



Natura Impact Statement
For Proposed Open Cycle Gas Turbine (OCGT) Generating Plant
SSE Platin, Platin, Co. Meath

prepared for PM Group

on behalf of SSE Generation (Ireland) Ltd.

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1 Introduction

- 1 This report has been prepared by Scott Cawley Ltd., for the applicant PM Group on behalf of SSE Generation (Ireland) Ltd. who is seeking permission for a proposed Open Cycle Gas Turbine (OCGT) Generating Plant on lands at Carranstown and Caulstown, Duleek, Co. Meath hereinafter referred to as the Proposed Development).
- 2 This Natura Impact Statement (NIS) has been prepared in accordance with the provisions of Part XAB of the Planning and Development Act, 2000 (as amended) and in accordance with the requirements 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 Habitats Directive).
- 3 It considers the implications of the Proposed Development, on its own and in combination with other plans or projects, for European sites¹ in view of the conservation objectives of those sites. It includes a scientific examination of evidence and data to identify and assess the implications of the Proposed Development for any European sites in view of the conservation objectives of those sites. It considers whether the Proposed Development, by itself and in combination with other plans or projects, would adversely affect the integrity of any European sites. In reaching a conclusion in this regard consideration is given to any mitigation measures necessary to avoid or reduce any potential negative impacts.
- 4 The purpose of this NIS is to provide an examination, analysis and evaluation of the potential impacts of the Proposed Development on European sites and to present findings and conclusions with respect to the Proposed Development in light of the best scientific knowledge in the field. This NIS will inform and assist the competent authority, Meath County Council, in carrying out its Appropriate Assessment as to whether or not the Proposed Development will adversely affect the integrity of any European sites, either alone or in combination with other plans and projects, taking into account their conservation objectives.
- 5 The Proposed Development is neither connected with nor necessary to the management of any European sites.

2 Legislative Context

- 6 The Birds and Habitats Directives - Council Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (as amended) (the Birds Directive) and Council Directive 92 /43 /EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive) – require Ireland to establish protected sites as part of a European wide network of sites (the Natura 2000 network which are known in Ireland as European sites) for habitats and species that are of international importance for conservation. In Ireland, European sites include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). SACs are selected for habitats listed on Annex I of the Habitats Directive (including priority Annex I habitat types which are in danger of disappearance) and species listed on Annex II. SPAs are selected for bird species (listed on Annex I of the Birds Directive), regularly-occurring populations of migratory bird species (such as ducks, geese and waders), and areas of international importance for migratory birds. The specified habitats and species for which each SAC and SPA is selected, correspond to the qualifying interests (in the case of SACs) or special conservation interest species (in the case of SPAs) for the sites, for which conservation objectives are prepared.

¹ The Natura 2000 network of sites are defined under the Habitats Directive (Article 3) as a European ecological network of special areas of conservation, composed of sites hosting the natural habitat types listed in Annex I and species listed in Annex II, and special protection areas classified pursuant to the Birds Directive (2009/147/EC). The aim of the network is to aid the long-term survival of Europe's most valuable and threatened species and habitats. In Ireland, these sites are designed as *European sites* – as defined under the Planning and Development Acts and/or European Communities (Birds and Natural Habitats) Regulations 2011 as (a) a candidate site of Community importance, (b) a site of Community importance, (c) a candidate special area of conservation, (d) a special area of conservation, (e) a candidate special protection area, or (f) a special protection area. They are commonly referred to in Ireland as candidate Special Areas of Conservation (cSACs) and Special Protection Areas (SPAs).

7 Article 6(3) of the Habitats Directive states that:

'Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.'

8 This provision is transposed into Irish law by Part XAB of the Planning and Development Acts 2000 as amended. Section 177U(4) of the said Acts provides for screening for Appropriate Assessment as follows:

'The competent authority shall determine that an appropriate assessment of [...] a Proposed Development [...] is required if it cannot be excluded, on the basis of objective information, that the [...] Proposed Development, individually or in combination with other plans or projects, will have a significant effect on a European site.'

9 Section 177U(5) provides as follows:

'The competent authority shall determine that an appropriate assessment of a [...] Proposed Development, [...], is not required if it can be excluded, on the basis of objective information, that the [...] Proposed Development, individually or in combination with other plans or projects, will have a significant effect on a European site.'

10 Section 177T(1) and (2) provide that a NIS is *'a statement, for the purposes of Article 6 of the Habitats Directive, of the implications of a Proposed Development, on its own or in combination with other plans or projects, for one or more than one European site, in view of the conservation objectives of the site or sites'* and specifies that it *'shall include a report of a scientific examination of evidence and data, carried out by competent persons to identify and classify any implications for one or more than one European site in view of the conservation objectives of the site or sites'*.

11 The Court of Justice of the European Union (CJEU) has made a number of rulings in relation to Appropriate Assessment, regarding when it is required, its purpose and the standards it should meet. Two of the key rulings include, Case C-127/02 Waddenzee where the CJEU found that *'Any plan or project not directly connected with or necessary to the management of the site is to be subject to an appropriate assessment of its implications for the site in view of the site's conservation objectives if it cannot be excluded, on the basis of objective information, that it will have a significant effect on that site, either individually or in combination with other plans or projects'* and that the plan or project may only be authorised *'where no reasonable scientific doubt remains as to the absence of such effects'*, and Case C-258/11 where the CJEU found that *'[The Appropriate Assessment] cannot have lacunae and must contain complete, precise and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the works proposed on the protected site concerned'*.

12 Consideration has been given in the preparation of this report, to the evolution in interpretation and application of directives and national legislation arising from jurisprudence of the European and Irish courts, in respect of Article 6 of the Habitats Directive.

3 Methodology

3.1 Scientific and Technical Competence Relied Upon

13 This NIS was authored by Siofra Quigley and reviewed by Tim Ryle and Andrew Speer of Scott Cawley Ltd. The background and experience of the author and contributors to this report are set out below.

14 Siofra Quigley is a Senior Ecologist with Scott Cawley Ltd.. She obtained an honours degree in Zoology, from National University of Ireland Galway, and a Master's degree in Wildlife Biology and Conservation from Edinburgh Napier University. She has five years' professional experience working in the UK and Ireland on a range of projects, from residential to large-scale infrastructure. Siofra is experienced in carrying out field surveys in several protected

species; bat, otter, badger, birds, red squirrel, reptile, pine marten, and undertakes and manages surveys for a range of projects. She has also been involved in radio tracking mountain hares and bats, bat call analysis, badger bait marking, has acted as an Ecological Clerk of Works role on construction projects. Síofra is experienced in habitat classification (Joint Nature Conservation Committee, 2010, EU Habitats Directive and Fossitt classification) and mapping (QGIS and ArcGIS). Síofra's work in Scott Cawley involves project management, and the preparation of reports, including Ecological Impact Assessment (EclA) Appropriate Assessment (AA) Screening reports, and Natura Impact Statements (NIS) for residential, commercial, and infrastructure projects across Ireland. Síofra has also been involved in the preparation of bat derogation licence applications, prepared habitat management plans and advised on enhancement measures for planning applications.

- 15 Tim Ryle is a Principal Ecologist with Scott Cawley Ltd. He holds an honours degree in Botany from University College Dublin and was later awarded a Ph.D. from the same institution. He is a full Member of the Institute of Environmental Scientists. Tim is an experienced ecological consultant with twenty years' experience in private consultancy in designing, undertaking and managing a wide range of ecological survey and in assessing impacts and designing mitigation measures and biodiversity enhancements, in particular for protected species including badgers, otters, bats, birds, amphibians as well as habitats of conservation importance. He is also experienced in undertaking Appropriate Assessment for small-scale development projects and larger infrastructural projects, land plans as well as national/government plans.
- 16 Andrew Speer is a Chief Technical Officer at Scott Cawley Ltd., with over 14 years' professional ecological consultancy experience in ecological impact assessment. Andrew is a Full Member of the Chartered Institute of Ecology and Environmental Management (CIEEM) and holds an honours degree in Zoology from NUI Galway, a Postgraduate Diploma in Geographic Information Systems (GIS) from the University of Ulster and an Advanced Diploma in Planning and Environmental Law from Kings Inns. He has extensive experience in the Appropriate Assessment (AA) process and has been the lead author for the preparation of numerous Screening for Appropriate Assessment Reports, Natura Impact Statements (NISs) and Natura Impact Reports (NIRs). Andrew also provides technical review and due diligence of Appropriate Assessment documentation for public and local authorities to aid their decision-making process as well as peer review of AA documentation prior to lodgement of planning applications.

3.2 Guidance and Approach

- 17 This NIS has been prepared in accordance with the following documents.

European Commission Guidance

- *Assessment of Plans and Projects in Relation to Natura 2000 sites: Methodological Guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC* (European Commission, 2021);
- *Managing Natura 2000 Sites: The Provisions of Article 6 of the Habitat's Directive 92/43/EEC* (European Commission, 2019);
- *Communication from the Commission on the Precautionary Principle* (European Commission 2000)²;

² The precautionary principle is a guiding principle that derives from Article 191 of the Treaty on the Functioning of the European Union and has been developed in the case law of the European Court of Justice (e.g. ECJ case C-127/02 – Waddenzee, Netherlands).

This guidance document notes that the precautionary principle “covers those specific circumstances where scientific evidence is insufficient, inconclusive or uncertain and there are indications through preliminary objective scientific evaluation that there are reasonable grounds for concern that the potentially dangerous effects on the environment, human, animal or plant health may be inconsistent with the chosen level of protection”.

Applying the precautionary principle in the context of screening for appropriate assessment requires that where there is uncertainty or doubt about the risk of significant effects on a European site(s), it should be assumed that significant effects are likely and AA must be carried out.

- *Nature and Biodiversity Cases – Ruling of the European Court of Justice* (European Commission 2006);
- *Article 6 of the Habitats Directive – Rulings of the European Court of Justice* (European Commission Final Draft September 2014);

Irish Guidance

- *Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities* (Department of Environment, Heritage and Local Government 2010 revision)
- *Appropriate Assessment under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPW 1/10 & PSSP 2/10* (NPWS, 2010)
- *OPR Practice Note PN01. Appropriate Assessment Screening for Development Management* (Office of the Planning Regulator, 2021)

18 In addition, has applied the following guidance in characterising impacts, including determining magnitude and significance of impacts, as relevant in the application to Appropriate Assessment and European sites:

- *Guidelines for Ecological Impact Assessment in the UK and Ireland* (Chartered Institute of Ecology and Environmental Assessment, 2018)

3.3 Assessment Methodology

- 19 The Proposed Development (including the proposed design, construction methodologies, operational effects and decommissioning) was analysed and assessed to identify the potential impacts associated with the Proposed Development that could affect the ecological environment.
- 20 From this, the zone of influence of the Proposed Development was defined. Based on the identified impacts, and their zone of influence, the European sites potentially at risk of any direct or indirect impacts were identified.
- 21 In establishing which European sites are potentially at risk (in the absence of mitigation) from the Proposed Development, a source-pathway-receptor approach was applied. In order for an impact to occur, there must be a risk enabled by having a source (e.g. water abstraction or construction works), a receptor (e.g. a European site or its Qualifying Interest(s) (QIs) or Special Conservation Interest(s) (SCIs) species), and a pathway between the source and the receptor (e.g. pathway by air for air borne pollution, or a pathway by a watercourse for mobilisation of pollution). For an impact to occur, all three elements must exist; the absence or removal of one of the elements means there is no possibility for the impact to occur.
- 22 The identification of source-pathway-receptor connection(s) between the Proposed Development and European sites essentially is the process of identifying which European sites are within the zone of influence of the Proposed Development, and therefore potentially at risk of significant effects. The zone of influence is defined as the area within which the Proposed Development could affect the receiving environment such that it could potentially have significant effects on the QI habitats or QI/SCI species of a European site, or on the achievement of their conservation objectives (as defined in CIEEM, 2018).
- 23 The identification of a source-pathway-receptor risk does not automatically mean that significant effects will arise. The likelihood of significant effects will depend upon the characteristics of the source (e.g. extent and duration of construction works), the characteristics of the pathway (e.g. direction and strength of prevailing winds for air borne pollution) and the characteristics of the receptor (e.g. the sensitivities of the European site and its QIs/SCIs). However, identification of the risk does mean that there is a possibility of ecological or environmental damage occurring, with the significance of the effect depending upon the nature and exposure to the risk and the characteristics of the receptor. In this case, where there is uncertainty, the precautionary principle has been applied.
- 24 This assessment has been undertaken in consideration of all potential impact sources and pathways connecting the Proposed Development to European sites, in view of the conservation objectives supporting the conservation condition of the sites' QIs/SCIs.

- 25 The conservation objectives relating to each European site and its QIs/SCIs are expressed generally for SACs as “to maintain or restore the favourable conservation condition of the Annex I habitat(s) and/or the Annex II species for which the cSAC has been selected”, and for SPAs “to maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA”.
- 26 Following on from this, and as defined in the Habitats Directive, favourable conservation status (or condition, at a site level) of a habitat is achieved when:
- its natural range, and area it covers within that range, are stable or increasing, and
 - the specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future, and
 - the conservation status of its typical species is favourable
- 27 The favourable conservation status (or condition, at a site level) of a species is achieved when:
- population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and
 - the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and
 - there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis
- 28 Where site-specific conservation objectives have been prepared for a given European site, these include a series of specific attributes and targets against which effects on conservation condition, or integrity, can be measured, i.e. an impact which affects the achievement of favourable conservation condition, as measured by the attributes and targets, is an impact on site integrity.
- 29 In the case of some QIs/SCIs in certain European sites, the conservation objective is to restore rather than maintain conservation condition and this distinction is taken into account in the assessment; as is any legacy damage to European sites that has occurred since their designation, insofar as possible.

3.4 Desktop Study

- 30 The desktop data sources used to inform the assessment presented in this report are as follows (accessed in July 2023):
- Online data available on European sites and protected habitats/species as held by the National Parks and Wildlife Service (NPWS) from www.npws.ie³, including conservation objectives documents
 - Online data available on protected species as held by the National Biodiversity Data Centre (NBDC) from www.biodiversityireland.ie
 - Information on the surface water network and surface water quality in the area available from www.epa.ie
 - Information on groundwater resources and groundwater quality in the area available from www.epa.ie and www.gsi.ie
 - Ordnance Survey of Ireland mapping and aerial photography available from www.osi.ie

³ The following SAC and SPA GIS boundary datasets are the most recently available at the time of writing: SAC_ITM_2023_07 and SPA_ITM_2023_07.

- Information on the location, nature and design of the Proposed Development supplied by the applicant's design team

3.5 Baseline Surveys

- 31 This section describes the methodologies followed for the ecological surveys undertaken to inform the assessment presented in this NIS. Whilst surveys for this planning application were undertaken in 2022 and 2023, surveys have previously been undertaken by Scott Cawley Ltd., on the same lands in 2019 for a separate planning application on this site for the same client. Survey details for both planning applications are included below. For all of the receptors/survey types described below, the area within the Red Line boundary of the Proposed Development was surveyed, as shown in Figure 1.

3.5.1 Habitats and Flora Survey

- 32 A habitat survey was undertaken of the Proposed Development on the 12th April 2023 by Nicholas Fettes B.Sc. which followed on from an earlier survey on the 21st May 2019 by Colm Clarke B.Sc. M.Sc., both of Scott Cawley Ltd., following the methodology described in *Best Practice Guidance for Habitat Survey and Mapping*⁴. All habitat types were classified using the *Guide to Habitats in Ireland*⁵, recording the indicator species and abundance using the DAFOR scale⁶ and recording any species of conservation interest. Vascular and bryophyte plant nomenclature generally follow that of *The National Vegetation Database*⁷, having regard to more recent taxonomic changes to species names after the *New Flora of the British Isles*⁸ and the British Bryological Society's *Mosses and Liverworts of Britain and Ireland: A Field Guide*⁹.

3.5.2 Fauna Surveys

3.5.2.1 Terrestrial Mammals (excluding Bats)

- 33 A terrestrial fauna survey (excluding bats) was undertaken on the 12th April 2023 by Nicholas Fettes, following on from a previous survey on the 21st May 2019 by Colm Clarke. The presence/absence of terrestrial fauna species were surveyed through the detection of field signs such as tracks, markings, feeding signs, and droppings, as well as by direct observation. The habitats within the Proposed Development were assessed for signs of usage by protected/red-listed fauna species, and their potential to support these species. Surveys to check for the presence of badger setts within the study area, and to record any evidence of use, were undertaken.

⁴ Smith, G.F., O'Donoghue, P., O'Hora, K. & Delaney, E. (2011) *Best Practice Guidance for Habitat Survey and Mapping*. The Heritage Council Church Lane, Kilkenny, Ireland.

⁵ Fossitt, J.A. (2000) *A Guide to Habitats in Ireland*. Heritage Council, Kilkenny.

⁶ The DAFOR scale is an ordinal or semi-quantitative scale for recording the relative abundance of plant species. The name DAFOR is an acronym for the abundance levels recorded: Dominant, Abundant, Frequent, Occasional and Rare.

⁷ Weekes, L.C. & FitzPatrick, Ú. (2010) *The National Vegetation Database: Guidelines and Standards for the Collection and Storage of Vegetation Data in Ireland*. Version 1.0. Irish Wildlife Manuals, No. 49. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

⁸ Stace, C. (2019) *New Flora of the British Isles*. 4th Edition. C&M Floristics.

⁹ Atherton, I., Bosanquet, S. & Lawley, M. (2010) *Mosses and Liverworts of Britain and Ireland: A Field Guide*. Latimer Trend & Co., Plymouth.

3.5.2.2 Breeding Birds

- 34 Breeding bird surveys were undertaken on the 30th March 2023 by Wayne Daly B.Sc. on the 12th April 2023 by Nicholas Fettes (both of Scott Cawley Ltd.,) and on the 21st and 31st May 2019 by Colm Clarke using a methodology adapted from the *Bird Monitoring Methods – A Manual of Techniques for Key UK Species*¹⁰. The habitats within the Proposed Development were slowly walked in a manner allowing the surveyor to come within 50m of all habitat features. Birds were identified by sight and song, and general location and activity were recorded using the British Trust for Ornithology (BTO) species and activity codes.

3.5.2.3 Wintering Birds

- 35 Wintering bird surveys were undertaken by Scott Cawley Ltd. ecologists' on the following dates:
- 9th and 22nd December 2022 by Cathal O'Brien and Wayne Daly;
 - 10th and 26th January 2023 by Camilla Casella and Sorcha Shanley;
 - 10th February 2023 by Cathal O'Brien; and
 - 3rd, 14th and 22nd March 2023 by Shane Brien.
- 36 All surveys were undertaken using a methodology based on the *Bird Monitoring Methods – A Manual of Techniques for Key UK Species*¹¹. Lands were initially surveyed visually using binoculars/scope from vantage points at the edge of the Proposed Development followed by a walkover of the site to identify birds which may not be visible from a distance (e.g. waders) and evidence of usage by wildfowl such as swans or geese (e.g. droppings). Birds were identified by sight and general location and activity were recorded using the British Trust for Ornithology (BTO) species and activity codes.
- 37 Wintering bird survey season generally consists of monthly visits between September – March (i.e. one survey a month), based on guidance found in *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*. Whilst early season visits were not completed for this application, due to the distance from the Proposed Development and large estuaries and the SPA sites therein, and as additional surveys were undertaken between December – March to supplement missing the start of the season, this is not a limitation to the development and still complies with best practice guidance. In addition, early arrival species such as geese and swans, would still be picked up later in the season, should they be using the development site.

4 Description of the Proposed Development

- 38 A full description of the Proposed Development is also provided in Chapter 2 of the Environmental Report accompanying the planning application for the Proposed Development.
- 39 The proposed OCGT Generation Plant site is 10.55ha in size and located 4.8km south-west of the centre of Drogheda and 2.7km north-east of the centre of Duleek (refer to Figure 1).
- 40 The site is currently a greenfield site and used for agriculture tillage. The land is situated approximately 450m to the south of a large cement manufacturing plant and its associated quarry (Irish Cement Ltd), at its nearest point to the site. In addition, the Indaver Waste to Energy facility lies immediately northwest of the site across the R152 road. Directly adjacent to the proposed OCGT Generating Plant is a cluster of commercial and residential buildings including a commercial vehicle servicing centre and CVRT (Commercial Vehicle Roadworthiness Testing) centre. Residential development in the vicinity of the site is scattered, typical of the rural location.

¹⁰ Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*. RSPB: Sandy

¹¹ Gilbert, G., Gibbons, D.W. & Evans, J. (1998) *Bird Monitoring Methods - A Manual of Techniques for Key UK Species*. RSPB: Sandy

4.1 Overview of Construction Phase Development

- 41 The Proposed Development will comprise a 170MW (electrical output) Open Cycle Gas Turbine (OCGT) Power Plant. The Proposed Development will comprise an electricity generating plant which will use Hydrotreated Vegetable Oil (HVO) as fuel and will be connected to a previously permitted 110kV substation (ABP-303678-19) and associated site works and improved access from the R152. The development comprises the following elements:
- a) Three gas turbine buildings (each 990m²) each housing 1 no. turbine, 1 no. generator and auxiliary equipment with a total of 269 MWth (thermal output) generating capacity all on concrete plinths.
 - b) The power plant will have three exhaust stacks (25m in height), one exhaust stack per OCGT. Therefore, each OCGT will comprise a standalone Large Combustion Plant. The power plant may need to utilise, selective catalytic reduction (SCR) (18m high, 4.5 width, 14m length) for nitrogen oxide (NO_x) abatement.
 - c) Water treatment plant comprising:
 - o a 275m² Deionising Building (6m high x 11m wide x 25m long)
 - o a raw water treatment tank of 2,262m³ (12.8m high)
 - o a deionised water tank (max. volume of 3,925m³) 15.4m high
 - o a processed water tank of 450m³ (9m high)
 - o 1 no. 20m² firefighting water tank of 45m³ (2m high)
 - o 1 no. 25m² firewater module (4m high x 5m wide x 5m long)
 - o 1 no. sanitary foul water cesspool tank of 79m³ located underground (1.98m high x 2.5m wide x 16m long)
 - o a bulk chemical storage area (4.75m wide x 7.75m long)
 - d) 2 no. HVO tanks (max. storage of 2300 m³ of HVO per tank), 13m high with a diameter of 15m and associated fuel pumping and filtering equipment and pipework, within a 43.5m L x 45.5m W x 1.5m Bund capacity is 2970m³
 - e) 1 ammonia tank –1.8m high 3.5m length with bund 2.5 m x 5 m with a height of 1.5 m
 - f) 1 no. fuel polishing system (3m high x 6m wide x 24m long)
 - g) 2 no. transformers each 160m², and each measuring (5m high x 10m wide x 15m long). 3 no. Lightning Masts (18m in height) and cable gantry connection to the adjoining consented 110kV Substation.
 - h) a 520m² services building (6m high x 13m wide x 40m long)
 - i) a 160m² Switchgear (MV) building (5m high x 6.1m wide x 26.3m long)
 - j) all other miscellaneous and ancillary site works, including: 12 no. Car parking spaces and 1 No. unloading bay, one lowered site platform area, internal circulation road, internal access road and hard and soft landscaping including a material berm (1.2m high), a temporary construction compound, temporary security building, staff welfare facilities, and palisade fencing (2.4m high).
 - k) New road markings, including deceleration lane approaching the site, on the R152
- 42 The Proposed Development will include connection to public water mains and wastewater provision, supplied by Uisce Éireann.
- 43 Foul water produced will be less than 1m³ per day from the Services building sinks/toilets and will be stored in a separate c. 79m³ underground tank (subject to detailed design) pending collection by an appropriately licensed waste collector for treatment off-site. With 1m³ of waste being produced each day it is estimated a maximum of 1 tanker per month should be adequate to remove the foul waste water from the site. All underground waste water storage tanks will be supplied by a specialist manufacturer and installed with a concrete surround to the

manufacturer's specification. The waste will be transported by a specialist waste contractor to a suitable licensed waste facility for treatment.

- 44 The Proposed Development will connect to a previously consented 110 kV substation which will be located adjacent and to the south-west of the proposed OCGT Power Plant.
- 45 The application relates to a development which comprises or is for the purposes of an activity requiring an Industrial Emissions Directive (IED) licence, and full details of the Proposed Development and its anticipated environmental impacts will be notified to the Environmental Protection Agency. This is a site to which the Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S.I. 209 of 2015) applies.
- 46 Storm water from the Proposed Development will be discharged from the site at two outfall points: one at the eastern boundary toward the north of the Proposed Development, and a second at the eastern boundary in the centre of the site. The proposed storm water system include the provision of a hydro-brake to limit the volume of discharge to the receiving drainage ditch to 1.24 l/s and 7.33 l/s, respectively, in line with greenfield run-off rates. All storm water runoff from hard-standing areas will pass through a full retention oil separator. The Proposed Development will include the installation of 6 no. full retention separators.

4.1.1 *Grid Connection*

- 47 Power generated from the Proposed Development will ultimately feed into the national grid controlled. This will occur, with separate approval of the Commission for Regulation of Utilities (CRU) and in accordance with the requirements of Eirgrid, via a connection to the consented substation (ABP Case Reference PL17.303678) (This CRU consent process is separate from the planning process).

4.1.2 *Landscaping*

- 48 As the main construction elements draw to a close, the landscaping of the site includes enhancement planting and the seeding of a wildflower planting along the road verge and constructed embankment.

4.1.3 *Estimated Construction Duration*

- 49 Pending the grant of planning permission, the construction is expected to commence in Q4 2023 and expected to last 30 months and will employ 60-80 construction personnel.

4.2 **Decommissioning**

- 50 In the event the Proposed Development is decommissioned at the end of its operational lifetime (expected to be at least 20 years), a specific Decommissioning Management Plan will be developed which will outline the mitigation measures required, similar to those outlined in the Construction Environmental Management Plan and submitted to Meath County Council for approval. The decommissioning phase would return the area to the levels at this time, including any other changes from other plans/projects in the environment.



Figure 1: Site Location and Red line boundary of the Proposed Development¹²

¹² Image taken from Outline Construction Environmental Management Plan SSE Generation Ireland Ltd., PM Group (2023).

5 Overview of the Receiving Environment

5.1 European Sites

- 51 There are no European sites within or adjacent to the Proposed Development. The closest European sites are the River Boyne and River Blackwater SAC and the River Boyne and River Blackwater SPA, located c.3.5km to the north. The Proposed Development is not hydrologically linked or connected to the River Boyne or any of its tributaries.
- 52 The European sites present in the vicinity of the Proposed Development are listed in Table 1, along with their Qualifying Interests (QIs) and Special Conservation Interests (SCIs) and proximity to the Proposed Development, are shown on

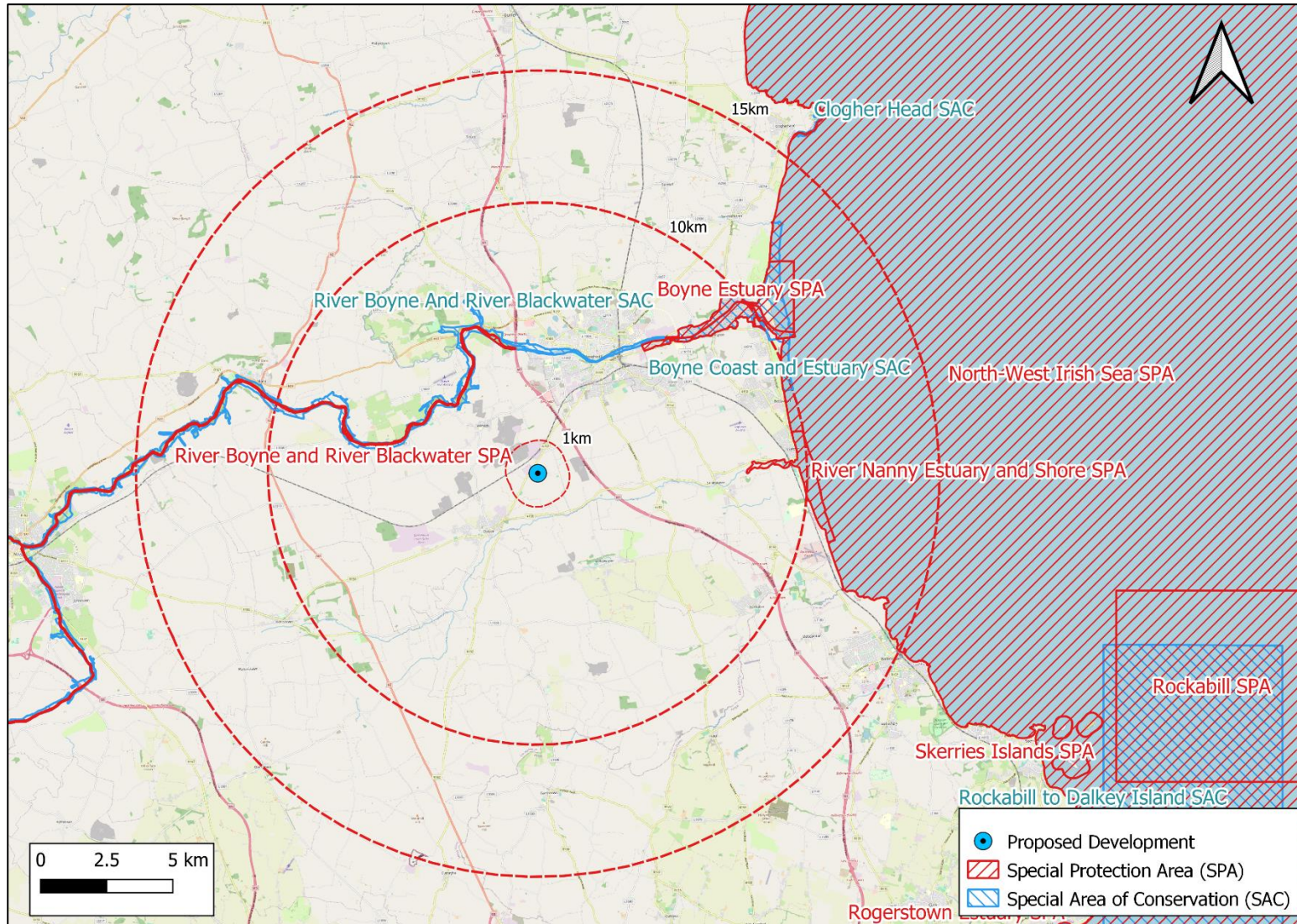


Figure 2 : European sites within the vicinity of the Proposed Development

Table 1: European sites in the vicinity of the Proposed Development

Site name and code	Distance from Proposed Development	Reasons for designation ¹³
Special Areas of Conservation (SACs)		
River Boyne and River Blackwater SAC (002299)	Located c. 3.5km north of the Proposed Development	<p>[1099] River Lamprey <i>Lampetra fluviatilis</i></p> <p>[1106] Salmon <i>Salmo salar</i></p> <p>[1355] Otter <i>Lutra lutra</i></p> <p>[7230] Alkaline fens</p> <p>[91E0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)*</p> <p>NPWS (2021) Conservation Objectives: River Boyne and River Blackwater SAC 002299. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.</p>
Boyne Coast and Estuary SAC [001957]	Located c. 6.9km north east of the Proposed Development	<p>1130 Estuaries</p> <p>1140 Mudflats and sandflats not covered by seawater at low tide</p> <p>1210 Annual vegetation of drift lines</p> <p>1310 <i>Salicornia</i> and other annuals colonising mud and sand</p> <p>1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)</p> <p>1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>)</p> <p>2110 Embryonic shifting dunes</p> <p>2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes)</p> <p>2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)*</p> <p>S.I. No. 433/2021- European Union Habitats (Boyne coast and Estuary Special Area of Conservation 001957) Regulations 2021</p> <p>NPWS (2012) <i>Conservation Objectives: Boyne Coast and Estuary SAC 001957</i>. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>
Clogher Head SAC [001459]	Located c. 15.6km north east of the Proposed Development	<p>[1230] Vegetated sea cliffs of the Atlantic and Baltic coasts</p> <p>[4030] European dry heaths</p> <p>S.I. No. 610/2019 - European Union Habitats (Clogher Head Special Area of Conservation 001459) Regulations 2019</p>

¹³ “Qualifying Interests” for SACs and “Special Conservation Interests” for SPAs based on relevant Statutory Instruments for each SAC and SPA, or NPWS Conservation Objectives downloaded from www.npws.ie in June 2023. Data on NHA/pNHA sites from the site synopsis documents published by the NPWS (where available).

