside the remaining existing drainage facilities, can be used to treat runoff for silt and hydrocarbons early on in the programme. Daily weather forecasting will also be used to inform the works schedule, ensuring excavation works do not coincide with high intensity or extreme rainfall events.
- The proposed surface water management system, including existing and proposed infrastructure, will be inspected and confirmed to be of sufficient capacity to treat any additional water generated by the Designated Development, including runoff from dust suppression, prior to discharge.
- Washout from power cleaning of drainage lines, oil interceptors or any other pipework which may contain pollutants will be collected and treated. No contaminated washout will be allowed enter any watercourse or be discharged to ground.
- There will be regular monitoring and prompt maintenance of these the overall surface water management system throughout the Designated Development. This will ensure that the drainage system continues to function as designed.
- There will be no direct discharge to any watercourse at any time during the demolition, construction or phases. All surface water run-off within the Site will be directed to this drainage system.

4.7.5.2 Sedimentation of Surface Waters and Sediment Barriers

During the construction phase, the mitigation measures will ensure that no sediment contamination, contaminated run-off or untreated wastewater will enter watercourses on or near the Site.

- Excavations will only remain open for the shortest possible time to reduce groundwater ingress. Silt traps will be placed around the Site to reduce silt loss and these will be inspected and cleaned or replaced regularly.
- Run-off from spoil heaps will be prevented from entering watercourses by diverting it through settlement ponds and removing material off-site as soon as possible to designated storage areas.
- Good construction practices will also be used during the construction phase, such as wheel washers and dust suppression on-site roads and at the Site access points.
- Sediment barriers, such as silt fencing, will be used in areas where works are within 10m of watercourses. These barriers will be installed to directly treat surface water or direct surface water to the wider surface water management system. No existing riparian vegetation will be removed at any stage of the works.

- The extent of exposed ground will be minimised where possible and stockpiles covered so to reduce sediment supply and prevent the creation of any contaminated runoff. The potential will be further minimised by using grit traps to drain stockpile and wheel-wash areas so silt from these activities can be diverted to the drainage network. Straw bales and Terram will also be used at appropriate locations deemed to be at risk from silt pollution during construction works. In addition to these mitigation measures, general methods of good practice to keep the site tidy will be employed to minimise surface water contamination.
- Should short-term stockpiles be required these will be located at least 50m away from any watercourse. Slopes of these stockpiles will be made stable and regularly checked by the Contractor. Stockpiles shall be stored on impermeable surfaces and covered using tarpaulin.
- Surface water run-off from working areas will not be allowed to discharge directly to the River Shannon. To achieve this, the drainage system will be constructed prior to the commencement of major site works. All design and construction will be carried out in accordance with *CIRIA C532 Control of Water Pollution from Construction Sites Guidance for Consultants and Contractors*.

4.7.5.3 Fuel and Chemical Handling

It will be necessary to adopt the following mitigation measures at the Site in order to prevent spillages to ground and drains of fuels, and to prevent any consequent surface water impacts.

- Designate a bunded storage area at the Contractor's compound(s) and at least 50m away from surface water gullies or drains for oils, solvents and paints used during construction. The fuel storage tanks shall be bunded to a volume of 110% of the capacity of the largest tank / container within the bunded area, away from any drains and / or watercourses. The Contractor will allow for regular checks and maintenance as required.
- Drainage from the bunded area shall be diverted for collection and safe disposal. All containers within the storage area will be clearly labelled so that appropriate remedial action can be taken in the event of a spillage. When moving drums from the bunded storage area to locations within the Site, a suitably sized spill pallet will be used for containing any spillages during transit.
- Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles, will take place in designated impermeable refuelling areas isolated from surface water drains. Spill kit facilities shall be provided at the fuelling area in order to provide for any accidental releases or spillages in and around the area. Any used spill kit materials should be disposed of via a hazardous waste contractor.
- Where mobile fuel bowzers are used on the Site in the event of a machine requiring refuelling outside of the designated area, fuel will be transported in a mobile double skinned tank. Any flexible pipe, tap or valve must be fitted with a safety lock where it leaves the container and locked shut when not in use. Each bowser should carry a spill kit and each bowser operator must have spill response training. No refuelling will be allowed within 50m of the River Shannon.
- Adequate stocks of hydrocarbon absorbent materials (e.g., spill-kits and / or booms) shall be held on-site in order to facilitate response to accidental spills. Spill response materials shall also

be stored on all construction vehicles. It is important that the spill kits are regularly inspected and immediately replaced if used.

- All equipment and machinery will be checked for leaks and other potential sources of contaminants before arriving on-site and on a daily basis. Any equipment or machinery likely to introduce to contaminants will not be brought on-site or will be removed from the Site immediately if any leak is discovered. Spill kits will be available to machine operators, and they will be trained in their use.
- The storage of fuels and hazardous materials during the construction phase provides further potential for pollution incidents. Some removed topsoil and excavated material will be stored for reuse by the Site, and it is important that these designated storage areas are strategically located in relation to the watercourses and any other drains, so that there is no risk of topsoil or any other material being washed into the watercourses or drainage network.
- The storage of hazardous substances will be necessary during construction and a number of considerations will need to be made to reduce the potential for pollution from these sources. Fuel will be required to be stored at least 50m from a watercourse and refuelling will only take place in designated areas, on hardstanding by appropriately trained personnel.

4.7.5.4 Control of Concrete and Lime

Ready-mixed concrete will be brought to the Site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated water to the underlying subsoil and groundwater.

The pouring of concrete will take place within a designated area protected to prevent concrete runoff into the soil / groundwater media. Washout of concrete transporting vehicles will take place at an appropriate facility, offsite where possible. Alternatively, where wash out takes place on-site, it will be carried out in carefully managed designated on-site wash out areas.

4.7.5.5 Concrete Crushing

Crushing of concrete on Site will only occur at the designated location. The mobile concrete crusher, if used, will be located c. 350m from the River Shannon at the closest point. Dust and surface water control systems will be put in place at this location prior to crushing activities.

4.7.5.6 Concrete Run-off

- No wash-down or wash-out of ready-mix concrete vehicles during the construction works will be carried out at the Site within 20m of an existing surface water drainage point. Wash-outs will only be allowed to take place in designated areas with an impervious surface.
- Concrete will be used to construct the Designated Development and will therefore need to be managed to reduce the potential for pollution. The Contractor will be required to manage and mitigate concrete works ensuring that no concrete is laid during wet weather if achievable, so to reduce the risk of concrete being washed off the site and into the surface water drains or watercourses.

4.7.5.7 Monitoring

Weekly checks will be carried out to ensure surface water drains are not blocked by silt, or other items, and that all storage is located at least 50m from surface water receptors. A regular log of inspections will be maintained, and any significant blockage or spill incidents will be recorded for root cause investigation purposes and updating procedures to ensure incidents do not reoccur.

A programme of water monitoring and controlled discharges of water abstracted from open excavations should be implemented. Where necessary, it is proposed that groundwater monitoring of existing boreholes (using boreholes installed as part of the Ground Investigation (GI) should be undertaken around the site in order to ensure the monitoring process is effective. Automatic water level data loggers (or other suitable method) to facilitate continuous monitoring would be installed in selected monitoring boreholes at strategic locations.

A Contractor's CEMP for the Designated Development in line with the Framework CEMP, refer to **Appendix B**. The Contractor's CEMP will cover all potentially polluting activities and include an Incident Response Plan. All personnel working on the Site will be trained in the implementation of the procedures. As a minimum, the CEMP for the Designated Development will be formulated in consideration of the standard best practice. The CEMP will include a range of site-specific measures as discussed above.

4.7.6 Operational Phase - Mitigation Measures

Currently, the existing drainage network collects runoff from building roofs, hardstanding / paved areas and discharges from bunds and storage tanks. Drainage arising from hardstanding, are conveyed to the existing surface water drainage network on-site and existing settlement pond prior to discharging to the River Shannon. This drainage network incorporates hydrocarbon interceptors (2 no.), peat interceptors (6 no.) and a suspended solids settlement pond prior to discharging to the River Shannon⁷⁴.

During the operational phase, surface water generated on impermeable surfaces will continue to be collected in a slightly modified underground pipe network. The surface water runoff will be conveyed by the existing drainage network to the settlement pond prior to discharging to the River Shannon. Surface water management, the use of impermeable surfacing, bunding and kerbing, and preventative measures will be required under the IE Licence for the operational development.

Rainwater collected in the bund containing the 110 kV transformers will be inspected prior to discharge to the River Shannon via the oil water interceptor in accordance with the existing IE licence. Treated water from the plant wastewater system incorporating oily water separator will be discharged to the surface water drain.

4.7.7 Residual Effects

This assessment concludes that the impact of the Designated Development upon any groundwater or surface water environment in proximity would be *Imperceptible* subject to the CEMP and the management of temporary drainage during construction. Although this assessment identified activities during demolition, construction and operational phases that have potential to generate temporary and

⁷⁴ AWN Consulting Ltd. (2022). *EIAR Chapter 11 Material Assets*.

local adverse impacts, when the proposed mitigation is considered, *no significant effects* are anticipated.

4.7.8 Limitations

The limitations of the above assessment are as follows:

- Where any conclusions and recommendations are outlined, they are based upon project design information available at the time of assessment. Site specific ground investigation work is ongoing for the Designated Development.

4.8 Climate

4.8.1 Introduction

Irish Policy and Legislation

As noted in **Section 1.2** of this report, the *Development (Emergency Electricity Generation) Act 2022* ('the Act') has recently been enacted to provide for emergency measures for electricity generation development. Section 10 of the 2022 Act refers to the duty on public bodies that is contained in Section 15 of the Climate Action and Low Carbon Development Act 2015. Section 10 of the 2022 Act emphasises, in the context of Section 15 of the 2015 Act, the particular urgency and compelling necessity of the Designated Development. Section 10 of the 2022 Act provides as follows:

Section 15 of Climate Action and Low Carbon Development Act 2015:

10. Taking into account the exceptional circumstances and the urgent and compelling necessity for securing the supply of electricity in the State, the Minister and the Board, in performing their functions under this Act, shall do so in a manner consistent with the plans, strategy, framework and objectives referred to in section 15(1) of the Climate Action and Low Carbon Development Act 2015 to the extent that they consider practicable, taking particular account of the said exceptional circumstances and urgent and compelling necessity.

The Climate Action and Low Carbon Development Act 2015 sets out the long-term goal of Ireland achieving net-zero emissions by no later than 2050. In order to stay on course to achieve this target Ireland will need to achieve a 51% reduction in emissions by 2030 (relative to 2018 levels). The updated Climate Action Plan (CAP) 2023 outlines how Ireland will meet these targets, while keeping in line with the recently published economy-wide carbon budgets and sectoral emissions ceilings.

However, as mentioned in **Section 1.2**, since this legislation and policy was published there has been a great deal of uncertainty surrounding energy supply and security. As a result of these factors the 2022 Act was established to provide emergency measures for electricity generation development to ameliorate and protect security of supply of electricity in the State.

As stated in the CAP 2023 Government are responsible for ensuring critical services remain operational at all times, which as a result may require fossil fuel sources to provide back-up/emergency power when there is a temporary shortfall in energy supply. This is seen as only a short-term fix and as the Irish energy grid continues to decarbonise Ireland will still progress towards its target of net-zero emissions by no later than 2050.

Chapter 12 in the Climate Action Plan 2023:

“Government set out its response to these challenges in the National Energy Security Framework, published in April 2022. This Framework details Government action to manage the impacts for energy users, ensuring continued security of supply, and reducing dependency on fossil fuels in the long term. It also highlights the work required in strengthening the grid to ensure a secure supply of electricity”.

Potential Climate Related Effects

This section assesses the potential climate-related effects of the Designated Development. There is the potential for a number of greenhouse gas (GHG) emissions to be released into the atmosphere during the demolition / construction, operational and decommissioning phases of the Designated Development.

In line with the international EU and Irish reporting obligations, GHGs will be reported as tonnes of carbon dioxide equivalent (tCO₂e) and consider the following seven gases:

- a) Carbon dioxide (CO₂)
- b) Methane (CH₄)
- c) Nitrous oxide (N₂O)
- d) Sulphur hexafluoride (SF₆)
- e) Hydrofluorocarbons (HFCs)
- f) Perfluorocarbons (PFCs)
- g) nitrogen trifluoride.

During the demolition / construction and decommissioning phases, GHG emissions can be caused by fuel used in construction vehicles, generators and site equipment as well as embodied carbon in construction materials.

During the operational phase of the Designated Development, Site operational GHG emissions will be caused primarily by fuel combustion during energy generation.

Section 4.8.2 outlines the Site baseline GHG emissions, **Section 4.8.3** outlines the potential impact the Designated Development will have on GHG emissions.

Section 4.8.4 outlines the mitigation measures that will be implemented to keep GHG emissions as low as possible.

During the demolition / construction, operational and decommissioning phases of the Designated Development, it is also important to note the impacts climate change will have on the development and identify what adaptation measures will be implemented to help mitigate any impacts.

Section 4.8.2 outlines the climate baseline data or historic climate conditions and the projected climate data for the Site and surrounding environs. Based on the findings from the baseline data, **Section 4.8.3** outlines the potential effect these climatic conditions could have on the Designated Development.

Section 4.8.4 discusses a mix of adaptation measures that can be instated to reduce the Sites vulnerability to climate change during its lifecycle.

4.8.2 Baseline

Greenhouse Gases

The Designated Development will be constructed on industrial / brownfield site, therefore the baseline for GHG emissions is anticipated to be minimal and not material. The GHG baseline is therefore assumed to be zero as there is no preceding ecological value on the land and therefore no sequestration value. Prior to the demolition (dismantling) embodied carbon emissions would be zero, as no activity took place on the Site.

The dismantling / demolition phase for the Designated Development will extend over approximately 1.5 months and will comprise:

- Dismantling and demolition of existing equipment and structures and associated foundations.
- Disconnection, removal and rerouting of existing underground services.

Prior to the construction of the Designated Development some pre-existing equipment and infrastructure located on the Site will be dismantled / demolished, resulting in the emissions of GHGs from demolition and the waste disposal process. However, these are considered to result in minor GHG emissions. Although these GHG emissions were not included in this baseline, they have been addressed in section 4.7 in Chapter 4 of the EIAR, which looked at the demolition and removal of the existing WOP Station (AWN Consulting Ltd. 2022).

Climate Risk Baseline

In order to effectively use climate change projections for mitigating the effects of climate change on the Designated Development, it is necessary to understand the historic and future climate conditions experienced in the surrounding environs. **Table 4.39** outlines the historic climate change baseline for the period 1981-2000 and the future baseline using climate change projections under Representative Concentration Pathway (RCP) scenario, RCP 4.5 and RCP 8.5. These climate predictions will help to understand what future climate conditions may impact the Designated Development during the demolition / construction, operational and decommissioning phases.

By understanding and pre-empting what climate impacts may affect the Designated Development, we can look at adaptation measures that can be implemented to reduce the Designated Development vulnerability to them. **Sections 4.8.4** outlines some short-term measures that may be considered where necessary to reduce the Sites vulnerability to climate conditions for the duration of its lifecycle.

