AtkinsRéalis

Environmental Constraints Report

EirGrid PLC

October 2024

0087703DG0023

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CP1214 Fingal to East Meath Grid Reinforcement

AtkinsRéalis - Baseline / Référence

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1. Introduction

1.1 Who is EirGrid?

EirGrid PLC (hereafter referred to as EirGrid) is responsible for a safe, secure, and reliable supply of electricity in Ireland. EirGrid develops, manages, and operates the electricity transmission grid. This brings power from where it is generated to where it is needed throughout Ireland. EirGrid uses the grid to supply power to industry and businesses that use large amounts of electricity. The grid also powers the distribution network. This supplies the electricity used every day in homes, businesses, schools, hospitals, and farms.

1.2 What is Capital Project CP1214?

The Fingal to East Meath Grid Reinforcement (EirGrid Capital Project CP1214) is a proposed project to address the needs for additional capacity at transmission interface substations in the North Dublin and East Meath area. This project addresses the need for new infrastructure to accommodate the continued growth in electricity demand in the region, which is being driven by several sectors including residential housing, commercial and industrial development, the electrification of heat and transportation, and integration of renewable energy connections.

The existing transmission interface substations and the associated transmission circuits are at risk of reaching their capacity limits and as a result the existing infrastructure will not be capable to supply sufficient power to where it is needed. To address this need, new infrastructure is required to ensure a reliable, sustainable electricity supply to customers in the area.

A high-level project location is identified in Figure 1-1.

The development of this project follows EirGrid's 6-Step approach to Grid Development (refer to Figure 1-2) which sets out the steps to be taken to identify and implement the best performing solution that meets the needs outlined above.

The Fingal to East Meath Grid Reinforcement Project is currently in Step 3, with the objective of identifying a best performing technology solution and associated study area to meet the identified need from the shortlist of options identified previously by EirGrid in Step 1 and Step 2.

This grid reinforcement will create opportunities by providing capacity to supply electricity to areas where it is needed in the future which will enable businesses, schools, hospitals, homes, and farms to prosper and grow, and will also create opportunities for facilitating renewable generation.