Priority Annex I habitat types are denoted with an “*” and are habitat types which are in danger of disappearance at a European level – from the definition of “priority natural habitat types” in Article 1(d) of the Habitats Directive

Site name and code	Distance from Proposed Development	Reasons for designation ¹³
		NPWS (2017) Conservation Objectives: Clogher Head SAC 001459. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs.
Rockabill to Dalkey Island SAC [003000]	Located c. 22km south east of the Proposed Development	<p>[1170] Reefs [1351] Harbour porpoise <i>Phocoena phocoena</i></p> <p>S.I. No. 94/2019 - European Union Habitats (Rockabill To Dalkey Island Special Area Of Conservation 003000) Regulations 2019</p> <p>NPWS (2013) Conservation Objectives: Rockabill to Dalkey Island SAC 003000. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>
Rogerstown Estuary SAC [000208]	Located c. 23km south east of the Proposed Development	<p>1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide 1310 Salicornia and other annuals colonising mud and sand 1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) 1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>) 2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)*</p> <p>S.I. No. 286/2018 - European Union Habitats (Rogerstown Estuary Special Area of Conservation 000208) Regulations 2018</p> <p>NPWS (2013) Conservation Objectives: Rogerstown Estuary SAC 000208. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht</p>
Special Protection Areas (SPAs)		
River Boyne and River Blackwater SPA [004232]	Located c. 3.7km north west of the Proposed Development	<p>A229 Kingfisher <i>Alcedo atthis</i></p> <p>S.I. No. 462/2012 - European Communities (Conservation of Wild Birds (River Boyne and River Blackwater Special Protection Area 004232)) Regulations 2012.</p> <p>NPWS (2022) Conservation objectives for River Boyne and River Blackwater SPA [004232] First Order Site-Specific Conservation Objectives Version 1. Department of Housing, Local Government and Heritage.</p>
Boyne Estuary SPA [004080]	Located c. 5.7km north east of the Proposed Development	<p>A048 Shelduck <i>Tadorna tadorna</i> A130 Oystercatcher <i>Haematopus ostralegus</i> A140 Golden Plover <i>Pluvialis apricaria</i> A141 Grey Plover <i>Pluvialis squatarola</i> A142 Lapwing <i>Vanellus vanellus</i> A143 Knot <i>Calidris canutus</i> A144 Sanderling <i>Calidris alba</i> A156 Black-tailed Godwit <i>Limosa limosa</i> A162 Redshank <i>Tringa totanus</i> A169 Turnstone <i>Arenaria interpres</i></p>

Site name and code	Distance from Proposed Development	Reasons for designation ¹³
		<p>A195 Little Tern <i>Sterna albifrons</i> A999 Wetlands</p> <p><i>S.I. No. 626/2011 - European Communities (Conservation of Wild Birds (Boyne Estuary Special Protection Area 004080)) Regulations 2011.</i></p> <p>NPWS (2013) <i>Conservation Objectives: Boyne Estuary SPA 004080</i>. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>
<p>River Nanny Estuary and Shore SPA [004158]</p>	<p>Located c. 8km east of the Proposed Development</p>	<p>A130 Oystercatcher <i>Haematopus ostralegus</i> A137 Ringed Plover <i>Charadrius hiaticula</i> A140 Golden Plover <i>Pluvialis apricaria</i> A143 Knot <i>Calidris canutus</i> A144 Sanderling <i>Calidris alba</i> A184 Herring Gull <i>Larus argentatus</i> A999 Wetlands</p> <p><i>S.I. No. 140/2012 - European Communities (Conservation of Wild Birds (River Nanny Estuary and Shore SPA 004158)) Regulations 2012.</i></p> <p>NPWS (2012) <i>Conservation Objectives: River Nanny Estuary and Shore SPA 004158</i>. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>
<p>North-West Irish Sea cSPA [004236]</p>	<p>Located c. 10.1km east of the Proposed Development</p>	<p>[A065] Common Scoter <i>Melanitta nigra</i> [A001] Red-throated Diver <i>Gavia stellata</i> [A003] Great Northern Diver <i>Gavia immer</i> [A009] Fulmar <i>Fulmarus glacialis</i> [A013] Manx Shearwater <i>Puffinus puffinus</i> [A018] Shag <i>Phalacrocorax aristotelis</i> [A017] Cormorant <i>Phalacrocorax carbo</i> [A177] Little Gull <i>Larus minutus</i> [A188] Kittiwake <i>Rissa tridactyla</i> [A179] Black-headed Gull <i>Chroicocephalus ridibundus</i> [A182] Common Gull <i>Larus canus</i> [A183] Lesser Black-backed Gull <i>Larus fuscus</i> [A184] Herring Gull <i>Larus argentatus</i> [A187] Great Black-backed Gull <i>Larus marinus</i> [A195] Little Tern <i>Sterna albifrons</i> [A192] Roseate Tern <i>Sterna dougallii</i> [A193] Common Tern <i>Sterna hirundo</i> [A194] Arctic Tern <i>Sterna paradisaea</i> [A204] Puffin <i>Fratercula arctica</i> [A200] Razorbill <i>Alca torda</i> [A199] Guillemot <i>Uria aalge</i></p>

Site name and code	Distance from Proposed Development	Reasons for designation ¹³
		The North-West Irish Sea cSPA was subject to a Regulation 15 notification on 13 July 2023. No conservation objectives have been published for the site at the time of publication of this report in August 2023.
Skerries Islands SPA [004122]	Located c. 21km south east of the Proposed Development	<p>A017 Cormorant <i>Phalacrocorax carbo</i> A018 Shag <i>Phalacrocorax aristotelis</i> A046 Light-bellied Brent Goose <i>Branta bernicla hrota</i> A148 Purple Sandpiper <i>Calidris maritima</i> A169 Turnstone <i>Arenaria interpres</i> A184 Herring Gull <i>Larus argentatus</i></p> <p><i>S.I. No. 245/2010 - European Communities (Conservation of Wild Birds (Skerries Islands Special Protection Area 004122)) Regulations 2010.</i> <i>NPWS (2022) Conservation objectives for Skerries Islands SPA [004122]. First Order Site-Specific Conservation Objectives Version 1.0. Department of Housing, Local Government and Heritage</i></p>
Rogerstown Estuary SPA [004015]	Located c. 23km south east of the Proposed Development	<p>A043 Greylag Goose <i>Anser anser</i> A046 Brent Goose <i>Branta bernicla hrota</i> A048 Shelduck <i>Tadorna tadorna</i> A056 Shoveler <i>Anas clypeata</i> A130 Oystercatcher <i>Haematopus ostralegus</i> A137 Ringed Plover <i>Charadrius hiaticula</i> A141 Grey Plover <i>Pluvialis squatarola</i> A143 Knot <i>Calidris canutus</i> A149 Dunlin <i>Calidris alpina alpina</i> A156 Black-tailed Godwit <i>Limosa limosa</i> A162 Redshank <i>Tringa totanus</i> A999 Wetlands</p> <p><i>S.I. No. 271/2010 - European Communities (Conservation of Wild Birds (Rogerstown Estuary Special Protection Area 004015)) Regulations 2010.</i> <i>NPWS (2013) Conservation Objectives: Rogerstown Estuary SPA 004015. Version 1. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</i></p>

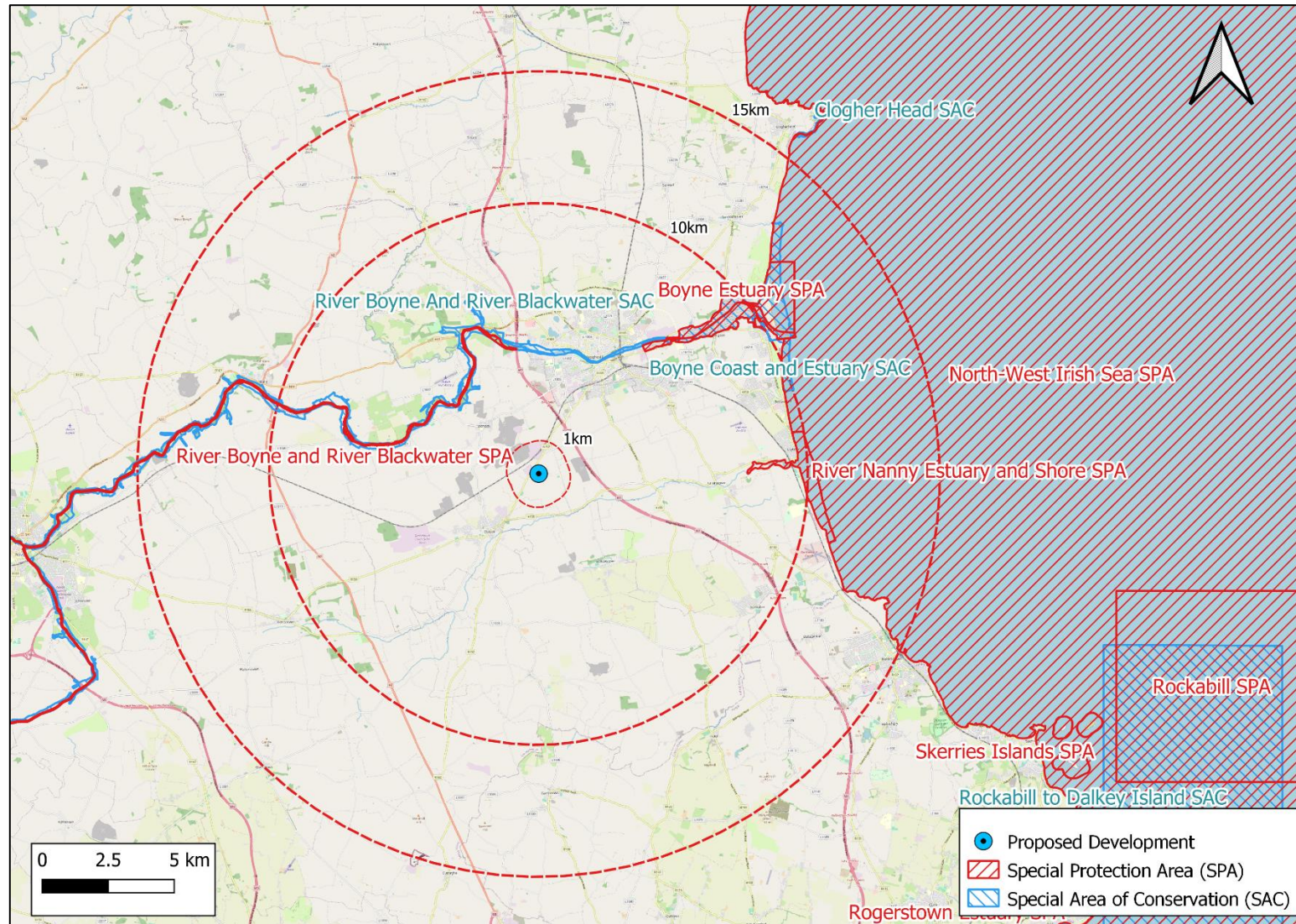


Figure 2 : European sites within the vicinity of the Proposed Development

5.1.1 Habitats and Flora

5.1.1.1 Habitats

- 55 The Proposed Development is located in the 10km Grid Square O07, at O 06670 70776 on lands at Carranstown and Caulstown, Duleek, Co. Meath. The lands are comprised of a single large arable field (BC1), bordered by hedgerows (WL1) and treelines (WL2). Drainage ditches (FW4) and a grassy verge (GS2) are also present along the boundaries of the site. The hedgerow habitat is approximately 1-2m in height, but well established and dominated by hawthorn *Crataegus monogyna*, with bramble *Rubus fruticosus* agg., ivy *Hedera helix*, and elder *Sambucus nigra* also noted in this habitat. The southern and eastern boundary contain a mosaic of hedgerow and treeline habitat, with ash *Fraxinus excelsior* and sycamore *Acer pseudoplatanus* present in the canopy layer, and hawthorn in the understorey.
- 56 A grassy verge (GS2) separates the hedgerow/treeline habitat from the arable crop field habitat, and is dominated by rank grassland species such as false oat-grass *Arrhenatherum elatius*, Cock's-foot *Dactylis glomerata*, Yorkshire fog *Holcus lanatus*, cleavers *Galium aparine*, and other tall ruderals including nettle *Urtica dioica*, broad-leaved dock *Rumex obtusifolius* and hogweed *Heracleum sphondylium*.
- 57 A number of drainage ditches also border the boundaries of the site. The western, and most of the southern ditches were dry during site visits in April 2023, while the northern and eastern ditches contained water. Water appears to enter the lands from the adjacent vehicular facility to the north of the lands, and likely flows into the Nanny (Meath)_050 watercourse located c. 130m east of the Proposed Development.
- 58 Spoil and bare ground habitat (ED2) was present in the southwest and northwest of the site, with evidence of recently excavated soil. Species such as common daisy *Bellis perennis*, ribwort plantain *Plantago lanceolata*, common dandelion *Taraxacum officinale* agg, were found in this habitat type.
- 59 Overall, the habitats located within the Proposed Development have limited ecological value in terms of flora. None of these habitats corresponds to Annex I habitats, provide a supporting role to any Annex I habitats connected with any European site and none of the QI habitats of European sites within the Zol of the Proposed Development occur in or in close proximity to the Proposed Development.

5.1.1.2 Rare and Protected Flora

- 60 The NBDC desktop study of records within c. 2km of the Proposed Development contained no records for any species listed on the Flora (Protection) Order, 2022 (FPO). The habitat survey did not identify any rare or protected flora within the Proposed Development.

5.1.1.3 Invasive Species

- 61 The NBDC desktop study of records within c. 2km of the Proposed Development contained no records for any species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended). No non-native invasive species listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended) were identified during any of the surveys undertaken within the Proposed Development.

5.1.2 Fauna species

5.1.2.1 Birds

- 62 The desktop study found a total of seven birds of Special Conservation Interest (SCIs) associated with European sites illustrated in Figure 2 and also listed in Table 2 of this report. With the exception of kingfisher, all of the other six species are wintering species of wader, duck, and gull which overwinter in the estuaries on the eastern coastline, i.e. River Boyne Estuary, and the River Nanny Estuary, and therefore the European sites therein. Whilst all of these species forage and roost within estuaries, lapwing, golden

plover and herring gull can also use agricultural grasslands and arable land for foraging¹⁴. Kingfisher is a SCI species for the River Boyne and River Blackwater SPA, located c. 3.7km north west of the Proposed Development. Kingfisher are only found along rivers, streams and canals, where they nest in burrows along vertical banks, and forage and commute along watercourses, rarely venturing inland¹⁵. The Proposed Development therefore does not have any suitable habitat for kingfisher species.

- 63 During wintering bird surveys carried out in 2022 and 2023, lapwing (an SCI species of Boyne Estuary SPA) were observed foraging within the lands during the survey on the 9th December 2022, with a peak count of 12. They were not observed during subsequent surveys. Herring gull, an SCI species of the River Nanny Estuary and Shore SPA and the North-West Irish Sea cSPA, were observed during all of the wintering bird surveys either foraging within the site or flying over the site, with a peak count of 124 birds observed foraging in the central area of the site in January 2023. Therefore the Proposed Development provides suitable *ex-situ* habitat for SCI species of the River Boyne Estuary SPA, North-West Irish Sea cSPA and River Nanny Estuary and Shore SPA.

Table 2: Desktop result of SCI bird species associated with European sites

Bird Species
Kingfisher <i>Alcedo atthis</i>
Common redshank <i>Tringa totanus</i>
Shelduck <i>Tadorna tadorna</i>
Oystercatcher <i>Haematopus ostralegus</i>
Golden Plover <i>Pluvialis apricaria</i>
Herring gull <i>Larus argentatus</i>
Northern lapwing <i>Vanellus vanellus</i>

5.1.2.2 Mammals

- 64 The NBDC data search returned records of the aquatic and terrestrial mammals species otter *Lutra lutra* within c. 2km of the Proposed Development. Otter and their breeding and resting places, are protected under the Wildlife Act 1976 (as amended). Otter are also listed on Annex II and Annex IV of the EU Habitats Directive and are afforded strict protection under the Habitats Directive and the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended). Otter have a widespread distribution in Ireland and are expected to inhabit all significant watercourses within the study area. Typically, otter territories are within the range of 7.5km for females and up to 21km for males¹⁶. Otter is a QI species of the River Boyne and River Blackwater SAC, which is located c. 3.5km north of the proposed works. There are no watercourses within the Proposed Development, with the closest being a tributary of the River Nanny (Nanny (Meath)_050), located c. 130m west of the Proposed Development. The Proposed Development is not hydrologically linked to the River Boyne or any of its tributaries.

¹⁴ NPWS (2012). *River Nanny Estuary & Shore Special Protection Area, Conservation Objectives Supporting Document, Version 1*.

¹⁵ Accessed in June 2023: <https://birdwatchireland.ie/birds/kingfisher/>

¹⁶ Ó'Neill, L., Veldhuizen, T., de Jongh, A. & Rochford, J. (2009). Ranging behaviour and socio-biology of Eurasian otters (*Lutra lutra*) on lowland mesotrophic river systems. *European Journal of Wildlife Research*. 55:363-370.

5.1.2.3 Other Fauna

65 Desmoulin's whorl snail *Vertigo moulinsiana* is protected through its inclusion on Annex II of the EU Habitats Directive. The NBDC database search of records c. 2km from the Proposed Development returned records for this species from 1972 in the O07 10km Grid Square, in an area covering western Drogheda and surroundings. The closest European site for which Desmoulin's whorl snail is a SCI species is the Rye Water Valley/Carton SAC, located c. 33km southwest and not within the same WFD Catchment of the Proposed Development. The desk study did not return records for any other Annex I/II fauna within the study area, nor did the fauna surveys on site..

5.1.3 Hydrology

66 The Proposed Development contains a network of drains which connect it to the Nanny River, c. 1.5km south of the Proposed Development via the Platin Stream (located c. 130m east of the Proposed Development), as shown in Figure 3. From the confluence of the Platin Stream with the Nanny River, c. 1.5km downstream of the Proposed Development, the Nanny River travels for a length of c. 6.5km before discharging to the Nanny Estuary transitional waterbody. The Nanny Estuary transitional waterbody in turn discharges to the Northwest Irish Sea coastal waterbody after a distance of a further 3.5km.

67 In light of the location of the Proposed Development in the catchment of the River Nanny and the Nanny Estuary, there is potential for waters generated in the lands to influence the downstream receiving environment in the River Nanny and Nanny Estuary.

68 The EPA collects data on water quality of river, transitional and coastal waterbodies in Ireland and hosts this data on the EPA web database . The following water quality data is available for watercourses in the vicinity of the development site:

- Downstream: There are no EPA water monitoring stations along the Platin Stream. There are however two operational EPA water monitoring stations along the River Nanny downstream of the Proposed Development: Station Code RS08N010550 (Station Name = NANNY (MEATH) - Br u/s Beaumont Br); and, Station Code RS08N010700 (Station Name = Br at Julianstown). Both stations recorded a Q-Value code of 3 or 'poor' water quality status when last surveyed in 2018 by the EPA. The Nanny Estuary Transitional Waterbody was recorded as being of 'intermediate' status in 2018-2020, while the Northwest Irish Sea coastal waterbody was recorded as being 'unpolluted' in 2018-2020.
- Upstream: There are no water monitoring stations upstream of the Proposed Development.

69 Separately, the EPA also undertakes monitoring and reporting of the Water Framework Directive (WFD) status of Irish waterbodies. The WFD classification scheme includes five status classes: high, good, moderate, poor and bad¹⁷. The WFD status of a waterbody reflects the biological, chemical and morphological conditions associated with it. The WFD status of the Platin Stream and the River Nanny downstream of the Proposed Development is "poor" for the period 2016-2021, while for the Nanny Estuary, its 2016-2021 WFD status is "moderate". The WFD status of the Northwest Irish Sea Coastal waterbody is 'Good' for the period 2016-2021..

70 In addition to monitoring WFD status, the EPA characterises whether waterbodies are at risk of failing to meet their environmental objectives. The River Nanny and the Northwestern Irish Sea are listed as being "At risk", while the Nanny Estuary is listed as being under "review" under the WFD 2nd risk cycle period covering the years 2016-2021.

¹⁷ Information on WFD classification categories and characterisation from the EPA website www.epa.ie/water/watmg/wfd/ Accessed June 2023

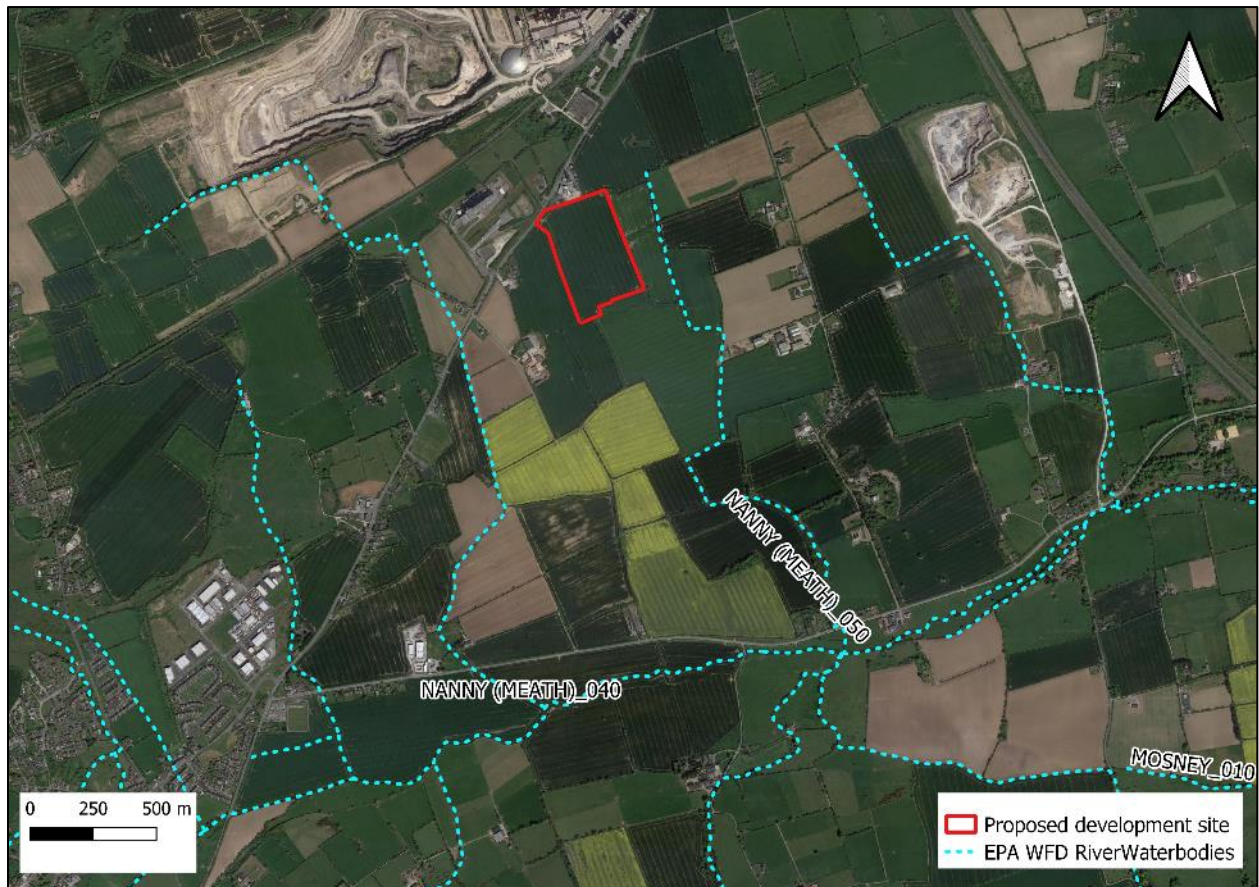


Figure 3. Watercourses in the vicinity of the Proposed Development

5.1.4 Hydrogeology

- 71 The Geological Survey of Ireland (GSI) data indicates that the site is underlain by a Regionally Important Aquifer - Karstified (diffuse). The site is located in an area of 'Moderate vulnerability', in relation to the underlying aquifer.
- 72 The Proposed Development is within the 'Bettystown' groundwater body (GWB) and is classified by the EPA as having 'Poor Status' and 'at risk' for the period 2016-2021. The Bettystown GWB overlaps with one European site, the River Nanny Estuary and Shore SPA, designated for overwintering bird species and their associated wetland habitat.

5.1.5 Air Quality

- 73 The effects of air pollution derived from anthropogenic activities is known to have negative impacts on the environment, either directly by causing vegetation die-back, or indirectly by affecting the acidity and nutrient status of soils and waters¹⁸. Governments have set limit values for a range of air pollutants in ambient air, known as Air Quality Standards (AQS). The Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) transpose EU Directive 2008/50/EC into Irish law.

¹⁸ Aherne, J. (2021) *Nitrogen-sulfur critical loads: Assessment of the impacts of air pollution on habitats*. Available at: https://www.epa.ie/publications/research/air/Research_Report_390.pdf (Accessed: June, 2023).

74 According to the Air Quality and Climate chapter of the Environmental Report¹⁹ prepared for the Proposed Development, there are two Industrial Emission (IE) licenced facilities within close proximity of the Proposed Development:

- Indaver Ireland Ltd. (IE Licence no. W0167-03), c.50m north-west of the Proposed Development; and,
- Irish Cement Ltd. (IE Licence no. P0030-05), c. 200m north of the Proposed Development.

75 The EPA produces an annual report on air quality²⁰, which includes results from air quality monitoring stations across various Air Quality Zones within Ireland. The Proposed Development is located within Air Quality Zone D: Rural Ireland, but is very close to Air Quality Zone C: Other Cities and Large Towns. Zone C in this instance is associated with Drogheda. Background pollutant levels in Zone C are elevated relative to Zone D and have been used as a conservative baseline for the purpose of this report. Background levels for aerosols for Zone C are replicated from the Air Quality and Climate chapter of the Environmental Report for the Proposed Development in Table 3, below. **Table 4** includes the most recent data available for ambient ammonia in the study area.

Table 3: EPA Quality Zone C Monitoring Stations: Background Pollutant concentrations ($\mu\text{g}/\text{m}^3$) for period 2017 – 2021

Pollutant Parameter	Resultant Estimated Background Concentration
Nitrogen Dioxide (NO ₂) Hourly - Annual Mean $\mu\text{g}/\text{m}^3$	12.05
Nitrogen Dioxide (NO ₂) Hourly – 99.8 th Percentile $\mu\text{g}/\text{m}^3$	24.10
Carbon Monoxide (CO) 8-Hour - Annual Mean mg/m^3	0.22
Particulate Matter (PM ₁₀) Daily - Annual Mean $\mu\text{g}/\text{m}^3$	13.8
Particulate Matter (PM _{2.5}) Daily - Annual Mean $\mu\text{g}/\text{m}^3$	8.4
Sulphur Dioxide (SO ₂) Hourly – Annual Mean $\mu\text{g}/\text{m}^3$	2.85
Sulphur Dioxide (SO ₂) Hourly – 99.7 th Percentile $\mu\text{g}/\text{m}^3$	5.7
Sulphur Dioxide (SO ₂) Daily – 99.2 th Percentile $\mu\text{g}/\text{m}^3$	5.7

Table 4: Background Ammonia (NH₃) concentrations ($\mu\text{g}/\text{m}^3$) for period 2013 – 2014

Pollutant Parameter	Resultant Estimated Background Concentration
Ammonia (NH ₃) Hourly mean $\mu\text{g}/\text{m}^3$	3.2
Ammonia (NH ₃) Hourly – Annual Mean $\mu\text{g}/\text{m}^3$	1.6

¹⁹ Chapter 10 Air Quality, Environmental Report, Platin.

²⁰ The most recent air quality report is 'Air Quality in Ireland 2021 (2022)'

6 Potential Impacts, Zone of Influence and Identifying European Sites at Risk of Effects

76 Based on the baseline and receiving ecological environment and the nature and characteristics of the Proposed Development the following potential impacts have been identified:

- Habitat loss and fragmentation;
- Habitat degradation as a result of hydrological impacts;
- Habitat degradation as a result of hydrogeological impacts;
- Habitat degradation as a result of introducing/spreading non-native invasive species;
- Habitat degradation as a result of air quality impacts;
- Disturbance and displacement impacts; and
- Collision Risk.

6.1 Habitat loss and fragmentation

77 The Proposed Development does not overlap with the boundary of any European site. Therefore, there are no European sites at risk of direct habitat loss impacts.

78 As the Proposed Development does not traverse any European sites there is no potential for habitat fragmentation to occur.

79 Several wetland bird SCIs of European sites in the vicinity of the Proposed Development are known to regularly utilise terrestrial grassland and arable sites for supplementary forage. Wintering bird species are mobile and can regularly travel up to 20km between roosting and feeding sites²¹. The following species have been identified foraging within the Proposed Development, and / or are known to forage in habitats such as those within the Proposed Development, e.g. arable fields:

- [A130] Oystercatcher *Haematopus ostralegus* – an SCI species of the Boyne Estuary SPA (004080), River Nanny Estuary and Shore SPA (004158), and Rogerstown Estuary SPA (004015).
- [A140] Golden Plover *Pluvialis apricaria* – an SCI species of the Boyne Estuary SPA (004080) and the River Nanny Estuary and Shore SPA (004158).
- [A141] Grey Plover *Pluvialis squatarola* - an SCI species of the Boyne Estuary SPA (004080) and Rogerstown Estuary SPA (004015).
- [A142] Lapwing *Vanellus vanellus* - an SCI species of the Boyne Estuary SPA (004080).
- [A184] Herring Gull *Larus argentatus* – an SCI species of the Skerries Islands SPA (004122) and the North-West Irish Sea cSPA. (designated for its breeding population).
- [A043] Greylag Goose *Anser anser* – an SCI species of Rogerstown Estuary SPA (004015).
- [A046] Brent Goose *Branta bernicla hrota* – an SCI species of Rogerstown Estuary SPA (004015).

80 Notwithstanding their association with inland suitable foraging/feeding sites, in this instance, there is a large distance of separation between the Proposed Development and the closest European site for which the any of the aforementioned species have been designated, the Boyne Estuary SPA located c. 6km to the north-east. Much of the land separating the Proposed Development and the Boyne Estuary SPA is composed of habitats suitable for foraging wetland birds, e.g. arable land, and improved agricultural grassland. Similarly, there are large distances of separation between the Proposed Development and the River Nanny Estuary SPA, Skerries Islands SPA, North-West Irish Sea cSPA, and Rogerstown Estuary SPA, respectively, which are largely occupied by similar agricultural and coastal habitats. Therefore there is an

²¹ Scottish Natural Heritage (2016). *Guidance: Assessing connectivity with Special Protection Areas (SPAs). Version 3.*

abundance of alternative suitable habitat for wintering wetland bird species in the surrounding area. The loss of the Proposed Development, which is 10.55 ha in area, would not be significant in the context of the wider environment, given the abundance of similar habitat in the immediate and surrounding area. It is also worth noting that field parcels will change in rotation between grassland, winter crops, stubble etc., year on year, and that this would constitute “natural patterns of variation”. The fact that these field parcels are constantly changing from season to season and year to year, means that wintering birds using land in the area are habituated to these changes and are accustomed to moving from field to field in order to find suitable foraging habitat. Whilst SCI species lapwing and herring gull were identified feeding within the lands on one occasion, in this context, the loss of the Proposed Development would not result in population level effects on SCI bird number and would not adversely affect the integrity of SCI species from distal SPAs identified as being within the ZoI of the Proposed Development.

- 81 All other species for which European sites in the potential zone of influence for loss of *ex-situ* habitat (20km from the Proposed Development) are strongly associated with aquatic or estuarine habitats that do not occur within the Proposed Development and are therefore not at risk of any effects of habitat loss.
- 82 On the above basis, and as the Proposed Development does not overlap with the boundary of any European sites, there are no European sites at risk of direct habitat loss impacts.
- 83 As the Proposed Development will not result in habitat loss or habitat fragmentation within any European site, there is no potential for any in combination effects to occur in that regard.

6.2 Habitat degradation as a result of hydrological impacts

Surface Waters

- 84 Contaminated surface water run-off, or an accidental pollution event during construction, or operation, has the potential to affect water quality in the receiving surface water environment. In this instance, the potential zone of influence of such an event extends to the Platin Stream, River Nanny and Nanny Estuary. Habitats that occur below the high tide line and fauna that use intertidal and marine habitats within the Nanny Estuary are potentially at risk of effects of hydrological impacts.
- 85 Hydrological impacts are not predicted to cause discernible affects in waters beyond the Nanny Estuary as any pollution event would be temporary in nature, and would be imperceptible considering the dilution factor in the Northwest Irish Sea Coastal Waterbody²². Therefore, habitat degradation as a result of hydrological impacts would be limited to European sites located in the Nanny Estuary, i.e. the River Nanny Estuary and Shore SPA.
- 86 Hydrological impacts with the potential to affect intertidal habitats occurring below the high tide mark in the Nanny Estuary also have the potential to impact fauna associated with these habitats. Such fauna includes wintering birds which feed and roost on intertidal habitats and benthic meiofauna associated with mudflats and sandflats not covered by seawater at low tide [1140].
- 87 Chapter 9 Water and Waste Water of the ENVIRONMENTAL REPORT for the Proposed Development concluded “*in the absence of mitigation measures, construction works for the Proposed Development have the potential to have a medium-term, significant effect on the local water environment*”. Contaminated surface water run-off or a pollution event, of a sufficient magnitude, has the potential to affect the receiving aquatic and estuarine environments (either alone or in combination with other pressures on water quality) to an extent that could undermine the conservation objectives of the River Nanny Estuary and Shore SPA.

Process Waters and Foul Waters

- 88 In the absence of any mitigation measures, process or foul waters generated from the Proposed Development could adversely affect conditions in the receiving surface water environment in the Platin

²² See also, Chapter 9 Water and Waste Water Environmental Report, 2023. AECOM.

Stream, River Nanny and Nanny Estuary. The potential zone of influence of such effects would extend to intertidal habitats occurring below the high tide mark in the Nanny Estuary and fauna associated with these habitats. Therefore, habitat degradation as a result of hydrological impacts would be limited to European sites located in the Nanny Estuary.

- 89 Hydrological impacts with the potential to affect intertidal habitats occurring below the high tide mark in the Nanny Estuary also have the potential to impact fauna associated with these habitats. Such fauna includes wintering birds which feed and roost on intertidal habitats and benthic meiofauna associated with mudflats and sandflats not covered by seawater at low tide [1140].
- 90 A leak or release of foul or process waters, of a sufficient magnitude, has the potential to affect the receiving aquatic and estuarine environments (either alone or in combination with other pressures on water quality) to an extent that could undermine the conservation objectives of the River Nanny Estuary and shore SPA.

6.3 Habitat degradation as a result of hydrogeological impacts

- 91 The Proposed Development lies within the Bettystown GWB. The River Nanny Estuary and Shore SPA is the only European site located within the Bettystown GWB.
- 92 Based on information published by Geological Survey Ireland (GSI) on the Bettystown GWB²³, 'Regional groundwater flow will be towards the River Nanny and also, in the northeast to the Coast, but on a local scale, groundwater discharges to the streams and rivers crossing the aquifer. Flow path lengths are generally 500-2000 m. The main discharge areas for the aquifer are the coast and the River Nanny.' The River Nanny Estuary and Shore SPA is not designated for groundwater dependent habitats and/or species, and as there will be no dewatering or interactions with the water table, therefore there will be no hydrogeological impacts on European site or their SCI species and supporting wetland habitats as a result of the development.

6.4 Habitat degradation as a result of introducing/spreading non-native invasive species

- 93 As the Proposed Development does not contain any species listed on the Third Schedule of the *European Communities (Birds and Natural Habitats) Regulation 2011 (as amended)*, there is no possibility of spreading non-native invasive species from the lands to any European sites.

6.5 Habitat degradation as a result of air quality impacts

- 94 The effects of sulphur and nitrogen air pollution derived from anthropogenic activities is known to have negative impacts on the environment, either directly by causing vegetation die-back, or indirectly by affecting the acidity and nutrient status of soils and waters²⁴. Direct effects are limited to flora and habitats, while indirect effects for fauna may arise from changes to forage availability and habitat quality (e.g. acidification of waters).
- 95 Although Carbon Monoxide (CO) will be generated by the OCGTs, it does not contribute to air quality impacts to vegetation²⁵, and is not discussed further.
- 96 A reduction in air quality within the immediate vicinity of the construction works may occur as a consequence of dust deposition associated with these construction activities. This includes reduction in

²³ <https://gsi.geodata.gov.ie/downloads/Groundwater/Reports/GWB/BettystownGWB.pdf> [Accessed June 2023]

²⁴ Aherne, J., Henry, J., and Wolniewicz, M. (2017). *Development of critical loads for Ireland: Simulating impacts on systems (SIOS)*. EPA Research Report 2008-CCRP-4.1a. Prepared for the Environmental Protection Agency by Trent University. March 2017. ISBN: 978-1-84095-677-1

²⁵ Bignal, K.L., Ashmore, M.R., Headley A.D., Stewart, K., & Weigert, K. (2007). *Ecological Impacts of Air Pollution from Roads on Local Vegetation*. Applied Geochemistry 22:1265-1271.

photosynthesis due to smothering from dust on the plants and chemical changes such as acidity to soils. There are no European or other Designated Sites within 350m of the site boundary, which is the threshold distance for ecological sensitivity²⁶. According to Chapter 5 Traffic and Transportations of the Environmental Report, construction traffic associated with the Proposed Development is not significant²⁷. Due to the scale and duration of the construction works, similarly no significant impacts are expected from construction machinery. Therefore associated emissions are not significant. On this basis, there is no possibility of significant effects on any European sites arising from air quality impacts during the construction-phase of the Proposed Development, and this element is not assessed further.

97 The impact of emissions within 20 km of the Proposed Development and existing emission points on ambient ground level concentrations within the following designated habitat sites was assessed using AERMOD (a standardly used dispersion modelling software). The models contained extend to an area of 20km by 20km (coarse grid with 500m grid spacing), and 4km by 4km (fine grid with 100m grid spacing), and cover an area of 10km radius around the Proposed Development. The Air quality modelling and assessment included the following European sites:

- Special Areas of Conservation (SAC): River Boyne and River Blackwater SAC, Boyne Coast and Estuary SAC;
- Special Protection Areas (SPA): River Boyne and River Blackwater SPA, Boyne Estuary SPA, River Nanny Estuary and Shore SPA.

98 In the absence of any mitigation measures (in this instance including the design technology which has the result of the abatement of gases in the emissions from the Proposed Development), and adopting the precautionary principle, the potential for significant effects arising from air quality impacts during operation of the Proposed Development from sulphurous, nitrogenous, ammonia and/or particulate matter emissions, on the QIs/SCIs of the aforementioned European sites and/or their conservation objectives cannot be ruled out.

6.6 Disturbance and displacement impacts

99 Construction-related disturbance and displacement of fauna species could potentially occur within the vicinity of the Proposed Development. For mammal species such as otter, disturbance effects would not be expected to extend beyond 150m²⁸. There are no European sites designated for otter in the vicinity of the Proposed Development, with the closest European site being the River Boyne and River Blackwater SAC located c.3.5km to the north. For birds, disturbance effects would not be expected to extend beyond a distance of c.300m, as noise levels associated with general construction activities would attenuate to close to background levels at that distance.²⁹

²⁶ Holman, C. *et al.* (2014). IAQM Guidance on the assessment of dust from demolition and construction. Institute of Air Quality Management, London. <http://www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf>. Revised in 2016.