Table 4.39: Climate Change Baseline and Projection Data

Climate Variable	Historic Baseline (1981-2000) Shannon Airport Weather Station	Future baseline Climate change projection		Projected Trend	Source
		Moderate scenario RCP4.5 (2041-2060)	Extreme scenario RCP8.5 (2041- 2060)		
Temperature					
Mean annual maximum daily temperature (°C)	14.0	1.2 15.2	1.5 15.5	↑	2
Mean annual minimum daily temperature (°C)	7.4	1.2 8.6	1.5 8.9	↑	2
Mean summer maximum daily temp (°C)	19.3	1.2 20.5	1.6 20.9	↑	2
Mean winter minimum daily temp (°C)	3.5	1 4.5	1.4 4.9	↑	2
Frost days per annum (days)	16.7	-42.3% 9.6	-56.6% 7.2	↓	2
Heatwaves (no.)	2.0	4.2	6.2	↑	2
Highest temperature for baseline period (°C)	30.6				1
Lowest temperature for baseline period (°C)	-8.2				1
Rainfall					
Mean annual rainfall levels (mm)	985.3	-2.3% 962.6	-1.1% 974.5	↓	2
Mean summer rainfall (mm)	214.8	-4.4% 205.3	-7.3% 199.1	↓	2
Mean winter rainfall (mm)	278.9	-1.10% 275.8	3% 286.2	↓↑	2
Wettest month on average (mm)	December				1
Driest month on average (mm)	April				1
Wet Days (>20mm) (%)	84	17.4% 98.6	22.2% 102.6	↑	2
Very Wet Days (>30mm)	15.0	33.4% 20.0	34.8% 20.2	↑	2
Summer dry days (5 consecutive days where daily precip <1mm)		22.2%	27.5%	↑	2
Highest daily rainfall (mm) for baseline period	44.3				1
Other					
Snowfall		-54.2%	-65.9%	↓	2
Mean wind speed (knot)	9.2	-1.90% 9.0	-2.60% 9.0	↓	2
Highest gust (knot)	83				1
Potential Evapotranspiration (mm)	1.6	4.4% 1.7	4.9% 1.7	↑	2
Sea level rise (m) *		0.2	0.2		4
Storms	The number of very intense storms is projected to increase over the North Atlantic region in the future (2041-2060), under RCP8.5. Projections suggest that the winter track of these storms may extend further south and over Ireland more often. Under RCP4.5, the projections of future intense storm tracks have a similar, but weaker signal.				3
Projection source:					
1 Met Eireann Historical Data: https://www.met.ie/climate/available-data/historical-data					
2 Climate Ireland: https://www.climateireland.ie/#!/tools/climateDataExplorer					
3 Environmental Protection Agency: https://www.epa.ie/publications/research/climate-change/EPA-159_Ensemble-of-regional-climate-model-projections-for-Ireland.pdf					
4 The World Bank Group: https://climateknowledgeportal.worldbank.org/country/ireland/impacts-sea-level-rise					

Table 4.40: Climate Variable Definitions

Climate Variable	Definition
Summer dry days	Projected change number of dry periods defined as at least five consecutive days on which daily precipitation <1mm
Heatwaves	Periods of at least three consecutive days where maximum temperatures exceed >95% of the normal monthly distribution
Wet Days	Projected change (%) in number of days with rainfall >20mm
Very Wet Days	Projected change (%) in number of days with rainfall >30mm
Frost days per annum	Projected change (%) in the number of days when minimum temperatures are <0°C
Wind speed	Projected change (%) in windspeed at 10m elevation
Sea level rise	Median projections of regional sea level rise, relative to a 1995-2014 baseline. The projection period for sea level rise was 2040-2059, due to data limitations and another source having to be used. The World Bank 'Projected Sea Level Rise' tool was used for predicting sea level rise in Ireland.
Snowfall	Projected change (%) in the snowfall

4.8.3 Predicted Effects: Whole Lifecycle (Demolition / Construction and Operational Phases)

Do Nothing Scenario

In a 'do nothing' scenario, the environment will remain unchanged, and there will be additional no GHG emissions as a result of the Designated Development.

Greenhouse Gases Emissions

As noted above, there is potential for GHG emissions to be released to atmosphere during the demolition / construction, operational and decommissioning phases of the Designated Development. Although the level of GHG emissions released during each phase of the Designated Development is dependent on a number tentative factors, it's important to note that minimising unnecessary GHG emissions is a priority throughout each phase of the Designated Development.

The GHG emissions for the operational phase of the Designated Development have been calculated based on the assumption that the plant will only run for a maximum of 500 hours per annum. The net capacity of the plant is 264MW, comprising of eight 35MW LM2500Xpress units. When run for 500 hours per calendar year, there will be a total annual generation of 132,000 MWh. Assuming the manufacturer's stated efficiency of 38%⁷⁵ for the LM2500Xpress units, this output will require a fuel energy input of 347,368 MWh per year.

Applying standard emissions factors for 100% mineral diesel (assumed to be the equivalent of distillate fuel for carbon accounting purposes)⁷⁶ the consumption of this amount of fuel will result in direct Scope 1 emissions of 93,578 tonnes CO₂e/year. There will also be indirect Scope 3 emissions of 21,759 tonnes CO₂e from the upstream fuel supply chain; these are also known as Well to Tank (WTT) emissions. Total annual emissions are 115,337 tonnes CO₂e.

As stated in **Section 1.4.1** the Designated Development was commissioned as the Government identified the potential for a shortfall in electricity supply during periods of peak demand, should these

⁷⁵ GE GAS Power (2023). Available at <https://www.ge.com/gas-power/products/gas-turbines/lm2500>

⁷⁶ DBEIS (2022). Available at: <https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2022>

periods coincide with low renewable and interconnector availability. This is not contradictory to the target of achieving net-zero emissions by no later than 2050 as this is seen only as a short-term measure to allow for the grid to decarbonise and increase capacity, and as a result the long-term goal of net zero remains.

GHG mitigation measures will be implemented at all phases of the Designated Development, and these are outlined in **Section 4.8.4** and Framework CEMP (**Appendix B**). No formal mitigation measures are considered to be required for the construction of the Designated Development but in accordance with best practice, the Contractor will seek to adopt low carbon solutions during its design and construction, recognising that the extent of construction and use of concrete is expected to be limited.

Climate Risks

Table 4.39 outlines the expected trends, relative to the baseline period 1981-2000, and the predicted climatic conditions for the Site and surrounding environs. However, due to the nature of the Designated Development, being *temporary*, the trends outlined in **Table 4.39** may be less severe.

Looking at the general predicted climatic trends for Ireland and the trends predicted in **Table 4.40**, a number of climate risks were identified that may impact the Designated Development. Ireland is predicted to experience an increase in the severity and frequency of storms and an increase in the annual average temperature⁷⁷, with 2022 being the warmest year recorded since 1900⁷⁸. Ireland is also set to experience changes in the frequency and intensity of precipitation. Summer and autumn are predicted to be drier, while winters are expected to experience an increase in heavy precipitation events⁷⁹.

Based on these predictions and given the location of the Site, the following climate risks were identified:

- Pluvial, fluvial and groundwater flooding.
- Extreme weather conditions during storms e.g., high winds.
- Increased temperatures.

Section 4.8.4 will outline a number of measures that can be taken to reduce these climate risks.

4.8.4 Mitigation and Adaptation Measures: Whole Lifecycle (Demolition / Construction and Operational Phases)

4.8.4.1 GHG Emissions Mitigation Measures

The Framework CEMP will act as an overarching document that presents a number of considerations that will limit GHG emissions and ensure the Designated Development is in line with industry best practice standards. Where applicable carbon mitigation measures will be secured through the CEMP.

The following list outlines a number of measures that will be considered for integration into the construction, operational and decommissioning phases of the Designated Development, to minimise GHG emissions.

⁷⁷ EPA (2015). *EPA Research Programme 2014–2020. Ensemble of regional climate model projections for Ireland*

⁷⁸ Met Eireann (2022). *Provisionally Ireland's Warmest Year on Record.*

⁷⁹ EPA (2015).

- When sourcing materials for the Designated Development first choice should be given to locally sourced materials.
- Any existing materials already on the Site should be considered for reuse for the Designated Development, where feasible.
- When possible, machinery, vehicles and energy should all use low and zero carbon energy e.g., electric vehicles and solar powered pitch lights.
- Workers will be informed of the ways in which they can reduce their energy use and avoid unnecessary energy consumption onsite e.g., avoid leaving equipment running when not in use and turning off lighting when not in use.
- Reduce potential emissions by minimising the waiting time for loading and unloading materials, and efficiently handling materials on site.
- Undertaking regular maintenance of plant and machinery.
- Refer to **Sections 4.13.4** and **4.13.5**, for waste management mitigation measures.

4.8.4.2 Climate Change Adaptation Measures

Climate change adaptation for infrastructure projects is the process of adjustment to actual or expected climate and its effect to increase resilience, moderate harm and exploit beneficial opportunities. There are a range of measures or options that are available and appropriate for addressing climate change adaptation often described as either Grey, Green or Soft:

- **Grey Actions** - technical or engineering-oriented responses to climate impacts. For example, the construction of a sea wall in response to sea level rise or the consideration of climate change projections in the design of drainage structures.
- **Green Actions** - use nature-based solutions to enhance the resilience of human and natural systems. For example, the addition of green spaces to infrastructure projects to counteract urban heat island effect, or the use of drought and heat tolerant species in landscaping.
- **Soft Actions** - alterations in behaviour, regulation, or systems of management such as increased monitoring of climate change impacts during operation, or the consideration of climate risk in asset management plans. They are flexible and inexpensive to implement.

The following is a number of measures that will be considered for integration into the demolition / construction, operational and decommissioning phases of the Site, to help reduce the effects of climate change and extreme weather events on the Designated Development.

- Preference will be given to construction materials that are more resilient to the identified impacts of climate change.
- The Contractor will monitor weather forecasts and plan works accordingly, protecting workers and resources from any extreme weather conditions.
- Consideration will be given to suitable storage and bunding of any pollutants to protect from high rainfall events.

- Omit any topographic low points and install drainage if required to mitigate the risk of surface water flooding.
- Critical equipment to be raised above estimated peak flood level (e.g., electrical equipment).
- Minimise maintenance during extreme weather events e.g., high wind events.
- Maintenance of the drainage system to be included within the general site management.

4.8.5 Residual Effects

Following the implementation of the recommended GHG emission mitigation measures and climate change adaptation measures the level of unnecessary GHG emissions emitted during the Designated Developments lifecycle will be minimal and the risk posed by extreme weather events, caused by climate change, will be lessened.

4.9 Material Assets

4.9.1 Introduction

This section assesses the potential effect to material assets (built services) as a result of the Designated Development.

Material assets are resources that are valued and intrinsic to the Site and the surrounding area. Material assets can be described as “built services” (*i.e.*, utility networks such as electricity, telecommunications, gas, water supply infrastructure and sewerage), “waste management” and “infrastructure” (roads and traffic)⁸⁰.

The 2022 EPA Guidelines state that:

In Directive 2011/92/EU this factor included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes transport infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils.

The study area is the Site, as well as the surrounding area (within 200m) in relation to land use and utilities network that could be impacted by the Designated Development.

4.9.2 Baseline

Land Use

The WOP Station site is located south of Shannonbridge, Co. Offaly on the eastern bank of the River Shannon. The WOP Station site comprises industrial and brownfield lands, reflecting its long-established use for power generation activity, including fuel management and electricity transmission infrastructure. The WOP Station site has its main access from the R357 (Cloghan Rd.).

⁸⁰ EPA (2022).

There has been continuous production of electricity at the WOP site since 1964 when the station used three generating units to produce electricity. The station was replaced by the existing WOP Station, which was commissioned in 2004. The WOP Station ceased operations on the 11 December 2020.

The WOP Station site accommodates structures and activities typical of a power station including fuel (peat and fuel oil) storage, handling areas and associated plant, the power station - including exhaust gas treatment; filter house, stack and a range of ancillary services including water treatment and management systems, offices and administration areas. Refer to **Figure 1.1, Section 1.5**. The established character and use of the WOP site is industrial; reflecting its long-established use for power generation activity.

The Site is located just outside of the village of Shannonbridge, adjacent to land zoned for either “Enterprise and Employment” or “Industrial and Warehousing” in the Shannonbridge Village Settlement Plan within the Offaly County Development Plan (Offaly CDP) 2021-2027. The areas surrounding the Site are considered a mix of recreation / amenity and green spaces, agriculture and urban settlement.

Electrical Supply

The WOP station is connected to the national grid via a 110 kV substation. Lower voltage supplies are available on the Site from the 110kV substation supplied via step-down transformers for use during construction and operation phases. The Contractor will also be responsible for providing electrical generators as required across the Site during construction.

Surface Water

The existing surface water drainage network collects runoff from building roofs, hardstanding / paved areas and discharges from bunds and storage tanks. Drainage arising from paved road surfaces and buildings, such as the boiler house and turbine house, are conveyed to the existing surface water drainage network on-site and existing settlement pond prior to discharging to the River Shannon.

The extensive drainage network incorporates hydrocarbon interceptors (2 no.), peat interceptors (6 no.) and a suspended solids settlement pond prior to discharging to the River Shannon⁸¹. There are no designated attenuation storage systems or flow control devices associated with the existing development⁸².

Foul Water

The existing WOP Station has a foul Water Treatment Plant (WTP) which was used in the treatment of domestic foul water discharged from the WOP Station site. The existing foul WTP plant will be disconnected as part of the proposed demolition phase (above and below ground structure), refer to **Section 3.3** and **Figure 3 Dismantling and Demolition Plan** (submitted with this application).

An existing septic tank (below ground) on the Site, will also be removed, refer to **Section 3.3**.

Water Supply Network

The River Shannon (Lower) is designated under Article 7 of the Water Framework Directive (WFD), *areas designated for the abstraction of water intended for human consumption*, upstream of the WOP Station site to Banagher.

⁸¹ AWN Consulting Ltd. (2022). *EIAR Chapter 11 Material Assets*.

⁸² ESB (2022). *Drainage & Services Report - West Offaly Power Station. Document No.: QP-000047-02-R460-006-000*

There is one known public surface water abstraction point at Banagher (Banagher Public Water Supply (PWS))⁸³, approximately 10km downstream of the Site⁸⁴. The WOP Station is served by this Irish Water public watermain.

Telecommunications

There are existing telecommunication lines for telephone and fibre services at the WOP site. There are existing underground carrier ducts existing within the Site.

4.9.3 Predicted Effects

Do Nothing Scenario

In the absence of the Designated Development, no significant changes to material assets, are anticipated. There would be no impact with regard to the upgrade and / or connection of utilities proposed as part of the Designated Development.

Demolition / Construction Phases

Land Use

The land use on the Site is industrial, as it is associated with the WOP Station. There will be no effects associated with the change of land use.

The main Site access for demolition and construction phase traffic will be available via existing retained entrances to the existing WOP Station. Direct access to the Site will be via a site gate and the existing internal roadways. Traffic controls will be used to and from the Site as required and will consist of an allocated member of the construction team. It is anticipated that the significance of impact without mitigation will be *Imperceptible* without mitigation.

Power and Electrical Supply

The construction compounds and laydown areas will be located entirely within the WOP Station site. During the demolition and construction phases the Contractor will require power for onsite accommodation, and demolition / construction equipment / plant.

It is anticipated that the power requirements during the demolition / construction phase will be minor, and the significance of impact without mitigation will be *Imperceptible* without mitigation.