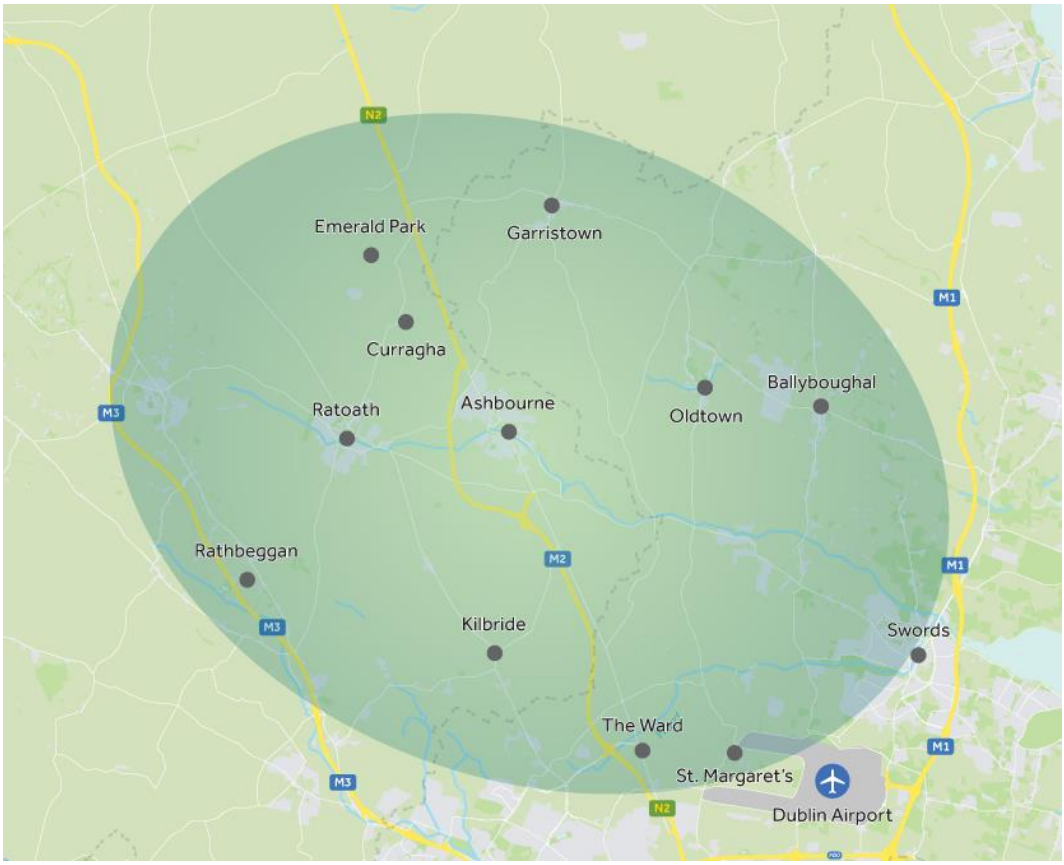

Figure 1-1 - Initial CP1214 Project Location Indicated in June Public Information Leaflet

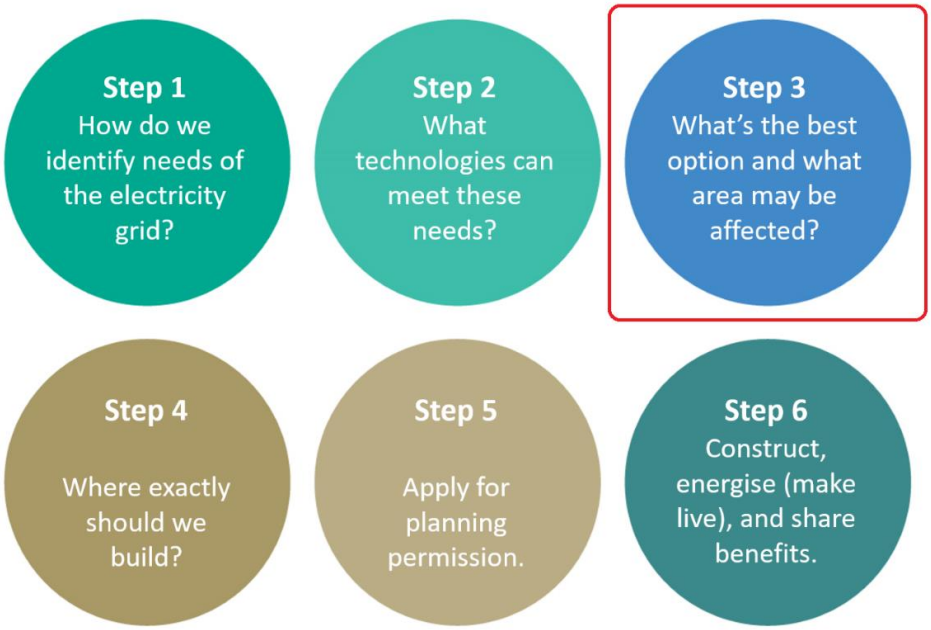

Figure 1-2 - EirGrid's 6-Step approach to Grid Development

2. Background to the Project

2.1 Need for Development

EirGrid, as the Transmission System Operator (TSO) of Ireland, and ESB Networks, as the Distribution System Operator (DSO) of Ireland, work collaboratively to ensure that the needs of transmission and distribution connected customers are met. This includes planning development of transmission interface substations.

As part of feedback received from the 'Shaping Our Electricity Future' consultation, the DSO has highlighted to EirGrid the emerging need for additional capacity at transmission interface substations in the North Dublin and East Meath area. This capacity is needed to accommodate forecast growth of electricity demand in the distribution network. This projected demand growth is driven by a number of factors including residential, electrification of heat and transport, and growth in commercial sectors.

The significant electricity demand growth in the distribution system also leads to a significant burden on the transmission system, particularly at existing transmission interface substations and the associated transmission circuits. The existing transmission interface substations and the associated transmission circuits are at risk of reaching their capacity limits and as a result the existing infrastructure will not be capable to supply sufficient power to where it is needed. To address this need, new infrastructure is required.

2.2 Project Benefits

Figure 2-1 shows the benefits associated with the CP1214 project.