²⁷ Chapter 5 Traffic and Transportations Environmental Report (EIAR), Platin (June 2023).

²⁸ This is consistent with Transport Infrastructure Ireland (TII) guidance (Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (NA 2006) and Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes) (NRA 2005) documents. This is a precautionary distance, and likely to be moderated by the screening effect provided by surrounding vegetation and buildings, with the actual ZoI of construction related disturbance likely to be much less in reality.

²⁹ The disturbance zone of influence for waterbirds is based on the relationship between the noise levels generated by general construction traffic/works (BS 5228:2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 1 Noise) and the proximity of those noise levels to birds – as assessed in Cutts, N. Phelps, A. & Burdon, D. (2009) *Construction and Waterfowl: Defining Sensitivity, Response, Impacts and Guidance*, and Wright, M., Goodman, P & Cameron, T. (2010) Exploring Behavioural Responses of Shorebirds to Impulsive Noise. *Wildfowl* (2010) 60: 150–167. At 300m, noise levels are below 60dB or, in most cases, are approaching the 50dB threshold below which no disturbance or displacement effects would arise.

- 100 Noise generated from the Proposed Development does not have the potential to affect any QI or SCI of any European sites as the proposal is separated from European sites by a minimum distance of 3.5km. Noise generated from the Proposed Development will attenuate to background levels before reaching European sites. In the event that the lands or fields within c. 300m of the Proposed Development (e.g. the potential zone of influence of disturbance or displacements impacts) act as *ex-situ* foraging habitat for wintering bird SCIs of European sites, there is no possibility of significant effects, as there is an abundance of alternative suitable habitat for wintering wetland bird species in the surrounding area. The loss of the Proposed Development, which is 10.55ha in area and an additional buffer of c. 300m radius around the Proposed Development, would not be significant in the context of the wider environment. As outlined in Section 3.3.1, field parcels will change in rotation between grassland, winter crops, stubble etc., year on year, and this would constitute “natural patterns of variation”. The fact that these field parcels are constantly changing from season to season and year to year, means that wintering birds using land in the area are habituated to these changes and are accustomed to moving from field to field in order to find suitable foraging habitat. In this context, the loss of the Proposed Development and the c.300m radius surrounding it is not significant.
- 101 As the Proposed Development does not have the potential to result in the disturbance/displacement of the qualifying/special conservation interest species of any European site, there is no potential for in combination effects to occur.

6.7 Collision Risk

- 102 The power plant will have 3 exhaust stacks, all 25m in height. There will also be 3 gas turbine buildings of 16.9m in height. All other buildings within the site are at a lower height. Therefore, as the surrounding landscape is generally flat, there is potential for direct collision of SCI bird species from the exhaust stacks. However; the Proposed Development will be screened by the existing treelines and hedgerows, and the development is also not on a known flight path for SCI and wintering bird species, with gull species (such as herring gull, an SCI species of the River Nanny Estuary and Shore SPA and the North-West Irish Sea cSPA) typical flying height range up to 250m above sea level while foraging and travelling³⁰. Only one other SCI species was observed foraging within the lands (i.e. 12 lapwing, an SCI species of the Boyne Estuary SPA), and this species was observed on one occasion during a number of site visits with low number of birds observed. It is predicted that there is no potential for the Proposed Development to significantly increase the collision risk to mobile SCI species which are present in the area. Therefore, there is no potential for the Proposed Development to result in significant effects which could have implications for the conservation objectives of the River Nanny and Shore SPA, the Boyne Estuary SPA, the North-West Irish Sea cSPA or any other European site.

6.8 Summary

- 103 The potential impacts associated with the Proposed Development have the potential to affect the receiving environment and, as a result, the conservation objectives supporting the QIs / SCIs of five European sites: River Boyne and River Blackwater SAC, River Boyne and River Blackwater SPA, Boyne Estuary SPA, Boyne Coast and Estuary SAC, and River Nanny Estuary and Shore SPA.
- 104 The potential impacts of the Proposed Development on the receiving environment, their zone of influence, and the European sites at risk of likely significant effects are summarised in Table 5.

Table 5: Summary of the potential impacts of the Proposed Development on the receiving environment, their potential zone of influence, and the European sites within the zone of influence

³⁰ Thaxter, C., Ross-Smith, V., & Cook, A. (2015). How high do birds fly? A review of current datasets and an appraisal of current methodologies for collecting flight height data: Literature review. British Trust for Ornithology Research Report No. 666.

Potential Direct or Indirect Impacts and zone of influence of the Potential Effects	Are there any European sites within the zone of influence?
<p>Habitat loss. Habitat loss will be confined to the lands within the Proposed Development boundary.</p>	<p>No There are no European sites at risk of direct or ex-situ habitat loss associated with the Proposed Development</p>
<p>Habitat degradation as a result of hydrological impacts. Habitats and species downstream of the Proposed Development and the associated surface water drainage discharge points, and downstream of offsite wastewater treatment plants.</p>	<p>Yes The River Nanny Estuary and Shore SPA is at risk of hydrological effects arising from surface water run-off and pollution associated with the construction and/or operational phases of the Proposed Development.</p>
<p>Habitat degradation as a result of hydrogeological impacts. Groundwater-dependant habitats, and the species those habitats support, in the local area that lie downgradient of the Proposed Development.</p>	<p>No There are no European sites at risk of hydrogeological effects associated with the Proposed Development</p>
<p>Habitat degradation as a result of introducing/spreading non-native invasive species. Habitat areas within, adjacent to, and potentially downstream of the Proposed Development.</p>	<p>No There are no non-native invasive species present on the Proposed Development and, therefore, no risk associated with the Proposed Development to any European sites from the spread/introduction of non-native invasive species</p>
<p>Disturbance and displacement impacts. Potentially up to several hundred metres from the Proposed Development boundary, dependent upon the predicted levels of noise, vibration and visual disturbance associated with the Proposed Development, taking into account the sensitivity of the qualifying interest species to disturbance effects</p>	<p>No There are no European sites within the potential zone of influence of disturbance effects associated with the construction or operation of the Proposed Development</p>
<p>Habitat degradation as a result of air quality impacts. QI habitats, and QI/SCI species that rely upon these habitats for forage/roosting within 20km of the Proposed Development are potentially at risk.</p>	<p>Yes The following European sites are potentially at risk of air quality impacts arising from the Proposed Development during its operation:</p> <ul style="list-style-type: none"> • River Boyne and River Blackwater SAC (002299) • River Boyne and River Blackwater SPA (004232) • Boyne Estuary SPA (004080)

	<ul style="list-style-type: none">• Boyne Coast and Estuary SAC (001957)• River Nanny Estuary and Shore SPA (004158)
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7 Assessment of Effects on European Sites

- 105 This section of the NIS assesses the direct and indirect impacts of the Proposed Development on the European sites which fall within its zone of influence. For each of these European sites, the assessment below sets out the relevant ecological baseline information, the analysis of the potential impacts, the QIs / SCIs at risk of these potential impacts in view of the sites' conservation objectives, and the mitigation measures (if required) to avoid/reduce the effects of any potential impacts.
- 106 European sites have been grouped in the sub-sections below where the impact pathways, European sites' sensitivities, and potential effects are identical.
- 107 The assessment of the Proposed Development in combination with any other plans or projects on European sites is presented in Section 8.

7.1 River Boyne and River Blackwater SAC [002299]

7.1.1 Ecological Baseline Description for River Boyne and River Blackwater SAC

- 108 The Natura 2000 Standard Data Form (NPWS, 2019) lists the site as the main channel of the Boyne containing a good example of alluvial woodland of the *Salicetum albo-fragilis* type which has developed on three alluvium islands. Alkaline fen vegetation is well represented at Lough Shesk, where there is a very fine example of habitat succession from open water to raised bog. The Boyne and its tributaries is one of Ireland's premier game fisheries and offers a wide range of angling, from fishing for spring salmon and grilse to sea trout fishing and extensive brown trout fishing. The site is one of the most important in eastern Ireland for Atlantic salmon *Salmo salar* and has very extensive spawning grounds. The site also has an important population of river lamprey *Lampetra fluviatilis*, though the distribution or abundance of this species is not well known. Otter *Lutra lutra* is widespread throughout the site. Some of the grassland areas along the Boyne and Blackwater are used by a nationally important winter flock of whooper swan *Cygnus cygnus*. Several Red Data Book plants occur within the site, with round-leaved wintergreen *Pyrola rotundifolia*, fowl bluegrass *Poa palustris* and round fruited rush *Juncus compressus*. Also occurring are a number of Red Data Book animals, notably badger *Meles meles*, pine marten *Martes martes* and common frog *Rana temporaria*. The River Boyne is a designated Salmonid Water under the EU Freshwater Fish Directive.

7.1.2 Qualifying Interests and Conservation Objectives of River Boyne and River Blackwater SAC

- 109 The QIs of River Boyne and River Blackwater SAC, and the overall conservation objective, are listed in Table 6.

Table 6: Qualifying Interests and Conservation Objectives of River Boyne and River Blackwater SAC

Qualifying Interest(s)	Conservation Objective(s)
7230 Alkaline fens 91E0 Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)* 1099 River Lamprey <i>Lampetra fluviatilis</i> 1106 Salmon <i>Salmo salar</i> 1355 Otter <i>Lutra lutra</i>	To maintain or restore the favourable conservation condition of the Annex I habitats and the Annex II species for which the SAC has been selected

Qualifying Interest(s)	Conservation Objective(s)
NPWS (2021) <i>Conservation objectives for River Boyne and River Blackwater SAC [002299]</i> . Version 1. Department of Housing, Local Government and Heritage. ³¹	

110 In conjunction with considering the generic conservation objective for this SAC “*To maintain or restore the favourable conservation condition of the Annex I habitat(s) and the Annex II species for which the SAC has been selected*”, the site specific conservation objectives document for River Boyne and River Blackwater SAC also informed this assessment.

111 The site-specific conservation objectives document sets out the attributes, measures and targets that define the favourable conservation condition of the qualifying interests within the European site. Affecting the conservation condition of the qualifying interests/special conservation interests is deemed to constitute an adverse effect on the integrity of a European site. The specific attributes and targets used to define the conservation objectives of the qualifying interests of River Boyne and River Blackwater SAC are presented in Section 7.1.3.2, Table 9.

7.1.3 Examination and Analysis of Potential Direct and Indirect Impacts

112 The direct and/or indirect impacts by which the Proposed Development could (in the absence of mitigation measures) potentially affect the conservation objective attributes and targets supporting the conservation condition of the qualifying interests of River Boyne and River Blackwater SAC, are:

- Air Quality Impacts on QI habitats and species during operation

7.1.3.1 Air Quality Impacts on QI habitats and species during operation

113 The principal emissions to atmosphere during the operation of the Proposed Development will be combustion by-products from the OCGT unit combustion chambers.

114 The models contained extend to an area of 20km by 20km (coarse grid with 500m grid spacing), and 4km by 4km (fine grid with 100m grid spacing), and cover an area of 10km radius around the Proposed Development. The models include cumulative predicted air pollutant emissions from the Proposed Development in-combination with background emission levels for EPA Air Quality Zone C, and adjacent Industrial Emissions (IE) licensed facilities at Indaver Ireland Ltd (IE Licence no. W0167-03) and Irish Cement Ltd. (IE Licence no. P0030-05).

115 Heavy metals from generator emissions are associated with emissions of Particulate Matter, PM₁₀ (particulate matter less than 10µm) and PM_{2.5} (particulate matter less than 2.5µm). According to the Air Quality and Climate Chapter of the Environmental Report for the Proposed Development, emissions of PM₁₀ and PM_{2.5} are well below the relevant AQS for either human health or the environment for both configurations. The maximum annual ground level concentrations (GLC) for both PM₁₀ and PM_{2.5} will be 500m from the Proposed Development. Particulate matter decays at an exponential rate with distance from a source. There is a large distance of separation (in excess of 3.5km) between the area of highest GLC and the River Boyne and River Blackwater SAC. Given this distance of separation, there will be no direct or indirect impacts on vegetation in European sites.

116 Air quality limit value are set out by the United Nations Economic Commission for Europe (UNECE, 2010) and World Health Organisation (WHO). Critical loads is a concept that concentrates on the link between atmospheric pollutants, and how they affect ecosystems, essentially describing the tolerance of an ecosystem to pollutants before it becomes compromised.

³¹ The versions of the conservation objectives documents referenced in this table are the most recent published versions at the time of writing

- 117 A critical level for ambient annual NO₂ concentration is specified in the Air Quality Standards Regulations 2011 (S.I. No. 739 of 2022) as 30 µg/m³. The intent of this critical level for vegetation was to assess the impact at distances greater than 20 km from the source of NO₂ emissions. It is also appropriate to use this limit value in assessing any impacts on local rivers and small sites of ecological importance.
- 118 The predicted PC NO₂ value generated by the Proposed Development and neighbouring facilities is at the nearest point of the River Boyne and River Blackwater SAC is 1.63 µg/m³. Using a background NO₂ concentration of 12.05 µg/m³ the maximum annual average PEC at the River Boyne and River Blackwater SAC is equivalent to 45.6% of the AQS.
- 119 Ammonia is one of the key pollutants that contribute to nitrogen deposition. The background concentrations for Ammonia were gathered from the EPA³² which collected data from various monitoring stations located around the island of Ireland in the years 2013 and 2014. The background concentration of ammonia (annual mean) is 1.6 µg/m³, with the cumulative NH₃ levels at 1.9 µg/m³. The critical level for higher plants is 3 µg NH₃ m⁻³ annual mean, whilst the critical level for lichens and bryophytes is 1 µg NH₃ m⁻³ annual mean (APIS, 2000). According to the Air Dispersion Modelling Report (Appendix II) in the Environmental Report, the contour plots for the annual mean ground level concentrations for NH₃ at 100% load from the Proposed Development are at maximum 0.0497µg/m³ for the River Boyne and River Blackwater SAC. Therefore, emissions from ammonia as a result of the Proposed Development fall well below the critical load threshold values for the QI habitats and species for which the River Boyne and River Blackwater SAC have been designated.
- 120 The predicted environmental concentrations (PECs) (i.e. background concentrations plus modelled process contributions) were calculated for each parameter and averaging time, for comparison to AQS limit values. This assessment ensures that both the modelled emission and the existing background concentrations are taken into account when determining the possible overall ambient air quality once the Proposed Development is operational.
- 121 The results presented in Table 7 are those for the worst case modelling scenarios (i.e. 100% operational load) with the OCGT units at the Proposed Development utilising HVO fuel. The predicted maximum Process Contributions (PC) quoted in Table 7 are the cumulative effect of the Proposed Development and nearby facilities. The full results of the operational load sensitivity analysis are included in Appendix II and illustrate that there is a minimal difference in the results of the air dispersion models when the OCGT units were modelled at 100% load, 70% load and 35% load.
- 122 To note, the air dispersion models were calculated on the basis of the inclusion of air abatement measures, which are a requirement of the design of the Proposed Development. As such, they can be considered 'design mitigation measures' for the purposes of the NIS. From a practical point of view, it would not be a realistic scenario to model the air dispersion from the plant in the absence of the air abatement measures as in respect of licenced emissions by the EPA, the Proposed Development would not be consented nor constructed without their inclusion.

Table 7: Nitrogenous Ground Level Concentrations from the Proposed Development and examination against QI habitats for which the River Boyne and River Blackwater SAC have been designated.

River Boyne and River Blackwater SAC at Irish Grid O 04114 73412		
Pollutant		OCGT Maximum Annual Concentration
N	Annual Mean (Kg ha ⁻¹ a ⁻¹) Proposed Development on its own	0.163

³² EPA Research report *Ambient Atmospheric Ammonia in Ireland 2013-2014* (2017)

	Cumulative N (Kg ha ⁻¹ a ⁻¹) from Proposed Development, background concentrations for EPA Air Quality Zone C, and emissions from Indaver and Irish Cement Facilities	1.368
Annex I Habitats		
[7230] Alkaline fens – Rich fen, an equivalent to this habitat, have a critical loading of 15-30 kg N ha ⁻¹ a ⁻¹ , according to UNECE (2010) and APIS (2020). In this instance, the lower value of 15 kg N ha ⁻¹ a ⁻¹ has been used as the critical load, on a precautionary basis.		
Percentage of critical load N for Alkaline fens arising from Cumulative N		9%
Difference between cumulative N and Critical Load (Kg N ha ⁻¹ a ⁻¹)		13.632
Annual Mean N GLC below critical load for Alkaline fens?		Yes
[91E0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>)* - Broadleaved deciduous woodland, an equivalent to this habitat, have a critical loading of 10-20 kg N ha ⁻¹ a ⁻¹ , according to APIS (2020). In this instance, the lower value of 10 kg N ha ⁻¹ a ⁻¹ has been used as the critical load, on a precautionary basis.		
Percentage of critical load N for Alluvial forests arising from Cumulative N		14%
Difference between cumulative N and Critical Load (Kg N ha ⁻¹ a ⁻¹)		8.632
Annual Mean N GLC below critical load for Alkaline fens?		Yes

123 As shown in Table 7, the total maximum ground level concentration (GLC) for nitrogen both from the Proposed Development on its own as well as cumulatively with background concentrations of Nitrogen for Air Quality Zone C and existing outputs from nearby licenced facilities, fall well below the critical load threshold values for the QI habitats for which the River Boyne and River Blackwater SAC have been designated.

Table 8: Sulphur dioxide ground level concentrations (GLCs) from the Proposed Development and examination against QI habitats for which the River Boyne and River Blackwater SAC have been designated.

River Boyne and River Blackwater SAC at Irish Grid O 04114 73412		
Pollutant		OCGT Maximum Annual Concentration
SO ₂	Annual Mean (Kg SO ₂ ha ⁻¹ a ⁻¹) Proposed Development on its own	0.028
	Cumulative SO ₂ (Kg ha ⁻¹ a ⁻¹) from Proposed Development, background concentrations for EPA Air Quality Zone C, and emissions from Indaver and Irish Cement Facilities	0.312
Annex I Habitats		
[7230] Alkaline fens – Rich fen, an equivalent to this habitat, does not have a critical load threshold for SO ₂ listed in APIS (2020). In this instance, a precautionary approach has been adopted whereby the critical load has been set at 1 kg SO ₂ ha ⁻¹ a ⁻¹ . This value is in line with habitats sensitive to acidification such as petrifying springs have a critical loading of 1 kg SO ₂ ha ⁻¹ a ⁻¹		
Percentage of critical load SO ₂ for alkaline fens arising from Cumulative SO ₂		31%
Difference between cumulative SO ₂ and Critical Load (Kg SO ₂ ha ⁻¹ a ⁻¹)		0.688

Annual Mean SO ₂ GLC below critical load for Alkaline fens?	Yes
[91E0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)* - Broadleaved deciduous woodland, an equivalent to this habitat, have a critical loading of 1-2 kg SO ₂ ha ⁻¹ a ⁻¹ , according to APIS (2020). In this instance, the lower value has been used as the critical load, on a precautionary basis.	
Percentage of critical load SO ₂ for Alluvial woodland arising from Cumulative SO ₂	31%
Difference between cumulative SO ₂ and Critical Load (Kg SO ₂ ha ⁻¹ a ⁻¹)	0.688
Annual Mean SO ₂ GLC below critical load for Alkaline fens?	Yes

124 As shown in Table 8, the total maximum GLC rate for sulphur dioxide both from the Proposed Development on its own, as well as cumulatively with background concentrations of SO₂ for Air Quality Zone C and existing outputs from nearby licenced facilities, are below the critical load threshold values for the QI habitats for which the River Boyne and River Blackwater SAC has been designated.

125 Otter, Salmon and Lamprey are potentially sensitive to the effects of increased nitrogen GLCs, where nitrogen is a limiting factor in the river system. These species are also potentially sensitive to acidification (e.g. from SO₂ GLCs) of their aquatic habitat. In this instance, the additional loading of nitrogen and SO₂ arising from the Proposed Development, as demonstrated within the Air Quality and Climate Chapter of the Environmental Report, will not affect the pH that will result in a change in water quality in receiving watercourses used by Otter, Salmon or Lamprey species or their habitat in the River Boyne and River Blackwater SAC.

126 As the highest ground level concentrations of NO₂ and SO₂ from the Proposed Development fall below the critical load levels for sensitive habitats, and as the additional contributions from the Proposed Development fall below the AQs for human health and the environment, there is no possibility of airborne emissions affecting the QI habitats, species, or their conservation objectives for the River Boyne and River Blackwater SAC.

7.1.3.2 Summary

127 Table 9 presents a summary of the potential impacts of the Proposed Development on the QIs of River Boyne and River Blackwater SAC, and how these impacts relate to affecting the site's conservation objectives.

Table 9: Potential Impacts/Effects on the Conservation Objectives of River Boyne and River Blackwater SAC

Conservation Objectives Attribute/Measure/Target (*=priority Annex I habitat)	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
River Boyne and River Blackwater SAC			
7230] Alkaline Fens			
Maintain or restore the favourable conservation condition			
Habitat area / Hectares / Area stable or increasing, subject to natural processes	Yes Alkaline fen has the potential to be impacted by an increase in emissions from the Proposed Development, without mitigation in place.	Yes Impacts on air quality are scoped in due to the measures included in the design of the plant. As demonstrated in Table 7 and Table 8 the total maximum GLCs for nitrogen and SO ₂ , both from the Proposed Development on its own as well as cumulatively with background concentrations of N and SO ₂ for Air Quality Zone C and existing outputs from nearby licenced facilities, fall well below the critical load threshold values for the QI habitat. The air abatement design measures included in the design of the plant, as highlighted in Section 6.5 are required.	No
Habitat distribution / Occurrence / No decline, subject to natural processes.			
Hydrological regime / Flow rates, metres / Appropriate natural hydrological regime necessary to support the natural structure and functioning of the habitat.			
Peat formation / Flood duration / Active peat formation, where appropriate.			
Water quality: nutrients / Water chemistry measures / Appropriate water quality to support the natural structure and functioning of the habitat.			
Vegetation composition: typical species / Presence / Maintain vegetation cover of typical species including brown mosses and vascular plants.			
Vegetation composition: trees and shrubs / Percentage / Cover of scattered native trees and shrubs less than 10%.			
Physical structure: disturbed bare ground / Percentage / Cover of disturbed bare ground less than 10%. Where tufa is present, disturbed bare ground less than 1%.			
Physical structure: drainage / Percentage / Areas showing signs of drainage as a result of drainage ditches or heavy trampling less than 10%.			
[91E0] *Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae)			
Maintain or restore the favourable conservation condition			

Conservation Objectives Attribute/Measure/Target (*=priority Annex I habitat)	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Habitat area / Hectares / Area stable or increasing, subject to natural processes.	Yes	Yes	No
Habitat distribution / Occurrence / No decline	Alluvial forest habitat has the potential to be impacted by an increase in emissions from the Proposed Development, without mitigation in place.	Impacts on air quality are scoped in due to the measures included in the design of the plant.	
Woodland size / Hectares / Area stable or increasing.		As demonstrated in Table 7 and Table 8 the total maximum GLCs for nitrogen and SO ₂ , both from the Proposed Development on its own as well as cumulatively with background concentrations of N and SO ₂ for Air Quality Zone C and existing outputs from nearby licenced facilities, fall well below the critical load threshold values for the QI habitat.	
Woodland structure: cover and height / Percentage and metres / Diverse structure with a relatively closed canopy containing mature trees; subcanopy layer with semi-mature trees and shrubs; and well-developed herb layer.		The air abatement design measures included in the design of the plant, as highlighted in Section 6.5 are required.	
Woodland structure: community diversity and extent / Hectares / Maintain diversity and extent of community types			
Woodland structure: natural regeneration / Seedlings: sapling: pole ratio / Seedlings, saplings and pole age-classes occur in adequate proportions to ensure survival of woodland canopy.			
Hydrological regime: flooding depth/height of water table / Metres / Appropriate hydrological regime necessary for maintenance of alluvial vegetation			
Woodland structure: dead wood / m ³ per hectare; number per hectare / At least 30m ³ /ha of fallen timber greater than 10cm diameter; 30 snags/ha; both categories should include stems greater than 40cm diameter (greater than 20cm diameter in the case of alder).			
Woodland structure: veteran trees / Number per hectare / No decline			
Vegetation composition: native tree cover / Percentage / No decline. Native tree cover not less than 95%.			

Conservation Objectives Attribute/Measure/Target (*=priority Annex I habitat)	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Vegetation composition: typical species / Occurrence / A variety of typical native species present, depending on woodland type, including alder (<i>Alnus glutinosa</i>), willows (<i>Salix spp</i>) and, locally, oak (<i>Quercus robur</i>) and ash (<i>Fraxinus excelsior</i>).			
Vegetation composition: negative indicator species / Occurrence / Negative indicator species, particularly non-native invasive species, absent or under control			
River Lamprey <i>Lampetra fluviatilis</i> [1099]			
To maintain the favourable conservation condition of the species in the SAC, which is defined as follows:			
Distribution / Percentage of river accessible / Restore access to all water courses down to first order streams	Yes Lamprey are potentially sensitive to increased levels of SO ₂ and NO ₂ GLCs, specifically the effects of reduction of habitat suitability and mortality (toxicity), in this instance, the additional loading of nitrogen and SO ₂ arising from the Proposed Development. Without mitigation is place (in this case the air abatement design measures) emissions could affect Lamprey or their habitat in the River Boyne and River Blackwater SAC.	Yes The air abatement design measures included in the design of the plant, as highlighted in Section 6.5 are required.	No
Distribution of larvae / Number of positive sites in 2nd order channels (and greater), downstream of spawning areas / Not less than 50% of sample sites with suitable habitat positive for larval brook/river lamprey			
Population structure of larvae / Number of age/size classes / At least three age/size classes of larval brook/river lamprey present			
Larval lamprey density in fine sediment / Larval lamprey/m ² / Mean density of brook/river larval lamprey in sites with suitable habitat more than 5/m ²			
Extent and distribution of spawning nursery habitat / m ² and occurrence / No decline in extent and distribution of spawning and nursery beds			
Salmon <i>Salmo salar</i> [1106]			
To maintain the favourable conservation condition of the species in the SAC, which is defined as follows:			
Distribution: extent of anadromy / Percentage of river accessible / 100% of river channels down to second order accessible from estuary	Yes Yes	Yes	No

Conservation Objectives Attribute/Measure/Target (*=priority Annex I habitat)	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Adult spawning fish / Number / Conservation limit (CL) for each system consistently exceeded	Salmon are potentially sensitive to increased levels of SO ₂ and NO ₂ GLCs, specifically the effects of reduction of habitat suitability and mortality (toxicity), in this instance, the additional loading of nitrogen and SO ₂ arising from the Proposed Development. Without mitigation is place (in this case the air abatement design measures) emissions could affect Lamprey or their habitat in the River Boyne and River Blackwater SAC	The air abatement design measures included in the design of the plant, as highlighted in Section 6.5 are required.	
Salmon fry abundance / Number of fry/5 minutes electrofishing / Maintain or exceed 0+ fry mean catchment-wide abundance threshold value. Currently set at 17 salmon fry/5 minutes sampling			
Out-migrating smolt abundance / Number / No significant decline			
Number and distribution of redds / Number and occurrence / No decline in number and distribution of spawning redds due to anthropogenic causes			
Water quality / EPA Q value / At least Q4 at all sites sampled by EPA			
Otter <i>Lutra lutra</i> [1355]			
To maintain the favourable conservation condition of the species in the SAC, which is defined as follows:			
Distribution / Percentage positive survey sites / No significant decline	Yes	Yes The air abatement design measures included in the design of the plant, as highlighted in Section 6.5 are required.	No
Extent of terrestrial habitat / Hectares / No significant decline. Area mapped and calculated as 447.6ha along river banks/ lake shoreline/around ponds			
Extent of freshwater (river) habitat / Kilometres / No significant decline. Length mapped and calculated as 263.3km			
Extent of freshwater (lake) habitat / Hectares / No significant decline. Area mapped and calculated as 31.6ha			
Couching sites and holts / Number / No significant decline			
Fish biomass available / Kilograms / No significant decline			

Conservation Objectives Attribute/Measure/Target (*=priority Annex I habitat)	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Barriers to connectivity / Number / No significant increase	<p> Otter are potentially sensitive to increased levels of SO₂ and NO₂ GLCs, specifically the effects of reduction of habitat suitability and mortality (toxicity), in this instance, the additional loading of nitrogen and SO₂ arising from the Proposed Development. Without mitigation is place (in this case the air abatement design measures) emissions could affect Lamprey or their habitat in the River Boyne and River Blackwater SAC </p>		

7.1.4 Mitigation Measures

- 128 With the inclusion of the air abatement design measures included in the design of the plant, no additional mitigation measures are required.
- 129 However, Section 10.3 of ENVIRONMENTAL REPORT chapter 10 Air Quality prescribes the following good site practice mitigation measures to minimise emissions to air during the construction phase.
- 130 The following mitigation measures will be in place to minimise any construction related emissions to air and thus prevent any significant impact on air quality
- Good housekeeping and site management including the proper storage of spoil / loose materials on site
 - Hard surfaced roads will be swept to remove mud and aggregate materials from their surface and any un-surfaced roads will be restricted to essential site traffic only with speed restrictions
 - Water bowsers will be deployed for dust suppression in periods of dry weather during the construction phase
 - Wheel washing of construction vehicles leaving site will be implemented as necessary
 - Public roads outside the site will be regularly inspected and cleaned as necessary
 - Provision of an adequate water supply for effective dust/particulate matter suppression/mitigation
 - All vehicles and equipment used in relation to the site will be: mechanically sound; operated and maintained in accordance with the manufacturer's recommendations and switched off when not in use.

7.1.5 Residual Impacts

- 131 With the effective implementation of appropriate mitigation measures identified in this NIS including the operational design requirements, the Proposed Development poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the QIs of the River Boyne and River Blackwater SAC, and there are, therefore, no residual direct or indirect impacts associated with the Proposed Development that could adversely affect the integrity of River Boyne and River Blackwater SAC.

7.1.6 Conclusion of Assessment for River Boyne and River Blackwater SAC

- 132 Following an examination, analysis and evaluation in light of best scientific knowledge, of all relevant information in respect of the qualifying interests of River Boyne and River Blackwater SAC, the potential impacts and mitigation measures, and whether or not the predicted impacts would affect the conservation objectives that support the conservation condition of the qualifying interests, it has been concluded that the Proposed Development does not pose a risk of adversely affecting (either directly or indirectly) the integrity of River Boyne and River Blackwater SAC.

7.2 Boyne Estuary and Coast SAC

7.2.1 Ecological Baseline Description for Boyne Coast and Estuary SAC

133 The Natura 2000 Standard Data Form (NPWS, 2018) lists the site as having a good diversity of coastal habitats, including fixed dunes, however most have been modified in some way. The containment of the main tidal channel has altered the tidal pattern which affects the functioning of the various estuarine habitats. Both dune systems were formerly far more extensive but much of the stable areas have now been converted to golf courses. The site is important for wintering waterfowl, supporting nine species in nationally important numbers, including golden plover *Pluvialis apricaria*, an Annex I EU Birds Directive species. Little tern *Sterna albifrons* breeds or attempts to breed in most years.

7.2.2 Qualifying Interests and Conservation Objectives of the Boyne Coast and Estuary SAC

134 The QIs of the Boyne Coast and Estuary SAC, and the overall conservation objectives, are listed in Table 11.

Table 10: Qualifying Interests and Conservation Objectives of the Boyne Coast and Estuary SAC

Qualifying Interest(s)	Conservation Objective(s)
1130 Estuaries 1140 Mudflats and sandflats not covered by seawater at low tide 1210 Annual vegetation of drift lines 1310 <i>Salicornia</i> and other annuals colonising mud and sand 1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) 1410 Mediterranean salt meadows (<i>Juncetalia maritimi</i>) ³³ 2110 Embryonic shifting dunes 2120 Shifting dunes along the shoreline with <i>Ammophila arenaria</i> (white dunes) 2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)* S.I. No. 433/2021- European Union Habitats (Boyne coast and Estuary Special Area of Conservation 001957) Regulations 2021 NPWS (2012) <i>Conservation Objectives: Boyne Coast and Estuary SAC 001957</i> . Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.	To maintain or restore the favourable conservation condition of the Annex I habitats for which the SAC has been selected

135 In conjunction with considering the generic conservation objective for this SAC “*To maintain or restore the favourable conservation condition of the Annex I habitats for which the SAC has been selected*”, the site-specific conservation objectives document for the Boyne Estuary and Coast SAC also informed this assessment.

136 The site-specific conservation objectives document sets out the attributes, measures and targets that define the favourable conservation condition of the qualifying interests within the European site. Affecting

³³ The NPWS CO document notes that the status of Mediterranean salt meadows (*Juncetalia maritimi*) as a qualifying Annex I habitat for Boyne Coast and Estuary SAC is under review. The outcome of this review will determine whether a site-specific conservation objective is set for this habitat. Presently there is none set.

the conservation condition of the QIs is deemed to constitute an adverse effect on the integrity of a European site. The specific attributes and targets used to define the conservation objectives of the QIs of the Boyne Coast and Estuary SAC are presented in Section 7.2.4.1, Table 11.

7.2.3 Examination and Analysis of Potential Direct and Indirect Impacts

137 The direct and/or indirect impacts by which the Proposed Development could (in the absence of mitigation measures) potentially affect the conservation objective attributes and targets supporting the conservation condition of the QIs of the Boyne Coast and Estuary SAC, are:

- Air Quality Impacts on QI habitats and species

7.2.3.1 Air Quality Impacts on QI habitats and species

138 The scope of the Air Quality models for the Proposed Development are discussed in detail in Section 7.1.3.1 of this report.

139 As described in Section 7.1.3.1 the maximum annual ground level concentrations for both PM₁₀ and PM_{2.5} will be 500m from the Proposed Development. Particulate matter decays at an exponential rate with distance from a source. There is a large distance of separation (in excess of 6km) between the area of highest GLC and the Boyne Coast and Estuary SAC. Given this distance of separation, there will be no direct or indirect impacts on vegetation in the Boyne Coast and Estuary SAC.

140 The predicted levels for NO₂ and SO₂ GLCs at the closest point of the Boyne Coast and Estuary SAC (Irish Grid O 10425 75506) have been examined in the context of relevant guidelines on limit values (i.e. relevant air quality standards for the protection of vegetation and ecological receptors) in Table 11. Air quality limit value are set out by the United Nations Economic Commission for Europe (UNECE, 2010) and World Health Organisation (WHO)³⁴. Critical loads³⁵ is a concept that concentrates on the link between atmospheric pollutants, and how they affects ecosystems, essentially describing the tolerance of an ecosystem to a pollutant before it becomes compromised.

141 The background concentration of ammonia (annual mean) is 1.6 µg/m³, with the cumulative NH₃ levels at 1.9 µg/m³. The critical level for higher plants is 3 µg NH₃ m⁻³ annual mean, whilst the critical level for lichens and bryophytes is 1 µg NH₃ m⁻³ annual mean (APIS, 2000). According to the Air Dispersion Modelling Report (Appendix II) in the Environmental Report, the contour plots for the annual mean ground level concentrations for NH₃ at 100% load from the Proposed Development are at maximum 0.0497µg/m³ for the Boyne Coast and Estuary SAC. Therefore, emissions from ammonia as a result of the Proposed Development fall well below the critical load threshold values for the QI habitats for which the Boyne Coast and Estuary SAC have been designated.

³⁴ These relevant air quality standards for the protection of vegetation and ecological receptors are described in *Working Group on Ecological Effects* (WHO, 1994) and *Report of workshop on atmospheric ammonia: detecting emission changes and environmental impacts* (UNECE, 2010).

³⁵ The term “critical load” in the context of air pollution may be defined as “a quantitative estimate of an exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge” (UNECE, 2015).