Any excavations within the vicinity of existing electrical services will be carried out in consultation with ESB Networks to ensure there is no impact on existing users. It is not anticipated that there will be any impact or disruptions to the national grid during Site works.

All utilities work shall be carried out in accordance with the relevant requirements of the respective service providers.

Surface Water

During the demolition and construction phases, the following potential surface water impacts may occur:

- Sedimentation of surface water features from construction works.
- Pollution of surface waters from accidental spills and leaks of fuels and chemicals.

⁸³ EPA Maps (2023). Available at: <https://gis.epa.ie/EPAMaps/Water>

⁸⁴ AWN Consulting Ltd. (2022). *EIAR Chapter 11 Material Assets*.

Various construction activities have the potential to release sediment and cause unacceptable sediment levels in the catchment area. Contamination from suspended sediments may also be caused by run-off from material stockpiles. Run-off containing large amounts of suspended solids could potentially adversely impact on surface water.

During the demolition and construction phases, there is a risk of accidental pollution incidences from spillage or leakage of oils and fuels stored on-site or refuelling on-site and the spillage or leakage of oils and fuels from construction machinery. For the duration of the demolition and construction phases, mobile plant will be returned to a secure overnight plant storage area on the Site, at the end of each shift. Drip trays will be utilised under the various types of plant.

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

Section 4.7.3 of this report (and **Table 4.37**) outlines the potential construction effects in relation to surface water.

Foul Water

Welfare facilities will be provided by the Contractor on-site during the construction phase. Foul water from welfare facilities during the construction phase will be collected and periodically removed from the Site by road tanker. As this control measure will be incorporated into the Site set-up, there will not be an impact.

Water Supply Network

During the demolition and construction phases, water supply will be provided for by the Irish Water public watermain which will be retained. Water will be used by the following during the construction phase:

- potable water for general purposes - drinking water, toilets etc.; and
- water for fire-fighting purposes.

The water supply arrangements will be carried out to the requirements of Irish Water.

The number of construction workers required during the construction phase is expected to peak at approximately 100 persons.

There is sufficient capacity in the water supply network to facilitate the demolition / construction works, therefore it is anticipated that the potential water supply impacts will be *temporary* and *imperceptible*.

Telecommunications

The exact location of existing telecommunications services (underground / overhead) will be confirmed prior to the commencement demolition / construction works. It is anticipated that the potential impacts will be *temporary* and *imperceptible*.

Operational Phase

Land Use

The land use on the Site is industrial, as it is associated with the WOP Station. There will be no effects associated with the change of land use during the operational phase. Therefore, there are no effects

associated with the change of land use or access during the operational phase of the Designated Development.

Power and Electrical Supply

The eight gas turbine generator units will be connected to one of the two Generator Step-up Transformers (GSUT), 110 kV, which will export to the grid through cable connection to a bay at the existing 110 kV substation, located within the WOP Station site. The significance of impact without mitigation it *not anticipated to be significant*.

Surface Water

During the operational phase, the following potential surface water impacts may occur:

- Pollution of surface waters from accidental spills and leaks of fuels and chemicals.

Diesel fuel storage and preparation for use have the potential to release hydrocarbon contamination to the surface water system and into the catchment area. Contamination may also arise from transformer oil and from chemicals stored on site.

During the operational phase therefore, there is a risk of accidental pollution incidences from spillage or leakage of oils and fuels stored on-site.

Diesel oil will be stored in double wall tanks and in steel tanks located in a concrete bund. Electrical transformers will be located in a bund and chemicals will be stored in bunded containers.

Storage areas will be provided for flammable / toxic / corrosive materials, in a separate location that will be locked, impermeable bunded and fenced off. Material data sheets will be used for all these materials. The significance of impact without mitigation it *not anticipated to be significant*.

Foul Water

The existing WOP Station has a foul Water Treatment Plant (WTP) which was used in the treatment of domestic foul water discharged from the WOP Station site. The existing foul WTP plant will be disconnected and removed as part of the proposed demolition phase (above and below ground structure). An existing septic tank (below ground) on the Site, will also be removed, refer to **Section 3.3**.

Welfare facilities will be provided for the Contractor on-site during the construction phase. Foul water from welfare facilities during the construction and operation phases will be collected in a sump and periodically removed from the Site by road tanker. Refer to **Section 2.3.6.2**. The significance of impact without mitigation it *not anticipated to be significant*.

Water Supply Network

Water supply will be provided from the existing connection to Irish Water public watermain. Water will be used for the following purposes during the operational phase:

- potable water for general purposes - drinking water, toilets etc.; and
- water for fire-fighting purposes.

The water supply arrangements will be carried out to the requirements of Irish Water.

Mains water will be stored in a common firewater / storage tank of approximately 1,600m³ in volume and will be used by the fire water system and for non-potable general domestic supplies. Refer to **Section 2.3.5**. The significance of impact without mitigation is *not anticipated to be significant*.

Telecommunications

Existing telecommunications connections to WOP station include an Eir telephone cable connection and fibre optic system connected to an ESB radio mast on the Site. In addition, mobile phone communication will be used. It is anticipated that all systems will be used during the operational phase. The significance of impact without mitigation will be *Imperceptible*.

4.9.4 Demolition & Construction Phase - Mitigation Measures

The following measures will be implemented during the dismantling / demolition and construction phase:

- Construction works will be carried out in such a way as to prevent, contain or limit, as far as reasonably practicable, any adverse effects arising from the presence of contaminated land or materials (if encountered).
- 'Clean' and 'dirty' (contaminated) work areas will be divided by internal fencing where any contamination is encountered.
- Appropriate Personal Protective Equipment (PPE) will be worn by ground workers and other staff.
- Those potentially at risk will be made aware of potential hazards via site safety induction procedures. Leaks and spills will be prevented, and control measures (outlined in **Section 4.7**) used to prevent contaminants entering the sub-surface or groundwater environment.
- Material removed as part of the construction will be re-used elsewhere in the project where practicable and possible.
- Any soil / overburden encountered will be separated where removal is required and will be conserved and stored in a designated area and appropriately protected, ready for re-use as fill for the project.
- Contaminated materials will be assessed as either: solids; liquids; gas; and leachate to allow for appropriate management.
- The measures outlined in **Section 4.7** will be implemented to prevent the contamination of ground and surface watercourses and aquifers during the works.
- Hazardous dust emissions will be prevented during excavation, or from stockpiles by implementing the measures outlined in **Section 4.2**.
- The Contractor has a duty under the *Safety, Health and Welfare at Work (Construction) Regulations 2013* to protect their employees against hazardous substances encountered at work. To that end and in accordance with CIRIA guidance (R132) *A Guide for Safe Working on Contaminated Sites (1996)*, the Contractor will be required to undertake a risk assessment before any work is carried out at the site which is likely to expose staff to substances hazardous to health. Should hazards be identified during additional site investigation, the Contractor will be

required to ensure that all employees (construction workers) are issued with personal protective equipment (PPE) appropriate to the hazards identified. PPE could consist of hazard specific gloves, eye protection and respiratory protective equipment (RPE).

4.9.5 Operational Phase - Mitigation Measures

There will be no requirement for additional mitigation measures during the operational phase.

Operational procedures will be in place that will clearly outline responsibilities for operational staff / site personnel. Operational phase employees will receive the appropriate training required for their role, including responding to emergency events such as fires and floods etc. These operational measures will be included in the Environment Management System (EMS) and regulated by EPA through the IE Licence.

Water supply arrangements will be carried out to the requirements of Irish Water.

4.9.6 Residual Effects

Following the implementation of these mitigation measures and the measures in the Framework CEMP (refer to **Appendix B**), it is unlikely that there will be any residual effects on material assets during the demolition, construction and operational phases of the Designated Development.

4.10 Cultural Heritage

4.10.1 Introduction

This section assesses the potential effect to archaeological, architectural and cultural heritage assets as a result of the Designated Development.

No features of archaeological or architectural heritage were identified in a previous archaeological study at the WOP Station site, which has been characterised through previous archaeological evaluations. The Designated Development is located within an industrial site and industrial setting which has been previously disturbed by the construction of the WOP Station.

4.10.2 Baseline

No recorded archaeological assets are located within the boundaries of the Site. The closest reported heritage asset concerns the report of human remains being uncovered in June 1963 at the original station (Shannonbridge Power Station) located to the immediate south of the Site. These human remains comprised between sixteen and 24 skeletons which were located 0.46m below ground level (BGL) and all aligned in the same direction although the orientation was unspecified. A possible iron knife was recovered from the one of the graves and the remains were reburied locally. The site was not further investigated at the time and the current whereabouts of the knife and remains is unknown. No further discoveries have been reported during the subsequent phases of work at the power station.

There are seven recorded archaeological assets within a 1km study area around the Site. The closest of these to the Site are a church (OF013-007001) and graveyard (OF013-007002) which are located 390m to the south-east of the Site. The church comprises a small rectangular structure which only survives as the east end of the south wall and wall footings elsewhere. The church is located within a

square area measuring 33m north to south by 34m east to west and enclosed by a bank of earth and stone. The graveyard (OF013-007002) comprises rows of upright unmarked stones aligned in north to south rows in the southern sector of the enclosure. These are the grave-markers of unbaptised children which were probably interred after the church went out of use. The original station (Shannonbridge Power Station) is located 80m to the north-west and it is possible that the human remains uncovered in 1963 are related to this church (OF013-007001).

The settlement of Shannonbridge derives from a crossing point on the River Shannon as its name suggests. The ford of Raghra (OF013-037001) is mentioned in 1620 and appears to have been a weir probably located where one is shown on the 1st edition OS map (1837) 50m below the current bridge and 740m to the north-west of the Site. Subsequent descriptions of the crossing point describe it as a ford (OF013-037002) and fish weir (OF013-037003).

The location was and remains one of the few crossing points on the River Shannon, a waterway which was bounded by bog and woods in the past which hindered access. Shannonbridge was also a crossing point for the road to Athlone. This crossing had great strategic value which saw the location protected. The earliest recorded fortification is a castle (OF013-010) which was thought to have been located on the site where the Constabulary Barracks is marked on the 1st edition OS map (1838). This site, on the main street of Shannonbridge, is 634m to the north-west of the Site. The Constabulary Barracks has been levelled and replaced by a modern bungalow which served as a Garda Station. The walled perimeter of the Constabulary Barracks may contain cut stone from the levelled castle.

The ford of Raghra (OF013-037002) was replaced by a bridge (OF013-037001 / RO056-018001) of 17 arches in c.1700. In 1755 the Commissioners of Inland Navigation built an extra span on the east bank which was replaced in 1845 by a cast iron swivel bridge (NIAH 14805010) to replace this span as part of improvements to the Shannon Navigation to allow steamers to pass. The swivel bridge (NIAH 14805010) itself, was replaced by a concrete span in 1983-4. The bridge (RO056-018001) is also recorded on the County Roscommon Record of Protected Structures as 05600027 and on the County Offaly Record of Protected Structures as 19-08. The cast iron swivel bridge (NIAH 14805010) was relocated to the quayside and is recorded on the County Offaly Record of Protected Structures as 19-08.

The strategic value of Shannonbridge continued especially during the late 18th century and early 19th century when the threat of French invasion was high. An earthwork of two redoubts was built in 1804 and upgraded to the current battery (RO056-016) by 1817. This battery is located on the County Roscommon side of the River Shannon 790m to the north-west of the Site. This battery is a substantial structure with its defences including redoubts with gun loop openings, a caponniere (a vaulted structure designed to be bomb proof), batteries and earthworks known as glacis, which sloped to expose attackers to fire.

This bridgehead fortification is unique within Ireland and Britain and consequently is considered of great historic significance. It is subject to a preservation order made under the National Monuments Acts 1930 to 2014 (PO no. 1/1974) and is also recorded as 05600028 and 05600029 on the County Roscommon Record of Protected Structures.

A further fortification (RO056-017) is located on the west side of Lamb Island 130m to the north of the later, unrelated, battery (RO056-016). This earlier battery (RO056-017) comprises a rectangular grass-covered area defined by ditches at north and south and by banks at east and west. There is a raised platform inside the grass covered for artillery which would have fired west through two double-splayed openings in the west bank.

The settlement at Shannonbridge developed close to the crossing point especially after the construction of the bridge (RO056-018001) in c.1700. Further development occurred during the mid-1750s when an early navigation scheme was completed at Shannonbridge comprising a short canal with a flash lock were constructed. Other associated development is a lockhouse which is recorded on the County Offaly Record of Protected Structures as 19-06 and on the National Inventory of Architectural Heritage as NIAH 14805008. This lockhouse is located 720m to the north-west of the Site. It consists of a detached three-bay two-storey lock keeper's house, built c.1760, to a design by the architect Thomas Omer. It fronts east onto the main street and is now used as a tourist office.

One other building within Shannonbridge dates to this period. This is a house recorded on the County Offaly Record of Protected Structures as 19-11. It is located at the east end of Main Street 340m to the north-east of the Site. The building comprises a 2-storey gable ended house.

The fortifications added during the early 19th century saw a sizeable garrison located at the bridge while other development related to improvement to the Shannon Navigation. The cast iron swivel bridge (19-08) replaced the eastern span of the bridge as part of improvements to the Shannon Navigation to allow steamers to pass. Replaced in 1984, it was relocated to the quayside 680m to the north-west of the Site. Another feature located on the quayside is a cast-iron crane (19-07) which was erected c.1840 to lift loads from canal barges. The crane remains intact and is located 700m to the north-west of the Site.

Lewis (1837) described Shannonbridge as having 559 inhabitants which was a sizeable village at the time. Nineteenth (19th) century buildings within the village include the former St. Kieran's Church (19-03), St. Kieran's Church (19-02), Luker (19-05) and The Laurels (19-04). The former St. Kieran's Church (19-03) is the earliest of these dating to 1858 and comprising a detached T-plan former Roman Catholic church. It was deconsecrated and replaced by the current St. Kieran's Church (19-02) in 1965 and is now used as a community centre located 500m to the north-northwest of the Site.

Luker (19-05) is a terraced two-bay two-storey house built around 1860, with a shopfront and two-storey return and extensions to rear. It is located on Main Street 670m to the north-west of the Site and is now used as a public house. The Laurels (19-04) is located on Main Street within the centre of Shannonbridge and comprises a detached four-bay two-storey house, built around 1880, with a return to the rear.

The remaining architectural heritage within Shannonbridge dates to the 20th century and represents modern development and change within the settlement. The detached six-bay single-storey national school (19-01) was built in 1940 with single-storey blocks to the rear angles and a modern extension to rear. It is set back from the road 382m to the north of the Site. Built slightly later in 1950 is the concrete water tower with adjacent pump house. Four stilts with horizontal tie-beams support the square-profile reservoir while the pump house is flat roofed with rendered and brick walls. They are located 466m to the north-northeast of the Site.

The final architectural heritage is the current St. Kieran's Church (19-02) which replaced the original church (19-03) in 1965. It is detached seven-bay double-height Catholic church on a rectangular plan comprising six-bay double-height nave opening into single-bay double-height apse (east) on a half-octagonal plan. It is considered to represent an integral component of the 20th-century built heritage of Shannonbridge and is located 424m to the north-north-west of the Site.