Table 11 Nitrogenous GLCs from the Proposed Development and examination against QI habitats for which the Boyne Coast and Estuary SAC have been designated.

Boyne Coast and Estuary SAC at Irish Grid O 10425 75506		
Pollutant		OCGT Maximum Annual Concentration
N	Annual Mean (kg N ha ⁻¹ a ⁻¹) Proposed Development on its own	0.128
	Cumulative N (Kg ha ⁻¹ a ⁻¹) from Proposed Development, background concentrations for EPA Air Quality Zone C, and emissions from Indaver and Irish Cement Facilities	1.333
Annex I Habitats		
<p>[1130] Estuaries [1140] Mudflats and sandflats not covered by seawater at low tide [1310] Salicornia and other annuals colonizing mud and sand [1330] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) [1410] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) Pioneer, low-mid, mid-upper saltmarshes, an equivalent to these habitat, have a critical loading of 20-30 kg N ha⁻¹a⁻¹, according to UNECE (2010) and APIS (2020). In this instance, the lower value of 20 kg N ha⁻¹a⁻¹ has been used as the critical load, on a precautionary basis.</p>		
Percentage of critical load N for estuarine habitats arising from Cumulative N		7%
Difference between cumulative N and Critical Load (Kg N ha ⁻¹ a ⁻¹)		18.667
Annual Mean N GLCs below critical load for estuarine habitats?		Yes
<p>[2110] Embryonic shifting dunes [2120] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ('white dunes') Shifting Coastal Dunes, an equivalent to these habitat, have a critical loading of 10-20 kg N ha⁻¹a⁻¹, according to APIS (2020). [2130] *Fixed coastal dunes with herbaceous vegetation ('grey dunes') Coastal stable dune – calcareous type, an equivalent to this habitat, have a critical loading of 10-15 kg N ha⁻¹a⁻¹, according to APIS (2020). In this instance, the lower value of 10 kg N ha⁻¹a⁻¹ has been used as the critical load, on a precautionary basis.</p>		
Percentage of critical load N for shifting coastal dunes and coastal stable dunes (calcareous type) arising from Cumulative N		13%
Difference between cumulative N and Critical Load (Kg N ha ⁻¹ a ⁻¹)		8.667
Annual Mean N GLCs below critical load for shifting coastal dunes and coastal stable dunes (calcareous type)?		Yes

142 As demonstrated in Table 11, the total maximum GLCs for nitrogen both from the Proposed Development on its own as well as cumulatively with background concentrations of N for Air Quality Zone C and existing outputs from nearby licenced facilities, fall well below the critical load threshold values for the QI habitats for which the Boyne Coast and Estuary SAC have been designated.

Table 12: Sulphur dioxide GLCs from the Proposed Development and examination against QI habitats for which the Boyne Coast and Estuary SAC has been designated.

Boyne Coast and Estuary SAC at Irish Grid O 10425 75506		
Pollutant		OCGT Maximum Annual Concentration
SO ₂	Annual Mean (kg SO ₂ ha ⁻¹ a ⁻¹) Proposed Development on its own	0.024
	Cumulative SO ₂ (Kg ha ⁻¹ a ⁻¹) from Proposed Development, background concentrations for EPA Air Quality Zone C, and emissions from Indaver and Irish Cement Facilities	0.309
Annex I Habitats		
<p>[[1130] Estuaries</p> <p>[1140] Mudflats and sandflats not covered by seawater at low tide</p> <p>[1310] Salicornia and other annuals colonizing mud and sand</p> <p>[1330] Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)</p> <p>[1410] Mediterranean salt meadows (<i>Juncetalia maritimi</i>)</p> <p>Pioneer, low-mid, mid-upper saltmarshes, an equivalent to these habitat, do not have a critical load threshold listed in APIS (2020). In this instance, a precautionary approach has been adopted whereby the critical load has been set at 1 kg SO₂ ha⁻¹a⁻¹. This value is in line with habitats sensitive to acidification such as petrifying springs.</p> <p>[2110] Embryonic shifting dunes</p> <p>[2120] Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ('white dunes')</p> <p>Shifting Coastal Dunes, an equivalent to these habitats, do not have a critical load threshold listed in APIS (2020). In this instance, a precautionary approach has been adopted whereby the critical load has been set at 1 kg SO₂ ha⁻¹a⁻¹. This value is in line with habitats sensitive to acidification such as petrifying springs.</p> <p>[2130] *Fixed coastal dunes with herbaceous vegetation ('grey dunes')</p> <p>Coastal stable dune – calcareous type, an equivalent to this habitat, do not have a critical load threshold listed in APIS (2020). In this instance, a precautionary approach has been adopted whereby the critical load has been set at 1 kg SO₂ ha⁻¹a⁻¹. This value is in line with habitats sensitive to acidification such as petrifying springs.</p>		
Percentage of critical load SO ₂ for pioneer, low-mid, mid-upper saltmarshes, shifting coastal dunes, and coastal stable dune (calcareous type) arising from Cumulative SO ₂		62%
Difference between cumulative SO ₂ and Critical Load (Kg SO ₂ ha ⁻¹ a ⁻¹)		0.691
Annual Mean SO ₂ GLCs below critical load for pioneer, low-mid, mid-upper saltmarshes, shifting coastal dunes, and coastal stable dune (calcareous type)?		yes

143 As demonstrated in Table 11, the total maximum GLCs for sulphur dioxide both from the Proposed Development on its own as well as cumulatively with background concentrations of SO₂ for Air Quality Zone C and existing outputs from nearby licenced facilities, fall well below the critical load threshold values for the QI habitats for which the Boyne Coast and Estuary SAC have been designated.

144 As the highest concentrations of NO₂ and SO₂ outputs from the Proposed Development fall below the critical load levels for sensitive habitats, and as the additional contributions from the Proposed Development fall below the AQs for human health and the environment, there is no possibility of airborne emissions affecting the QI habitats, or their conservation objectives for the Boyne Coast and Estuary SAC.

7.2.3.2 Summary

145 Table 13 presents a summary of the potential impacts of the Proposed Development on the QIs of the Boyne Coast and Estuary SAC, and how these impacts relate to affecting the site's conservation objectives.

Table 13: Potential Impacts/Effects on the Conservation Objectives of Boyne Coast and Estuary SAC

Conservation Objectives Attribute/Measure/Target	Potential Impacts Mitigation?	Requiring	Are mitigation measures required?	Residual Impacts?
Boyne Coast and Estuary SAC				
Estuaries [1130]				
To maintain the favourable conservation condition of the habitat in the SAC, which is defined as follows:				
Habitat area / Hectares / The permanent habitat area is stable or increasing, subject to natural processes	Yes Estuaries habitat has the potential to be impacted by emissions from the Proposed Development, without mitigation in place.		Yes The air abatement design measures included in the design of the plant, as highlighted in Section 6.5 are required. As demonstrated in Table 11 and Table 12 the total maximum GLCs for nitrogen and SO ₂ , both from the Proposed Development on its own as well as cumulatively with background concentrations of N and SO ₂ for Air Quality Zone C and existing outputs from nearby licenced facilities, fall well below the critical load threshold values for the QI habitat. There is therefore no possibility of affecting the attributes or targets underpinning the conservation condition of the QI habitat in the European site. Impacts on air quality are scoped in due to the measures included in the design of the plant.	No
Community distribution / Hectares / Conserve the following community types in a natural condition: Intertidal estuarine mud and fine sand with <i>Hediste diversicolor</i> and <i>Corophium volutator</i> community; and Subtidal fine sand dominated by polychaetes community				

Mudflats and sandflats not covered at low tide [1140] To maintain the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / The permanent habitat area is stable or increasing, subject to natural processes	Yes Mudflats and sandflats habitat has the potential to be impacted by emissions from the Proposed Development, without mitigation in place.	Yes The air abatement design measures included in the design of the plant, as highlighted in Section 6.5 are required. As demonstrated in Table 11 and Table 12 the total maximum GLCs for nitrogen and SO ₂ , both from the Proposed Development on its own as well as cumulatively with background concentrations of N and SO ₂ for Air Quality Zone C and existing outputs from nearby licenced facilities, fall well below the critical load threshold values for the QI habitat. There is therefore no possibility of affecting the attributes or targets underpinning the conservation condition of the QI habitat in the European site. Impacts on air quality are scoped in due to the measures included in the design of the plant.	No
Community distribution / Hectares / Conserve the following community types in a natural condition: Intertidal estuarine mud and fine sand with <i>Hediste diversicolor</i> and <i>Corophium volutator</i> community; and Fine sand dominated by bivalves community complex			
Salicornia and other annuals colonizing mud and sand [1310] To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession. For sub - sites mapped: Baltray - 2.91ha, Mornington - 1.14ha	Yes This habitat has the potential to be impacted by emissions from the	Yes The air abatement design measures included in the design of the plant, as	No

<p>Habitat distribution / Occurrence / No decline or change in habitat distribution, subject to natural processes</p>	<p>Proposed Development, without mitigation in place.</p>	<p>highlighted in Section 6.5 are required.</p> <p>As demonstrated in Table 11 and Table 12 the total maximum GLCs for nitrogen and SO₂, both from the Proposed Development on its own as well as cumulatively with background concentrations of N and SO₂ for Air Quality Zone C and existing outputs from nearby licenced facilities, fall well below the critical load threshold values for the QI habitat. There is therefore no possibility of affecting the attributes or targets underpinning the conservation condition of the QI habitat in the European site. Impacts on air quality are scoped in due to the measures included in the design of the plant.</p>	
<p>Physical structure: sediment supply / Presence/ absence of physical barriers / Maintain/restore natural circulation of sediments and organic matter, without any physical obstructions</p>			
<p>Physical structure: creeks and pans / Occurrence / Maintain creek and pan structure, subject to natural processes, including erosion and succession</p>			
<p>Physical structure: flooding regime / Hectares flooded; frequency / Maintain natural tidal regime</p>			
<p>Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession</p>			
<p>Vegetation structure: vegetation height / Centimeters / Maintain structural variation within sward</p>			
<p>Vegetation structure: vegetation cover / Percentage cover at a representative sample of monitoring stops / Maintain more than 90% of area outside creeks vegetated</p>			
<p>Vegetation composition: typical species and sub - communities / Percentage cover / Maintain the presence of species - poor communities with typical species listed in the Saltmarsh Monitoring Project (McCorry and Ryle, 2009)</p>			
<p>Vegetation structure: negative indicator species - <i>Spartina anglica</i> / Hectares / No significant expansion of common cordgrass (<i>Spartina anglica</i>), with an annual spread of less than 1%</p>			

<p>Atlantic salt meadow (<i>Glauca-Puccinellietalia maritima</i>) [1330]</p> <p>To maintain the favourable conservation condition of the habitat in the SAC</p> <p>Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410]</p> <p>The status of Mediterranean salt meadows (<i>Juncetalia maritimi</i>) as a qualifying Annex I habitat for Boyne Coast and Estuary SAC is under review. The outcome of this review will determine whether a site - specific conservation objective is set for this habitat.</p>			
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession. For sub - sites mapped: Baltray - 17.67ha, Mornington - 8.76ha	<p>Yes</p> <p>This habitat has the potential to be impacted by emissions from the Proposed Development, without mitigation in place.</p>	<p>Yes</p> <p>The air abatement design measures included in the design of the plant, as highlighted in Section 6.5 are required.</p> <p>As demonstrated in Table 11 and Table 12 the total maximum GLCs for nitrogen and SO₂, both from the Proposed Development on its own as well as cumulatively with background concentrations of N and SO₂ for Air Quality Zone C and existing outputs from nearby licenced facilities, fall well below the critical load threshold values for the QI habitat. There is therefore no possibility of affecting the attributes or targets underpinning the conservation condition of the QI habitat in the European site. Impacts on air quality are scoped in due to the measures included in the design of the plant.</p>	<p>No</p>
Habitat distribution / Occurrence / No decline or change in habitat distribution, subject to natural processes			
Physical structure: sediment supply / Presence/ absence of physical barriers / Maintain natural circulation of sediments and organic matter, without any physical obstruction			
Physical structure: creeks and pans / Occurrence / Maintain creek and pan structure, subject to natural processes, including erosion and succession			
Physical structure: flooding regime / Hectares flooded; frequency / Maintain natural tidal regime			
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation structure: vegetation height / Centimeters / Maintain structural variation within sward			
Vegetation structure: vegetation cover / Percentage cover at a representative sample of monitoring stops / Maintain more than 90% of area outside creeks vegetated			

Vegetation composition: typical species and sub - communities / Percentage cover at a representative sample of monitoring stops / Maintain range of sub - communities with typical species listed in Saltmarsh Monitoring Project (McCorry and Ryle, 2009)			
Vegetation structure: negative indicator species - <i>Spartina anglica</i> / Hectares / No significant expansion of common cordgrass (<i>Spartina anglica</i>), with an annual spread of less than 1%			
Embryonic shifting dunes [2110]			
To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes, including erosion and succession. For sub - sites mapped: Baltray - 2.52ha, Mornington - 0.67ha	Yes This habitat has the potential to be impacted by emissions from the Proposed Development, without mitigation in place.	Yes The air abatement design measures included in the design of the plant, as highlighted in Section 6.5 are required. As demonstrated in Table 11 and Table 12 the total maximum GLCs for nitrogen and SO ₂ , both from the Proposed Development on its own as well as cumulatively with background concentrations of N and SO ₂ for Air Quality Zone C and existing outputs from nearby licenced facilities, fall well below the critical load threshold values for the QI habitat. There is therefore no possibility of affecting the attributes or targets underpinning the conservation condition of the QI	No
Habitat distribution / Occurrence / No decline or change in habitat distribution, subject to natural processes			
Physical structure: functionality and sediment supply / Presence/ absence of physical barriers / Maintain the natural circulation of sediment and organic matter, without any physical obstructions			
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation composition: plant health of foredune grasses / Percentage cover / More than 95% of sand couch (<i>Elytrigia juncea</i>) and/or lyme - grass (<i>Leymus arenarius</i>) should be healthy (i.e. green plant parts above ground and flowering heads present)			

Vegetation composition: typical species and sub - communities / Percentage cover / Maintain the presence of species - poor communities with typical species: sand couch (<i>Elytrigia juncea</i>) and/or lyme - grass (<i>Leymus arenarius</i>)		habitat in the European site. Impacts on air quality are scoped in due to the measures included in the design of the plant.	
Vegetation composition: negative indicator species / Percentage cover / Negative indicator species (including non - natives) to represent less than 5% cover			
Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ('white dunes') [2120]			
To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area stable or increasing, subject to natural processes including erosion and succession. For sub - sites mapped: Baltray - 2.97ha, Mornington - 1.99ha	Yes This habitat has the potential to be impacted by emissions from the Proposed Development, without mitigation in place.	Yes The air abatement design measures included in the design of the plant, as highlighted in Section 6.5 are required. As demonstrated in Table 11 and Table 12 the total maximum GLCs for nitrogen and SO ₂ , both from the Proposed Development on its own as well as cumulatively with background concentrations of N and SO ₂ for Air Quality Zone C and existing outputs from nearby licenced facilities, fall well below the critical load threshold values for the QI habitat. There is therefore no possibility of affecting the attributes or targets underpinning the conservation condition of the QI habitat in the European site. Impacts on air quality are scoped in due to the measures included in the design of the plant.	No
Habitat distribution / Occurrence / No decline or change in habitat distribution, subject to natural processes			
Physical structure: functionality and sediment supply / Presence/ absence of physical barriers / Maintain the natural circulation of sediment and organic matter, without any physical obstructions			
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation composition: plant health of dune grasses / Percentage cover / More than 95% of marram (<i>Ammophila arenaria</i>) and/or lyme - grass (<i>Leymus arenarius</i>) should be healthy (i.e. green plant parts above ground and flowering heads present)			
Vegetation composition: typical species and sub - communities / Percentage cover at a representative number of monitoring stops / Maintain the presence of species - poor communities dominated by marram (<i>Ammophila arenaria</i>) and/or lyme - grass (<i>Leymus arenarius</i>)			

Vegetation composition: negative indicator species / Percentage cover / Negative indicator species (including non - natives) to represent less than 5% cover			
Fixed coastal dunes with herbaceous vegetation ('grey dunes')* [2130]			
To restore the favourable conservation condition of the habitat in the SAC, which is defined as follows:			
Habitat area / Hectares / Area increasing, subject to natural processes including erosion and succession. For sub - sites mapped: Baltray - 26.41ha;Mornington - 20.46ha	Yes This habitat has the potential to be impacted by emissions from the Proposed Development, without mitigation in place.	Yes The air abatement design measures included in the design of the plant, as highlighted in Section 6.5 are required. As demonstrated in Table 11 and Table 12 the total maximum GLCs for nitrogen and SO ₂ , both from the Proposed Development on its own as well as cumulatively with background concentrations of N and SO ₂ for Air Quality Zone C and existing outputs from nearby licenced facilities, fall well below the critical load threshold values for the QI habitat. There is therefore no possibility of affecting the attributes or targets underpinning the conservation condition of the QI habitat in the European site. Impacts on air quality are scoped in due to the measures included in the design of the plant.	No
Habitat distribution / Occurrence / No decline or change in habitat distribution, subject to natural processes			
Physical structure: functionality and sediment supply / Presence/ absence of physical barriers. / Maintain the natural circulation of sediment and organic matter, without any physical obstructions			
Vegetation structure: zonation / Occurrence / Maintain the range of coastal habitats including transitional zones, subject to natural processes including erosion and succession			
Vegetation structure: bare ground / Percentage cover / Bare ground should not exceed 10% of fixed dune habitat, subject to natural processes			
Vegetation composition: sward height / Centimeters / Maintain structural variation within sward			
Vegetation composition: typical species and sub - communities / Percentage cover at a representative sample of monitoring stops / Maintain range of sub - communities with typical species listed in Ryle <i>et al.</i> (2009)			
Vegetation composition: negative indicator species / Percentage cover / Negative indicator species (including non - natives) to represent less than 5% cover			

Vegetation composition: scrub/trees / Percentage cover / No more than 5% cover or under control			
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7.2.4 Mitigation Measures

146 With the inclusion of the air abatement design measures included in the design of the plant, as highlighted in Section 6.5 and the implementation of good site practice measures described in Section 7.1.4, no additional mitigation measures are required.

7.2.5 Residual Impacts

147 Although no specific mitigation are required in respect of potential impacts, nonetheless with the effective implementation of standard appropriate mitigation measures identified in this NIS, the Proposed Development poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the QIs of the Boyne Coast and Estuary SAC, and there are, therefore, no residual direct or indirect impacts associated with the Proposed Development that could adversely affect the integrity of the Boyne Coast and Estuary SAC.

7.2.6 Conclusion of Assessment for Boyne Coast and Estuary SAC

148 Following an examination, analysis and evaluation in light of best scientific knowledge, of all relevant information in respect of the qualifying interests of the Boyne Coast and Estuary SAC, the potential impacts, and mitigation measures, and whether or not the predicted impacts would affect the conservation objectives that support the conservation condition of the qualifying interests, it has been concluded that the Proposed Development does not pose a risk of adversely affecting (either directly or indirectly) the integrity of the Boyne Coast and Estuary SAC.

7.3 River Boyne and River Blackwater SPA (004232), Boyne Estuary SPA (004080), and River Nanny Estuary and Shore SPA (004158)

7.3.1 Ecological Baseline Description of the River Boyne and River Blackwater SPA

149 The European site has been designated for its internationally important population of kingfisher *Alcedo atthis* (NPWS, 2022). Threats and pressures identified as having highest impact on the European sites include urbanisation, roads and motorways, and dispersed habitation. Information on the distribution of kingfisher within the River Boyne catchment in Cummins *et al.* (2010) states that the river contains 0.12 kingfisher per km, and has a nest density of 0.11 per km. A total of 20-22 territories were estimated to occur within the catchment based on these surveys, and the densities of birds and nesting territories are amongst the highest in the country.

7.3.2 Ecological Baseline Description of the Boyne Estuary SPA

150 According to the *Natura 2000 Standard Data Form* (NPWS, 2020), the Boyne Estuary is one of the most important sites for wintering waterfowl on the east coast with nationally important populations of 10 species. The European site hosts 7% of the national total of knot *Calidris canutus*, and 4% of the national population of golden plover *Pluvialis apricaria*. The site formerly hosted breeding little tern *Sterna albifrons*, although this species has not bred successfully since 1996. Threats and pressures identified as having highest impact on the European sites include reclamation of lands, human intrusion and disturbance from walking, horse-riding and motor vehicles, invasive and non-native species, changes to rates of siltation and modification of hydrographic function. Site-specific conservation objectives are available for the European site, and distribution maps of special conservation interest species are available for download from the NPWS (NPWS, 2018).

7.3.3 Ecological Baseline Description of the River Nanny Estuary and Shore SPA

151 According to the *Natura 2000 Standard Data Form* (NPWS, 2020), this is an important east coast site, with nationally important populations of golden plover *Pluvialis apricaria*, oystercatcher *Haematopus ostralegus*, common ringed plover *Charadrius hiaticula*, knot *Calidris canutus*, sanderling *Calidris alba*, and herring gull *Larus argentatus*. The populations of knot and sanderling are of particular importance as they

represent 4% and 3.8%, respectively, of the national populations. Threats and pressures identified within the *Natura 2000 Standard Data Form* (NPWS, 2020) are of medium rank at highest and include continuous urbanisation and human intrusion and disturbance from walking, horse-riding and motor vehicles. Site-specific conservation objectives are available for the European site, and distribution maps of Special Conservation Interest species are available for download from the NPWS (NPWS, 2012).

7.3.4 Special Conservation Interests and Conservation Objectives of the River Boyne and River Blackwater SPA, Boyne Estuary SPA, and River Nanny Estuary and Shore SPA

152 The SCIs of the River Boyne and River Blackwater SPA, Boyne Estuary SPA and River Nanny Estuary and Shore SPA, and the overall conservation objective for each, are listed below in Table 14 below.

Table 14: Special Conservation Interests and conservation objectives of the River Boyne and River Blackwater SPA, Boyne Estuary SPA, and River Nanny Estuary and Shore SPA.

Special Conservation Interest(s)	Conservation Objective(s)
<p>River Boyne and River Blackwater SPA (004232) [A229] Kingfisher <i>Alcedo atthis</i></p> <p>NPWS (2022). <i>Conservation objectives for River Boyne and River Blackwater SPA [004232]. First Order Site-specific Conservation Objectives Version 1.0.</i> Department of Housing, Local Government and Heritage.</p>	<p>To maintain or restore the favourable conservation condition of the SCI species for which the SPA has been selected.</p>
<p>Boyne Estuary SPA (004080) [A048] Shelduck <i>Tadorna tadorna</i> [A130] Oystercatcher <i>Haematopus ostralegus</i> [A140] Golden Plover <i>Pluvialis apricaria</i> [A141] Grey Plover <i>Pluvialis squatarola</i> [A142] Lapwing <i>Vanellus vanellus</i> [A143] Knot <i>Calidris canutus</i> [A144] Sanderling <i>Calidris alba</i> [A156] Black-tailed Godwit <i>Limosa limosa</i> [A162] Redshank <i>Tringa totanus</i> [A169] Turnstone <i>Arenaria interpres</i> [A195] Little Tern <i>Sterna albifrons</i> [A999] Wetlands</p> <p>NPWS (2013B). <i>Conservation Objectives: Boyne Estuary SPA 004080. Version 1.</i> National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>	<p>To maintain the favourable conservation condition of the SCI species for which the SPA has been selected.</p> <p>To maintain the favourable conservation condition of the wetland habitat in Boyne Estuary SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.</p>
<p>River Nanny Estuary and Shore SPA (004158) [A130] Oystercatcher <i>Haematopus ostralegus</i> [A137] Ringed Plover <i>Charadrius hiaticula</i> [A140] Golden Plover <i>Pluvialis apricaria</i> [A143] Knot <i>Calidris canutus</i> [A144] Sanderling <i>Calidris alba</i> [A184] Herring Gull <i>Larus argentatus</i></p>	<p>To maintain or restore the favourable conservation condition of the SCI species for which the SPA has been selected</p> <p>To maintain the favourable conservation condition of the wetland habitat in the River Nanny Estuary and Shore SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.</p>

Special Conservation Interest(s)	Conservation Objective(s)
<p>[A999] Wetlands</p> <p>NPWS (2012B). <i>Conservation Objectives: River Nanny Estuary and Shore SPA 004158. Version 1.0.</i> National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht.</p>	

153 In conjunction with considering the generic conservation objective for SPAs “*To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for this SPA*”, site-specific conservation objectives document for the Boyne Estuary SPA and River Nanny Estuary and Shore SPA also informed this assessment. While the NPWS has published First Order site-specific conservation objectives for the River Boyne and River Blackwater SPA there are no attributes or targets. This is also the case for the River Nore SPA, the only other SPA in Ireland of which Kingfisher has been designated as an SCI. Therefore pragmatic attributes and targets from other European sites have been used as analogues.

154 This document sets out the attributes, measures and targets that define the favourable conservation condition of the SCIs within the European site. Affecting the conservation condition of the SCIs is deemed to constitute an adverse effect on the integrity of a European site. The specific attributes and targets used to define the conservation objectives of the SCIs of the River Boyne and River Blackwater SPA, Boyne Estuary SPA, and River Nanny Estuary and Shore SPA are presented in Section 7.3.5.3, Table 14.

7.3.5 Examination and Analysis of Potential Direct and Indirect Impacts

155 The direct and/or indirect impacts by which the Proposed Development could (in the absence of mitigation measures) potentially affect the conservation objective attributes and targets supporting the conservation condition of the SCIs of the River Boyne and River Blackwater SPA, Boyne Estuary SPA and River Nanny Estuary and Shore SPA are:

- The effects of hydrological impacts on SCI species and habitats
- The effects of air quality impacts on SCI habitats and species

7.3.5.1 The effects of hydrological impacts on SCI species and habitats

156 An accidental pollution event during construction, or operation, has the potential to affect water quality in the Nanny Estuary as the Proposed Development drains to the waterbody via the Platin Stream and River Nanny.

157 Internationally important numbers of wintering birds use intertidal and estuarine habitats in the Nanny Estuary for feeding and roosting. These species would be vulnerable to an accidental pollution incident either directly *e.g.* through direct contact with oil or other polluting chemicals, or indirectly by affecting the habitats and food supply on which they rely for feeding and roosting.

158 Affecting the water quality of the Nanny Estuary due to an accidental surface water pollution event during construction/operation has the potential to undermine the conservation objectives the Nanny Estuary and Shore SPA by affecting the quality of intertidal, estuarine and marine habitats the Nanny Estuary and/or through direct contact with SCI species causing harm or mortality.

159 No other European sites are hydrologically linked/connected to the Proposed Development.

7.3.5.2 The effects of air quality impacts on SCI species and habitats

160 Kingfisher and other wetland bird SCI species are potentially sensitive to the effects of increased levels of nitrogen GLCs on its habitat and prey species, where nitrogen is a limiting factor. It is also potentially sensitive to acidification (*e.g.* from SO₂ GLCs) of their aquatic habitat, and the consequent effects on prey abundance. In this instance, the additional loading of emissions arising from the Proposed Development,

will not result in a change in water quality or pH that will affect any of the SCI species for which the River Boyne and River Blackwater SPA, Boyne Estuary SPA, and River Nanny Estuary and Shore SPA have been designated.

161 As the additional contributions from the Proposed Development fall below the AQs for human health and the environment, and as wetland birds associated with the estuarine and coastal habitats of the Boyne Estuary and the Nanny Estuary are not sensitive to nitrogen or acid GLCs, there is no possibility of airborne emissions affecting the SCI habitats, species, or their conservation objectives for the River Boyne and River Blackwater SPA, Boyne Estuary SPA and River Nanny Estuary and Shore SPA.

7.3.5.3 Summary

162 **Table 15** presents a summary of the potential impacts of the Proposed Development on the SCIs of the River Boyne and River Blackwater SPA, Boyne Estuary SPA and the River Nanny Estuary and Shore SPA, and how these impacts relate to affecting the site's conservation objectives.

Table 15: Potential Impacts/Effects on the Conservation Objectives of River Boyne and River Blackwater SPA, Boyne Estuary SPA and the River Nanny Estuary and Shore SPA

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
River Boyne and River Blackwater SPA (004232)			
[A229] Kingfisher <i>Alcedo atthis</i>			
To maintain or restore the favourable conservation condition of the SCI of the SPA, which is defined as follows:			
Population trend / Percentage change / Long term population trend stable or increasing	Yes	Yes	No
Distribution / Range, timing and intensity of use of areas No significant decrease in the range, timing or intensity of use of areas by the special conservation interest species, other than that occurring from natural patterns of variation	Kingfisher are potentially sensitive to increased levels of SO ₂ and NO ₂ GLCs, specifically the effects of reduction of habitat suitability (prey abundance), in this instance, the additional loading of nitrogen and SO ₂ arising from the Proposed Development, could affect kingfisher populations or their distribution in the River Boyne and River Blackwater SPA. Without mitigation is place (in this case the air abatement design measures) emissions could affect kingfisher or their habitat/prey in the Boyne Estuary and Coast SPA.	The air abatement measures included in the design of the plant, as highlighted in Section 6.5 are required.	
Boyne Estuary SPA (004080)			
[A048] Shelduck <i>Tadorna tadorna</i> ; [A130] Oystercatcher <i>Haematopus ostralegus</i> ; [A140] Golden Plover <i>Pluvialis apricaria</i> ; [A141] Grey Plover <i>Pluvialis squatarola</i>; [A142] Lapwing <i>Vanellus vanellus</i>; [A143] Knot <i>Calidris canutus</i>; [A144] Sanderling <i>Calidris alba</i>; [A156] Black-tailed Godwit <i>Limosa limosa</i>; [A162] Redshank <i>Tringa totanus</i>; [A169] Turnstone <i>Arenaria interpres</i>			
To maintain the favourable conservation condition			
Population trend / Percentage change / Long term population trend stable or increasing	Yes	Yes	No

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
<p>Distribution / Range, timing and intensity of use of areas No significant decrease in the range, timing or intensity of use of areas by the special conservation interest species, other than that occurring from natural patterns of variation</p>	<p>SCI Bird species are potentially sensitive to increased levels of SO₂ and NO₂ GLCs, specifically the effects of reduction of habitat suitability (prey abundance), in this instance, the additional loading of nitrogen and SO₂ arising from the Proposed Development, that could affect SCI bird populations or their distribution in the Boyne Estuary SPA.</p> <p>Without mitigation is place (in this case the air abatement design measures) emissions could affect SCI species or their habitat/prey in the Boyne Estuary and Coast SPA.</p>	<p>The air abatement measures included in the design of the plant, as highlighted in Section 6.5 are required.</p>	
<p>[A195] Little Tern <i>Sterna albifrons</i> To maintain the favourable conservation condition</p>			
<p>Breeding population abundance: apparently occupied nests (AONs) / Number / No significant decline</p>	<p>Yes</p> <p>Little tern are potentially sensitive to increased levels of SO₂ and NO₂ GLCs, specifically the effects of reduction of habitat suitability (prey abundance), in this instance, the additional loading of nitrogen and SO₂ arising from the Proposed Development, that could affect SCI bird populations or their distribution in the Boyne Estuary SPA.</p> <p>Without mitigation is place (in this case the air abatement design measures) emissions could affect SCI species or their</p>	<p>Yes</p> <p>The air abatement measures included in the design of the plant, as highlighted in Section 6.5 are required.</p>	<p>No</p>
<p>Productivity rate: fledged young per breeding pair / Mean number / No significant decline</p>			
<p>Distribution: breeding colonies / Number; location; area (Hectares) / No significant decline</p>			
<p>Prey biomass available / Kilogrammes / No significant decline</p>			
<p>Barriers to connectivity / Number; location; shape; area (hectares) / No significant increase</p>			

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
Disturbance at the breeding site / Level of impact / Human activities should occur at levels that do not adversely affect the breeding little tern population	habitat/prey in the Boyne Estuary and Coast SPA.		
[A999] Wetlands			
To maintain the favourable conservation condition			
Habitat area / Hectares / The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 594 hectares (, other than that occurring from natural patterns of variation	<p>Yes</p> <p>Wetland habitats are potentially sensitive to increased levels of SO₂ and NO₂ GLCs, specifically the effects of reduction of habitat suitability (prey abundance), in this instance, the additional loading of nitrogen and SO₂ arising from the Proposed Development, that could affect SCI bird populations or their distribution in the Boyne Estuary SPA.</p> <p>Without mitigation is place (in this case the air abatement design measures) emissions could affect SCI species or their habitat/prey in the Boyne Estuary and Coast SPA.</p>	<p>Yes</p> <p>The air abatement design measures included in the design of the plant, as highlighted in Section 6.5 are required.</p>	No
River Nanny Estuary and Shore SPA (004158)			
[A130] Oystercatcher <i>Haematopus ostralegus</i>; [A137] Ringed Plover <i>Charadrius hiaticula</i> [A140] Golden Plover <i>Pluvialis apricaria</i>; [A143] Knot <i>Calidris canutus</i>; [A144] Sanderling <i>Calidris alba</i>; [A184] Herring Gull <i>Larus argentatus</i> To maintain the favourable conservation condition			
Population trend / Percentage change / Long term population trend stable or increasing	Yes	Yes.	No

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
<p>Distribution / Range, timing and intensity of use of areas / No significant decrease in the range, timing or intensity of use of areas by the special conservation interest species, other than that occurring from natural patterns of variation</p>	<p>The Proposed Development will drain to the Nanny Estuary via the Platin Stream and River Nanny. In the absence of any mitigation, there is potential for a pollution event during construction or operation of the Proposed Development to affect water quality in the Nanny Estuary. A pollution event could affect the distribution and/or range of SCI bird species, if of sufficient magnitude to affect their prey or to result in direct mortality of birds.</p> <p>SCI Bird species are potentially sensitive to increased levels of SO₂ and NO₂ GLCs, specifically the effects of reduction of habitat suitability (prey abundance), in this instance, the additional loading of nitrogen and SO₂ arising from the Proposed Development, that could affect SCI bird populations or their distribution in the Boyne Estuary SPA.</p> <p>Without mitigation in place (in this case the air abatement design measures) emissions could affect SCI species or their habitat/prey in the River Nanny Estuary and Shore SPA.</p>	<p>The mitigation measures described in Section 7.3.6, to protect water quality in the receiving environment, will ensure that surface water quality in the Nanny Estuary is protected, during construction and operation of the Proposed Development.</p> <p>With regards to air quality, no additional mitigation measures, over and above the air abatement design measures included in the design of the plant, as highlighted in Section 6.5 of this NIS are required.</p>	
<p>[A999] Wetlands Maintain the favourable conservation condition</p>			

Conservation Objectives Attribute/Measure/Target	Potential Impacts Requiring Mitigation?	Are mitigation measures required?	Residual Impacts?
<p>Wetland habitat / Area (ha) / The permanent area occupied by the wetland habitat should be stable and not significantly less than the area of 230ha, other than that occurring from natural patterns of variation</p>	<p>Yes.</p> <p>The Proposed Development will drain to the Nanny Estuary via the Platin Stream and River Nanny. In the absence of any mitigation, there is potential for a pollution event during construction or operation of the Proposed Development to affect water quality in the Nanny Estuary. A pollution event could affect the SCI habitat, by altering the biotic conditions in it, although it does not have the potential to affect the area of wetland habitat.</p> <p>Wetland habitats are potentially sensitive to increased levels of SO₂ and NO₂ GLCs, specifically the effects of reduction of habitat suitability (prey abundance), in this instance, the additional loading of nitrogen and SO₂ arising from the Proposed Development, that could affect habitats in the Boyne Estuary SPA.</p> <p>Without mitigation in place (in this case the air abatement design measures) emissions could affect SCI species or their habitat/prey in the River Nanny Estuary and Shore SPA.</p>	<p>Yes.</p> <p>The mitigation measures described in Section 7.3.6, to protect water quality in the receiving environment, will ensure that surface water quality in the Nanny Estuary is protected, during construction and operation of the Proposed Development.</p> <p>With regards to air quality, no additional mitigation measures, over and above the air abatement design measures included in the design of the plant, as highlighted in Section 6.5 are required.</p>	<p>No</p>

7.3.6 Mitigation Measures

163 With the inclusion of the air abatement design measures included in the design of the plant, as highlighted in Section 6.5 and the implementation of good site practice measures described in Section 7.1.4, no additional mitigation measures are required in respect of air quality. However, as a hydrological pathway to the Nanny Estuary has been identified, mitigation measures prescribed below will ensure no deterioration of surface water quality during construction and operation of the Proposed Development.

7.3.6.1 Mitigation Measures to Protect Surface Water During Construction

164 This section presents the mitigation measures that will be implemented during construction to avoid or reduce the potential impacts of the Proposed Development. All of the mitigation measures will be implemented in full. They are in accordance with best practice, and are tried and tested, effective control measures to protect the receiving environment.

165 Mitigation measures have been developed in consideration of the following standard best international practice including but not limited to:

- Construction Industry Research and Information Association (CIRIA) (2005) *Environmental Good Practice on Site (C741)*;
- Construction Industry Research and Information Association (2001) *Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors (C532)*;
- Construction Industry Research and Information Association (2000) *Environmental Handbook for Building and Civil Engineering Projects (C512)*;
- Environmental Protection Agency (2018) *List of Waste and Determining if Waste is Hazardous or Non-Hazardous*; available at: <https://www.epa.ie/publications/monitoring--assessment/waste/2019--FULL-template.pdf>; and
- Environment Agency (2015) *Guidance on the Classification and Assessment of Waste, Technical Guidance WM3*;
- Environmental Protection Agency (2013) *Guidance (and Templates) on the Management of Contaminated Land and Groundwater at EPA Licensed Sites*
- Environment Agency (2020) *Land Contamination risk management (LCRM)*. Available at: <https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm>

166 The following mitigation measures to protect surface water quality during construction have been included in the Ecological Impact Assessment Report which is part of the planning application and replicated here for the protection of environment which supports the European sites' SCIs:

- Silt traps will be placed in drains to capture any excess silt in the run-off;
- Good housekeeping (daily site clean-ups, use of disposal bins, etc.) will be maintained on the Proposed Development during construction, and the proper use, storage and disposal of construction materials and their containers will prevent contamination;
- For all activities involving the use of potential pollutants or hazardous materials, such as concrete, fuels, lubricants and hydraulic fluids, the material will be carefully handled and stored to avoid spillages. Potential pollutants will also be adequately secured against vandalism and will be provided with proper containment according to codes of practice. Any spillages will be immediately contained, and contaminated soil removed from the site by an appropriately licensed contractor and disposed of to a licensed facility;
- Water pollution will be minimised by the implementation of good construction practices. Such practices will include adequate bunding for silos, oil containers, wheel washers and dust suppression on site roads, and regular plant maintenance. The Construction Industry Research and

Information Association (CIRIA) provides guidance on the control and management of water pollution from construction sites, which will be adhered to (Masters – Williams *et al.*, 2001).

- In accordance with the CIRIA document, a contingency plan for pollution emergencies will be prepared which will address the following:
 - containment measures;
 - emergency discharge routes;
 - list of appropriate equipment and clean-up materials;
 - maintenance schedule for equipment;
 - details of trained staff, location and provision for 24-hour cover;
 - details of staff responsibilities;
 - notification procedures to inform the Environmental Protection Agency (EPA) or environmental department of the Dublin City Council;
 - audit and review schedule;
 - telephone numbers of statutory water consultees; and
 - list of specialist pollution clean-up companies and their telephone numbers.

7.3.6.2 Measures to Protect Surface Water Quality during Operation

167 The design maximises the use of sustainable urban drainage systems (SuDS) to minimise the impact on the surface water system. This is in compliance with the Greater Dublin Strategic Drainage Study (GDSDS) (DDS 2005). The storm water design of the Proposed Development as described in detail in Chapter 2 of the Environmental Report for the Proposed Development, notes that storm waters will be discharged from the site at two outfall points: one at the eastern boundary toward the north of the Proposed Development, and a second at the eastern boundary in the middle of the site. The storm water system include the provision of a hydro brake to limit the volume of discharge to the receiving drainage ditch to 1.24 l/s and 7.33 l/s, respectively. All storm water runoff from hard-standing areas will pass through a full retention oil separator. The Proposed Development will include 6 no. full retention separators

168 In addition to the OCGT Generating Plant, the Proposed Development will include the provision of a water treatment plant on site which includes a deionising facility. This plant will include a raw water treatment tank of 2,262m³ volume, to store water supplied by the Uisce Éireann mains supply, and a deionised (treated water) water storage tank with a maximum volume of 3,925m³. This plant will also include a bunded storage area for hydrochloric acid and sodium hydroxide which are stored in Intermediate Bulk Carriers (IBCs). These chemicals will be used in the water treatment plant process for pH balancing of the processed waste water and will be appropriately bunded to minimise the impact of spills to the environment. A waste water storage tank (79m³) will also be included. The water treatment plant will produce deionised water for use in a water injection abatement system within the OCGT unit to minimise nitrogen oxide (NOx) air emissions during fuel combustion.

7.3.7 Residual Impacts

169 Following the effective implementation of all of the mitigation measures identified in this NIS (including the design mitigation), the Proposed Development poses no risk of affecting the conservation objectives, or the favourable conservation condition, of the SCIs of the River Boyne and River Blackwater SPA, Boyne Estuary SPA and River Nanny Estuary and Shore SPA, and there are therefore, no residual direct or indirect impacts associated with the Proposed Development that could adversely affect the integrity of the River Boyne and River Blackwater SPA, Boyne Estuary SPA and River Nanny Estuary and Shore SPA.

7.3.1 Conclusion of Assessment for the River Boyne and River Blackwater SPA, Boyne Coast SPA, and River Nanny Estuary and Shore SPA

170 Following an examination, analysis and evaluation in light of best scientific knowledge, of all relevant information in respect of the SCIs of the River Boyne and River Blackwater SPA, Boyne Coast SPA, and River Nanny Estuary and Shore SPA, the potential impacts and mitigation measures, and whether or not the predicted effects would affect the conservation objectives that support the conservation condition of the SCIs, it has been concluded that the Proposed Development does not pose a risk of adversely affecting (either directly or indirectly) the integrity of the River Boyne and River Blackwater SPA, Boyne Coast SPA, and River Nanny Estuary and Shore SPA.

8 In Combination Assessment

171 This section of the NIS presents the assessment carried out to examine whether any other plans or projects have the potential to act in combination with the Proposed Development to adversely affect the integrity of River Boyne and River Blackwater SAC, River Boyne and River Blackwater SPA, Boyne Coast and Estuary SAC, Boyne Estuary SPA, and the River Nanny Estuary and Shore SPA. All other European sites fall beyond the zone of influence of the Proposed Development. Therefore, there is no potential for any other plans or projects to act in combination with the Proposed Development to adversely affect the integrity of any other European sites.

8.1 Analysis of Potential In Combination Effects

172 A review of all planning applications, submitted within the last 5 years, within 5km to the proposed works was undertaken on the 3rd July 2023. A considerable number of the applications are for minor works, typically associated with modifications to houses etc. However, there are a number of larger scale projects including the existing Indaver Facility located opposite the Proposed Development, proposing to increase the annual amount of waste, the existing Irish Cement facility proposed to facilitate further replacement of fossil fuels, and the SSE Substation proposed for the area adjacent to the Proposed Development. The locations of planning applications were assessed in relation to these proposed works.

173 As assessed in Section 6, none of the potential impacts associated with the Proposed Development will result in any perceptible residual effect on the receiving environment or on the QIs / SCIs of the River Boyne and River Blackwater SAC, River Boyne and River Blackwater SPA, Boyne Coast and Estuary SAC, Boyne Estuary SPA and the River Nanny Estuary and Shore SPA. Therefore, there will not be any residual impacts associated with the Proposed Development that will adversely affect the conservation objectives supporting the conservation condition of the QI/SCI of those European sites, and the Proposed Development in isolation will not adversely affect the integrity of those European site.

174 There is the potential for other pollution sources within the catchment of the Nanny Estuary to cumulatively affect water quality in the receiving estuarine and marine environments. There is also the potential for other airborne pollution sources to influence ground level concentrations of airborne pollutants at European sites in the zone of influence for airborne emissions (e.g. European sites within 10km radius of the Proposed Development).

175 The potential for in combination effects to arise from any existing or proposed land use plans or developments is regulated and controlled by the environmental protective policies and objectives of the *Meath County Development Plan 2021-2027* (Meath County Council, 2021) and all other land use plans in the catchment of the Nanny Estuary zone of influence for hydrological impacts and air quality emissions. The aforementioned land use plan include protective policies and objectives in relation to European sites. Any existing/proposed plan or project that could potentially affect European sites in the Nanny Estuary or within the zone of influence of airborne emissions of the Proposed Development, in combination with the Proposed Development, must adhere to these overarching environmental protective policies and objectives. These policies and objectives will ensure the protection of the European sites within the zone of influence of the Proposed Development, and include the requirement for any future plans or projects to undergo Screening for Appropriate Assessment and/or Appropriate Assessment to examine and assess their effects on European sites, alone and in combination with other plans and projects.

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- 176 There are specific objectives and policies in the Meath County Development Plan 2021-2027 to protect biodiversity, and specifically European sites. Policies HER POL 32, HER POL 33 and HER POL 34 relate to the protection of European sites, the statutory requirement to undertake AA and commitments to prohibiting projects giving rise to adverse effects on the integrity of any European sites without demonstrating there are no alternatives, there are imperative reasons of overriding public interest, and undertaking all compensation measures necessary to ensure the overall coherence of the network of European sites. The Meath County Development Plan 2021-2027 also includes policies to protect (from risk of pollution), manage and enhance the counties' surface water and groundwater resources (INF 8, INF 13, INF 15, INF 16, INF 17).
- 177 The environmental protective policies and objectives set out in the Meath County Development Plan 2021-2027 are mirrored in other land plans in terms of the protection of European sites and the protection of a County's surface water and groundwater resources.
- 178 Land use plans for the other local authorities (e.g. Louth County Council and Fingal County Council) whose functional areas include surface water features which drain to River Nanny Estuary, were examined and analysed and those land use plans also include protective environmental policies to protect European sites and the receiving surface water environments.
- 179 The potential cumulative impacts on those European sites within the Zol of the proposed works from the proposed works in combination with other plans and projects, as identified from Meath County Council planning e-portal³⁶ and An Bord Pleanála mapviewer³⁷ are identified and assessed in Table 16 and Table 17.

³⁶<https://meathcoco.maps.arcgis.com/apps/webappviewer/index.html?id=e268775bc8dc4b40bc9e3f8878e45862> – Accessed 03/07/2023

³⁷ <https://www.pleanala.ie/en-ie/Map-search> - Accessed 03/07/2023

Table 16 In Combination Assessment of Plans and Programmes

Plan Description	Are there potential impact pathways by which the Plan / Programme could act in combination with the Proposed Scheme to adversely impact European sites	Will the Plan/Programme act in combination with the Proposed Scheme to adversely affect the integrity of European sites
<p>National Energy & Climate Plan 2021-2030</p> <p>This National Energy and Climate Plan builds on previous national strategies and sets out in detail objectives regarding the five energy dimensions together with planned policies and measures to ensure that these objectives are achieved. It aims as a fundamental national objective to pursue a trajectory of emissions reduction which is in line with reaching net zero in Ireland by 2050.</p> <p>In relation to transport the plan aims to:</p> <ul style="list-style-type: none"> • make growth less transport intensive through better planning, remote and home-working and modal shift to public transport • Increase the renewable biofuel content of motor fuels • Set targets for the conversion of public transport fleets to zero carbon alternatives. 	<p>No potential impact pathways to European sites.</p> <p>There are no specific spatial references in this policy document and therefore, no specific link (in terms of potential impact pathways) between it and European sites within the Zone of Influence (Zoi) of the Proposed Development.</p>	<p>No in combination impact</p> <p>Key to considering the on-going evolution of national climate policy included are the obligations of the State under EU law (e.g. the EU Habitats Directive), and the promotion of sustainable development. Considering that, this policy position poses no identifiable risk of resulting in adverse effects on the integrity of any European sites.</p>
<p>Climate Action Plan 2023 – Changing Ireland for Better</p> <p>The Plan, which was not subject to AA, provides the Governments’ second update to the Climate Action Plan 2019, outlines the actions required to 2035 and beyond, to guide the Governments’ joint efforts over the coming years at reducing greenhouse gas emissions. The plan implements the carbon budgets and sectoral emissions ceilings and sets a roadmap for taking decisive action to halve our emissions by 2030 and reach net zero no later than 2050. It will be updated annually and will be improved and strengthened when required, allowing us to learn from our experiences in what is a very significant and complex undertaking.</p>	<p>There is the potential that actions and or developments implemented under the Climate Action Plan 2023 could affect European sites within the Zoi of the Proposed Development. The potential impact pathways cannot yet be defined and while the Plan includes a considerable number of actions, the detailed implementation steps are not yet available as a supplementary <i>Annex of Actions</i> is to be published in 2023.</p>	<p>No in combination impact.</p> <p>Although lacking full implementation detail, the bulk of the actions require the development of guidance, standards and plans, to positively reduce the greenhouse gas emissions. Any sectoral plans developed on foot of this will themselves be subject to AA and Strategic Environmental Assessment</p> <p>Any projects arising out of the Plan or the Sectoral plans required to achieve the objectives of the Plan must comply with the requirements and obligations of EU and Irish planning and environmental law, including those of the relevant land use plans (Development Plans, Local Area Plans etc.). In the context of European sites within the Zoi of the Proposed Development, the overarching land use plan is the Meath County Development Plan 2021-2027</p>

Plan Description	Are there potential impact pathways by which the Plan / Programme could act in combination with the Proposed Scheme to adversely impact European sites	Will the Plan/Programme act in combination with the Proposed Scheme to adversely affect the integrity of European sites
		<p>The land use plan contains objectives and policies to ensure the protection of European sites from any projects proposed within the plan area. These are presented in Section 8.1.</p> <p>Considering the environmental protection policies included within the land use plans, and that alone the Proposed Development will not adversely affect the integrity of any European sites, the Climate Action Plan 2023 Plan poses no identifiable risk of resulting in adverse effects on the integrity of any European sites in combination with the Proposed Development.</p>
<p>National Development Plan Ireland 2021-2030</p> <p>As part of Project Ireland 2040 the National Development Plan sets out the Government’s over-arching investment strategy and budget for the period 2021-2030. The plan that aims to balance demand for public investment across all sectors and regions of Ireland with a major focus on the delivery of infrastructure projects.</p>	<p>There is the potential that developments implemented under the National Development Plan could affect European sites within the Zol of the Proposed Scheme. The potential impact pathways cannot be defined based on the level of detail included in the plan. However, future developments implemented through the National Development Plan have the potential to lie either within those European sites or be situated in a location where they may be within the Zol of those European sites.</p>	<p>No in combination impact.</p> <p>Any projects required to achieve the objectives of the National Development Plan must comply with the requirements and obligations of EU and Irish planning and environmental law, including those of the relevant land use plans (Development Plans, Local Area Plans etc.). In the context of European sites within the Zol of the Proposed Development, the overarching land use plan is the Meath County Development Plan 2021-2027</p> <p>The land use plan contains objectives and policies to ensure the protection of European sites from any projects proposed within the plan area. These are presented in Section 8.1.</p> <p>Considering the environmental protection policies included within the Meath County Development Plan 2021-2027 and that alone the Proposed Development will not adversely affect the integrity of any European sites, the National Development Plan Ireland 2021-2030 Plan poses no identifiable risk of resulting in adverse effects on the integrity of any European sites in combination with the Proposed Development.</p>
<p>Project Ireland 2040 – National Planning Framework</p> <p>The National Planning Framework is a high-level strategic plan to guide future growth and development in Ireland. The NPF makes reference to integrating climate considerations into Statutory plans; supporting more energy efficient developments; enhance energy</p>	<p>There is the potential that developments implemented under Project Ireland 2040 could affect European sites within the Zol of the Proposed Scheme. The potential impact pathways cannot be defined based on the level of detail included in the plan. However, future developments implemented through Project Ireland 2040 have the</p>	<p>No in combination impact.</p> <p>Any projects required to achieve the objectives of Project Ireland 2040 Plan must comply with the requirements and obligations of EU and Irish planning and environmental law, including those of the relevant land use plans (Development Plans, Local Area Plans etc.).</p>

Plan Description	Are there potential impact pathways by which the Plan / Programme could act in combination with the Proposed Scheme to adversely impact European sites	Will the Plan/Programme act in combination with the Proposed Scheme to adversely affect the integrity of European sites
<p>security through further reductions in dependence on fossil fuels, moving towards wind, gas with carbon capture and sequestration, biomass and other renewable sources.</p>	<p>potential to lie either within those European sites or be situated in a location where they may be within the Zol of those European sites.</p>	<p>In the context of European sites within the Zol of the Proposed Development, the overarching land use plan is the Meath County Development Plan 2021-2027</p> <p>The land use plan contains objectives and policies to ensure the protection of European sites from any projects proposed within the plan area. These are presented in Section 8.1.</p> <p>Considering the environmental protection policies included within the Meath County Development Plan 2021-2027 and that alone the Proposed Development will not adversely affect the integrity of any European sites, the Project Ireland 2040 – National Planning Framework poses no identifiable risk of resulting in adverse effects on the integrity of any European sites in combination with the Proposed Development.</p>
<p>National Biodiversity Action Plan 2017-2021</p> <p>The National Biodiversity Action Plan sets out 119 targeted actions, underpinned by seven strategic objectives aimed at ensuring that Irelands’ biodiversity and ecosystems are conserved and restored, delivering benefits essential for all sectors of society and that Ireland contributes to efforts to halt the loss of biodiversity and the degradation of ecosystems in the EU and globally. The strategic objectives lay out a clear framework for Ireland’s national approach to biodiversity.</p>	<p>The purpose of this action plan is to halt the loss of biodiversity and the degradation of ecosystems therefore, it will contribute towards maintaining or restoring the conservation condition of the European sites within their Zol. Consequently, there are no potential impact pathways by which it could adversely affect the integrity of any European sites</p>	<p>No in combination impact</p> <p>As the National Biodiversity Action Plan aims to halt biodiversity loss, no likely significant in combination effects are predicted.</p>
<p>National Air Pollution Control Programme (NAPCP) 2021</p> <p>The National Air Pollution Control Programme (Article 6 of Directive (EU) 2016/2284 – ‘the NEC Directive’) is the main governance instrument by which EU Member States must ensure that the emission reduction commitments for 2020-2029 and 2030 onwards are met.</p>	<p>The purpose of this programme is to reduce emissions and improve air quality in Ireland therefore, it will contribute towards maintaining or restoring the conservation condition of the European sites within its Zol. Consequently, there are no potential impact pathways by which it could adversely affect the integrity of any European sites.</p>	<p>No in combination impact</p> <p>No potential for in combination impacts with the Proposed Development as such a plan is intended to improve the quality of the ecological environment within its Zol.</p>
<p>Regional Spatial & Economic Strategy for the Eastern and Midland Region 2019-2031</p>	<p>There is the potential that developments implemented under the Regional Spatial & Economic Strategy for the Eastern and Midland Region could affect European sites within the Zol of the Proposed Development. The Regional Spatial & Economic Strategy for the</p>	<p>No in combination impact.</p> <p>Any projects required to achieve the objectives of the Regional Spatial & Economic Strategy for the Eastern and Midland Region will</p>

Plan Description	Are there potential impact pathways by which the Plan / Programme could act in combination with the Proposed Scheme to adversely impact European sites	Will the Plan/Programme act in combination with the Proposed Scheme to adversely affect the integrity of European sites
<p>The RSES is a strategic plan which identifies regional assets, opportunities and pressures and provides appropriate policy responses in the form of Regional Policy Objectives. One of its main aims is to provide a framework to better manage spatial planning and economic development throughout the Region.</p> <p>In the context of the Proposed Development, this includes the sustainable growth through the provision of services and infrastructure</p>	<p>Eastern and Midland Region does not propose or support any specific development proposals in identified locations and the potential impact pathways cannot be defined. However, future developments implemented through the Regional Spatial & Economic Strategy for the Eastern and Midland Region have the potential to lie either within those European sites or be situated in a location where they may be within the ZoI of those European sites.</p>	<p>be implemented locally by the relevant local authority and must comply with the requirements and obligations of EU and Irish planning and environmental law, including those of the relevant land use plans (Development Plans, Local Area Plans etc.). In the context of European sites within the ZoI of the Proposed Scheme, the overarching land use plan is the Meath County Development Plan 2021-2027</p> <p>The land use plan contains objectives and policies to ensure the protection of European sites from any projects proposed within the plan area. These are presented in Section 8.1.</p> <p>Considering the environmental protection policies included within the Meath County Development Plan 2021-2027 and that alone the Proposed Development will not adversely affect the integrity of any European sites, the Project Ireland 2040 – National Planning Framework poses no identifiable risk of resulting in adverse effects on the integrity of any European sites in combination with the Proposed Development.</p>
<p>Meath Development Plan 2021-2027</p>	<p>The proposed works lie within the functional area of the MDP 2021 – 2027. Many of the objectives and policies of the MDP 2021 – 2027 have the potential to act in combination with the proposed works, through a variety of potential impact pathways, to affect European sites.</p> <p>As assessed in Section 7, the proposed works will not adversely affect the integrity of any European site in isolation. Therefore, the potential for in combination effects to arise are limited to those effects the proposed works will have on the receiving environment that are measurable in some way, but themselves will not affect the conservation objectives of European sites including:</p> <ul style="list-style-type: none"> Habitat degradation / effects on QI/SCI species as a result of hydrological impacts (for example reduction in water quality in catchments draining to Nanny Estuary) affecting the conservation objectives supporting aquatic habitats and species in: River Nanny Estuary and Shore SPA. 	<p>No in combination impacts</p> <p>The MDP 2021 – 2027 was subject to AA Screening, and AA, prior to its adoption and therefore, subject to any mitigation identified as being required, there will be no adverse effects on any European sites as a result of implementation of the plan.</p> <p>The MDP 2021 - 2027 contains objectives and policies to ensure the protection of European sites, including surface water quality, from any projects proposed within the plan area. These are presented in Section 8.</p> <p>Considering the protective environmental policies contained within the MDP 2021 - 2027, and that alone the proposed works will not adversely affect the integrity of any European sites, this land use plan will not act in combination with the proposed works to adversely affect the integrity of any European sites.</p>

Plan Description	Are there potential impact pathways by which the Plan / Programme could act in combination with the Proposed Scheme to adversely impact European sites	Will the Plan/Programme act in combination with the Proposed Scheme to adversely affect the integrity of European sites
	<ul style="list-style-type: none"> Habitat degradation/effects on QI/SCI species as a result of air quality impacts affecting the conservation objectives supporting habitats and species in: River Boyne and River Blackwater SAC, River Boyne and River Blackwater SPA, Boyne Estuary SPA, Boyne Coast and Estuary SAC, and River Nanny and Shore SPA. 	
<p>County Meath Biodiversity Action Plan 2015 -2020</p> <p>The purpose of this action plan is to halt the loss of biodiversity and the degradation of ecosystems.</p>	<p>The proposed works lie within the functional area of the MDP 2021 – 2027. Some of the actions of the Meath Biodiversity Action Plan, have the potential to act in combination with the proposed works, through a variety of potential impact pathways, to affect European sites.</p> <p>As assessed in Section 7, the proposed works will not adversely affect the integrity of any European site in isolation. Therefore, the potential for in combination effects to arise are limited to those effects the proposed works will have on the receiving environment that are measurable in some way, but themselves will not affect the conservation objectives of European sites including:</p> <ul style="list-style-type: none"> Habitat degradation / effects on QI/SCI species as a result of hydrological impacts (for example reduction in water quality in catchments draining to Nanny Estuary) affecting the conservation objectives supporting aquatic habitats and species in: River Nanny Estuary and Shore SPA. Habitat degradation/effects on QI/SCI species as a result of air quality impacts affecting the conservation objectives supporting habitats and species in: River Boyne and River Blackwater SAC, River Boyne and River Blackwater SPA, Boyne Estuary SPA, Boyne Coast and Estuary SAC, and River Nanny and Shore SPA. 	<p>No in combination impact</p> <p>No potential for in combination impacts with the proposed works as such a plan is intended to improve the quality of the ecological environment within its Zol.</p>

Table 17 In Combination Assessment of Projects

Application Reference	Applicant for 'Other Development' and Brief Description	Decision	Conclusion regarding In combination effect Will the project act in combination with the Proposed Works to adversely affect the integrity of European sites?
ABP 307433	Alterations to waste-to-energy facility. The applications relate to minor changes to existing operations	Consented (with conditions) – 30/03/2022	<p>No in combination effect.</p> <p>The Proposed Development must comply with all applicable planning and environmental approval requirements and be in accordance with the objectives and policies of the relevant land use plans (Development Plans.). These land use plans contain objectives and policies to ensure the protection of European sites.</p> <p>The proposed project was subject to planning consent.</p> <p>In granting permission for the proposed project, it would have been necessary to determine that the project will not result in adverse effects on the integrity of any European sites, including from the impact pathway of surface water networks, either alone or in combination with the Proposed Development.</p> <p>The environmental protection policies included within the relevant land use plans, the range of mitigation measures included in the proposed works to avoid significant impacts and that alone the proposed works will not adversely affect the integrity of any European sites, the consented project will not act in combination with the proposed works to have an adverse effect on the integrity of any European sites.</p> <p>The consented Indaver project will not adversely affect the integrity of any European sites, in its own right, nor in combination with other projects, including the proposed works and has included mitigation in that regard to prevent any such adverse effects.</p>
ABP 309308	20 year permission for a 13.5 hectare extension to existing Overburden Management Facility.	Consented (with conditions) – 08/07/2021	<p>No in combination effect.</p> <p>The Proposed Development must comply with all applicable planning and environmental approval requirements and be in accordance with the objectives and policies of the relevant land use plans (Development Plans.). These land use plans contain objectives and policies to ensure the protection of European sites.</p> <p>The proposed project was subject to planning consent. In granting permission for the proposed project, it would have been necessary to determine that the project will not result in adverse effects on the integrity of any European sites, including from the impact pathway of surface water networks, either alone or in combination with the Proposed Development.</p>

Application Reference	Applicant for 'Other Development' and Brief Description	Decision	Conclusion regarding In combination effect Will the project act in combination with the Proposed Works to adversely affect the integrity of European sites?
			<p>There is no physical overlap between the proposed works and the consented Development. The environmental protection policies included within the relevant land use plans, the range of mitigation measures included in the proposed works to avoid significant impacts and that alone the proposed works will not adversely affect the integrity of any European sites, the consented development will not act in combination with the proposed works to have an adverse effect on the integrity of any European sites.</p> <p>The consented development will not adversely affect the integrity of any European sites, in its own right, nor in combination with other projects, including the proposed works at a single location along the railway viaduct and has included mitigation in that regard to prevent any such adverse effects.</p>
ABP 303678	A 110kV Substation strategic infrastructure development adjacent to the Proposed Development	Consented (with conditions) – 17/01/2020	<p>No in combination effect.</p> <p>The Proposed Development must comply with all applicable planning and environmental approval requirements and be in accordance with the objectives and policies of the relevant land use plans (Development Plans.). These land use plans contain objectives and policies to ensure the protection of European sites.</p> <p>The proposed project was subject to planning consent. In granting permission for the proposed SID project, it would have been necessary to determine that the project will not result in adverse effects on the integrity of any European sites, including from the impact pathway of surface water networks, either alone or in combination with the Proposed Development.</p> <p>The proposed works and the consented SID are within the same site. The environmental protection policies included within the relevant land use plans, the range of mitigation measures included in the proposed works to avoid significant impacts and that alone the proposed works will not adversely affect the integrity of any European sites, the consented development will not act in combination with the proposed works to have an adverse effect on the integrity of any European sites.</p> <p>The consented SID will not adversely affect the integrity of any European sites, in its own right, nor in combination with other projects, including the proposed works at a single location along the railway viaduct and has included mitigation in that regard to prevent any such adverse effects.</p>

Application Reference	Applicant for 'Other Development' and Brief Description	Decision	Conclusion regarding In combination effect Will the project act in combination with the Proposed Works to adversely affect the integrity of European sites?
ABP 307433	Increase in annual total waste for treatment from currently permitted 235,000 tonnes to 250,000 tonnes, increase in annual amount of hazardous waste from currently permitted 10,000 tonnes to 25,000 tonnes, development of a aqueous waste tank farm, hydrogen generation unit, bottom ash storage building, development of a single storage warehouse, new concrete yard, weather canopy, demolition and rebuilding of an existing single storey modular office and ancillary site works.	Consented (with conditions) – 30/03/2022	<p>No in combination effect.</p> <p>The Proposed Development must comply with all applicable planning and environmental approval requirements and be in accordance with the objectives and policies of the relevant land use plans (Development Plans.). These land use plans contain objectives and policies to ensure the protection of European sites.</p> <p>The proposed project was subject to planning consent. In granting permission for the proposed project, it would have been necessary to determine that the project will not result in adverse effects on the integrity of any European sites, including from the impact pathway of surface water networks, either alone or in combination with the Proposed Development.</p> <p>There is no physical overlap between the proposed works and the consented Development. The environmental protection policies included within the relevant land use plans, the range of mitigation measures included in the proposed works to avoid significant impacts and that alone the proposed works will not adversely affect the integrity of any European sites, the consented development will not act in combination with the proposed works to have an adverse effect on the integrity of any European sites.</p> <p>The consented development will not adversely affect the integrity of any European sites, in its own right, nor in combination with other projects, including the proposed works at a single location along the railway viaduct and has included mitigation in that regard to prevent any such adverse effects.</p>
ABP 310768	Continuation of the use and further quarrying of limestone within the site which was granted by Substitute Consent	Consented (with conditions) – 03/03/2023	<p>No in combination effect.</p> <p>The Proposed Development must comply with all applicable planning and environmental approval requirements and be in accordance with the objectives and policies of the relevant land use plans (Development Plans.). These land use plans contain objectives and policies to ensure the protection of European sites.</p> <p>The proposed project was subject to planning consent. In granting permission for the proposed project, it would have been necessary to determine that the project will not result in adverse effects on the integrity of any European sites, including from the impact pathway of</p>

Application Reference	Applicant for 'Other Development' and Brief Description	Decision	Conclusion regarding In combination effect Will the project act in combination with the Proposed Works to adversely affect the integrity of European sites?
			<p>surface water networks, either alone or in combination with the Proposed Development.</p> <p>There is no physical overlap between the proposed works and the consented Development. The environmental protection policies included within the relevant land use plans, the range of mitigation measures included in the proposed works to avoid significant impacts and that alone the proposed works will not adversely affect the integrity of any European sites, the consented development will not act in combination with the proposed works to have an adverse effect on the integrity of any European sites.</p> <p>The consented development will not adversely affect the integrity of any European sites, in its own right, nor in combination with other projects, including the proposed works at a single location along the railway viaduct and has included mitigation in that regard to prevent any such adverse effects.</p>

8.2 Plan Level Environmental Protection Assessment

- 180 The overarching plan level environmental protection policies from the following plans: Eastern and Midland Region Assembly, Regional Spatial and Economic Strategy 2019-2023 and the Meath County Development Plan 2021 - 2027 are listed in Appendix I of this NIS.
- 181 The proposed works will be compliant with all of the plan level biodiversity protection policies and objectives described above, including those within the Meath DP 2021 - 2027. Furthermore, the proposed works will not prevent the achievement of any of these plan level biodiversity protection policies and objectives across the identified potential impact pathways.

8.3 Conclusion of In Combination Assessment

- 182 The Proposed Development will not adversely affect the integrity of any European sites including those within its Zol. It will not result in the loss or fragmentation of any QI habitats, or habitats supporting populations of QI / SCI species, in (or associated with) any European sites, nor will it degrade any such habitats or affect QI / SCI species as a result of hydrological or hydrogeological impacts (quality or quantity), air quality impacts or introducing / spreading non-native invasive plant species.
- 183 The implementation of, and adherence to, the policies and objectives described in Section 8.1 will ensure the protection of European sites across all identified potential impact pathways, and will include the requirement for any future project to undergo Screening for Appropriate Assessment and / or Appropriate Assessment as appropriate.
- 184 As the Proposed Development will not affect the integrity of European sites within the Zol of the Proposed Development, and given the protection afforded to European sites under the overarching land use plans, it has been concluded that there will be no adverse effects on the integrity of any European sites to arise as a consequence of the Proposed Development acting in combination with any other plans or projects.
- 185 Section 8.1 of this NIS provides the assessment of both Plans and Projects. The assessment found that there will be no adverse effects on the integrity of any European sites as a consequence of the Proposed Development acting in combination with each of these plans and projects.
- 186 Furthermore, for the same reasons, there will be no adverse effects on the integrity of any European sites as a consequence of the Proposed Development acting in combination with any, some or indeed all taken together, of these plans or projects.
- 187 Therefore, the Proposed Development will not adversely affect the integrity of any European sites, either alone or in combination with any other plans or projects. No additional mitigation measures are necessary or required following this update assessment.

9 NIS Conclusion

- 188 This NIS has examined and analysed, in light of the best scientific knowledge, with respect to those European sites within the zone of influence of the Proposed Development, the potential impact sources and pathways, the manner in which these could potentially impact on the European sites' QIs/SCOs and whether the predicted impacts would adversely affect the integrity of **River Boyne and River Blackwater SAC, River Boyne and River Blackwater SPA, Boyne Coast and Estuary SAC, Boyne Estuary SPA, River Nanny Estuary and Shore SPA**. There are no other European sites at risk of effects from the Proposed Development.
- 189 Avoidance, design requirements and mitigation measures are set out within this NIS (and its appendices) and the effective implementation of these mitigation measures will ensure that any impacts on the conservation objectives of European sites will be avoided during the construction and operation phases of the Proposed Development such that there will be no adverse effects on any European sites.
- 190 It has been objectively concluded by Scott Cawley Ltd., following an examination, analysis and evaluation of the relevant information, including in particular the nature of the predicted impacts from the Proposed Development and the effective implementation of the mitigation measures prescribed, that the Proposed

Development will not adversely affect (either directly or indirectly) the integrity of any European site, either alone or in combination with other plans or projects.

Appendix I - Plan Level Protection Measures.