Archaeological Investigations

Three previous archaeological investigations have taken place within the townland of Cloniffeen where the Site is located. The first of these, in 2002, is directly associated with the Site and WOP Station (Whitaker, 2002). Two phases of monitoring were carried out in the environs of Shannonbridge power station to facilitate the construction of an access road and the new power station (the Site). The location was deemed archaeologically sensitive due to its location close to the River Shannon and the Bord na Móna raised bogs where archaeological remains have been uncovered.

The first phase of monitoring took place in May 2002 in relation to the construction of the new access road. This road is located across the old ash disposal ponds which were found to be deeper than originally thought. Original ground level was not encountered with all works taking place within the ash. The second phase of monitoring took place between September and October 2002 in relation to the construction of the new WOP Station. This found that the footprint of the new power station was set on ground that had been badly disturbed with the underlying deposits comprising ash waste, brick and disturbed subsoil.

The two remaining archaeological investigations are associated with the Bord na Móna Blackwater bog which is located to the east of Shannonbridge and includes part of the townland of Cloniffeen. The investigations were not associated with the Site and took place within the commercially exploited bog.

The earlier of the investigations took place in 2009 and related to a re-assessment survey of bogs which were originally assessed in 1992 and 1993 by the Irish Archaeological Wetland Unit (Rohan, 2009). These previous surveys had identified 26 wetland archaeological sites (wooden trackways) which were located outside the townland of Cloniffeen. The resurvey found that these sites had been milled out or were overgrown and unrecognisable. Approximately 50% of the bog was cutaway, with the remaining 50% in production at the time of survey. The cutaway areas were milled down to basal marl, early tree horizons, covered with vegetation, planted with forestry or flooded to provide a habitat for wildfowl. No new wetland sites were identified during the resurvey.

The second archaeological investigation took place in 2013 and related to a re-assessment field walking survey carried out in Curraghmore Bog on behalf of Bord na Móna on sites recorded in 1992 (Whitaker, 2013). Curraghmore Bog measures c. 250ha in size and has been in production since 1992. A large portion of the central part of this bog has been out of production and has become considerably overgrown with shrubs and large birch trees. No sites were recorded during the course of the 2013 re-assessment field survey. Some of the previously recorded sites may remain extant in the overgrown area but this was not possible to determine owing to the lack of visible field or drain surfaces.

Historic Map Regression and General History of the Area

A previous EIAR (AWN Consulting Ltd.⁸⁵) has been completed regarding a larger development comprising the proposed demolition and removal of the existing WOP Station and other buildings within ESB controlled land, and to develop a synchronous condenser (Synch Con) and a battery energy storage system (BESS). This EIAR includes an Archaeological, Architectural and Cultural Heritage chapter which has carried out an historic map regression and general history for the Site. The results of this are outlined and elaborated upon below.

The actual settlement of Shannonbridge is associated with the bridge (RO056-018001 / OF013-037001) which was constructed around 1700 formalising the crossing point and replacing the ford (RO056-018002 / OF013-037002). The Down Survey of Ireland was drawn in the years between 1656 and 1658, The survey, led by William Petty, aimed to establish all the land to be forfeited by the Catholic Irish in order to facilitate its redistribution to Merchant Adventurers and English soldiers (www.downsurvey.tcd.ie). The Down Survey 'Barony of Garrycastle, in the County of Offaly' shows the area of the Site. The ford of Raghra (OF013-037001) would have been extant at this time although it is not marked and Raghra castle (OF013-010) is marked adjacent to the River Shannon. No settlement is shown at the location although it is likely that one associated with the castle would have existed. Nothing is shown at the location of the Site with the surrounding area labelled 'Raghra Protestant Land'.

The Taylor and Skinner map shows the location of the Site in 1777. This map was funded by Ireland's noblemen and gentry with the aim of mapping Ireland's road network. Given this, details depicted on the map are high level but do show the bridge (RO056-018001/OF013-037001) as well as housing on both sides of the road in both Offaly and Roscommon. Raghra castle (OF013-010) is not shown and no indication is given for any other fortifications on the river bank although this may have been a deliberate omission. The area of the Site is shown as open ground between the river and the road. A building is marked to the southeast although the Site appears undeveloped.

The late 18th century / early 19th century saw increasing development within the area both commercially and militarily. Improvements to the River Shannon saw sections of canal cut to improve navigation and the lock keeper's house (19-06) would have been in existence. The French landing at Bantry Bay, Cork in support of the United Irishmen in 1798 had spurred a wave of fortification across Ireland including at Shannonbridge. These fortifications are shown on a military map of 1810 and include the battery (RO056-017) on Lamb Island and the battery (RO056-016) on the west bank of the river and other smaller defences. The settlement at Shannonbridge is shown in good detail although the area of the Site is outside this and not depicted. The adjacent ground shown suggests that the area was still open and undeveloped.

The 1st edition OS map (1837) shows the area in good detail 27 years after the military map of 1810. While the battery (RO056-017) on Lamb Island is identified as being ruined, the battery (RO056-016) is clearly marked with barracks identified on both sides of the river. An Ordnance Ground with Sod Batteries is also identified on the east bank of the river immediately to the south of the bridge (RO056-

⁸⁵ AWN Consulting Ltd. (2022). *EIAR. Chapter 14.*

018001/OF013-037001). A weir is indicated to the south of the bridge and this is thought to be the location of the ford of Raghra (RO056-018002).

The settlement of Shannonbridge is clearly shown although few buildings are identified bar the barracks possibly built on the former location of the castle (OF013-010) and the Roman Catholic chapel (19-03). The location of the Site is shown as largely open ground crossed by north-south orientated lane with some field boundaries shown. These boundaries are straight enclosing rectangular fields. A small farm with a well is shown to the south of the Site, while Templeduff Church (OF013-007001) and graveyard (OF013-007002) are clearly identified further to the south.

The 2nd edition OS map shows the area of the Site in good detail. The area of the Site appears largely unchanged from the previous map edition with the exception of the farm buildings which are now shown as ruined. The field boundaries and laneway are as previously shown. Templeduff Church (OF013-007001) and graveyard (OF013-007002) are labelled to the south but appear out of use.

Shannonbridge is largely unchanged with the settlement no larger than previously shown. The settlement is now shown in greater detail with elements identified especially in relation to the quayside and Shannon Navigation. The swing bridge (19-08) is marked at its original location on the east end of the bridge (RO056-018001/OF013-037001) while the crane (19-07) is marked on the quayside with goods sheds adjacent. The former batteries are still shown although in poor detail including the remains of the sod batteries on the east bank of the river.

The original power station (Shannonbridge Power Station) was commissioned in 1964 and was the largest of the five peat burning stations at the time it was built (AWN. 2022⁸⁶). Units 1 and 2 were commissioned in 1965 and 1976 respectively, while a more modern unit 3 was commissioned in 1982 at a capacity of 45MW. The layout of the Site is shown on the black and white aerial photograph taken in 2005. This clearly shows the original Shannonbridge Power Station as well as the area to the north where the WOP Station / Site will be located. This area has access tracks running across it and appears disturbed as do the adjacent areas to west and north. It is bounded by an access road to the west and railway tracks to the east.

The aerial photograph from 2000 is in colour showing the Site in good definition. The original power station is still in operation while the area of the Site is shown as a mixture of bare earth and vegetated ground bounded by the access road to the west and railway tracks to the east. By the 2005, the WOP Station has been constructed with the area now occupied by the station's structures. The railway line has been extended to curve around the northern extent of the new station while the original station is still extant.

The recent aerial photograph (2022) shows the Site's current layout. The WOP Station is now the only structure on the Site with the original station removed and its location remediated. The railway line also appears disused with its tracks lifted and two buildings built on it. While grassed areas are visible, it is evident these are located on disturbed ground as witnessed on the earlier aerial photographs.

⁸⁶ AWN Consulting Ltd. (2022). *EIAR Chapter 14*.

4.10.3 Predicted Effects

Do Nothing Scenario

The 'do nothing' scenario would not result in any significant changes to the baseline cultural heritage resource.

Demolition / Construction Phases

There are no recorded heritage assets within the boundaries of the Site of the Designated Development. Human skeletons were reportedly uncovered during groundworks associated with the construction of the original power station (Shannonbridge Power Station) to the south in 1963 and subsequently reburied. This has not been confirmed and the location of the reburied skeletons is unknown.

The Designated Development concerns the demolition of some existing structures and the instalment of eight 35 MWe (nominal capacity) TEG units at WOP Station. The WOP Station has been modified / upgraded since it was constructed with significant groundworks carried out. These groundworks will have impacted any unrecorded heritage assets which may have existed. This was confirmed during archaeological testing associated with the construction of the WOP Station in 2002 found the underlying ground conditions to comprise ground that had been badly disturbed with the underlying deposits comprising ash waste, brick and disturbed subsoil. Given these conditions, there will be no physical impact to unrecorded heritage assets during the demolition / construction phases.

Groundworks associated with the Designated Development will introduce noise, dust and vibration to the study area while the physical presence of the eight emergency generating units with their 30m high emissions stacks will create a visual element against the existing skyline. These could impact the settings of heritage assets especially the Protected Structures.

The majority of the Protected Structures / heritage assets are located within Shannonbridge which is a small settlement located on a river crossing point. The settings of the Protected Structures / heritage assets are already subject to noise, dust and vibration from passing traffic and also the WOP Station. Noise, dust and vibration arising from groundworks will not affect the ability to understand or appreciate the Protected Structures / heritage assets and will be limited to the demolition / construction phases.

There are no direct views between the majority of the Protected Structures / heritage assets within Shannonbridge and the Designated Development. Therefore, the presence of the eight OCGT units will not create a visual impact upon the settings of these assets. The bridge (RO056-018001/OF013-037001) and battery (RO056-016) will have direct views of the eight emergency generating units although these will be set against the backdrop of the existing taller WOP Station. The WOP Station is already a feature within the settings of these heritage assets and the presence of the eight emergency generating units will not affect the ability to understand or appreciate the Protected Structures. The change to setting would be such that the special interests or qualities of these assets are only slightly affected without a noticeable change, leading to a magnitude of impact of *Low*, leading to a significance of effect of *Slight*. The quality of the *Slight* significance of effect is judged as *Neutral* while its duration is long-term.

Templeduff Church (OF013-007001) and graveyard (OF013-007002) are located to the south of the Designated Development. Noise, vibration and dust impacts associated with the development works will not be significant and will not impair the appreciation of these heritage assets. Moreover, the

proposed locations of the emergency generation units are set behind the WOP Station and there are no direct views. The change to setting would be such that the special interests or qualities are slightly affected without a noticeable change, leading to a magnitude of impact of *Low* and a significance of effect of *Imperceptible*.

Operational Phase

Significant effects for the operation of the Designated Development derive from changes to the setting of heritage assets. As the impacts to the setting of designated assets within the wider study area will be the same as for the permanent construction of the Designated Development, these are not restated here. The significance of effects for the operation of the Designated Development on heritage assets will therefore be the same as determined for the demolition and construction Phase on those individual assets *i.e.*, of *Low* and a significance of effect of *Imperceptible*.

4.10.4 Demolition & Construction Phase - Mitigation Measures

Given this, no archaeological mitigation is required during the dismantling / demolition and construction phase.

Should any archaeological features or material be uncovered during archaeological testing or any phase of the dismantling / demolition and construction phase, ground works will cease immediately, and the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage (DHLGH) will be informed. Time must be allowed for a suitably qualified archaeologist to inspect and assess any material. If it is established that archaeologically significant material is present, the NMS may require that further archaeological mitigation be undertaken.

4.10.5 Operational Phase - Mitigation Measures

Appropriate measures will have been implemented at demolition / construction phase to avoid or reduce adverse visual effects. No further mitigation is proposed with respect to heritage assets for the operational phase.

4.10.6 Residual Effects

This section describes the resultant residual significance of effects on cultural heritage assets following mitigation in relation to the Designated Development. This assessment has identified that, after mitigation, there would be impacts upon the settings of two designated heritage assets and two non-designated assets.

No specific mitigation for setting has been proposed in this section regarding these assets. For the two designated heritage assets the residual effect would remain *Slight*, leading to a *Neutral* effect, which is not significant.

For the two non-designated heritage assets the residual effect would remain *Imperceptible* and *Neutral*.

4.11 Landscape and Visual

4.11.1 Introduction

This section assesses the likely significant effects on the landscape and visual resource on the Site and surrounding area as a result of the Designated Development.

4.11.2 Baseline

The Site is located on the east bank of the River Shannon immediately south of Shannonbridge in the north-west corner of Co. Offaly. County Galway is to the immediate west, with County Roscommon to the immediate north-west.

The village of Shannonbridge is located on the east side of the 16 arch stone bridge crossing the River Shannon. Taking its name from the bridge, the settlement is linear in nature, extending approximately 1km along the R357 from the bridge. Significant structures and fortifications associated with the Napoleonic Fort, which protected the bridge crossing, lie on the west bank of the river. A former lock keeper's house is located at the east end of the bridge. The fortifications and bridge are recorded monuments and are also included on the National Inventory of Architectural Heritage (NIAH), as is the lock keeper's cottage. The existing WOP Station is a prominent visual feature in many existing views from the outskirts of Shannonbridge and surrounding regional and local roads as well as from the River Shannon and River Suck itself in a fairly flat landscape. The main receptor groups include residents, vehicle users and visitors to the area (including activities on the rivers).

Shannonbridge is the main centre of population in the area, however, residential development stretches out along the main roads: particularly south-east along the R357. A relatively narrow area of agricultural pasture with hedgerows and treelines follows the corridor of the River Shannon and the River Suck, a tributary to the River Shannon located to the west of the River Shannon and merging with the River Shannon west of the Site. East and west of Shannonbridge lies extensive areas of open peatland often edged by naturalised scrub and trees. Proposals exist to develop a network of greenways through the peatland landscape, potentially making use of the Bord na Móna network of narrow-gauge railways.

The River Shannon is the dominant landscape and visual feature in the area. The river is wide and strong flowing with islands dividing the main channel of the river, notably upstream of the bridge. The river is a major tourism asset and visitor attraction, particularly for cruising and fishing. The river is also the setting for a number of riverside amenities and recreational areas, including a looped walk – 'Shannonbridge Shannon River Loop' – which extends north from the bridge / fortifications along the west bank of the river. Shannonbridge marina is located on the east bank of the river north of the bridge. Shannonbridge is also an attractive settlement enhanced by the quality of its cultural and architectural heritage including the bridge, barracks and fortifications.

Shannonbridge is located less than 7km from the internationally significant cultural landscape and 6 century monastic site of Clonmacnoise. Clonmacnoise is included on the 'tentative list' for designation as an UNESCO World Heritage Site.

Roscommon County Development Plan 2022-2028

The *Roscommon County Development Plan 2022-2028* (Roscommon CDP) provides information, objectives and policies of relevance to the landscape and visual environment for the areas on the west bank of the River Shannon north of its confluence with the River Suck (west of the Site).

The LCA of County Roscommon divides the county into 36 No. separate Landscape Character Areas. Landscape Character Areas⁸⁸ *No. 9: Cloonown and Shannon Callows* runs along the west bank of the River Shannon north of county boundary (River Suck) with Galway. The Landscape Character Area is described as being of Very High Value.

Galway County Development Plan 2022-2028

The *Galway County Development Plan 2022-2028* (Galway CDP) provides information, objectives and policies of relevance to the landscape and visual environment for the areas on the west bank of the River Shannon south of its confluence with the River Suck (west of the Site).