Eastern and Midland Region Assembly, Regional Spatial and Economic Strategy 2019-2023

- **Regional Policy Objective 3.4-** Ensure that all plans, projects and activities requiring consent arising from the Regional Spatial and Economic Strategy are subject to the relevant environmental assessment requirements including SEA, EIA and AA as appropriate. In addition the future strategic development of settlements throughout the Region will have full cognisance of the legal requirements pertaining to sites of International Nature Conservation Interest.
- **Regional Policy Objective 7.2** -To achieve and maintain 'Good Environmental Status' for marine waters and to ensure the sustainable use of shared marine resources in the Region, and to promote the development of a cross-boundary and cross-border strategic management and stakeholder engagement framework to protect the marine environment.
- **Regional Policy Objective 7.10-** Support the implementation of the Water Framework Directive in achieving and maintaining at least good environmental status for all water bodies in the Region and to ensure alignment between the core objectives of the Water Framework Directive and other relevant Directives, River Basin Management plans and local authority land use plans.
- **Regional Policy Objective 7.11-** For water bodies with 'high ecological status' objectives in the Region, local authorities shall incorporate measures for both their continued protection and to restore those water bodies that have fallen below high ecological status and areas 'At Risk' into the development of local planning policy and decision making any measures for the continued protection of areas with high ecological status in the Region and for mitigation of threats to waterbodies identified as 'At Risk' as part of a catchment based approach in consultation with the relevant agencies. This shall include recognition of the need to deliver efficient wastewater facilities with sufficient capacity and thus contribute to improved water quality in the Region.
- **Regional Policy Objective 7.12-** Future statutory land use plans shall include Strategic Flood Risk Assessment (SFRA) and seek to avoid inappropriate land use zonings and development in areas at risk of flooding and to integrate sustainable water management solutions (such as SuDS, nonporous surfacing and green roofs) to create safe places in accordance with the Planning System and Flood Risk Assessment Guidelines for Local Authorities.
- **Regional Policy Objective 7.15-** Local authorities shall take opportunities to enhance biodiversity and amenities and to ensure the protection of environmentally sensitive sites and habitats, including where flood risk management measures are planned.
- **Regional Policy Objective 7.16-** Support the implementation of the Habitats Directives in achieving an improvement in the conservation status of protected species and habitats in the Region and to ensure alignment between the core objectives of the EU Birds and Habitats Directives and local authority development plans.
- **Regional Policy Objective 7.22-** Local authority development plan and local area plans, shall identify, protect, enhance, provide and manage Green Infrastructure in an integrated and coherent manner and should also have regard to the required targets in relation to the conservation of European sites, other nature conservation sites, ecological networks and protected species.
- **Regional Policy Objective 10.6** -Delivery and phasing of services shall be subject to the required appraisal, planning and environmental assessment processes and shall avoid adverse impacts on the integrity of the Natura 2000 network.
- **Regional Policy Objective 10.7-** Local authority core strategies shall demonstrate compliance with DHPLG Water Services Guidelines for local authorities and demonstrate phased infrastructure – led growth that is commensurate with the carrying capacity of water services and prevent adverse impacts on the integrity of water dependent habitats and species within the Natura 2000 network.
- **Regional Policy Objective 10.10** -Support Irish Water and the relevant local authorities in the Region to eliminate untreated discharges from settlements in the short term, while planning strategically for long term growth in tandem with Project Ireland 2040 and in increasing

compliance with the requirements of the Urban Waste Water Treatment Directive from 39% today to 90% by the end of 2021, to 99% by 2027 and to 100% by 2040.

- **Regional Policy Objective 10.11-** EMRA supports the delivery of the waste water infrastructure set out in Table 10.2, subject to appropriate environmental assessment and the planning process.³⁸
- **Regional Policy Objective 10.12-** Development plans shall support strategic wastewater treatment infrastructure investment and provide for the separation of foul and surface water networks to accommodate the future growth of the Region.
- **Regional Policy Objective 10.15-** Support the relevant local authorities (and Irish Water where relevant) in the Region to improve storm water infrastructure to improve sustainable drainage and reduce the risk of flooding in the urban environment and in the development and provision at a local level of Sustainable Urban Drainage solutions.
- **Regional Policy Objective 10.16-** Implement policies contained in the Greater Dublin Strategic Drainage Study (GSDSDS), including SuDS.
- **Regional Policy Objective 10.18** -Local authorities shall ensure adequate surface water drainage systems are in place which meet the requirements of the Water Framework Directive and the associated River Basin Management Plans.

Meath County Development Plan 2021 – 2027

Meath County Development Plan 2021-2027

HER POL 28

To integrate in the development management process the protection and enhancement of biodiversity and landscape features wherever possible, by minimising adverse impacts on existing habitats (whether designated or not) and by including mitigation and/or compensation measures, as appropriate.

HER POL 31

To ensure that the ecological impact of all development proposals on habitats and species are appropriately assessed by suitably qualified professional(s) in accordance with best practice guidelines – e.g. the preparation of an Ecological Impact Assessment (EclA), Screening Statement for Appropriate Assessment, Environmental Impact Assessment, Natura Impact Statement (NIS), species surveys etc. (as appropriate).

HER POL 32

To permit development on or adjacent to designated Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas, Statutory Nature Reserves or those proposed to be designated over the period of the Plan, only where the development has been subject to the outcome of the Appropriate Assessment process and has been carried out to the satisfaction of the Planning Authority, in consultation with National Parks and Wildlife.

HER POL 33

To have regard to the views and guidance of the National Parks and Wildlife Service in respect of Proposed Development where there is a possibility that such development may have an impact on a designated European or National site or a site proposed for such designation.

HER POL 34

To undertake appropriate surveys and collect data to provide an evidence-base to assist the Council in meeting its obligations under Article 6 of the Habitats Directives (92/43/EEC) as transposed into Irish Law, subject to available resources.

HER OBL 33

To ensure an Appropriate Assessment in accordance with Article 6(3) and Article 6(4) of the Habitats Directives (92/43/EEC) and in accordance with the Department of Environment, Heritage and Local

³⁸ The Greater Dublin Drainage Project, the Ringsend Wastewater Treatment Plant Project, the Athlone Main Drainage Project and the Upper Liffey Valley Sewerage Scheme

Government Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities, 2009 and relevant EPA and European Commission guidance documents, is carried out in respect of any plan or project not directly connected with or necessary for the management of the site but likely to have a significant effect on a Natura 2000 site(s), either individually or in-combination with other plans or projects, in view of the site’s conservation objectives.

HER OBL 34

To protect and conserve the conservation value of candidate Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas and proposed Natural Heritage Areas as identified by the Minister for the Department of Culture, Heritage and the Gaeltacht and any other sites that may be proposed for designation during the lifetime of this Plan in accordance with the provisions of the Habitats and Birds Directives and to permit development in or affecting same only in accordance with the provisions of those Directives as transposed into Irish Law.

HER POL 35

To ensure, where appropriate, the protection and conservation of areas, sites, species and ecological/networks of biodiversity value outside designated sites and to require an appropriate level of ecological assessment by suitably qualified professional(s) to accompany development proposals likely to impact on such areas or species.

HER POL 36

To consult with the National Parks and Wildlife Service and take account of their views and any licensing requirements, when undertaking, approving or authorising development which is likely to affect plant, animal or bird species protected by law.

HER OBJ 35

To ensure that development does not have a significant adverse impact, incapable of satisfactory avoidance or mitigation, on plant, animal or bird species protected by law.

HER POL 45

To ensure that peatland areas which are designated (or proposed for designation) as NHAs, SACs or SPAs are conserved for their ecological, climate regulation, archaeological, cultural and educational significance.

HER OBJ 39

To work in partnership with relevant stakeholders on a suitable peatland site(s) to demonstrate best practice in sustainable peatland conservation, management and restoration techniques and to promote their heritage and educational value subject to Ecological Impact Assessment and Appropriate Assessment Screening, as appropriate, having regard to local and residential amenities.

HER POL 47

To protect the ecological, recreational, educational, amenity and flood alleviation potential of navigational and non-navigational waterways within the County, towpaths and adjacent wetlands.

HER OBJ 42

To undertake conservation works in accordance with best practice on the coastal dune systems subject to ecological impact assessment and Appropriate Assessment, as appropriate.

HER OBJ 60

To encourage, pursuant to Article 10 of the Habitats Directive (92/43/EEC), the management of features of the landscape, such as traditional field boundaries, important for the ecological coherence of the Natura 2000 network and essential for the migration, dispersal and genetic exchange of wild species

INF POL 9

To consider the potential for the provision of temporary water treatment facilities for new developments but only where a permanent solution has already been identified and committed to by Irish Water but has not yet been implemented. The provision of such temporary facilities shall only be considered where the solution is environmentally sustainable and would not affect the quality status of water sources. Adequate provision shall be made by the developer for the operation and maintenance of the proposed temporary facility for the duration of its required existence and thereafter for its decommissioning and removal from site.

INF OBJ 6

To liaise and work in conjunction with Irish Water in their implementation of water conservation measures.

INF OBJ 7

To promote the sustainable use of water and water conservation in existing and new development within the County and encourage demand management measures among all water users

INF OBJ 8

To protect both ground and surface water resources and work with Irish Water to develop and implement Water Safety Plans to protect sources of public water supply and their contributing catchment

INF POL 11

To liaise and work in conjunction with Irish Water during the lifetime of the Plan in the provision, upgrading or extension of wastewater collection and treatment systems in the County to serve existing and planned future populations and enterprise in accordance with the requirements of the Core and Settlement Strategies.

INF OBJ 12

The Planning Authority shall consider the provision of temporary wastewater treatment facilities for new developments only in circumstances where a permanent solution is identified and committed to by Irish Water. The temporary solution shall only be considered where it is deemed to be environmentally sustainable and would not affect the water quality status of receiving waters. Adequate provision shall be made by the developer for the operation and maintenance of the temporary facility for the duration of the operation of the required infrastructure.

INF POL 16

To ensure that all planning applications for new development have regard to the surface water management policies provided for in the GSDSDS.

INF OBJ 14

To require the use of SuDS within Local Authority Developments and other infrastructural projects in accordance with the Greater Dublin Regional Code of Practice for Drainage Works.

INF OBJ 15

To require the use of SuDS in accordance with the Greater Dublin Regional Code of Practice for Drainage Works for new developments (including extensions).

INF OBJ 19

To ensure that developments permitted by the Council which involve discharge of wastewater to surface waters or groundwaters comply with the requirements of the EU Environmental Objectives (Surface Waters) Regulations and EU Environmental Objectives (Groundwater) Regulations.

INF POL 29

To facilitate the provision of new, or the reinforcement of existing flood defences and protection measures where necessary and in particular to support the implementation of flood schemes being progressed through the planning process during the lifetime of the Plan. The provision of flood defences will be subject to the outcome of the Appropriate Assessment process.

INF OBJ 22

To ensure flood relief measures are suitably designed to protect the conservation objectives of Natura 2000 sites, and to avoid direct or indirect impacts upon qualifying interests or Natura 2000 sites.

INF OBJ 25

To require the use of Sustainable Urban Drainage Systems (SuDS) to minimise and limit the extent of hard surfacing and paving and require the use of sustainable drainage techniques where appropriate, for new development or for extensions to existing developments, in order to reduce the potential impact of existing and predicted flooding risks.

INF POL 33

To protect recognised salmonid water courses (in conjunction with Inland Fisheries Ireland) such as the Boyne and Blackwater catchments, which are recognised to be exceptional in supporting salmonid fish species.

INF OBJ 30

To ensure the County's natural coastal defences, such as beaches, sand dunes, salt marshes and estuary lands, are protected and are not compromised by inappropriate works or forms of development.

INF OBJ 36

To protect and develop, in a sustainable manner, the existing groundwater sources and aquifers in the County and manage development in a manner consistent with the sustainable management of these resources in conformity with the EU Environmental Objectives (Groundwater) Regulations 2010 and the second cycle National River Basin Management Plan 2018-2021, and any subsequent plan and the Groundwater Protection Scheme.

Appendix II – Air Dispersion Modelling Report 2023, SSE Generation Ireland Ltd.



Air Dispersion Modelling Report 2023

SSE Generation Ireland Ltd
Planning Support
IE0312377-22-RP-0019, Issue: A



Document Sign Off

Air Dispersion Modelling Report 2023

SSE Generation Ireland Ltd
Planning Support
IE0312377-22-RP-0019, Issue A

File No: IE0312377.22.160

CURRENT ISSUE					
Issue No: A	Date: 14 Jul 2023	Reason for issue: Information			
Sign Off	Originator	Checker	Reviewer	Approver	Customer Approval (if required)
Print Name	Julia Carroll	AINE.MONAGHAN		PAUL.OSULLIVAN	
Signature	Authorised Electronically				
Date	14 July 2023	14 Jul 2023		14 Jul 2023	

PREVIOUS ISSUES							
Issue No	Date	Originator	Checker	Reviewer	Approver	Customer	Reason for issue

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Executive Summary

SSE proposes to install an Open Cycle Gas Turbine (OCGT) Generating Plant at its site in Carranstown, Duleek, Platin, Co. Meath. The proposed plant will have a capacity up to 170MW (electrical output), which is designed to support the national electricity network and to operate during peak demand periods. The proposed plant will be a Hydrotreated Vegetable Oil (HVO) fired electrical power generating facility.

The purpose of this air dispersion modelling report was to assess whether the emissions to air from the proposed development would cause a contravention of applicable European and Irish Air Quality Standards (AQs).

The assessment was carried out using BREEZE air dispersion modelling software (version 9.2.0.4), which implements US EPA AERMOD software version 19191. The air dispersion modelling input data consists of meteorological data, detailed information on the physical environment (including building dimensions and terrain features) and design details from all emission points to air on-site. Using this input data, the model predicts ambient ground level concentrations beyond the site boundary for each hour of the modelled meteorological years. The model post-processes the data to identify the location and concentration of the worst-case ground level concentrations. The modelling and reporting methodology was carried out based on the Irish Environmental Protection Agency (EPA) *Air Dispersion Modelling from Industrial Installations Guidance Note (AG4)(2020)*.

The following modelling scenario was considered in this air dispersion modelling assessment:

- 3 No. HVO fuelled Open Cycle Gas Turbine (OCGT) units with 3 No. emission points included in the model, as each turbine has its own emission stack.

The turbine units will operate a maximum of 1,800 hours annually with the highest demand occurring during the winter months. However, continuous operation 24 hours a day, 7 days a week was included in the air dispersion modelling as a conservative approach. In addition, relevant emission stacks from the nearby Industrial Emission (IE) licensed facilities, namely Indaver Ireland Ltd. and Irish Cement Ltd., were included in the air dispersion model to allow for a cumulative assessment of emissions.

The maximum predicted ground level concentrations (GLCs) of nitrogen dioxide (NO₂), sulphur dioxide (SO₂), carbon monoxide (CO), particulates (PM_{10/2.5}) and ammonia (NH₃) from the models were compared against the relevant European and Irish Air Quality Standard (AQs) and Environmental Assessment Level (EAL) limit values to assess the impact of atmospheric emissions from the proposed development on ambient air quality.

Results from the modelling assessment show that atmospheric emissions due to the proposed development do not result in ground level concentrations of NO₂, SO₂, CO, PM_{10/2.5} and NH₃ exceeding the relevant AQs and EALs for the protection of human health and the environment.

It is therefore concluded that atmospheric emissions from the proposed development will have no significant impact on ambient air quality.

1 Introduction

1.1 General

Air dispersion modelling has been carried out to assess the potential environmental impact of atmospheric emissions from the proposed development at the SSE site in Carranstown, Platin, Duleek, Co. Meath. The proposed development is an Open Cycle Gas Turbine (OCGT) Plant with a capacity up to 170MW (electrical output), which is designed to support the national electricity network and to operate during peak demand periods. The proposed plant will be a Hydrotreated Vegetable Oil (HVO) fired electrical power generating facility.

The plant design will allow for flexible operation so the plant can cater for high demand and respond quickly to fluctuations on the electricity grid. Operation over extended periods is not foreseen. The running regime, in terms of load and runtime, will depend on the size of the peak load experienced. It is anticipated that the plant will operate a maximum of 1,800 hours per year with the highest expected demand during winter months. However, a 24/7 operation was included in the air dispersion modelling as a conservative approach.

The currently green-field site location is located approximately 4.5 km south-west of Drogheda town centre (Figure 1-1).

The purpose of the modelling was to ensure that atmospheric emissions from the proposed development do not cause a contravention of applicable European and Irish Air Quality Standards (AQSS). The modelling assessment was carried out using BREEZE air dispersion modelling software (version 9.2.0.4), which implements US EPA AERMOD software version 19191.

All emissions data for the proposed development has been provided by the SSE design team. Building and tank dimensions were taken from project drawings together with an electronic site plan imported into BREEZE AERMOD.

The maximum predicted ground level concentrations (GLCs) of nitrogen dioxide (NO₂), sulphur dioxide (SO₂), carbon monoxide (CO), particulates (PM_{10/2.5}) and ammonia (NH₃) were compared against the relevant AQS and Environmental Assessment Level (EAL) limit values to assess the impact of atmospheric emissions from the facility on ambient air quality and human health and the environment.

The purpose of the modelling was to ensure that atmospheric emissions from the proposed facility do not exceed the applicable European and Irish AQSS.

A full assessment against relevant Best Available Techniques (BAT) will be carried out as part of the Industrial Emissions (IE) Licence application which will be submitted for the proposed development to the EPA. This will include an assessment against the requirements of the *Commission Implementing Decision (EU) 2021/2326 For Large Combustion Plants*¹ which sets out BAT-associated emission levels (BAT-AELs) that will be used as a reference to determine the appropriate licence emission limit values (ELVs) for emission parameters.

¹ Commission Implementing Decision (EU) 2021/2326 of 30 November 2021 Establishing Best Available Techniques (Bat) Conclusions, Under Directive 2010/75/EU of the European Parliament And Of The Council, For Large Combustion Plants

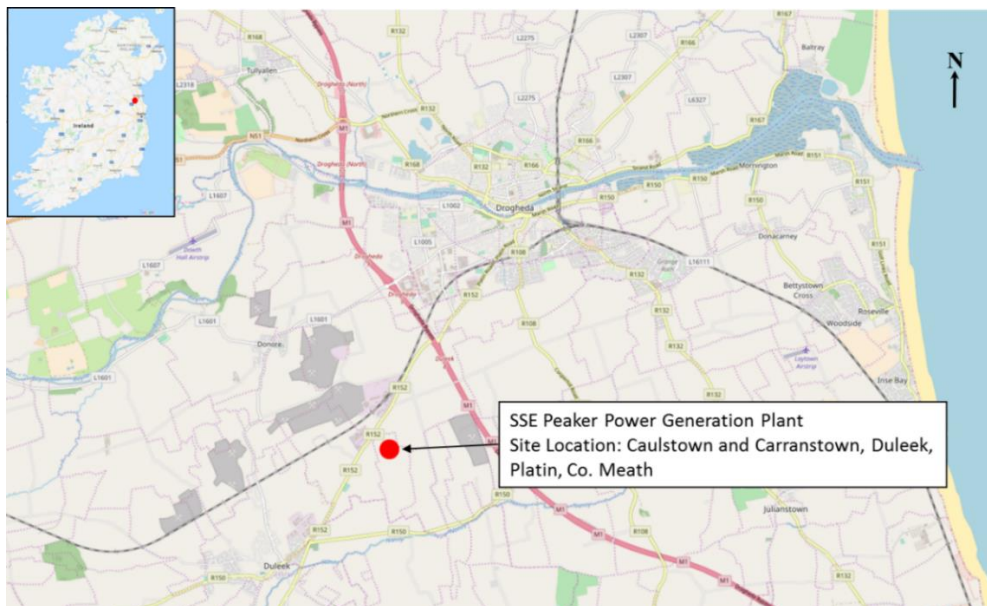


Figure 1-1: Site Location (Map Source: EPA GIS Map, Basemap: © OpenStreetMap)

1.2 Proposed Development

The proposed development will comprise a 170MW (electrical output) Open Cycle Gas Turbine (OCGT) Power Plant. The proposed development will comprise an electricity generating plant which will use Hydrotreated Vegetable Oil (HVO) as fuel and will be connected to a previously permitted 110kV substation (ABP-303678-19) and associated site works and improved access from the R152. The development comprises the following elements:

- a) Three gas turbine buildings (each 990m²) each housing 1 no. turbine, 1 no. generator and auxiliary equipment with a total of 269 MWth (thermal output) generating capacity all on concrete plinths.
- b) The power plant will have three exhaust stacks (25m in height), one exhaust stack per OCGT. Therefore, each OCGT will comprise a standalone Large Combustion Plant. The power plant may need to utilise, selective catalytic reduction (SCR) (18m high, 4.5 width, 14m length) for nitrogen oxide (NO_x) abatement.
- c) Water treatment plant comprising:
 - a 275m² Deionising Building (6m high x 11m wide x 25m long)
 - a raw water treatment tank of 2,262m³ (12.8m high)
 - a deionised water tank (max. volume of 3,925m³) 15.4m high
 - a processed water tank of 450m³ (9m high)
 - 1 no. 20m² firefighting water tank of 45m³ (2m high)
 - 1 no. 25m² firewater module (4m high x 5m wide x 5m long)
 - 1 no. sanitary foul water cesspool tank of 79m³ located underground (1.98m high x 2.5m wide x 16m long)
 - a bulk chemical storage area (4.75m wide x 7.75m long)
- d) 2 no. HVO tanks (max. storage of 2300 m³ of HVO per tank), 13m high with a diameter of 15m and associated fuel pumping and filtering equipment and pipework, within a 43.5m L x 45.5m W x 1.5m Bund capacity is 2970m³
- e) 1 ammonia tank –1.8m high 3.5m length with bund 2.5 m x 5 m with a height of 1.5 m

-
- f) 1 no. fuel polishing system (3m high x 6m wide x 24m long)
 - g) 2 no. 110kV transformers and equipment kiosks each 160m², and each measuring (5m high x 10m wide x 15m long). 3 no. Lightning Masts (18m in height) and cable gantry connection to the adjoining consented 110kV Substation.
 - h) a 520m² services building (6m high x 13m wide x 40m long)
 - i) a 160m² Switchgear (MV) building (5m high x 6.1m wide x 26.3m long)
 - j) all other miscellaneous and ancillary site works, including: 12 no. Car parking spaces and 1 No. fuel unloading bay, one lowered site platform area, internal circulation road, new internal access roads and hard and soft landscaping including a material berms (1.2m to 2m high), a temporary construction compound, temporary security building, staff welfare facilities, and palisade associated fencing (2.4m high).
 - k) New road markings, including deceleration lane approaching the site, on the R152

2 Receiving Environment and Sensitive Receptors

The proposed development is located in a rural setting approximately 4.5 km south-west of the Drogheda town centre. There are two Industrial Emission (IE) licenced facilities within close proximity (Figure 2-1). The boundary of Indaver Ireland Ltd. (IE Licence No. W0167-03) is located approximately 50m north-west of the site and the boundary for Irish Cement Ltd. (IE Licence No. P0030-06) is located approximately 200m north.

The nearest sensitive receptors regarding air emission from the site are illustrated in Figure 2-1.

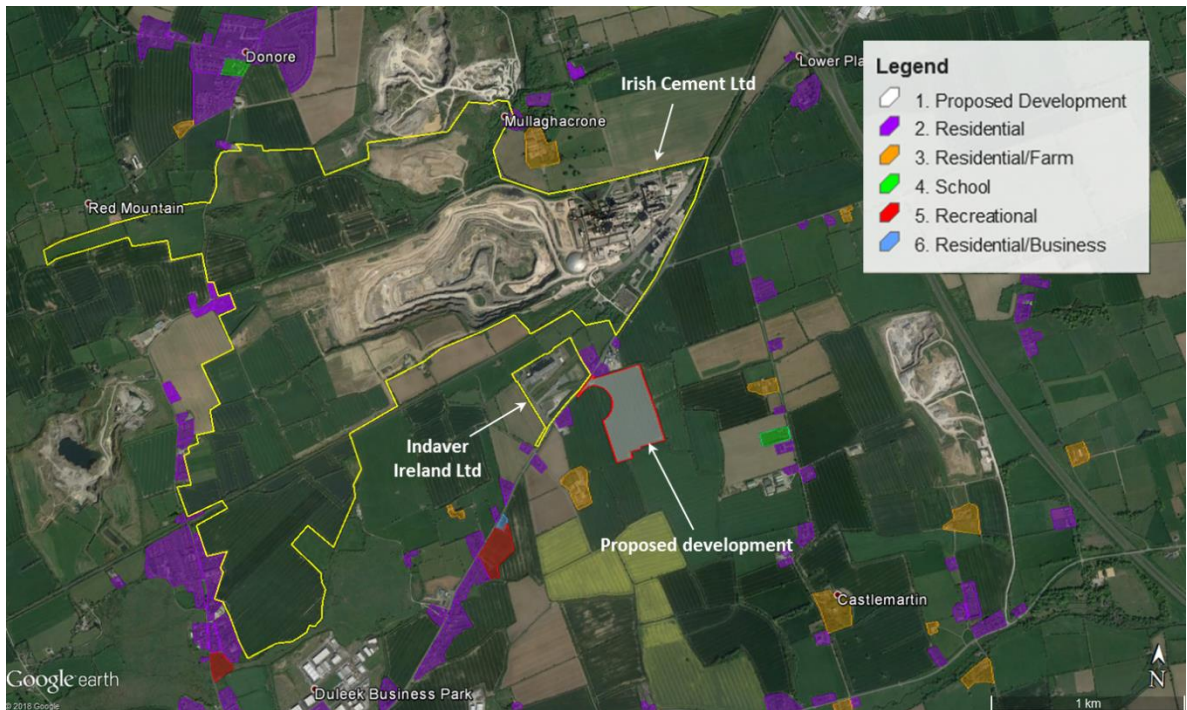


Figure 2-1: Sensitive receptors surrounding proposed development (Basemap: Google Earth, ownership boundary is outlined in red)

Special areas of conservation (SAC), special protection areas (SPA) and proposed natural heritage areas (pNHA) within a 15km radius of the proposed development are listed overleaf in Table 2-1. The SACs and SPAs are shown in Figure 2-2.

Table 2-1: SACs and SPAs within 15km and nearest pNHAs surrounding the site

Site	Site Code	Nearest Distance from site boundary	Nearest Co-ordinate point to site boundary (Irish National Grid)
Special Areas of Conservation (SAC) (within 15km)			
River Boyne and River BlackWater SAC	002299	3.5 km NW	(304113.99E, 273411.83N)
Boyne Coast and Estuary SAC	001957	7 km NE	(310425.15E, 275506.42N)
Special Protection Area (SPA) (within 15km)			
River Boyne and River BlackWater SPA	004232	3.7 km NW	(303708.62E, 273358.42N)
Boyne Estuary SPA	004080	6 km NE	(310753.40E, 275381.84N)
River Nanny and Shore SPA	004158	7.7 km E	(314637.14E, 270752.67N)
Proposed Natural Heritage Area (pNHA) (nearest surrounding site)			
Duleek Commons	001578	2.3 km WSW	(304590.18E, 269599.07N)
Rossnaree Riverbank	001589	6.6 km NW	(300054.41E, 271789.47N)
Dowth Wetland	001861	4 km NNW	(303830.16E, 273805.3N)
Boyne River Islands	001862	4.5 km N	(305872.6E, 275444.81N)
Boyne Coast and Estuary	001957	7km NE	(311908.74E, 275735.3N)
Laytown Dunes/Nanny Estuary	000554	6.6km E	(313491.93E, 270522.42N)
Cromwell's Bush Fen	001576	6.4 km SSE	(309932.09E, 264999.42N)



Figure 2-2: SACs and SPAs within 15km of the proposed development (Map Source: EPA GIS Map)

2.1 Ambient Air Quality Standards

Air Quality Standards (AQSS) for the protection of human health and the environment have been developed at European level and implemented into Irish legislation for a number of atmospheric pollutants. AQSS set limit values for Ground Level Concentrations (GLCs) of certain pollutants for both the short term (hourly, daily) and long term (annual averages). Limit values are often expressed as percentiles e.g. 98 percentile of mean hourly values which means that only 2% of the results obtained during the monitoring period can exceed the stated limit value.

The following ambient air quality legislation is currently implemented in Ireland:

- Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons In Ambient Air Regulations 2009 (S.I. No. 58/2009) which implement EU Directive 2004/107/EC. These regulations set target values in ambient air to be attained, from 31 December 2012, for concentrations of arsenic, cadmium, nickel and benzo(a)pyrene (a measurable indicator of the level of polycyclic aromatic hydrocarbons) and also specify monitoring requirements for mercury and other polycyclic aromatic hydrocarbons
- Air Quality Standards Regulations 2022 (S.I. No. 739/2022) replaces S.I. No. 180/2011 which implemented EU Directive 2008/50/EC on ambient air quality and cleaner air for Europe. This Directive merges most of the existing directives (Directives 96/62/EC, 1999/30/EC, 2000/69/EC and 2002/3/EC) into a single directive. The regulations set ambient air quality limit values for sulphur dioxide (SO₂), nitrogen dioxide (NO₂) and oxides of nitrogen (NO_x), benzene, lead and particulate matter (PM₁₀/ PM_{2.5}). S.I. No. 739/2022 sets the limit values and alert thresholds for air pollution for particular pollutants and also specifies the requirements for monitoring and reporting air quality data.

Emissions to the atmosphere from the proposed development include some of the pollutants addressed in the above air quality legislation. Therefore, the relevant air quality standards for this air quality assessment are detailed in Table 2-2 overleaf.

Table 2-2: Relevant Air Quality Standard (AQS) Limit Values

Pollutant	AQS ($\mu\text{g}/\text{m}^3$)	Source of AQS Value
Oxides of Nitrogen (NO_2 / NO_x)		
NO_2 99.8 Percentile Hourly	200	EU Directive 2008/50/EC / S.I. 739 of 2022
NO_2 Annual	40	EU Directive 2008/50/EC / S.I. 739 of 2022
NO_x + NO_2 Annual (Protection of Vegetation)	30	EU Directive 2008/50/EC / S.I. 739 of 2022
Sulphur Dioxide (SO_2)		
SO_2 99.7 Percentile Hourly	350	EU Directive 2008/50/EC / S.I. 739 of 2022
SO_2 99.2 Percentile Daily	125	EU Directive 2008/50/EC / S.I. 739 of 2022
SO_2 Annual & Winter (1 st October – 31 st Mar) (Protection of Vegetation)	20	EU Directive 2008/50/EC / S.I. 739 of 2022
Carbon Monoxide (CO)		
CO 8-hour	10,000	EU Directive 2008/50/EC / S.I. 739 of 2022
Particulate Matter less than 10 μm (PM_{10})		
PM_{10} 90.4 Percentile Daily	50	EU Directive 2008/50/EC / S.I. 739 of 2022
PM_{10} Annual	40	EU Directive 2008/50/EC / S.I. 739 of 2022
Particulate Matter less than 2.5 μm ($\text{PM}_{2.5}$)		
$\text{PM}_{2.5}$ Annual (up to end of 2019)	25	EU Directive 2008/50/EC / S.I. 739 of 2022
$\text{PM}_{2.5}$ Annual (from Jan 2020 onwards)	20	EU Directive 2008/50/EC / S.I. 739 of 2022
Ammonia (NH_3)		
NH_3 hourly	2,500	U.K. Department for Environment, Food & Rural Affairs (DEFRA) Environmental Assessment Level (EAL)
NH_3 Annual	180	U.K. Department for Environment, Food & Rural Affairs (DEFRA) Environmental Assessment Level (EAL)

3 Air Dispersion Modelling

3.1 Dispersion Model

The air dispersion modelling input data consists of meteorological data, detailed information on the physical environment (including building dimensions and terrain features) and design details from all emission points on site. Using this input data, the model predicts ground level concentrations of pollutants beyond the site boundary for each hour of the modelled meteorological years. The model post-processes the data to identify the location and concentration of the worst-case ground level concentrations.

Emissions from the proposed development have been modelled using AERMOD software (Version 19191), which has been developed by the U.S. Environmental Protection Agency (US EPA). The model is a steady-state Gaussian plume model used to assess pollutant concentrations associated with industrial sources. The model has been designated the regulatory model by the US EPA for modelling emissions from industrial sources in both flat and complex terrain. The modelling and reporting methodology was carried out based on the Irish Environmental Protection Agency (EPA) document '*Air Dispersion Modelling from Industrial Installations Guidance Note (AG4) (2020)*'.

3.2 Meteorological Data

The meteorological data required by the dispersion model is wind speed, wind direction, Pasquill-Gifford stability category, boundary layer height and ambient temperature. The stability category and boundary layer height are used to characterise the turbulence within, and the height of the lower levels of the atmosphere.

Extremely unstable conditions can cause plume looping and elevated concentrations close to the stack. Under stable conditions elevated concentrations can occur due to the emissions being trapped below the boundary layer. Neutral conditions, characterised by cloudy skies and strong winds, are most favourable for dispersion due to the mechanical mixing of the lower atmosphere. The wind direction determines the direction in which the plume is blown, and for a particular stability, higher wind speeds will result in reduced plume rise so causing the plume to reach ground level closer to the stack with elevated emission concentrations. The boundary layer height determines the total vertical distance over which the plume may spread.

The model has been run for each pollutant using five years of meteorological data (2017-2021) from Dublin Airport Meteorological Station. This is considered representative and appropriate data for use in the model and also satisfies the requirement of the Irish EPA AG4 Guidance Note. The meteorological windrose for the years 2017 to 2021 is presented in Figure 3-1.

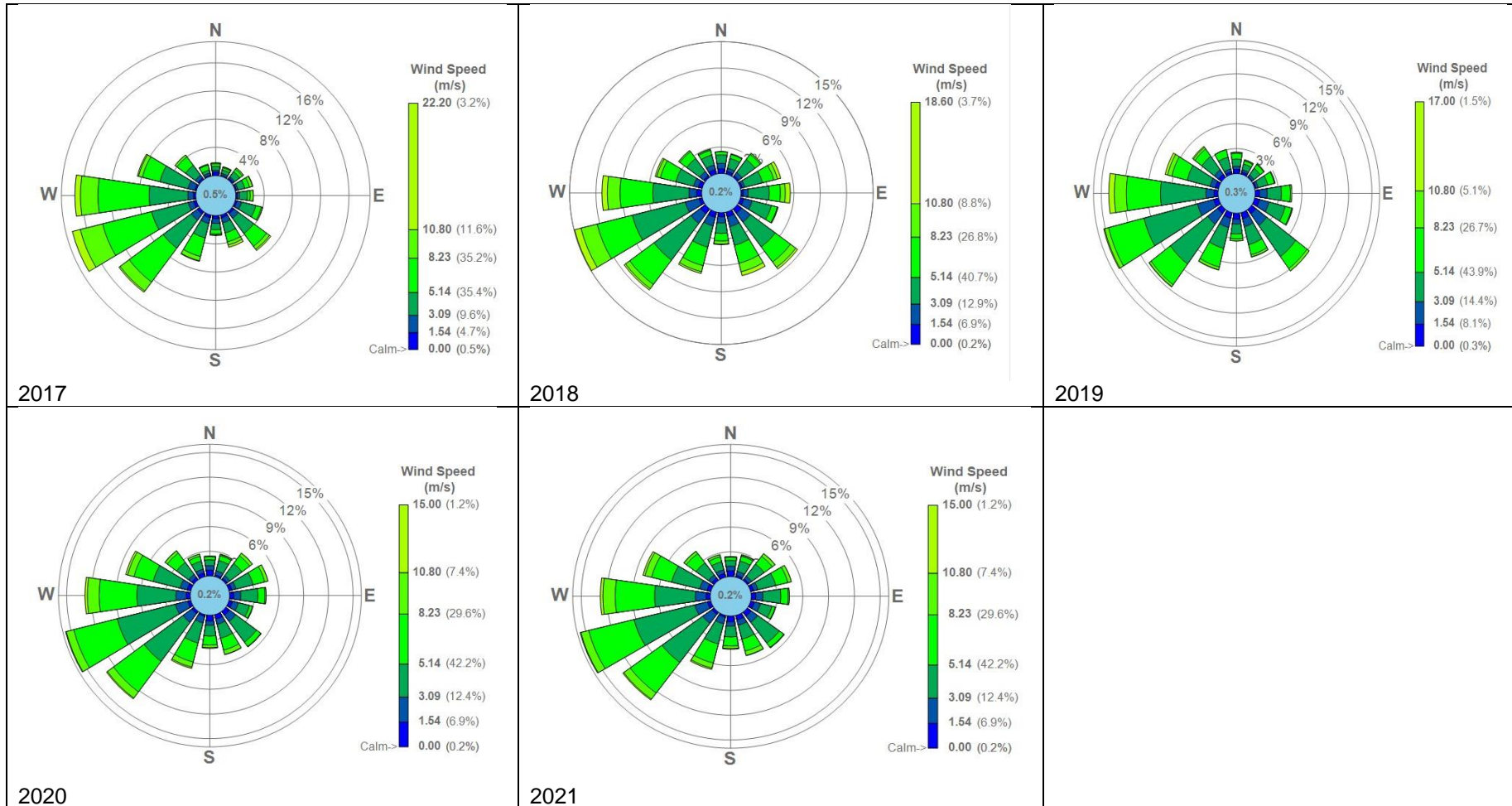


Figure 3-1: Meteorological Windrose for Dublin Airport Station 2017 to 2021

3.3 Building Downwash

Air streams blowing across buildings can become disrupted, with turbulent eddies occurring downwind in the building wake. If an emission point is sufficiently close to a building, then the plume may become entrained in the turbulent eddies of the building wake.

This entrainment can cause plume downwash resulting in elevated emission concentrations close to the emission point. The stacks modelled are subject to downwash and, as a result, direction specific building dimensions were calculated.

The AERMOD model interprets the influence zone of each building for a given wind direction using the Building Profile Input Program (BPIP). The dimensions of the buildings and tanks included in the modelling analysis are outlined in Table 3-1.

Table 3-1: Buildings and tanks included in the model to account for Building Downwash

Structure Description	Structure Height (m)	Elevation (m)
Switchgear building	5	34.5
GT3 Lube Oil Cooler 1	3.719	34.5
GT3 Lube Oil Cooler 2	3.719	34.5
GT2 Lube Oil Cooler 1	3.719	34.5
GT2 Lube Oil Cooler 2	3.719	34.5
GT1 Lube Oil Cooler 1	3.719	34.5
GT1 Lube Oil Cooler 2	3.719	34.5
GT1 Exhaust and Scrubber	18	34.5
GT2 Exhaust and Scrubber	18	34.5
GT3 Exhaust and Scrubber	18	34.5
Services Building	5	34.5
Denionising Building	6	34.5
Fire Fighting Water tank	2	34.5
Sodium Hydroxide Tank	2.8	34.5
Water Treatment Chemicals tank	2.8	34.5
Denionised water tank	15.4	34.5
Raw water tank	12.8	34.5
Processed water tank	9	34.5
HVO tank	13	34.5
HVO tank	13	34.5
Ammonia Tank	1.8	34.5
OCGT Enclosure 1	16.9	34.5
OCGT Enclosure 2	16.9	34.5
OCGT Enclosure 3	16.9	34.5
Fuel Polishing System	3	34.5
Firewater Module	4	34.5

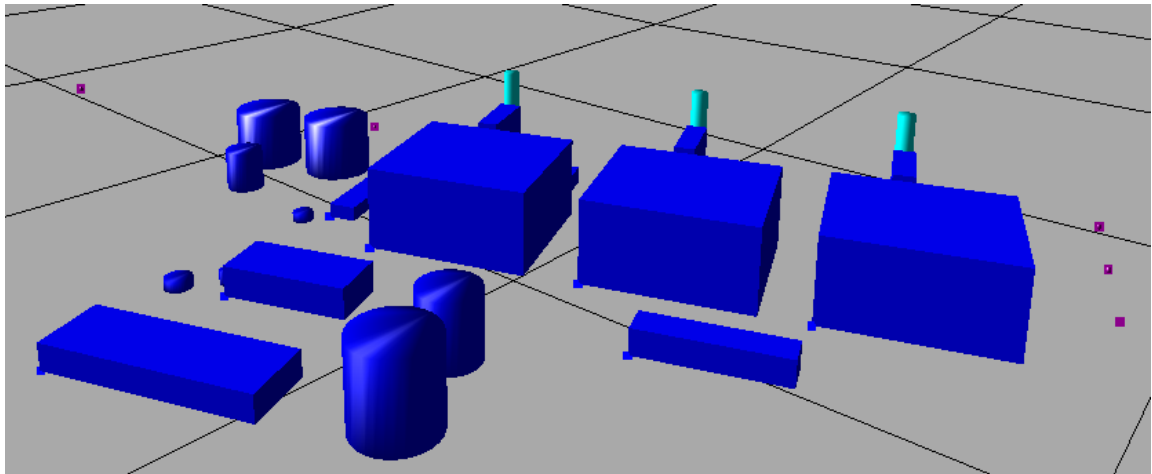


Figure 3-2: Image showing buildings and tanks included in the air dispersion model (also shown in turquoise are the emission stacks)

3.4 Model Receptor Points

The model was set up to examine the impact of emissions on the area surrounding the proposed development using a series of receptors. A receptor is a location at which the model will calculate maximum process contributions (PCs). A Cartesian co-ordinate receptor grid system was established centred on the area of the emission stacks. Grid convergence was performed to determine the optimum configuration, which was a nested grid consisting of:

- **Coarse grid:** Area of 20 km by 20 km with 500 m grid spacing
- **Fine grid:** Area of 4 km by 4 km with 100 m grid spacing

Receptors points were also established around the site boundary (spaced every 100m) and at the sensitive receptors, discussed in Section 2 of this report (NOTE: The ownership boundary was used in the model as opposed to the planning application boundary). Figure 3-3 shows a screenshot of the build model and receptor grids.

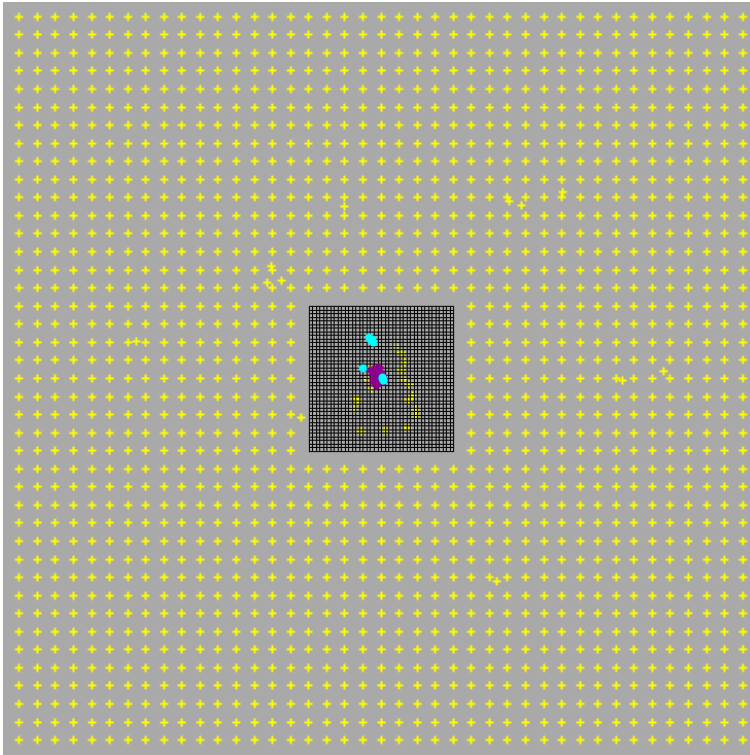


Figure 3-3: Built Model including Receptor Grids

3.5 Terrain Data

A terrain height for each of the receptors on the grid was input to the model in order to accurately represent the changing elevations of the surrounding landscape. Digitised terrain data was incorporated into the model using a Digital Elevation Model (DEM) file and the AERMAP function of the AERMOD software. It is noted that the facility objects, i.e. the buildings and the stacks were set at the floor levels indicated on the planning drawings, i.e. the DEM file was only used to give the elevations of the off-site receptors.

3.6 Stack Discharge Parameters and Emissions Data

The characteristics and emissions data are outlined in Table 3-2 for the proposed development. Figure 3-4 show the locations of the stacks within the model.

The plant design will allow for flexible operation so the plant can cater for high demand and respond quickly to fluctuations on the electricity grid. Operation over extended periods is not foreseen. The running regime, in terms of load and runtime, will depend on the size of the peak load experienced. It is anticipated that the plant will operate a maximum of 1,800 hours per year with the highest expected demand during winter months. The air dispersion modelling has conservatively considered the proposed development to be operational 24 hours a day, 7 days a week.

Table 3-2: Turbine Stacks Discharge Parameters and Emissions Data

Item	Value
Stack height	25 m
Stack internal diameter	3.541 m
Exit gas temperature @ 100% load	454 °C
Discharge volumetric flowrate @ 100% full load	459,549 Nm ³ /hr
Exit gas velocity @ 100% load	34.52 m/s
Nitrogen oxides (NO _x) max. emission concentration	50 mg/Nm ³
NO _x max. emission rate	6.38 g/s
Sulphur dioxide (SO ₂) max. emission concentration	5 mg/Nm ³
SO ₂ max. emission rate	0.64 g/s
Carbon monoxide (CO) max. emission concentration	100 mg/Nm ³
CO max. emission rate	12.77 g/s
Particulates max. emission concentration	5 mg/Nm ³
Particulates max. emission rate	0.64 g/s
Ammonia max. emission concentration	10 mg/Nm ³
Ammonia max. emission rate	1.28 g/s

NO_x/NO₂ Chemistry

During combustion a mixture of both nitric oxide (NO) and nitrogen dioxide (NO₂) is released. Once released, a series of complex chemical reactions take place during which a portion of the NO is converted into NO₂.

In accordance with the EPA's AG4 Guidance, the following default factors were used to convert the NO_x modelled to NO₂ for comparison with the relevant Air Quality Standard Limits:

- Annual NO₂/NO_x ratio of 1.00;
- 1-hour NO₂/NO_x ratio of 0.50.

3.6.1 Best Available Techniques-Associated Emission Levels (BAT-AELs)

The proposed development will be designed to the highest specification in line with Best Available Technologies (BAT) thus ensuring that atmospheric emissions from the facility will not result in an impact to human health or the environment. The proposed OCGT units have been specified so that the pollutant maximum emissions levels as set out in Table 3-2 will not be exceeded.

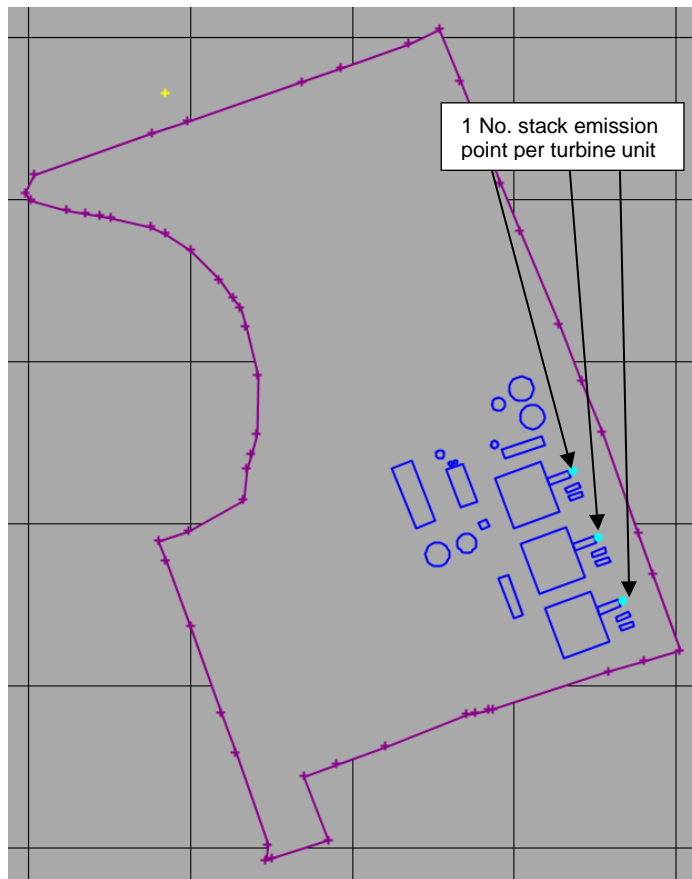


Figure 3-4 Stack Locations (turquoise dots represent each emission point) (NOTE: The ownership boundary was used in the model as opposed to the planning application boundary)

3.7 Cumulative Assessment and Off-site Stack Emissions Data

As discussed in Section 2 of this report, there are two IE Licenced sites, namely Irish Cement Ltd. and Indaver Ireland Ltd., near the proposed development. Both of these sites have the potential to emit more than 100 tonnes per annum of some (in the case of Indaver) or all (in the case of Irish Cement) of the pollutants being assessed as part of this air dispersion model. Hence the relevant stack emissions for both these sites were included as part of the air dispersion model. The stack discharge parameters and emissions data used are outlined in **Appendix C**.

3.8 Sensitivity Analysis and Modelling Scenarios

To determine the worst case modelling scenarios for the air dispersion modelling, sensitivity analysis was performed on the operational load and associated varying discharge parameters.

The emission flowrate, temperature and velocity vary depending upon the load. Table 3-3 details the varying emission discharge parameters with operational load.

Table 3-3: Discharge parameters for varying operational load

Item	100% Load	70% Load	35% Load
Exit Gas Temperature (°C)	454	454	454
Volumetric Flow rate Nm ³ /hr	459,549	384,950	297,573
NO _x conc. (mg/Nm ³)	50	50	50
SO _x conc. (mg/Nm ³)	5	5	5
CO conc. (mg/Nm ³)	100	100	100
Dust conc. (mg/Nm ³)	5	5	10
Ammonia conc. (mg/Nm ³)	10	10	10
NO _x emission rate (g/s)	6.38	5.35	4.13
SO _x emission rate (g/s)	0.64	0.53	0.41
CO emission rate (g/s)	12.77	10.69	8.27
Dust emission rate g/s	0.64	0.53	0.83
Ammonia emission rate g/s	1.28	1.07	0.83
Exit Gas Velocity m/s	34.52	28.92	22.35

4 Modelling Results

Tables 4-3 and 4-4 outline the results of the modelling exercise. The predicted maximum process contributions (PCs) outlined in Tables 4-3 to 4-4 are the cumulative effect of the proposed development and nearby facilities (Irish Cement Ltd. and Indaver Ireland Ltd.). Reported are the annual values and the relevant percentiles of hourly or daily values. Contour plots have also been produced for each scenario using the BREEZE 3D Analyst software tool and Google Earth Pro and are included in **Appendix A**.

4.1 Predicted Environmental Concentrations

Predicted Environmental Concentrations (PECs) (i.e. background concentrations plus modelled process contributions) were also calculated for each parameter and averaging time, for comparison to AQS limit values. This assessment ensures that both the modelled emission and the existing background concentrations are taken into account when determining the possible overall ambient air quality once the proposed facility is operational.

The site is located within Air Quality Zone D: Rural Ireland, however it is very close to Air Quality Zone C: Other Cities and Large Towns (Figure 4-1). Adopting a conservative approach, the monitoring results for Zone C will be used as they will give a higher background concentration than those for Zone D monitoring stations.



Figure 4-1: Air Quality Zones around the Proposed Development Site (Map Source: EPA GIS Map)

The EPA produces an annual report on air quality², which details the results from monitoring stations throughout the various Air Quality Zones within Ireland. Outlined in **Appendix B** is the Zone C monitoring stations results for the relevant study pollutants covering the five year period 2017-2021.

Table 4-1 summarises the background concentrations for these Zone C stations selected.

The background concentrations for Ammonia were gathered from the EPA³ which collected data from various monitoring stations located around the island of Ireland in the years 2013 and 2014. This is the most recent data available for ambient ammonia in the study area.

² The latest issued EPA report is *Air Quality in Ireland 2021 Key Indicators of Ambient Air Quality (2022)*

³ EPA Research report *Ambient Atmospheric Ammonia in Ireland 2013-2014 (2017)*

Table 4-2 summarises the background concentrations for ammonia for the area surrounding the proposed development.

Table 4-1: EPA Quality Zone C Monitoring Stations: Background Pollutant concentrations ($\mu\text{g}/\text{m}^3$) for period 2017 to 2021

Pollutant Parameter	Resultant Estimated Background Concentration
Nitrogen Dioxide (NO_2) Hourly - Annual Mean	12.05 $\mu\text{g}/\text{m}^3$
Nitrogen Dioxide (NO_2) Hourly - 99.8 th Percentile	24.10 $\mu\text{g}/\text{m}^3$
Sulphur Dioxide (SO_2) Hourly – Annual Mean	2.85 $\mu\text{g}/\text{m}^3$
Sulphur Dioxide (SO_2) Hourly – 99.7 th Percentile	5.7 $\mu\text{g}/\text{m}^3$
Sulphur Dioxide (SO_2) Daily – 99.2 th Percentile	5.7 $\mu\text{g}/\text{m}^3$
Carbon Monoxide (CO) 8-Hour – Annual Mean	0.22 mg/m^3
Particulate Matter (PM_{10}) Daily – Annual Mean	13.8 $\mu\text{g}/\text{m}^3$
Particulate Matter ($\text{PM}_{2.5}$) Daily – Annual Mean	8.4 $\mu\text{g}/\text{m}^3$

Table 4-2: Background Ammonia (NH_3) concentrations ($\mu\text{g}/\text{m}^3$) for period 2013 to 2014

Pollutant Parameter	Resultant Estimated Background Concentration
Ammonia (NH_3) Hourly mean	3.2 $\mu\text{g}/\text{m}^3$
Ammonia (NH_3) Hourly – Annual mean	1.6 $\mu\text{g}/\text{m}^3$

In relation to annual mean values the background concentrations were added directly to the maximum annual predicted concentrations for human health. This is also the case for the daily PM_{10} values and the 8 hour CO. In relation to combining the short term (relevant to hourly NO_2 , SO_2 and daily SO_2) peak contributions with background concentrations, guidance from the Appendix E of the 'EPA AG4 Guidance Note' advises that the background concentration should be twice the annual mean value added to the short term process contribution.

These background concentrations have been combined with the predicted ground level concentrations (GLCs) in order to determine the PECs, as summarised in the dispersion modelling results tables (Tables 4-3 and 4-4).

Table 4-3: Air Dispersion Modelling Results

Pollutant	Averaging Period	Predicted Max. Process Contribution (PC) ($\mu\text{g}/\text{m}^3$)	Predicted Max Occurred at Location (UTM Coords.)	Predicted Max Occurred in Year	Background Conc. ¹ ($\mu\text{g}/\text{m}^3$)	PEC: Background + Process Contribution ($\mu\text{g}/\text{m}^3$)	Air Quality Standards/ Limit Value ($\mu\text{g}/\text{m}^3$)	Predicted PC as Percentage of Limit	PEC as Percentage of Limit
Nitrogen Dioxide (NO₂)	99.8 th Percentile of 1 hr means	42.93	671863, 5951938	2021	24.1	67.03	200	21.47%	33.52%
	Annual Mean (Human Health Protection)	4.03	673663, 5952337	2017	12.05	16.1	40	10.07%	40.20%
	Annual Mean (Protection of Vegetation)						30	13.43%	53.59%
Sulphur Dioxide (SO₂)	99.7 th Percentile of 1 hr means	22.60	669763, 5951538	2021	5.69	28.30	350	6.46%	8.08%
	99.2 th Percentile of Daily Means	7.04	672263, 5951938	2021	5.69	12.74	125	5.63%	10.19%
	Annual Mean (Protection of Vegetation)	0.998	673163, 5952037	2017	2.85	3.84	20	4.99%	19.22%
Carbon Monoxide (CO)	8 hr Mean	234.91	671863, 5952337	2018	220	454.9	10,000	0.563%	4.55%

Pollutant	Averaging Period	Predicted Max. Process Contribution (PC) ($\mu\text{g}/\text{m}^3$)	Predicted Max Occurred at Location (UTM Coords.)	Predicted Max Occurred in Year	Background Conc. ¹ ($\mu\text{g}/\text{m}^3$)	PEC: Background + Process Contribution ($\mu\text{g}/\text{m}^3$)	Air Quality Standards/Limit Value ($\mu\text{g}/\text{m}^3$)	Predicted PC as Percentage of Limit	PEC as Percentage of Limit
Particulate Matter less than 10 μm (PM ₁₀)	90.4 th Percentile of Daily Means	0.63	671763, 5952238	2019	13.8	14.4	50	1.26%	28.86%
	Annual Mean	0.196	673263, 5950837	2017	13.8	14.0	40	0.49%	34.99%
Particulate Matter less than 2.5 μm (PM _{2.5})	Annual Mean	0.196	673263, 5950837	2017	8.4	8.6	20	0.98%	42.98%
Ammonia (NH ₃)	Hourly mean	13.63	672763, 5950337	2019	3.2	16.8	2,500	0.55%	0.67%
	Annual Mean	0.28	673663, 5952437	2017	1.6	1.9	180	0.16%	1.04%

NOTES

- From EPA Guidance document AG4:
 - the 99.8th percentile NO₂ PEC is equal to 99.8th percentile concentration plus twice the annual mean background NO₂;
 - the 99.7th percentile of 1-hr SO₂ PEC is equal to 99.7th percentile concentration plus twice the annual mean background SO₂;
 - the 99.2th percentile of daily SO₂ PEC is equal to 99.2th percentile concentration plus twice the annual mean background SO₂;
 - the 90.4th percentile PM₁₀ daily PEC is equal to 90.4th percentile concentration plus the annual mean background PM₁₀

Table 4-4 Air Dispersion Modelling Results – Maximum Annual NO₂ concentration for nearest SACs

Sensitive Receptor		UTM Coordinates (Zone 29N)		Year of Max Predicted Results	Max Annual NO ₂ Process Contributions (PC) conc. (µg/m ³)	Background Concentration (µg/m ³)	Max Annual NO ₂ PEC conc. (µg/m ³)	Air Quality Standards/ Limit Value (µg/m ³)	Predicted Result as Percentage of Limit
No	Description	Easting	Northing						
21	River Boyne and River Blackwater SAC	670026	5953246	2019	1.63	12.05	13.68	30	45.6%
22	Boyne Coast and Estuary SAC	676306	5955429	2017	1.28		13.33		44.4%
23	River Boyne and River BlackWater SPA	669622	5953187	2019	1.28		13.33		44.4%
24	Boyne Estuary SPA	676636	5955309	2017	1.35		13.40		44.7%
25	River Nanny and Shore SPA	680583	5950736	2017	0.90		12.95		43.2%

The results in Table 4-3 are those for the worst case modelling scenarios, as determined from the sensitivity assessment, the results of which are outlined in **Appendix D**.

The process contributions for each pollutant parameter indicated in Table 4-3 are the sum of contributions from both the proposed development and offsite emission stacks. The breakdown of these process contributions between on-site and off-site emissions is shown in Tables 4-5.

Table 4-5: Breakdown of Total Process Contribution between Proposed Development and Off-Site Emissions

Pollutant	Averaging Period	Predicted Max. Process Contribution (PC) ($\mu\text{g}/\text{m}^3$)	Proposed Development PC as % of Total PC	Off-Site PC as % of Total PC
Nitrogen Dioxide (NO₂)	99.8 th Percentile of 1 hr means	42.93	25%	75%
	Annual Mean (Human Health Protection)	4.03	15%	85%
	Annual Mean (Protection of Vegetation)			
Sulphur Dioxide (SO₂)	99.7 th Percentile of 1 hr means	22.60	6.3%	93.7%
	99.2 th Percentile of Daily Means	7.04	5.9%	94.1%
	Annual Mean (Protection of Vegetation)	0.998	6%	94%
Carbon Monoxide (CO)	8 hr Mean	234.91	24.0%	76.0%
Particulate Matter less than 10 μm (PM₁₀)	90.4 th Percentile of Daily Means	0.63	51%	49%
	Annual Mean	0.196	67%	33%
Particulate Matter less than 2.5 μm (PM_{2.5})	Annual Mean	0.196	67%	33%
Ammonia (NH₃)	Hourly Mean	13.63	99.97%	0.03%
	Annual Mean	0.28	44%	56%

4.2 Environmental Loading at Ecological Sites

4.2.1 Critical Level NO₂

Sensitive receptors surrounding the site were discussed in Section 2 of this report. As mentioned, the nearest SAC to the site is the River Boyne and River Blackwater SAC (site code 002299), at approximately 3.5 km northwest from the boundary of the site. A critical level for ambient annual NO₂ concentration is specified in the Air Quality Standards Regulations 2011 (S.I. No. 739 of 2022) as 30 µg/m³. The intent of this critical level for vegetation was to assess the impact at distances greater than 20 km from the source of NO₂ emissions. It is also appropriate to use this limit value in assessing any impacts on local rivers and small sites of ecological importance.

The predicted PC NO₂ value generated by the proposed development and neighboring facilities is at the nearest point of the River Boyne and River Blackwater SAC is 1.63 µg/m³. Using a background NO₂ concentration of 12.05 µg/m³ (refer to Section 4.1 of this report) the maximum annual average PEC at the River Boyne and River Blackwater SAC is equivalent to 45.6% of the AQS.

5 Discussion and Conclusions

As can be seen from Table 4-3, the cumulative maximum predicted ground level concentrations (GLCs) of NO₂, SO₂, CO, PM_{10/2.5} and NH₃ arising from the operation of the proposed development and neighbouring facilities are well below the relevant Air Quality Standards (AQSS) and Environmental Assessment Levels (EALs). Furthermore, the PECs are also below the relevant AQSS and EALs.

It is noted that the air dispersion modelling has conservatively considered the proposed development to be operational 24 hours a day, 7 days a week. As stated in this report, it is intended that the plant will operate for no more than 1,800 hours annually, therefore the air emissions generated by the operation of the facility will be less than stated in Table 4-3.

It is therefore concluded that atmospheric emissions from the proposed development will not have a significant impact on ambient air quality.

Appendix A

Dispersion Modelling Contour

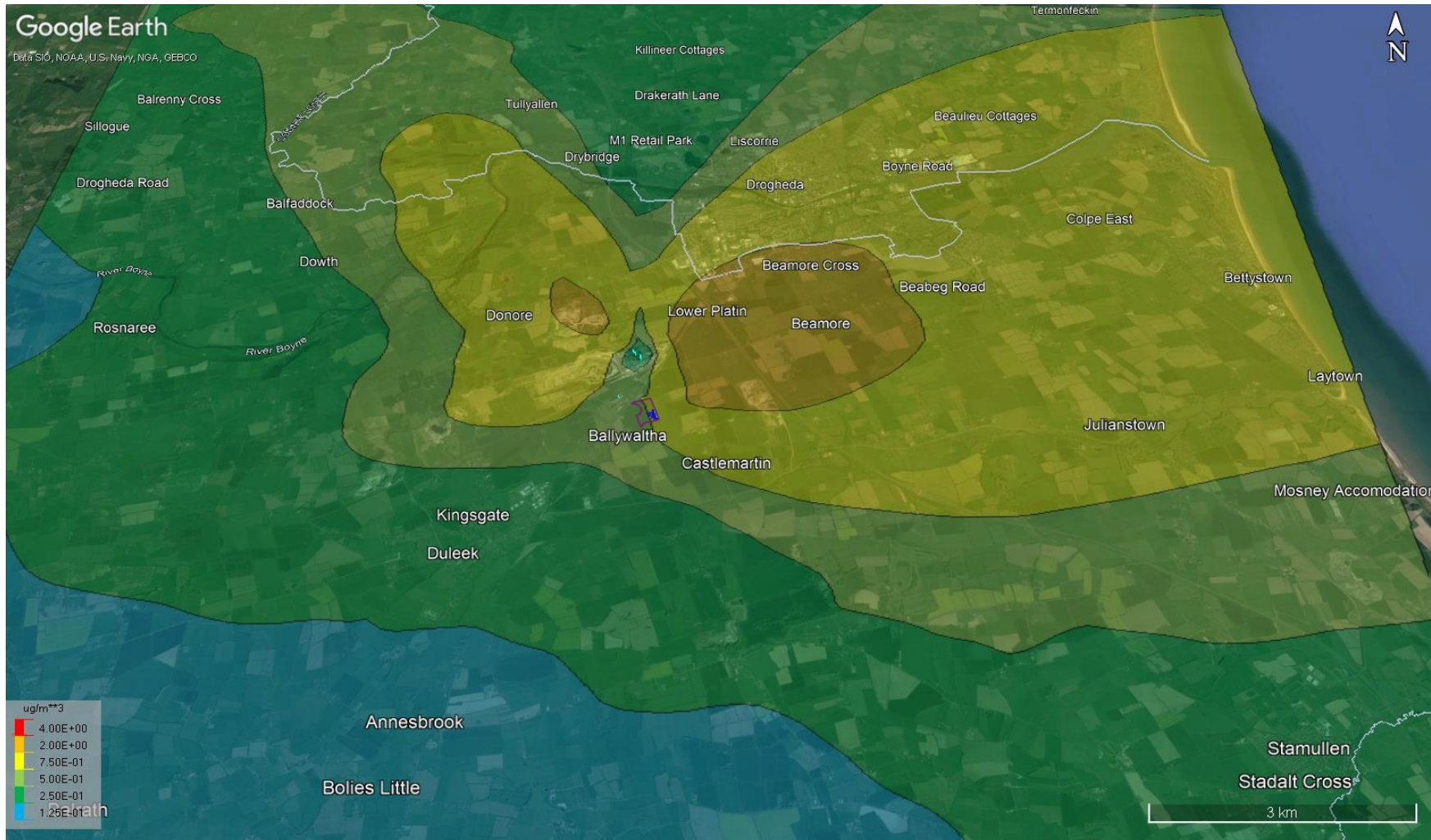


Figure 1: 99.8%ile of Hourly Mean Ground Level Concentrations for NO₂ at 100% Load (2021 Met Year) (Base Image from Google Earth)

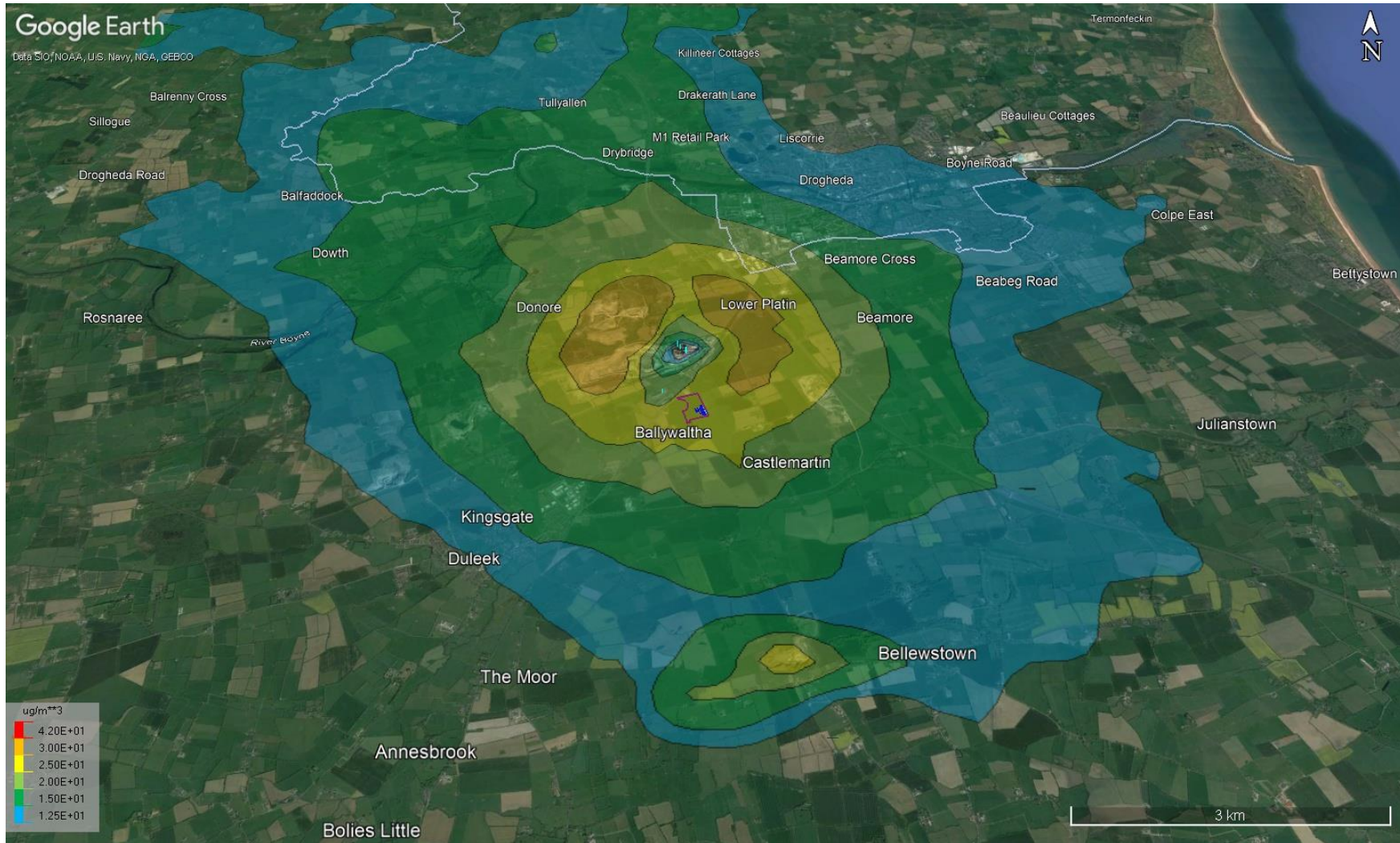


Figure 2: Annual Mean Ground Level Concentrations for NO₂ at 100% Load (2017 Met Year) (Base Image from Google Earth)

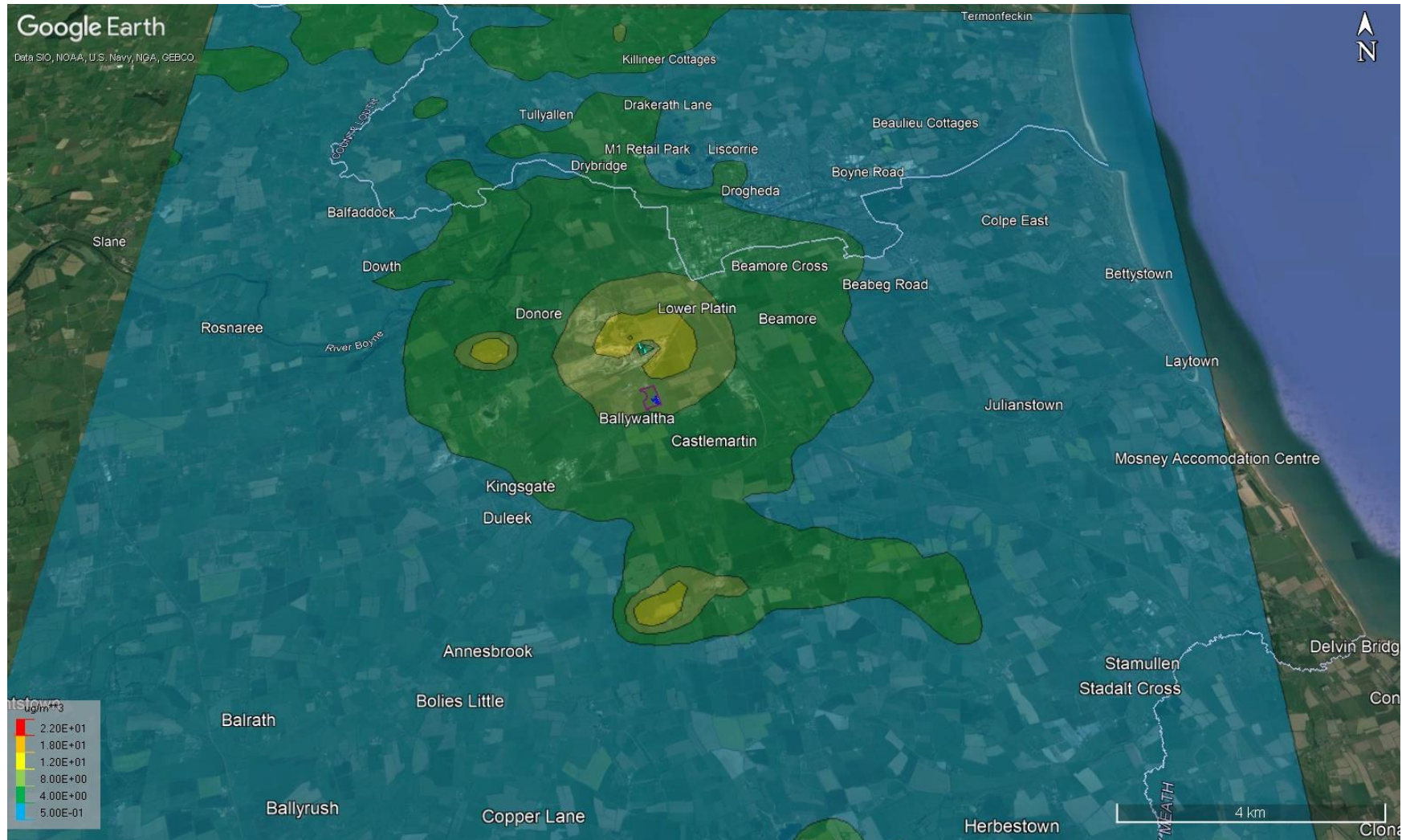


Figure 3: 99.7%ile of Hourly Mean Ground Level Concentrations for SO₂ at 35% Load (2021 Met Year) (Base Image from Google Earth)