The LCA of County Galway divides the county into ten separate Landscape Character Types (LCT). LCT *No. 8: Shannon Environs Landscape Type* runs along the west bank of the River Shannon and southern bank of the River Suck (which is the County Galway boundary with County Roscommon). The LCT is described as being “Special”.

4.11.2.2 Views and Prospects

Offaly County Development Plan 2021-2027

Section 4.14.2, Map 4.24 and Tables 4.21 and 4.22 of the Offaly CDP relates to Key Scenic Views, Prospects and Key Amenity Routes. However, the Site does not come within the visual context of any such identified view, prospect or route.

Roscommon County Development Plan 2022-2028

Appendix 1 of the Roscommon LCA identifies nine Scenic Routes and 26 No. Scenic Views within County Roscommon. However, none of the scenic routes / views are in proximity to the Site.

Galway County Development Plan 2022-2028

The Galway LCA identifies 52 No. Scenic Views and seven Scenic Routes within County Galway. However, none of the views or routes are in proximity to the Site.

4.11.2.3 Sensitive Receptors

The Site is located on the edge of the village of Shannonbridge, where it is close residential, community and recreational land uses. The Site is also located on the eastern bank of the River Shannon, a major landscape, visual, natural heritage, amenity, recreational and tourist asset.

4.11.2.4 Land Use and Settlement

The WOP Station site comprises industrial and brownfield lands, within which the Designated Development is located.

The Site accommodates large industrial buildings and associated ancillary structures, including water treatment and management systems, offices and administration areas, areas of hard standing, and overhead transmission lines typical of a power station.

⁸⁸ Landscape Character Areas are unique, geographically-specific areas of a particular landscape type.

4.11.3 Predicted Effects

Do Nothing Scenario

All components of the environment are constantly changing due to a combination of natural and human processes. When predicting likely direct and indirect effects it is important to remember that there are two available for comparison: the existing environment and the environment as it will be in the future if no development of any kind were to take place – the ‘do nothing’ impact.

In landscape terms, if the Designated Development did not go ahead, the Site will remain as a significant industrial feature in the landscape character. The significance will be *imperceptible* and *neutral*.

In visual terms, the content in available views will remain similar without significant changes to the visual amenity. Likely changes will relate to changes to the existing vegetation due to maturing, pruning or natural development. The significance will be imperceptible and neutral.

4.11.3.1 Landscape Effects

The Designated Development is located within boundary of the existing WOP Station, on the eastern banks of the River Shannon. The Site is located in close proximity of Shannonbridge, adjacent to land zoned for either “*Enterprise and Employment*” or “*Industrial and Warehousing*” in the Shannonbridge Village Settlement Plan within the Offaly CDP 2021-2027.

Figure 3 Dismantling and Demolition Plan (submitted with this application) shows the existing structures and plant to be dismantled / demolished. The list of existing structures and plant (including associated concrete foundations) which are intended to be dismantled / demolished include:

1. Rising Conveyor and associated reinforced concrete plinth supports (Blocks 1 & 8) (above and below ground structure).
2. Sewage Treatment System (Block 2) (above and below ground structure).
3. Septic Tank (Block 3) (Below Ground Structure).
4. Electrical Room (Block 4) (Steel Frame on Ground Bearing RC Slab).
5. Contractor's Office Building (Block 5).
6. First Aid Room Building (Block 6).
7. Maintenance Building (Block 7).
8. Entrance Gate, Fencing and Road (Block 9).
9. Laboratory / Office Building (Block 10).
10. Railway Service Building (Block 11).

Direct or indirect effects on the fabric of the landscape and its receptors are closely related to the nature and extent of visibility. The introduction of the Designated Development will not significantly modify the landscape character of the Site, as it will continue to remain industrial, and the structures associated with the Designated Development are of smaller massing and height than some of the existing structures at WOP Station.

As stated in **Section 4.4.4.3**, limited natural habitat is present on the Site, comprising small areas of existing vegetation with shrubs, immature trees and clusters or bands of semi-mature trees. It will be necessary to remove elements of the existing vegetation within the Site which directly impacts the Designated Development. The ornamental lines of trees located along the north-west perimeter of the Site will be removed to facilitate the initial ground investigation work, and in turn the Designated Development. These trees have not yet matured and offer little in the way of visual screening.

Direct changes to the character of the existing WOP Station site as a result of the Designated Development, include structures associated with the eight emergency generating units. The most prominent features are the 30m high emissions stacks which will not change but intensify short-term the existing industrial character of the Site, albeit with other existing structures being removed. Considering the low landscape sensitivity (as indicated in Figure 4.22 of the current Offaly CDP) of the Site, the alteration will be noticeable when seen in the context of the existing industrial landscape character of the Site, but the magnitude of landscape change will be low and the significance / quality will be *slight / adverse*.

Indirect changes and the perceptibility of the intensification of the existing industrial landscape character in the study area will reduce quickly with increasing distance from the Designated Development. The Designated Development will be seen in conjunction with existing significant WOP Station industrial infrastructure. The addition of the Designated Development will be noticeable, but it will not alter the landscape character further due to the proposed scale, location and nature of the Designated Development within an existing industrial environment. The magnitude of landscape character change within approximately 1km from the Site of the Designated Development is considered to range between low and *negligible* and *short-term*. The resulting significance / quality is considered to range between *slight / adverse* and *not significant / neutral* depending on the distance to the Site and the number of various landscape character elements visible in available views.

The magnitude of the intensification of the industrial landscape character beyond approximately 1km will be *negligible* and *short-term* with increasing distance. The significance / quality is considered reduce to *imperceptible / neutral*.

4.11.3.2 Visual Effects

The main visual receptor groups are residents, vehicle users, workers and visitors / tourists. Local residents will have a high susceptibility and sensitivity to changes in the visual amenity as they will experience those on a daily basis from their homes. Vehicle users will experience transient views and workers will focus mainly on commercial tasks and not primarily on available views. Both receptor groups have therefore a low susceptibility and sensitivity to change in available views. Visitors / tourists will have a medium susceptibility and sensitivity to changes in available views as some of their activities, including some of the water related activities, will be cognisant of the visual amenity, and form an important part of the experience of the area. However, the existing large industrial features are already part of the visual experience of all main receptor groups. The proposed alterations to the site will be readily noticeable in particular the introduction of the eight 30m tall stacks. These will be seen in conjunction with the remaining existing industrial features. The addition of the proposed facilities will intensify and increase the prominence of industrial features in available views.

Close distance (within approximately 500m) visual effects will mainly relate to the introduction of additional structures and the associated 30m high x 8 no. emissions stacks. *Short-term*⁸⁹ (c. 5 years) noise attenuation walls (acoustical screens) will be erected around the boundary of the Site (as shown on **Figure 2 Site Layout Map** (submitted with this application)) for the duration of the operational phase of the Designated Development. The noise attenuation walls / screens will range between 3m and 12m in height and be sited in accordance with the requirements of the noise assessment (refer to NIS, APEM (2023)). The Designated Development will be visible from immediately surrounding areas, especially from Shannonbridge and from more immediate areas along the River Shannon and north of the Site. The magnitude of the visual effects is considered *medium* and *short-term*, and their significance is considered *moderate* / *adverse*.

The visual prominence of the Designated Development will reduce in medium distance views (within approximately 500m and 1.5km) as intervening existing vegetation, topography or existing built structures will either partially or fully screen views. In the majority of views, the Designated Development will be seen in conjunction with the existing remaining power station structures. The magnitude of the visual effects is considered low and *short-term*, and their significance / quality is considered *slight* / *adverse*.

The magnitude of visual change in long distance views is considered to range from low to negligible due to the effects of distance and intervening features, which can either fully or partially screen the Designated Development. Available views will see the Designated Development in conjunction with the existing remaining power station structures. While recognisable, the overall perception of the view will not be altered. The significance / quality is considered *not significant* or *imperceptible* / *neutral*.

4.11.4 Demolition & Construction Phase - Mitigation Measures

Mitigation is a term used to describe the measures that are employed to address environmental effects. The purpose of mitigation is to avoid, reduce and where possible remedy or offset, any significant adverse direct and indirect effects on the environment arising from the Designated Development.

The Contractor's CEMP will detail the Contractor's overall management during the dismantling / demolition and construction phase. The CEMP will incorporate all of the mitigation measures required to ensure that the work is carried out in a way that minimises the potential for impacts to occur to the landscape, natural heritage and visual environment.

- Existing landscape areas within and on the boundary of the Site, including along the boundary with the River Shannon, shall be fenced off and protected during the dismantling / demolition and construction phase. These areas will not be used as compound or laydown areas.
- Construction compounds will not be located within the root protection area of trees or plantings to be retained. Proposed lighting within compounds and on the Site shall be directed downwards and shall not be directed to or illuminate landscape areas within the Site or areas outside of the construction site.

⁸⁹ EPA Guidelines terminology (2022).

- The compound areas will be fully decommissioned and reinstated at the end of the construction phase.

4.11.5 Operational Phase - Mitigation Measures

The following measures are detailed for the operational phase of the Designated Development.

- Existing trees, hedgerows and vegetation retained within the WOP Station site (excluding the ornamental trees located along the north-west perimeter) and including on the boundary with the River Shannon, will be maintained and managed in accordance with good ecological and landscape practice so as to ensure their continued growth and development. These are expected to provide partial screening of the Designated Development from sensitive receptors.
- Lighting within the Site shall be directed downwards and shall not be directed towards or illuminate landscape areas within the Site or any areas outside of the Site.
- Minimise lighting during night-time

4.11.6 Residual Effects

The proposed retention of existing trees and tree belts where possible will help to maximise the visual screening of the Designated Development at lower levels. The short-term nature of the Designated Development will not allow for sufficient time for potential additional vegetation to reach semi-maturity or maturity. Therefore, given the scale, location and *short-term* nature of the Designated Development, the effects on landscape character and visual amenity will remain similar as described in **Section 4.11.5** above.

4.12 Traffic and Transportation

4.12.1 Introduction

This section assesses the potential effect on the traffic and transport network as a result of the Designated Development.

A high-level desktop assessment was undertaken to describe the baseline traffic conditions, and to identify the potential impacts associated with the Designated Development upon the surrounding road network. This assessment is based on information at the time of writing and the data limitations described in the following sections.

4.12.2 Baseline

Access to the Site will be available via existing retained entrances to the existing WOP Station. Direct access to the Site will be via existing site entrances and the existing internal roadways.

The Site is accessed from the R357 which connects to Ballinasloe to the north-west and Cloghan to the south-east of Shannonbridge respectively. The Site is accessed via two routes, leading east and west along the R357. The existing western priority junction with the R357 (at St. Kieran's Church) is the main access for the Site, whilst the eastern junction was used by Bord na Móna for the delivery of fuel to the WOP Station site during its operation.

4.12.2.1 Road Network

Existing Road Access

The existing road network within the vicinity of the Site is illustrated in **Figure 4.10**.

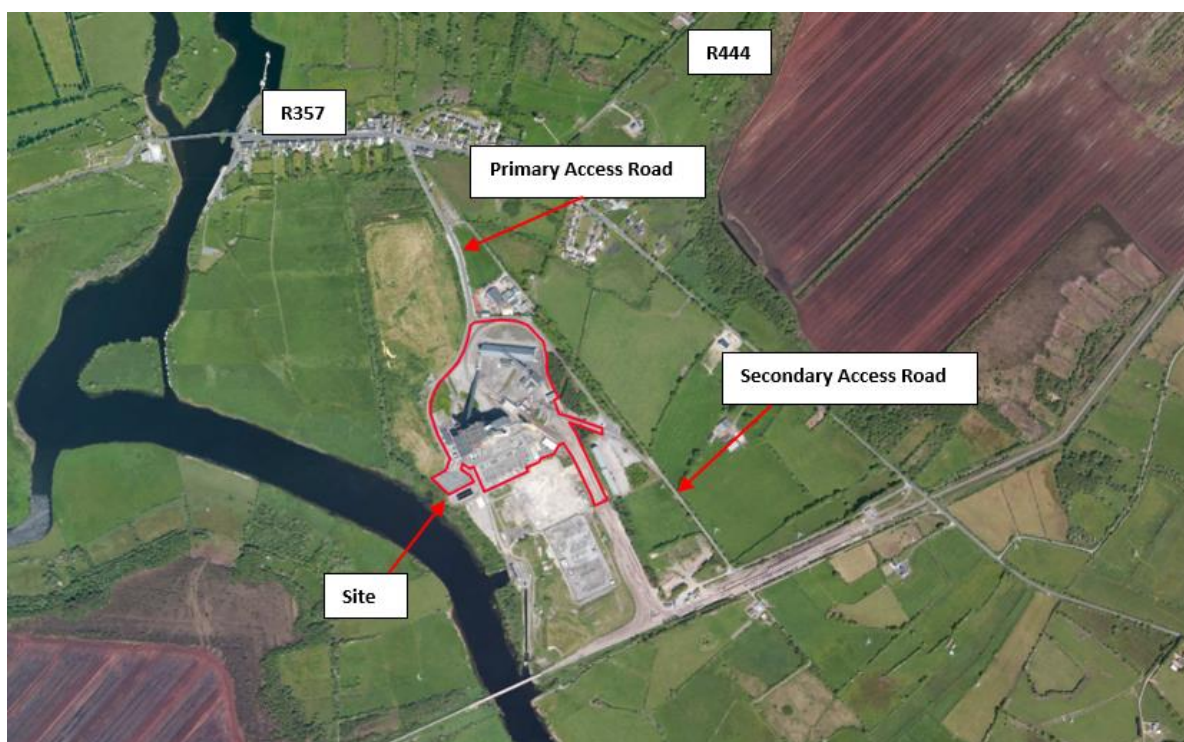


Figure 4.10: Site Location Map with Access Roads⁹⁰

Primary Access Road

The WOP Station site is accessed from the R357 by a priority junction in Shannonbridge, as shown in **Plate 4.1**. The Primary Access Road is a single carriageway subject to a 50 km/hr speed limit and street lighting is provided. A zebra crossing is provided approximately 30m from the junction with the R357 in the vicinity of the St. Kieran's Church access. There is a footway on one side of the road for a section reverting to gravelled surfaces to both sides of the road as the road gets closer to the power station. The road terminates at the WOP Station / car park access.

⁹⁰ Source: OpenStreetMap (2022).



Plate 4.1: Station Access Road Junction⁹¹

Secondary Access Road

A secondary Site access that was used by Bord na Móna for fuel deliveries links to the southern part of the Site via a priority junction with the R357, refer to **Plate 4.2**. The 5m wide single carriageway is part private and part public road, and is subject to an 80 km/hr speed limit on the public section. No street lighting is present and there are no pedestrian facilities present with only a grassed verge located on either side of the road.



Plate 4.2: Secondary Access Road Junction⁹²

R357 West and River Bridge

The R357 north-west passes through the village of Shannonbridge and is subject to a 30 km/hr speed limit. The road is single carriageway with a width of 7.3m provided and footways either side of the road. Street lighting is present. Parking bays are marked adjacent to both sides of the carriageway, but there are no parking restrictions governing use. There are a number of footway buildouts provided containing dropped kerbs and tactile paving to aid pedestrians crossing the carriageway. The bridge over the River

⁹¹ AWN Consulting Ltd. (2022). *EIAR. Chapter 13 Traffic and Transportation*

⁹² AWN Consulting Ltd. (2022). *EIAR. Chapter 13 Traffic and Transportation*

Shannon is a single way masonry arch bridge with a carriageway width of approximately 4m. Traffic flow is managed by traffic signals with shuttle flow over the bridge, refer to **Plate 4.3**.



Plate 4.3: River Shannon Bridge⁹³

R357 South-East

The R357 (south-east) extends from Shannonbridge through Cloghan towards Blue Ball, Co. Offaly, where it links with the N52 and is a single carriageway road with street lighting present within the village but not to the east. Outside the village there is a speed limit of 80 km/hr. **Plate 4.4** below shows a typical section of the R357. The road is generally two-way except for a single way working canal crossing at one location. No pedestrian facilities are provided beyond the village to the east.



Plate 4.4: R357 South-East⁹⁴

R444

The R444 extends from village of Shannonbridge at its priority junction with the R357 northwards intersecting with the N62 at Doon. Outside the village there is a speed limit of 80 km/hr and 50 km/hr within the village. The is a single carriageway and the width varies between 5m and 6m wide, street

⁹³ AWN Consulting Ltd. (2022). *EIAR. Chapter 13 Traffic and Transportation*

⁹⁴ AWN Consulting Ltd. (2022). *EIAR. Chapter 13 Traffic and Transportation*

lighting is provided only at the junction with the R357 and there are no pedestrian facilities present.

Plate 4.5 below shows a typical section of the R444.



Plate 4.5: R444⁹⁵

4.12.2.2 Accident Data

The Road Safety Authority (RSA) website containing collision statistics has not been accessible since 2020 and there is no indication of when it will be available.

4.12.2.3 Existing Traffic Flow

The AWN Consulting Ltd. 2022 EIAR⁹⁶, included existing traffic flow data in Section 13.4.3⁹⁷, which was used to assess the baseline traffic flow situation on the local road network.

As part of this previous applications at the WOP Station site, traffic surveys (weekday classified junction turning counts) were conducted over a 16-hour survey period from 06:00 to 24:00 during the week 24th October to 30th October 2016. It was found that the highest traffic volumes occurred on Thursday 27th October at the Primary Access Road / R357 priority junction.

Although the data used was collected in 2016, it is still considered to be the best available at the time of writing. Due to the nature of the application updated survey data for was not feasible to collect.

It is considered reasonable to use this information at this stage to provide an indication of traffic levels in the area. The traffic flows associated with the operation of the power station totalled 100 No. cars and 25 No. HGVs, two-way flow on Thursday 27th October 2016.

The survey established that the AM and PM peak hours occur between 08:00-09:00 and 17:00-18:00. The survey was carried out pre Covid-19.

⁹⁵ AWN Consulting Ltd. (2022). *EIAR. Chapter 13 Traffic and Transportation*

⁹⁶ AWN Consulting Ltd. (2022). *West Offaly Power Plant Demolition and Grid Services. EIAR Volume 1*

⁹⁷ AWN Consulting Ltd. (2022). *EIAR. Chapter 13 Traffic and Transportation*

4.12.2.4 Construction Routes

The WOP Station site has its main access from the R357 Cloghan Road which will form the access for demolition and construction phase traffic. Direct access to the Site will be via a site gate and the existing internal roadways.

The potential routings to disposal and quarries have been identified on ESB drawings in *West Offaly Power Plant Demolition & Grid Services* planning application (2022). The routes were selected to optimise the use of Regional, National and Motorway routes and avoid or minimise the use of local roads, wherever possible. Some locations have alternative routes, but this takes into account the aforesaid criteria.

There is the potential for a total of 13 No. routes to the Site which have been identified to a number of typical disposal and quarry sites that could be feasibly utilised during elements of the works. In the near vicinity to the Site all construction traffic will access the Site from the R357 and travel along the access road to the northern access point, as shown in **Figure 4.11**.

From a desktop review of the route to the R357 to the west of the River Shannon and the east of the railway bridge no potential pinch points or restrictions have been identified. It is predicted that emergency generator plant and equipment will mainly be delivered to the Site via Dublin Port, which follows the M6, R446, N62, R444 and R357 before reaching the Site.

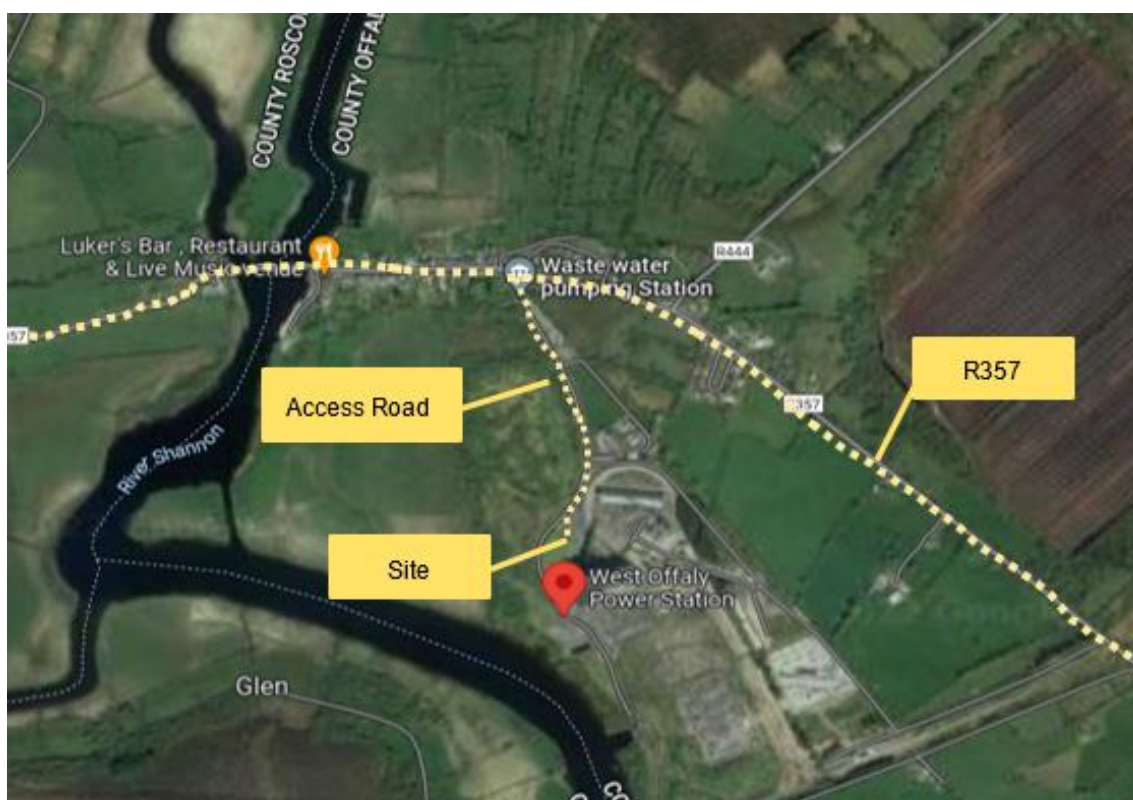


Figure 4.11: Proposed Construction Route⁹⁸

⁹⁸ Source: Google Map (2022).

4.12.2.5 Parking

Parking will be provided using existing parking facilities and open areas of the WOP Station site for construction personnel and construction vehicles. The construction compounds and laydown areas will be located entirely within the WOP Station site. Refer to **Figure 5 Parking, Office and Laydown Areas** (submitted with this application).

Where works are to take place at off peak times, sufficient on-site parking will be available for staff and visitors. Levels of employment will vary throughout the construction phase. Staff are expected to travel to the Site via a combination of car sharing and private passenger vehicles.

4.12.3 Predicted Effects

Do Nothing Scenario

If the Designated Development were to not go ahead, the surrounding road network will remain in the current conditions.

Demolition / Construction Phases: Predicted Traffic Flows

The demolition and construction phasing predicted traffic flows have been taken from the Construction Traffic Management Plan (CTMP), Section 2.9 of **Appendix C**.

The anticipated level of construction phase traffic has been based on an assumed preliminary outline construction methodology. The construction traffic is anticipated to arrive at set designated intervals throughout the day.

The peak work force is predicted to be 100 personnel per day with construction lasting eight months. It has been assumed that a maximum of 100 no. 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. There are no public transport services within close proximity to the Site but it is anticipated that up to 5% (five construction staff) would be staying in local accommodation (Bed and Breakfast, Hotel etc.) and transported to the Site via vehicles / minibus.

Pre-construction works require the highest number of HGVs, with an estimated 38 two-way HGV movements per day that will arrive and depart the Site during the pre-construction works.

For the demolition works it is estimated that up to 25 two-way HGV movements per day will arrive and depart the site during the demolition phases. After the demolition phase is complete, a construction phase will begin. At the peak of the construction works, approximately 30 two-way HGV movements daily will be required.

The worst-case scenario is therefore during the pre-construction phase and assumes that a maximum of 38 HGV movements will be required to remove material and to deliver loads to and from the site daily. It has conservatively been assumed that 50% (10 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 4.41**.

Table 4.41: Traffic Generation Estimated at Site

Phase	Personnel / Day	Vehicles with an occupancy of 1.2 passengers / day	ESB Minibus occupancy of 5 passengers / day	Total Staff Arrivals / Day (LGV)	HGV's Arrivals / Day	Total arrival trips / Day
Pre-construction	100	79	1	80	19	99
Demolition	100	79	1	80	13	93
Construction	100	79	1	80	15	95

As mentioned above, the likely route from Dublin Port is the M6, R446, N62, R444 and R357 before reaching the Site. This is therefore likely to be the main route used for plant and equipment to be delivered to the Site, and it is expected that this route will see an increase in the number of HGVs on this route, during each stage of the construction. During the pre-construction and demolition phases one or more of the 13 routes to / from disposal sites and quarries could be utilised.

Operational Phase: Predicted Traffic Flows

It is anticipated that minimal operational phase traffic will be generated with some HGV movements predicted to the Site each year. The majority of these movements will be associated with stored oil deliveries (diesel deliveries made by tanker) and the remainder associated with the movement of other consumables.

Deliveries of diesel will be directly linked to the operational need for the emergency generation units. For example, if all eight units were required to operate four hours per day, 10 deliveries of diesel (20 HGV movements) would be required per day (assuming delivery Mon-Sat). The most likely scenario is that on most days of the year the emergency generation units will not be called into use. HGV movements associated with maintenance activities are expected to be very low and infrequent and are not expected to exceed two per day (*i.e.*, arrival and departure of a single delivery vehicle).

Up to five operational staff will be on site during the daytime and up to two staff will be on-site in the evening time seven days a week, giving rise to passenger car movements up to 14 movements per day.

4.12.4 Demolition & Construction Phase - Mitigation Measures

A full / final CTMP will be developed by the Contractor prior to the commencement of work on-site.

No works shall commence until such time that the full CTMP has been prepared. The final CTMP will provide details of anticipated vehicle volumes, but indicative estimates are provided in the Framework CTMP, **Appendix C**.

The Contractor will make aware the proposed works which will be undertaken in an area with a number of existing residential premises. Therefore, the Contractor will be required to always accommodate and make provision for access and egress to these premises paying particular attention to the provision of pedestrian / disabled / cyclist safe access and egress. The CTMP will include alternative routes for pedestrians and vehicles in the event that public roads or right of ways are closed during works, although this is not expected to be required. The CTMP will include measures to limit the amount of queuing required by construction vehicles outside the Site boundaries.

Construction debris particularly site clearance, spoil removal and dirty water runoff, have the potential to cause a significant impact on footpaths and roads adjoining a construction site, if not adequately dealt with and these matters will be fully addressed in the contractors CTMP.

4.12.4.1 Site Management

The Site activities will be undertaken with due consideration of the surrounding environment and the close proximity of sensitive receptors such as residents and pedestrians. Dust management during the construction phase will be the most important aspect in terms of minimising the impacts of the Designated Development on the surrounding air quality. The following measures will be implemented to ensure impacts are minimised:

- complaint registers will be kept detailing all telephone calls and letters of complaint received in connection with construction activities, together with details of any remedial actions carried out;
- equipment and vehicles used on site will be in good condition such that emissions from diesel engines etc. are not excessive;
- pre-start checks will be carried out on equipment to ensure they are operating efficiently and that emission controls installed as part of the equipment are functional;
- monitoring and control of demolition / construction traffic during construction works; and
- the use of prefabricated elements to minimise on site fabrication and assembly thereby reducing the numbers of site operatives required.

Dust deposition levels will be monitored on a regular basis in order to assess the impact that site activities may have on the local ambient air quality. The following procedures will be implemented:

- The dust deposition rate will be measured by positioning Bergerhoff Dust Deposit Gauges at strategic locations near the boundaries of the site for a period of 30 (+/- 2) days if required. Monitoring should be conducted as required during periods when the highest levels of dust are expected to be generated *i.e.*, during site preparation works and soil stripping activities.
- The exact locations will be determined after consideration of the requirements of Method VDI 2119 with respect to the location of the samplers relative to obstructions, height above ground and sample collection and analysis procedures.
- After each 30 (+/- 2 days) exposure period, the gauges will be removed from the sampling location, sealed and the dust deposits in each gauge will be determined gravimetrically by an accredited laboratory and expressed as a dust deposition rate in mg/m²/day in accordance with the relevant standards.
- Technical monitoring reports detailing all measurement results, methodologies and assessment of results shall be subsequently prepared and maintained by the Site Manager.

4.12.4.2 Dust Control Measures

Refer to the Framework CTMP in **Appendix C**.

4.12.4.3 Site Routes

Site access routes (particularly unpaved areas) can be a significant source of fugitive dust from construction sites if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25% to 80% ⁸.

- a speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles or delivery vehicles within the vicinity of the Site;
- bowsers will be available during periods of dry weather throughout the construction period. Research shown found that the effect of surface watering is to reduce dust emissions by 50%. The bowser will operate during dry periods to ensure that unpaved areas are kept moist. The required application frequency will vary according to soil type, weather conditions and vehicular use; and
- any hard surface roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced areas shall be restricted to essential Site traffic only.

4.12.4.4 Site Traffic on Public Roads

- Spillage and blow-off of debris, aggregates and fine material onto public roads will be reduced to a minimum by employing the following measures:
- vehicles delivering material with potential for dust emissions to an off-site location shall be enclosed or covered at all times to restrict the escape of dust;
- any hard surface site roads will be swept to remove mud and aggregate materials from their surface while any unsurfaced roads shall be restricted to essential site traffic only;
- a power washing facility or wheel cleaning facility will be installed near to the Site compound for use by vehicles exiting the site when appropriate, and
- road sweepers will be employed to clean the Site access route as required.

4.12.4.5 Traffic Management Measures

Refer to Framework CTMP in **Appendix C**.

4.12.5 Operational Phase - Mitigation Measures

As outlined above the number of operational trips to the Site are expected to be minimal and therefore require no additional mitigation.

4.12.6 Residual Effects

The temporary increase in construction traffic is likely to result in a *slight* residual environmental effect during the pre-construction, demolition and construction phases of the Designated Development. The management of these effects will be achieved within the Contractors CTMP.