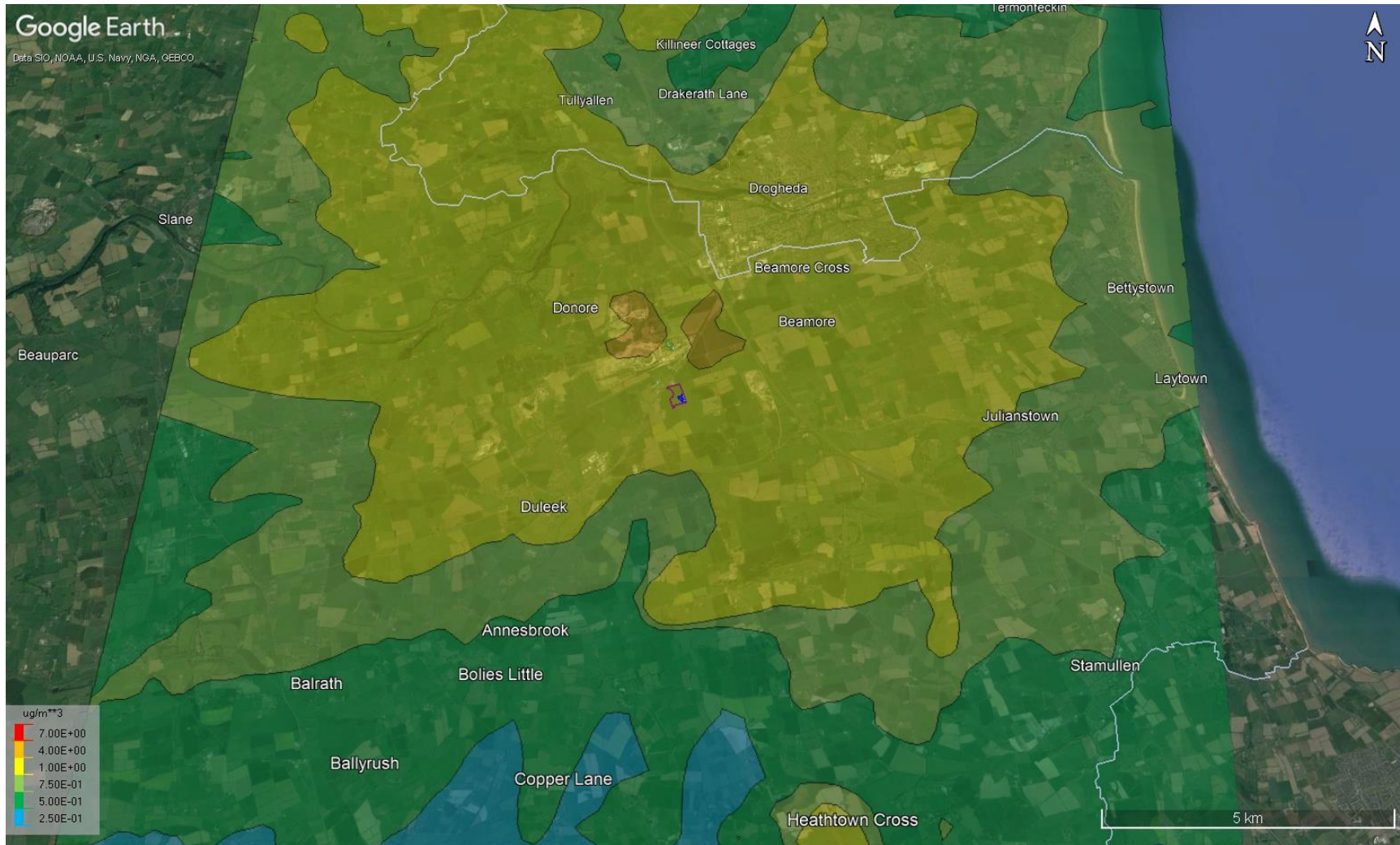


Figure 4: 99.2%ile of Daily Mean Ground Level Concentrations for SO₂ at 100% Load (2021 Met Year) (Base Image from Google Earth)

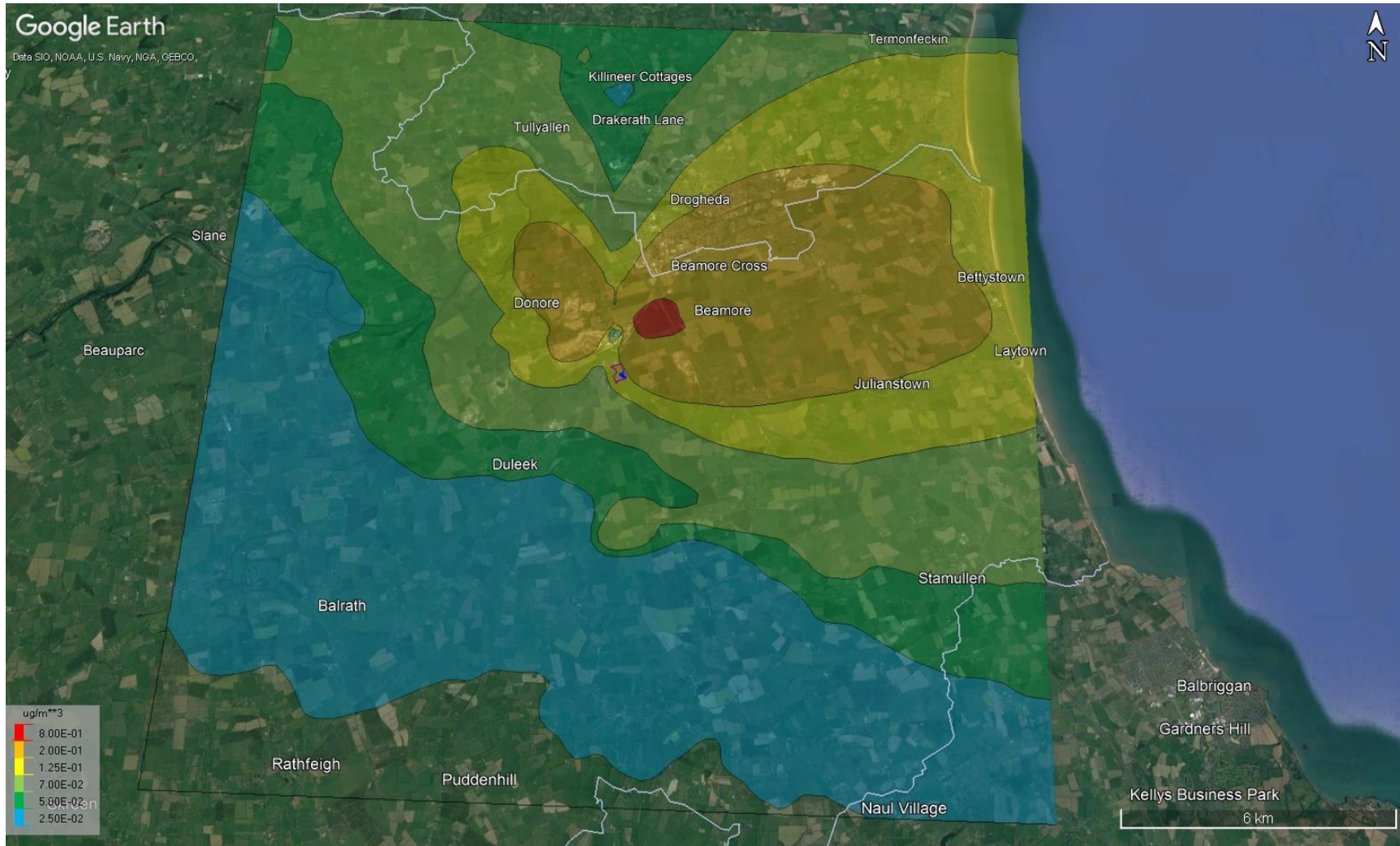


Figure 5: Annual Mean Ground Level Concentrations for SO₂ at 100% Load (2017 Met Year) (Base Image from Google Earth)

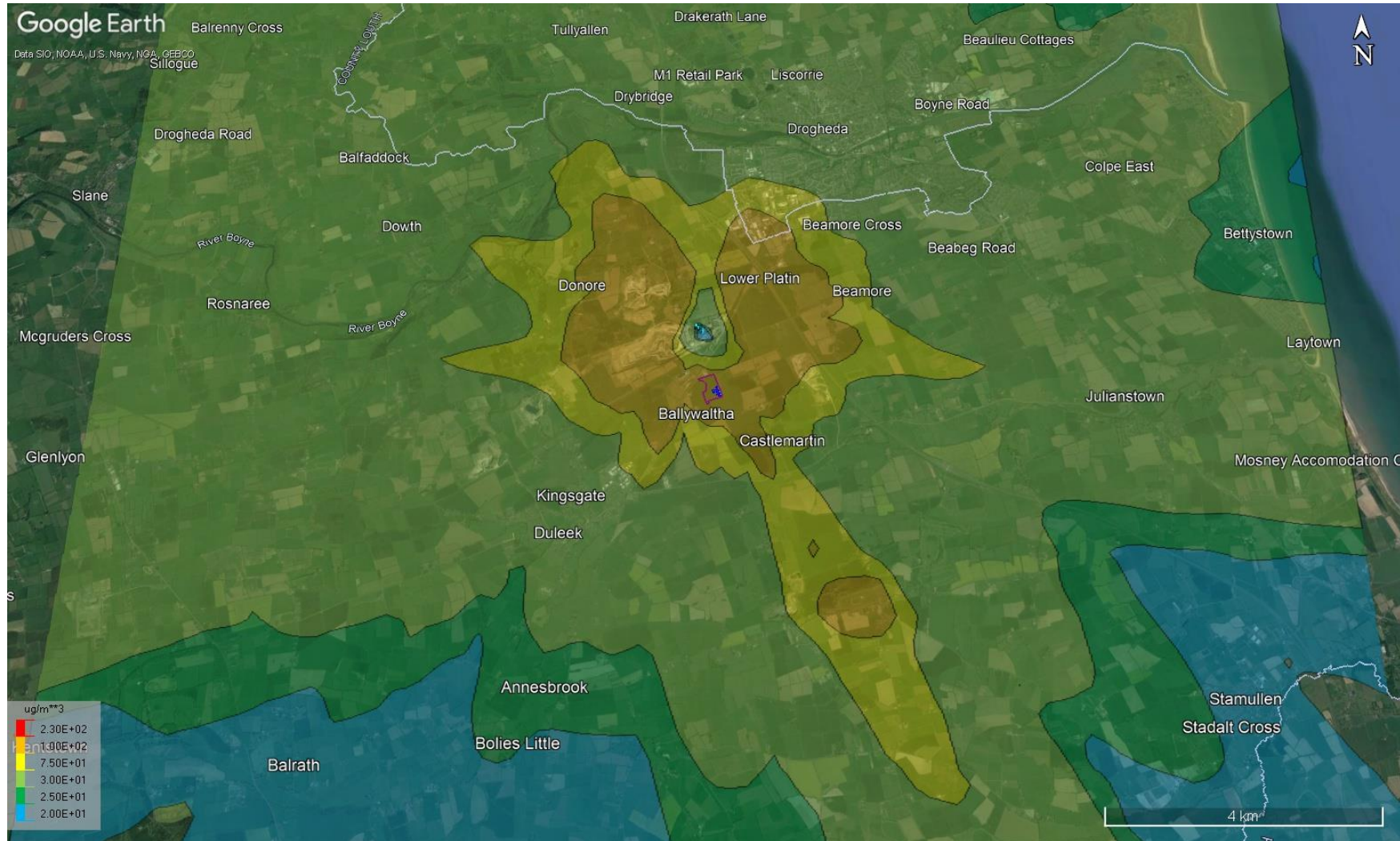


Figure 6: 8 hour Mean Ground Level Concentrations for CO at 100% Load (2018 Met Year) (Base Image from Google Earth)

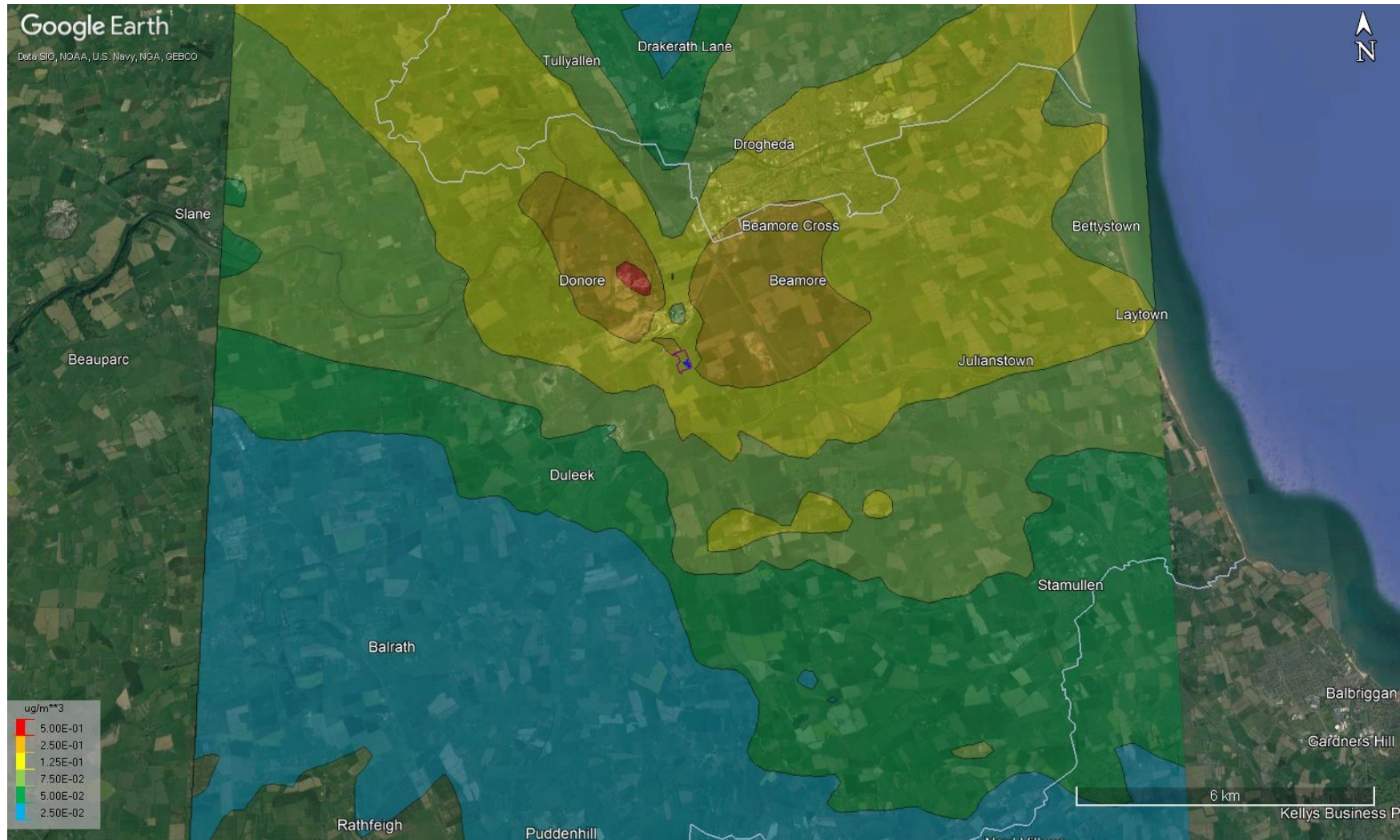


Figure 7: 90.4%ile of Daily Mean Ground Level Concentrations for PM₁₀ at 35% Load (2019 Met Year) (Base Image from Google Earth)

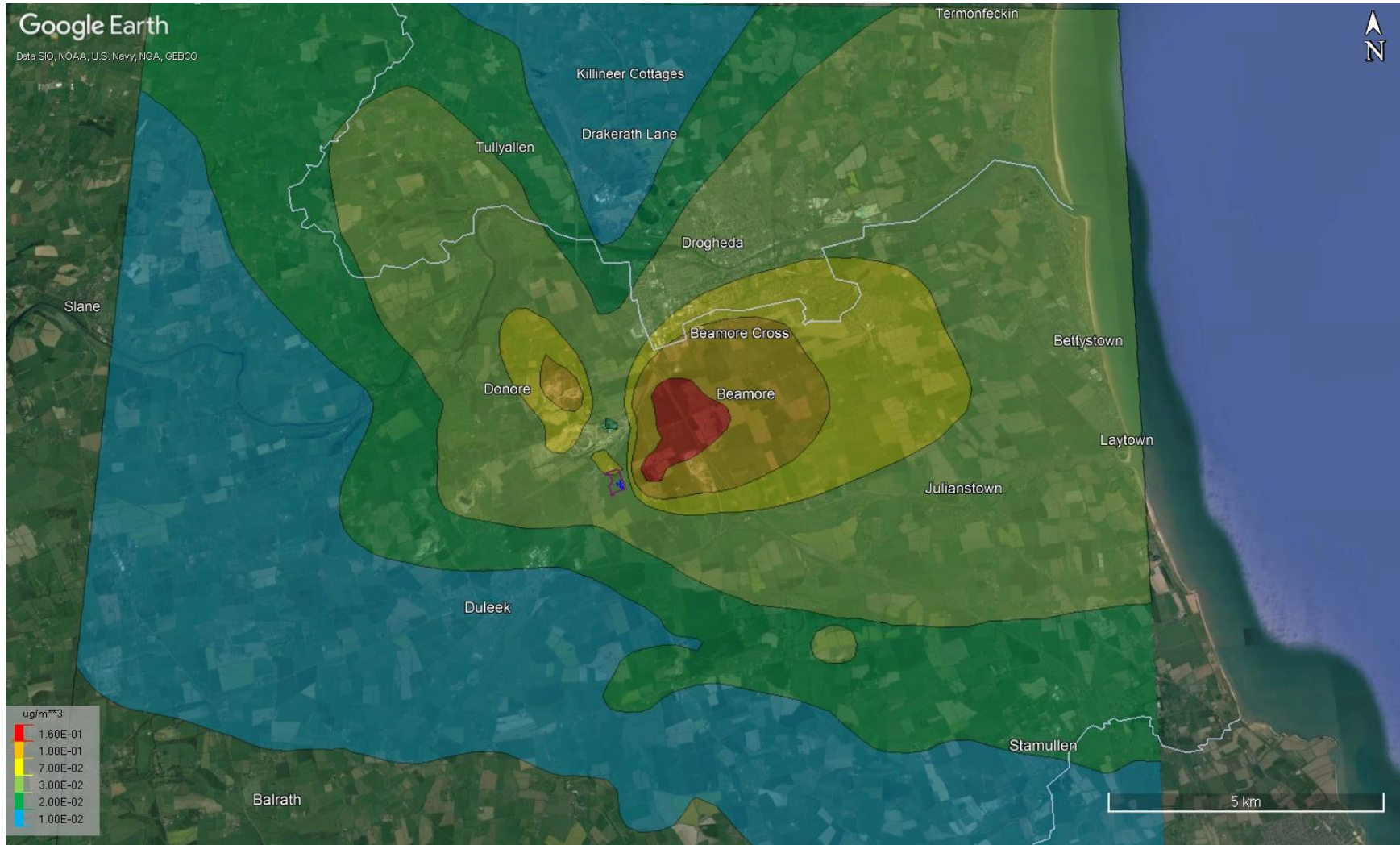


Figure 8: Annual Mean Ground Level Concentrations for PM₁₀/ PM_{2.5} at 35% Load (2017 Met Year) (Base Image from Google Earth)

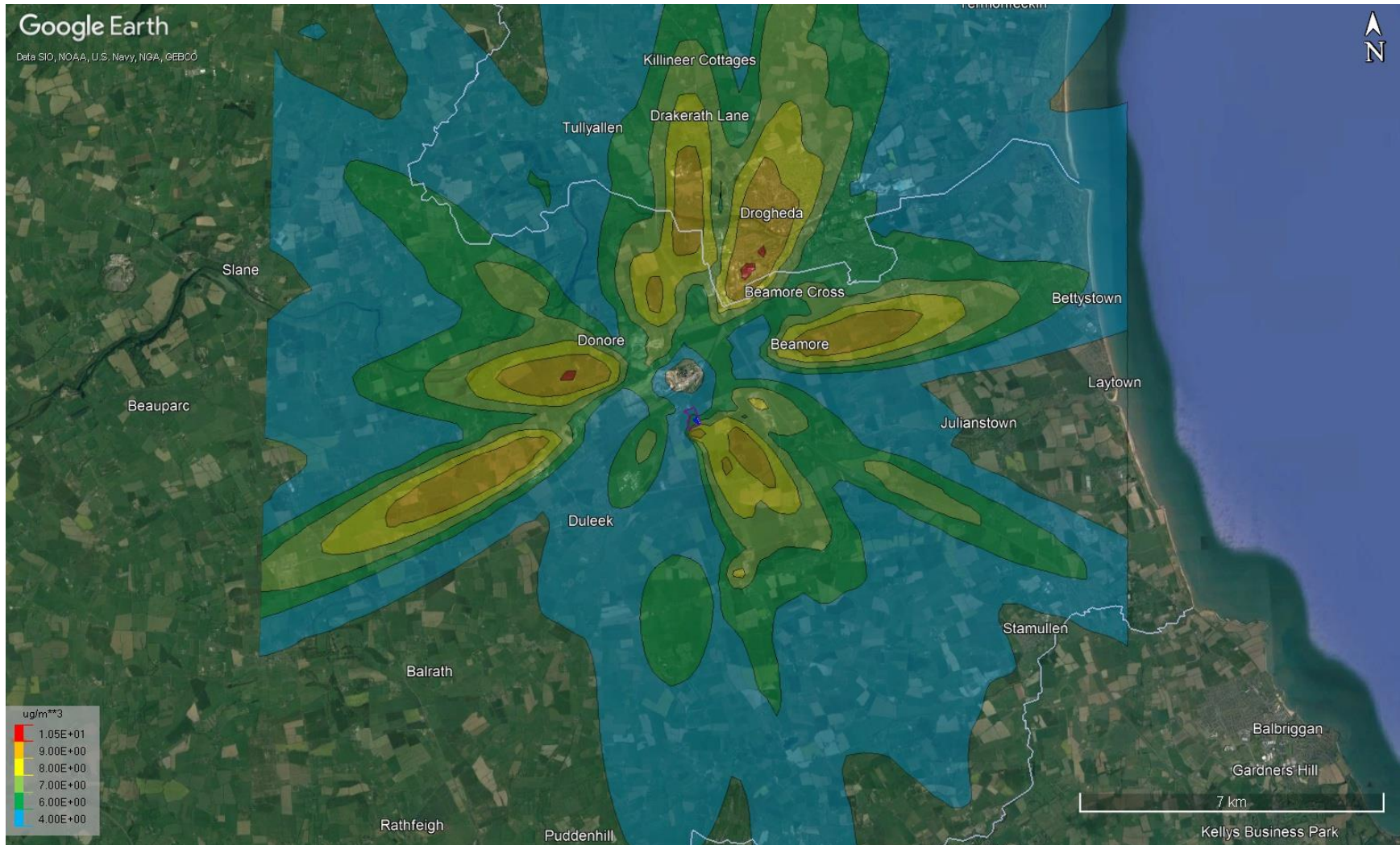


Figure 9: Hourly Mean Ground Level Concentrations for NH_3 at 35% Load (2019 Met Year) (Base Image from Google Earth)

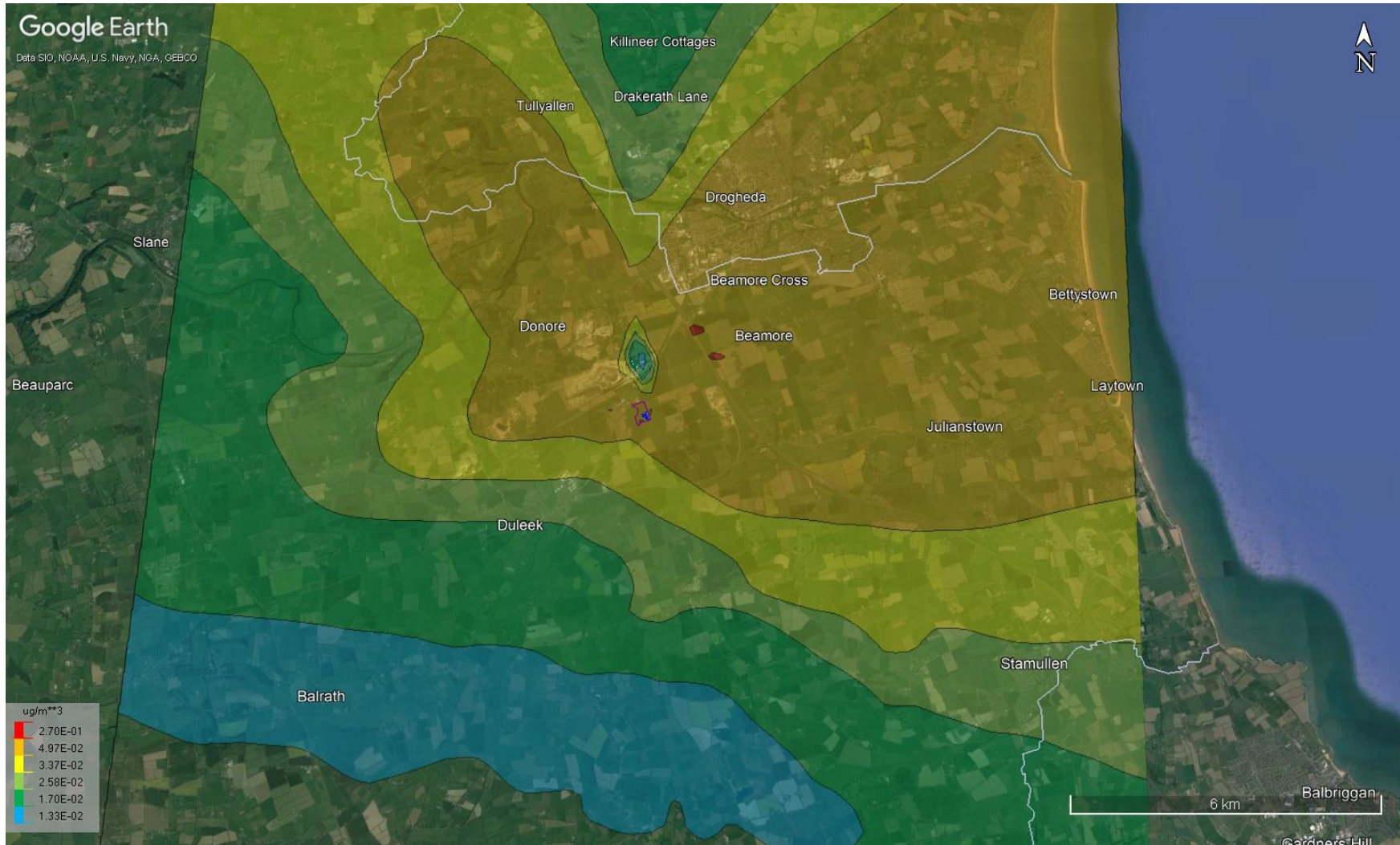


Figure 10: Annual Mean Ground Level Concentrations for NH₃ at 100% Load (2017 Met Year) (Base Image from Google Earth)

Appendix B

EPA Zone C - Ambient Air Quality Monitoring Results

The following tables outline ambient air quality monitoring results for EPA Zone C Monitoring stations (Other Cities and Large Towns). The results were obtained from the EPA Air Quality in Ireland Reports available at <http://www.epa.ie/pubs/reports/air/quality/>.

Table B.1 – EPA Air Quality Zone C Monitoring Stations: NO₂ Annual Mean concentrations (µg/m³) for period 2017-2021

Year	Meath Navan	Kilkenny Seville Lodge	Portlaoise	Dundalk	Total Average
2017	-	5.2	10.8	-	12.05
2018	-	6	11	14	
2019	23	5	11	12	
2020	19	4	11	10	
2021	21.90	4.20	7.90	10.73	
	21.3	4.9	10.3	10.4	

Table B.2 – EPA Air Quality Zone C Monitoring Stations: SO₂ Annual Mean concentrations (µg/m³) for period 2017-2021

Year	Ennis	Dundalk	Portlaoise	Total Average
2017	3.4		2.4	2.85
2018	3.2	3.8	3	
2019	3.6	1.5	1.3	
2020	4.4	2	1.6	
2021	5.90	2.30	1.90	
	4.1	2.4	2.0	

Table B.3 – EPA Air Quality Zone C Monitoring Stations: CO 8-hour Annual Mean concentrations (mg/m³) for period 2017-2021

Year	Dundalk	Portlaoise	Total Average
2017	-	0.15	0.220
2018	0.5	0.2	
2019	0.1	0.1	
2020	0.3	0.1	
2021	0.1	0.4	
	0.25	0.19	

Table B.4 – EPA Air Quality Zone C Monitoring Stations: PM₁₀ Annual Mean concentrations (µg/m³) for period 2017-2021

Year	Meath Navan	Ennis	Portlaoise	Dundalk	Drogheda	Total Average
2017	-	15.8	9.5	-	-	13.79
2018	-	16	11	15	-	
2019	-	18	15	14	-	
2020	14	20	12	13	-	
2021	13.5	19	19	11.7	10.7	
	13.75	17.76	13.43	13.75	10.7	

Table B.5 – EPA Air Quality Zone C Monitoring Stations: PM_{2.5} Annual Mean concentrations (µg/m³) for period 2017-2021

Year	Navan	Ennis	Bray	Drogheda	Total Average
2017	-	10.6	5.2	-	8.40
2018	-	10	6	-	
2019	11	7	14	-	
2020	8	14	5	-	
2021	8.2	14.7	5.6	6.1	
	9.07	11.26	7.16	6.10	

Appendix C

Cumulative Assessment Emissions Data

Indaver Ireland Ltd. Emission Stack

The information outlined in Table C.1 was obtained from either Indaver's IE License (Licence No. W0167-03) or licence application form data, available from the EPA's website (<http://www.epa.ie>).

Table C.1: Indaver Ireland Ltd. Emission Stack Data

Information	STACK A1-1
Emission point location (UTM Zone 29 Coordinates)	672276.8E, 5950829.4N
Minimum discharge height (m)	95.5
Height of stack above ground (m)	65
Diameter (m)	2
Normalised Volume to be emitted - max rate (Nm ³ /hr)	183,700
Sulphur dioxide conc. - daily avg (mg/Nm ³)	50
Oxides of Nitrogen conc. - daily avg (mg/Nm ³)	200
Carbon monoxide conc. - daily avg (mg/Nm ³)	100
Dust/Particulates conc. - daily avg (mg/Nm ³)	10
Emissions rate: NO _x (g/s)	10.21
Emissions rate: SO ₂ (g/s)	2.55
Emissions rate: CO (g/s)	5.10
Emissions rate: Particulates (g/s)	0.51
Temperature: Avg (°C)	140
Periods of emission:	Continuous
CALCULATED DATA:	
Max discharge velocity (m/s)	24.6

Irish Cement Ltd. Emission Stacks

The information outlined in Table C.2 was obtained from either Irish Cement's IE License (Licence No P0030-06) or licence application form data, available from the EPA's website.

Table C.2: Irish Cement Ltd. Stack's Emissions Data

Information	STACK A2-01	STACK A2-02	STACK A2-03	STACK A2-08
Emission point coordinates (UTM Zone 29N)	672454.6E, 5951622.8N	672424E, 5951669.4N	672533.8E, 5951606.9N	672537.7E, 5951545N
Minimum discharge height (m)	145.2	153.37	95.03	168.2
Height of stack above ground (m)	98.01	103.04	48.09	123
Diameter (m)	2.38	3.7	1	3.75
Normalised Volume to be emitted max rate (Nm ³ /hr)	49,000	650,000	31,000	650,000
Sulphur dioxide conc. - daily avg (mg/Nm ³)	50	390	390	50
Oxides of Nitrogen conc. - daily avg (mg/Nm ³)	500	500	500	500
Carbon monoxide conc. (daily avg) (mg/Nm ³)	1500	1500	1500	1500
Dust/Particulates - daily avg (mg/Nm ³)	20	20	20	20
Ammonia – daily average (mg/Nm ³)	N/A	50	N/A	50
Emissions rate: NO _x g/s	6.81	90.28	4.31	90.28
Emissions rate: SO _x g/s	0.68	9.03	3.36	9.03
Emissions rate: CO g/s	20.42	270.83	12.92	270.83
Emissions rate: Particulates g/s	0.27	3.61	0.17	3.61
Emissions rate: Ammonia g/s	N/A	9.03	N/A	9.03
Temperature - Avg (°C)	87	121	81	108
Periods of emission	Continuous	Continuous	Continuous	Continuous
CALCULATED DATA:				
Max discharge velocity (m/s)	4.03	24.235	14.22	22.815

Appendix D

Sensitivity Analysis Modelling Results

Operational Load Sensitivity Assessment Results

Nitrogen Dioxide Results – Process Contribution:

Pollutant	Parameter	Worst Case Year for Pollutant Parameter	100% Load	70% Load	35% Load
			Max conc. (µg/m3)	Max conc. (µg/m3)	Max conc. (µg/m3)
NO _x /NO ₂	Max 99.8th Percentile of 1-hr concentrations	2021	42.9327	42.9277	39.62975
NO _x /NO ₂	Max Annual concentration	2017	4.02846	4.0257	4.02087

Sulphur Dioxide Results –Process Contribution:

Pollutant	Parameter	Worst Case Year for Pollutant Parameter	100% Load	70% Load	35% Load
			Max conc. (µg/m3)	Max conc. (µg/m3)	Max conc. (µg/m3)
SO ₂	Max 99.7th Percentile of 1-hr concentrations	2021	22.60252	22.602530	22.602550
SO ₂	Max 99.2 Percentile Daily concentrations	2021	7.043589	7.04165	7.0393
SO ₂	Max Annual concentration	2017	0.997520	0.99730	0.99708

Carbon Monoxide Results – Process Contribution:

Pollutant	Parameter	Worst Case Year for Pollutant Parameter	100% Load	70% Load	35% Load
			Max conc. (µg/m3)	Max conc. (µg/m3)	Max conc. (µg/m3)
CO	Max 8-hour rolling average concentration	2018	234.909	234.63414	234.25014

Particulate Results – Process Contribution:

Pollutant	Parameter	Worst Case Year for Pollutant Parameter	100% Load	70% Load	35% Load
			Max conc. (µg/m3)	Max conc. (µg/m3)	Max conc. (µg/m3)
PM ₁₀	Max annual average concentration	2017	0.16997	0.16956	0.19599
PM ₁₀	Max 90.4 Percentile of Daily concentrations	2019	0.590094	0.589	0.62845
PM _{2.5}	Max annual average concentration	2017	0.16997	0.16956	0.19599

Ammonia Results – Process Contribution:

Pollutant	Parameter	Worst Case Year for Pollutant Parameter	100% Load	70% Load	35% Load
			Max conc. (µg/m3)	Max conc. (µg/m3)	Max conc. (µg/m3)
NH ₃	Max 1-hour average concentration	2019	12.8106	12.670	13.627
NH ₃	Max annual average concentration	2017	0.27963	0.27903	0.27821