Once the identified mitigation and monitoring measures, appropriate design standards and operational management plans are adhered to, it is considered that any impacts from the Designated Development will be both *temporary* and *slight*, based on the information available at the time of writing.

4.12.7 Summary

The Designated Development will utilise the existing regional road network, comprising of the R357 for the Designated Development construction traffic. Traffic volumes associated with the Designated Development are relatively low in number and relate primarily to the delivery of construction equipment, materials and operations.

The implementation of an approved CTMP put in place by the Contractor prior to construction will minimise the potential for traffic and transport impacts during construction activities and the residual impact will be slight and *temporary*.

4.13 Waste Management

4.13.1 Introduction

This section sets out the relevant aspects of legislation and policy, the current state of the environment and the future receiving environment and goes on to consider the impact of the Designated Development on waste management. This section also outlines the measures that will be undertaken to minimise the quantity of waste produced at the Site and the measures to handle the waste in such a manner as to minimise the effects on the environment.

For the purpose of this report, waste is defined as per the European Waste Framework Directive (Directive 2008/98/EC) as 'any substance or object which the holder discards or intends or is required to discard'⁹⁹.

4.13.2 Baseline

4.13.2.1 Legislation

European Communities (Waste Directive) Regulations, 2011

The European Communities (Waste Directive) Regulations S.I. No. 126 of 2011¹⁰⁰ (as amended) transpose the requirements of the European Waste Framework Directive (Directive 2008/98/EC)⁹⁹, as amended by Directive (EU) 2018/851¹⁰¹, into Irish legislation. The Regulations require that waste prevention programmes and waste management plans are established and that they apply the waste hierarchy. The waste hierarchy prioritises waste prevention, followed by preparing for re-use, recycling, other recovery (including energy recovery) and finally disposal.

For construction and demolition waste, the Regulations also require measures to be taken to achieve the following target:

- By 2020, the preparing for re-use, recycling and other material recovery, including backfilling operations using waste to substitute other materials, of non-hazardous construction and demolition waste excluding naturally occurring material defined in category 17 05 04 in the list of waste shall be increased to a minimum of 70% by weight.

⁹⁹ European and EU (2008). *European Waste Framework Directive (Directive 2008/98/EC)*.

¹⁰⁰ GOI (2011). *S.I. No. 126/2011 - European Communities (Waste Directive) Regulations 2011*.

¹⁰¹ EU (2018). *Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive 2008/98/EC on waste (Text with EEA relevance)*.

To support the implementation of the waste hierarchy, the Regulations also:

- Article 27: give provision for an operator to determine that a material is a by-product and not a waste, where certain conditions are met and if approved by the Environmental Protection Agency (EPA).
- Article 28: give provision for determining end-of-waste status, when a waste may cease to be a waste when it has undergone a recovery operation.

The assessment of waste within this section has taken account of the waste hierarchy in the management of waste, including the provisions under Article 27 and Article 28, and of the targets for recovery of non-hazardous construction and demolition waste.

Circular Economy and Miscellaneous Provisions Act 2022

The *Circular Economy and Miscellaneous Provisions Act 2022*¹⁰² provides for the following:

- The making by the Minister for the Environment, Climate and Communications of a circular economy strategy.
- The establishment of the Circular Economy Fund; to make provision in relation to the Environment Fund.
- The establishment by the Environmental Protection Agency (EPA) of a circular economy programme.
- A levy on certain single-use items.
- The prohibition on the supply of certain single-use items.
- To give further effect to Directive (EU) 2015/720 of the European Parliament and of the Council of 29 April 2015 and Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019.
- The making of a national food waste prevention strategy.
- For the use by local authorities of closed-circuit television and mobile recording devices in certain circumstances and for that purpose to amend the Waste Management Act 1996 and the Litter Pollution Act 1997.
- Inclusion of targets in respect of re-used and repaired products and materials in waste management plans.
- The introduction of a requirement for segregated waste bins and incentivised charging for the commercial sector.
- The operation of the national waste collection permit office.
- Waste recovery levy.

¹⁰² House of the Oireachtas (2022).

- Making by the Minister for the Environment, Climate and Communications of regulations to regulate end-of-waste and by-product notifications to the Environmental Protection Agency.
- Giving further effect to Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008.
- To amend the Waste Management Act 1996.
- Prohibition on certain licences relating to coal, lignite and oil shale and for that purpose to amend the Minerals Development Act 1940 and the Minerals Development Act 2017.
- Applications to the Environmental Protection Agency for licences, reviews of licences or revised licences in circumstances where an order under section 181(2)(a) of the Planning and Development Act 2000 has been made, or is proposed to be made, by a Minister of the Government for development comprising or for the purposes of the activity to which the application relates and for that purpose to amend the EPA Act 1992; to give further effect to Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 and for that purpose to amend the Electricity Regulation Act 1999; and to provide for related matters.

4.13.2.2 Relevant Waste Policy and Guidance

Eastern-Midlands Waste Management Plan 2015-2021

For the purposes of waste management planning, Ireland is divided into three regions. The Designated Development is located within the Eastern Midlands region and the Eastern-Midlands Waste Management Plan 2015-2021¹⁰³ provides the framework for the prevention and management of wastes in a safe and sustainable manner.

Offaly County Development Plan 2021-2027

Offaly County Development Plan (Offaly CDP) 2021-2027¹⁰⁴ is a land use plan and overall strategy for the proper planning and sustainable development of the functional area of County Offaly. Strategic objectives that relate to waste include: *“Make more efficient use of key resources such as land, water, energy, waste and transportation infrastructure”*. A number of Environment Policies relate to waste and a Development Management Standard 114 (DMS-114) requires that a Resource and Waste Management Plan (RWMP) is prepared.

Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects

The EPA *Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects*¹⁰⁵ provide a practical approach which is informed by best practice in the prevention and management of construction and demolition wastes and resources from design through to construction and deconstruction. The guidelines provide clients, developers, designers, practitioners, contractors, sub-contractors and competent authorities with a common approach to preparing resource and waste management plans.

¹⁰³ Eastern Midlands Region (2015). *Waste Management Plan 2015-2021*.

¹⁰⁴ Offaly County Council (2021). *Offaly County Development Plan 2021-2027*.

¹⁰⁵ EPA (2021). *Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects*.

The guidelines address the best practice approach both prior to construction, including the stages of design, planning and procurement in advance of works on-site, and during construction, relating to the effective management of resources and wastes during construction or demolition operations.

4.13.2.3 C&D Waste Arisings and Waste Management in Ireland

The study area for assessing impacts of non-hazardous and hazardous waste on waste arisings and inferred waste management capacity comprises the whole of Ireland due to the need to consider all available waste management infrastructure capacity, although it is noted that a proportion of hazardous waste arising in Ireland is managed outside of Ireland. Waste management capacity is inferred from national waste arisings since data for national waste management capacity is not readily available. Information has been sourced from the most recent data collated and published by the EPA¹⁰⁶.

Approximately 8.2 million tonnes of C&D waste was collected by authorised waste collectors in Ireland in 2020, with the majority comprising soil and stones and dredging spoil (84%, 6.9 million tonnes). The remainder consisted of metals, segregated wood, glass and plastic, concrete, brick, tile and gypsum, bituminous mixtures and mixed C&D waste (1.3 million tonnes).

In 2020, waste treatment by backfilling was the most utilised treatment method, managing 82% of C&D waste, and mainly comprising of soils, stones and dredging spoil.

The EPA's '*Progress to EU Targets*'¹⁰⁷ reports Ireland's performance against targets set out in European Directives. In terms of the Waste Framework Directive (2008/98/EC)⁹⁹ target of '*Preparing for reuse, recycling and other material recovery (incl. beneficial backfilling operations using waste as a substitute) of 70% by weight of non-hazardous construction and demolition waste (excluding natural soils & stone), by 2020*', a performance of 84% was reported for 2019, exceeding the 70% target. Ireland achieved 78% material recovery of non-hazardous, non-soil-and stone C&D waste in 2020¹⁰⁷¹⁰⁶.

4.13.2.4 Commercial Waste Arisings

Municipal waste consists of household waste, commercial waste and other waste that is similar in nature to household waste such as waste from schools, restaurants, businesses etc. Ireland generated 3.2 million tonnes of municipal waste in 2020. Households generated 57% of municipal waste and 43% came from other sources¹⁰⁷.

4.13.2.5 Waste Management Facilities

The waste management facilities to be utilised by the Designated Development are not yet known and suitability will be determined by the Contractor. Waste disposal and recovery activities in Ireland require authorisation in accordance with the Waste Management Act 1996 as amended.

4.13.2.6 Hazardous Waste Arisings and Management

The EPA reported that 557,221 tonnes of hazardous waste were generated in Ireland in 2020¹⁰⁸. The construction sector produced 32% of Ireland's hazardous waste in 2020. This mainly comprised dredging spoil and contaminated soil, but also included smaller quantities of asbestos, asphalt, and contaminated wood, concrete, bricks, metals and tiles.

¹⁰⁶ EPA (2022). *National Waste Statistics 2020 Summary Report for 2020*.

¹⁰⁷ EPA (2021). *Progress to EU Waste Targets. 1 December 2021*.

¹⁰⁸ EPA (2021). *Hazardous Waste Statistics for Ireland*.

4.13.2.7 Future Receiving Environment

The Construction & Demolition Waste - Soil and Stone Recovery / Disposal Capacity - Update Report 2020 presents a forecast of potential that C&D waste arisings to the year 2029 that takes account of the sharp reduction in arisings due to the impact of the Covid-19 pandemic. These forecasts indicate that C&D waste arisings may return to pre-pandemic levels by 2025 / 2026. Accordingly, the current baseline is assumed to apply between the planned commencement of construction of the Designated Development through to its opening year.

4.13.3 Predicted Effects

The potential impacts of the Designated Development with regards to waste are the effects that waste arisings generated on-site will have on the capacity of waste management infrastructure in Ireland and on meeting national targets for waste recovery. If the Designated Development generates more than 5% of national waste arisings (347,332 tonnes of soil, stone and dredging spoil, 64,089 of tonnes of non-hazardous C&D waste, 27,861 tonnes of hazardous waste, 66,650 tonnes of municipal waste from other sources e.g., commercial) or has a recovery rate for non-hazardous C&D waste less than 70% then the impacts would be considered to be significant.

Do Nothing Scenario

In a 'do nothing' scenario, there would be zero waste generation and disposal from the Designated Development and no significant effects.

Demolition / Construction Phases

The main construction phase impacts will be associated with the management of waste from:

- demolition;
- surplus or damaged construction materials;
- packaging;
- maintenance of plant and equipment used for construction; and
- construction workforce activities.

Some dismantling / demolition will be required as outlined in **Section 3.3**. The quantities of waste are unlikely to be more than 5% of national waste arisings due the nature and scale of demolition and therefore *not considered significant*. It is assumed that this waste would have a high recovery rate and is likely be recovered rather than sent to landfill.

Excavation of 9,600m³ of soil is estimated to be required which will be retained on site where possible provided that it is uncontaminated, as expected. This is relatively small in the context of the national quantity of soils, stones and dredging spoil collected. Therefore, the quantities of waste from excavation are unlikely to be more than 5% of national waste arisings and therefore *not considered significant*.

Waste from construction is unlikely to be more than 5% of national waste arisings and therefore *not considered significant*. The precise composition and waste management route of this waste is dependent on several factors and will be further informed by the Contractor, based on their experience of similar developments. It is assumed that all construction waste will be require off-site management.

Hazardous waste arisings are expected to comprise small quantities of oils, chemicals and similar materials typically used as part of construction activities. Procedures for the storage and management of these wastes will be further detailed in the Contractor's RWMP.

The waste management facilities to be utilised during construction are not yet known and suitability will be determined by the Contractor. Since it is not possible to estimate the exact composition of construction waste at this time a total recovery rate in line with the national performance of 78% (reported for 2020) is anticipated and likely to be achievable for non-hazardous construction waste (excluding naturally occurring soil and stones (Waste Code 17 05 04)). A recovery rate below 70% would be considered to be a significant impact.

Operational Phase

Operational waste impacts from the Designated Development are expected to be *negligible* and will be confined to occasional disposal, maintenance and repair. Operational waste quantities are unlikely to be more than 5% of national waste arisings and therefore *not considered significant*.

4.13.4 Demolition & Construction Phases - Mitigation Measures

A site-specific Resource and Waste Management Plan (RWMP) will be prepared by the Contractor. The RWMP will be employed to ensure sustainable and effective waste management throughout the dismantling / demolition and construction phase of the Designated Development.

Adherence to the RWMP prepared for the dismantling / demolition / construction works will ensure that the management of waste arising is dealt with in compliance with the provisions of the *Waste Management Act 1996 (as amended)*, associated Regulations, *Litter Pollution Act of 1997 (as amended)* and the *Eastern-Midlands Region Waste Management Plan 2015-2021*, and *A Waste Action Plan For a Circular Economy - Irelands National Waste Policy 2020-2025* and that it will achieve optimum levels of waste reduction, re-use and recycling.

Typical waste materials that will be generated from the C&D works include:

- Structural Steelwork
- Rebar
- Structural Concrete
- Cladding
- Rubber
- Plastic
- MMMF (Man Made Materials/Fibres)
- Soft Strip Cables and materials
- Masonry
- Mixed Waste
- Soil & Stone

- Topsoil
- Concrete
- Asphalt.

The management of all hazardous waste arisings, if they occur, shall be coordinated in liaison with Health and Safety Management.

4.13.4.1 Resource Management Routes

The Waste Hierarchy sets out the priority order that should be considered when managing wastes. A basic representation is provided in **Figure 4.12**. The Contractor will use the Waste Hierarchy as a guide to encourage the prevention of waste and to define waste management options.

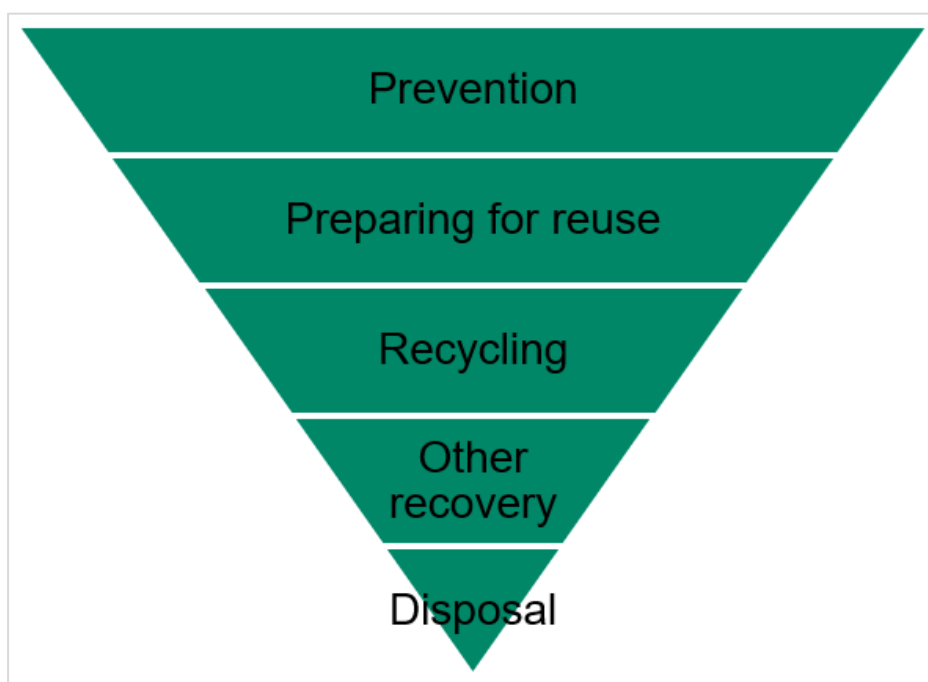


Figure 4.12: Waste Hierarchy¹⁰⁹

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

4.13.4.2 Prevention and Preparing for Reuse

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

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

¹⁰⁹ European Commission (2022). *Waste Framework Directive*.

As outlined in the RWMP Guidelines¹¹⁰ the Resource Manager (RM) will engage with team or individuals tasked with procurement of materials and services to ensure best practice procedures are employed to prevent residual resources at the Site. A range of good practice measures may include the following:

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

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

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

4.13.4.3 Recycling

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

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

4.13.4.4 Recovery

This generally aims to recover energy from waste which cannot otherwise be reused or recycled. This may include waste materials such as hazardous liquids or solids that can be sent to energy from waste facilities. Recovery may also include the beneficial use of materials on land for restoration (backfilling operations).

¹¹⁰ EPA (2021). *Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for C&D Projects*.

4.13.4.5 Disposal

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

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

4.13.4.6 Waste Storage

The main waste storage area will be located within the Site compound. A dedicated and secure area containing bins, and / or skips and storage areas will be provided for waste materials generated by construction site activities.

Waste materials generated will be segregated at waste collection and storage areas where it is practical. Where the on-site segregation of certain waste types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source. All waste receptacles leaving site will be covered or enclosed. The appointed waste Contractor will collect and transfer the wastes as receptacles are filled.

Construction and demolition waste will be directed to recycling locations. There are a number of licensed waste reception facilities located in the Eastern-Midlands Region¹¹¹ for the management of waste from the construction industry.

The Site construction manager will ensure that all staff are informed of the requirements for segregation of waste materials by means of clear signage and verbal instruction. Site employees will be made responsible for ensuring good Site housekeeping.

4.13.4.7 Pest Management

A pest control operator will be appointed as required to manage pest on-site during the dismantling / demolition and construction phase. Organic and food wastes generated by Site staff will not be stored in open skips, but in closed waste receptacles. Any waste receptacles will be carefully managed to prevent leaks, odours and pest problems.

4.13.5 Operational Phase - Mitigation Measures

The Waste Hierarchy sets out the priority order that should be considered when managing wastes. A basic representation is provided in. During the operational phase, the Waste Hierarchy (**Figure 4.12**) will be used as a guide to encourage the prevention of waste and to define waste management options.

Waste Storage

A dedicated and secure area containing bins, and / or skips and storage areas will be provided for waste materials generated during operation.

Waste materials generated will be segregated at waste collection and storage areas where it is practical. Where the on-site segregation of certain waste types is not practical, off-site segregation will be carried out. There will be skips and receptacles provided to facilitate segregation at source. All waste

¹¹¹ Eastern-Midlands Region Waste Management Plan 2015-2021.

receptacles leaving site will be covered or enclosed. The waste Contractor will collect and transfer the wastes as receptacles are filled.

Operational waste will be directed to recycling locations where possible. There are a number of licensed waste reception facilities located in the Eastern-Midlands Region¹¹² for the management of operation waste.

The operational manager will ensure that all staff are informed of the requirements for segregation of waste materials by means of clear signage and verbal instruction. Site employees will be made responsible for ensuring good operational housekeeping.

4.13.6 Residual Effects

Residual effects resulting from the Designated Development are *not anticipated*.

¹¹² Eastern-Midlands Region Waste Management Plan 2015-2021.

4.14 Interactions

Interactions or in-combination (inter-relationship) effects are by their nature interactive, the effect of one impact may be dependent or influenced by another effect. For example, the removal of trees can have landscape, visual and ecological effects, or an individual residential receptor can be affected by noise and visual impacts.

Without prejudice to the generality of paragraph (1), an assessment under that paragraph shall include an examination, analysis and evaluation by the Board in an appropriate manner, in light of the purpose referred to in section 2(1) of the Act of 2022, and to the extent reasonably possible in light of the information contained in the application and additional information (if any) provided in accordance with this Regulation by the applicant to the Board, of the likely main effects of the Designated Development on the following factors:

- (a) population and human health;*
- (b) biodiversity, with particular attention to species and habitats protected under Council Directive 92/43/EEC of 21 May 1992 and Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009;*
- (c) land, soil, water, air and climate;*
- (d) material assets, cultural heritage and the landscape;*
- (e) the interaction between the factors referred to in subparagraphs (a) to (d).*

The interaction of effects within the Designated Development in respect of each of the environmental factors, listed in Article 3(1) of the EIA Directive, have been addressed below.

A summary of the interactions (in-combination) of impacts and effects identified from the Designated Development between the following environmental aspects are outlined in **Table 4.42**:

- Air Quality
- Noise and Vibration
- Biodiversity
- Population and Human Health
- Land, Soils and Geology
- Water
- Climate
- Material Assets
- Cultural Heritage
- Landscape and Visual
- Traffic and Transportation
- Waste Management.

A summary of the key potential interactions are as follows:

- **Air Quality and Population & Human Health:** Potential for nuisance impacts due to dust-generating activities of proposed works on human health receptors.
- **Air Quality and Biodiversity:** Potential for nuisance impacts due to dust-generating activities of proposed works on sensitive SAC and SPA habitats.
- **Climate and Air Quality and Population & Human Health:** Potential for GHG emissions to be released to atmosphere during the demolition / construction, operational and decommissioning phases of the Designated Development.
- **Noise and Population & Human Health:** Potential for nuisance and disturbance due to noisy plant, noisy site activities and additional traffic as a result of the Designated Development.
- **Noise and Biodiversity:** There is potential for impacts on sensitive SAC and SPA habitats (*i.e.*, disturbance) due to noise and vibration during the demolition / construction, operational and decommissioning phases of the Designated Development.
- **Biodiversity and Water:** Potential for impacts to the surface water environment, which may in turn impact sensitive SAC and SPA habitats.
- **Biodiversity and Climate:** Potential for impacts to biodiversity, which may be exacerbated by climate change or the release of GHG emissions to the atmosphere as a result of the Designated Development.
- **Population & Human Health and Water:** Potential for impacts to the surface water environment
- **Population & Human Health and Landscape & Visual:** Potential for impacts on the landscape character and visual amenity during the construction and operational phase of the Designated Development.
- **Population & Human Health and Traffic & Transport:** Potential for nuisance and disturbance due to construction traffic noise on settlements in the vicinity of the Designated Development.
- **Population & Human Health and Waste Management:** Potential for impacts on human health receptors if waste is not management correctly, resulting in littering which could cause a nuisance to the public and attract vermin.
- **Water and Land, Soils & Geology:** Potential for contaminated surface water run-off to potential to enter soil and groundwater.
- **Land, Soils & Geology and Air Quality:** Construction activities such as excavations and stockpiling of materials, etc., have the potential to results in interactions between air quality and land and soils in the form of dust emissions.

Table 4.42: Summary of Environmental Interactions

Environmental Aspect / Interaction	Air Quality		Noise & Vibration		Biodiversity		Population & Human Health		Land, Soils & Geology		Water		Climate		Material Assets		Cultural Heritage		Landscape & Visual		Traffic & Transportation		Waste Management	
	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op	Con	Op
Air Quality																								
Noise & Vibration	x	x																						
Biodiversity	✓	✓	✓	✓																				
Population & Human Health	✓	✓	✓	✓	x	✓																		
Land, Soils & Geology	✓	x	✓	x	✓	✓	✓	✓																
Water	x	x	x	x	✓	✓	x	x	✓	✓														
Climate	✓	✓	x	x	✓	✓	✓	✓	✓	x	✓	✓												
Material Assets	x	x	x	x	x	x	✓	✓	x	x	x	x	x	✓										
Cultural Heritage	x	x	✓	x	x	x	x	x	✓	x	x	x	x	x	x	x								
Landscape & Visual	x	x	x	x	x	x	✓	✓	✓	x	x	x	x	x	x	x	x	x						
Traffic & Transportation	✓	✓	✓	✓	✓	✓	✓	✓	x	x	✓	x	✓	✓	x	x	x	x	✓	✓				
Waste Management	x	x	x	x	x	x	✓	✓	✓	✓	✓	✓	x	x	x	x	x	x	x	x	x	x		

Con	Construction Phase	✓	Weak / Some / Strong Interaction
Op	Operational Phase	x	No Interaction

4.15 Cumulative Effects

This assessment also takes into consideration cumulative impacts with consented, planned and reasonably foreseeable projects. A desktop search of proposed and existing planning applications was undertaken in January 2023. The search used publicly available data from the MyPlan.ie 'National Planning Application' database, the Offaly Co. Co., Roscommon Co. Co. and Galway Co. Co. planning application portals and An Bord Pleanála online database.

The purpose of this search is to inform the cumulative impact assessment for the Designated Development. A specified criteria informed the search and omitted any planning applications greater than five years old, refused, invalid and withdrawn applications. The criteria then focused on foreseeable developments to be considered in line with the Designated Development. In respect of this, any small scale residential and extension type developments along with minor amendments, changes of use and small-scale farming / agricultural applications were omitted. Only reasonably foreseeable developments were considered, refer to **Table 4.43**.

Table 4.43: Planning Search (5km radius)

Planning Authority	Planning Reference	Description of the Development	Grant / Decision	Status
Roscommon Co. Co.	22329	Permission to fill the site with inert materials including soil to return the land to productive agricultural land with all associated site development works.	27/01/2023	Granted (Conditional)
Offaly Co. Co.	22223	Description The Demolition of the Existing WOP Station (As approved under Offaly County Council Ref. 01/187/ An Bord Pleanála Ref. PI 19.125575 and all subsequent permissions); and the development and operation of electricity grid services — namely a Battery Energy Storage System (BESS) and a Synchronous Condenser (Sync Con). The Proposed Development comprises two distinct phases of activity. Phase I comprises the demolition of existing site structures (with a total footprint of c. 1 3, 124 sq.m. and a total gross floor area of c. 28,000 sq.m.) including the former WOP Station. The Intermediate Peat Storage Building and Associated Fuel Management System; and ancillary buildings including: Electrical Building, Tippler Building and associated Control Room and Office, Screening Building, Lorry Unloading Building, Water Treatment Plant Building, Offices Building, Laboratory Building, Workshop and Maintenance Buildings, Oil Pumphouse, Electrics Rooms, Railway / Locomotive Service Building, Cooling Water. Pump House and Sewage / Foul Water Treatment Facility.	18/01/2023	Granted (Conditional)
Galway Co. Co.	19377	To construct a new entrance and car park at Clonfert National School. Gross floor space of proposed works: 234 sqm.	17/06/2019	Granted (Conditional)
Offaly Co. Co.	1956	For (i) provision of open area Battery Energy Storage System (BESS) compound (area of 6,200sqm) containing battery and control system enclosures in lieu of the approved single storey main building (floor area of 4,500 sqm), (ii) increase in size (630 sqm), location and internal layout of switchgear building in lieu of that approved (100 sqm) which serves the main transformer on site before electrically connecting to the existing 220kv Shannonbridge substation located on lands adjoining the site to the west, and (iii) all associated site works.	07/05/2019	Granted (Conditional)

Planning Authority	Planning Reference	Description of the Development	Grant / Decision	Status
Offaly Co. Co.	18163	Construction of a new building adjacent to existing dressing rooms containing a multi-purpose fitness centre, new public toilets, showers & equipment store. Also, provision of new floodlighting system and construction of a walking track around the perimeter of the playing field and all associated site works	05/02/2019	Granted (Conditional)

This section of the report also considers the *potential effect* of the demolition, construction and operation of the Designated Development at WOP Station, Co. Offaly, cumulatively with the construction and operation of the Temporary Emergency Generation (TEG) project, located at Tarbert Power Station, Tarbert, Co. Kerry.

The TEG at Tarbert Power Station is also seeking planning approval under the Development (Emergency Electricity Generation) Act 2022 and both projects are expected to be operational in a similar time frame.

The Designated Development is located on the eastern bank of the River Shannon immediately south of Shannonbridge, Co. Offaly and the TEG project at Tarbert Power Station, is located on the Lower Shannon Estuary, Co. Kerry, 118km from the Site.

However, it has been determined that there will be *no potential for significant cumulative adverse effects* from the two developments, during the demolition, construction, operational or eventual decommissioning phases, due to the distance between the two development locations (direct distance c. 118km and in-stream distance >150km).

Conclusion

Following a planning portal search of other proposed developments in the vicinity of the Site, it has been determined that there are no potential significant cumulative effects with other developments or committed schemes in the area, based on their scale, location and potential interactions with the Designated Development.

5. Summary

Given the urgent need for temporary emergency electricity generation over the next number of years due to exceptional circumstances, the *Development (Emergency Electricity Generation) Act 2022* ('the Act') has recently been enacted to provide for emergency measures for electricity generation development.

The Act allows for the disapplication of the Planning and Development Act 2000 for the purpose of such development. The Act also allows for such development to be exempt from the provisions of Directive No. 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU ('the EIA Directive'), in accordance with Article 2(4) of that Directive. The European Commission has published guidance (2019/C 386/05) regarding application of exemptions under the EIA Directive (Directive 2011/92/EU of the European Parliament and of the Council, as amended by Directive 2014/52/EU) – Articles 1(3), 2(4) and 2(5). The guidance indicates that the need to ensure security of supply in electricity could amount to an 'exceptional case' to exempt a specific project from the requirements of the EIA Directive.

The Act provides for the application of arrangements for the alternative assessment of such development for the purposes of ensuring the objectives of that Directive are met. Article 2.4(a) also requires member states to consider whether another form of assessment would be appropriate. The Act also provides for the coordination of this assessment with the appropriate assessment of such development for the purposes of Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, as amended.

The Designated Development is exempt from the provisions of the EIA Directive¹¹³ on the basis that it is an exceptional case for the purposes of Article 2(4) of the EIA Directive and the application of those provisions would adversely affect the purpose of the Designated Development. The Minister will arrange for an environmental assessment of the Designated Development to be carried out by the Board to ensure that the objectives of the EIA Directive are met.

Notwithstanding the above, this Environmental Report provides an overview of each of the relevant environmental topics and considers the potential environmental effects associated with the demolition, construction, operational and eventual decommissioning phases of the Designated Development.

This report also provides mitigation measures that will be implemented, as appropriate, to reduce the effects from the different phases of the Designated Development. All construction phase mitigation measures outlined in this report are detailed within the Framework CEMP (refer to **Appendix B**).

Through the use of these control measures, the demolition and construction phase impacts of the Designated Development are *not considered significant* and will be *temporary* in nature.

Similarly, during the operational phase of the Designated Development, the predicted effects have been assessed as *not significant* through the proposed control measures outlined in this report.

¹¹³ In accordance with Section 5(1) of the *Development (Emergency Electricity Generation) Act 2022*.

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Appendix A Technical Team

Appendix B Framework Construction Environmental Management Plan (CEMP)

Appendix C Framework Construction Traffic Management Plan (CTMP)

Appendix D Requirement for Regulation 3 (4) of S.I. No. 719 of 2022

Appendix E GE Noise Concept Study