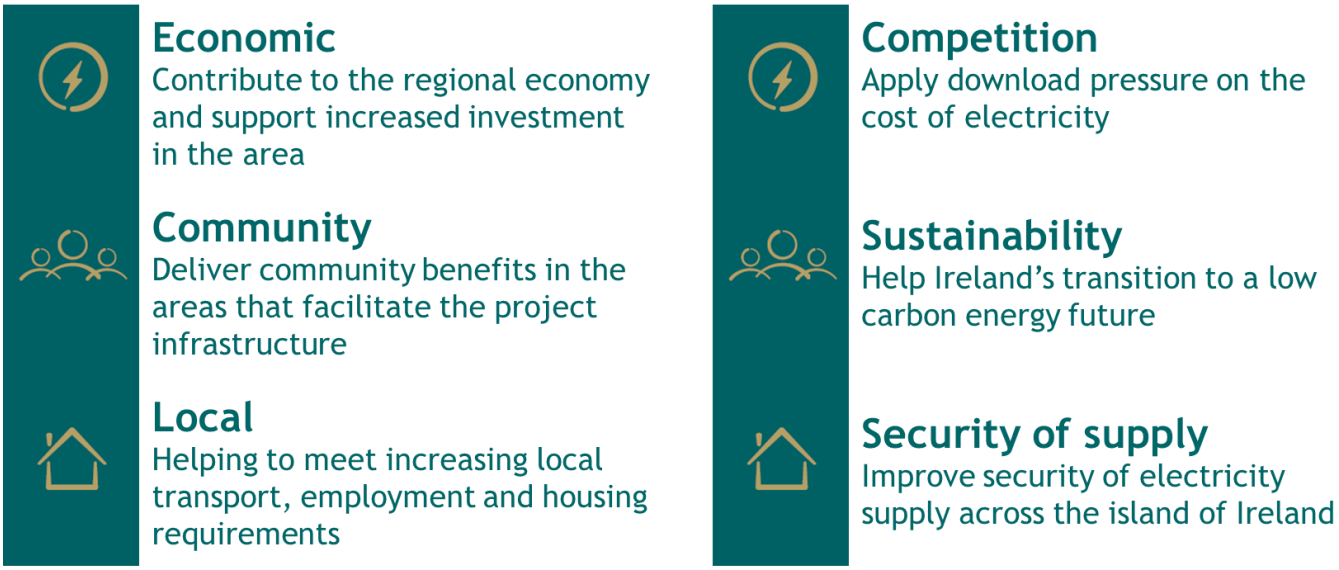

Figure 2-1 - CP1214 Project Benefits

2.3 New Infrastructure Identified in Step 2

The CP1214 infrastructure requirements that were identified by EirGrid during Step 2 and were brought forward into Step 3 are as follows:

- New Fingal 400/220/110 kV transmission interface substation, situated west of Swords, with new 400 kV loop-in circuits from the Fingal 400 kV substation to the proposed CP1021 East Meath-North Dublin 400 kV UGC;
- New East Meath 220/110 kV transmission substation, in the vicinity of Ratoath, with new 220 kV loop-in circuits from the East Meath 220 kV substation to the Louth-Woodland 220 kV OHL; and
- New 220 kV transmission circuit between the proposed East Meath 220 kV substation and the Fingal 400 kV substation (with the abbreviation EME-FGL).

It is noted that general substation names (i.e., East Meath and Fingal) are being used as placeholders in this report to help understanding and communication. When substation sites are confirmed, the substation names will be updated accordingly.

2.4 Development of East Meath 220 kV Substation

During the Step 3 process, a decision was taken by EirGrid for the East Meath 220 kV substation and the associated loop-in circuits to the existing Louth-Woodland 220 kV OHL to be developed by a private entity as a 'contestable build'. An indicative location for this substation is shown in Figure 2-2. The exact location is still to be determined by the private entity.

A contestable build is an element of connection works undertaken by a third-party entity. In this case a station and the associated loop-in to the existing OHL.

In consideration of the above decisions, the East Meath 220 kV substation and the associated loop-in circuits to the existing Louth-Woodland 220 kV OHL were excluded from further assessment in Step 3 of the CP1214 project. As one of the proposed CP1214 circuits will connect to the East Meath 220 kV substation, EirGrid and the project team will continue to liaise with the private entity in Step 4 and Step 5 to ensure that the objectives of CP1214 are met.

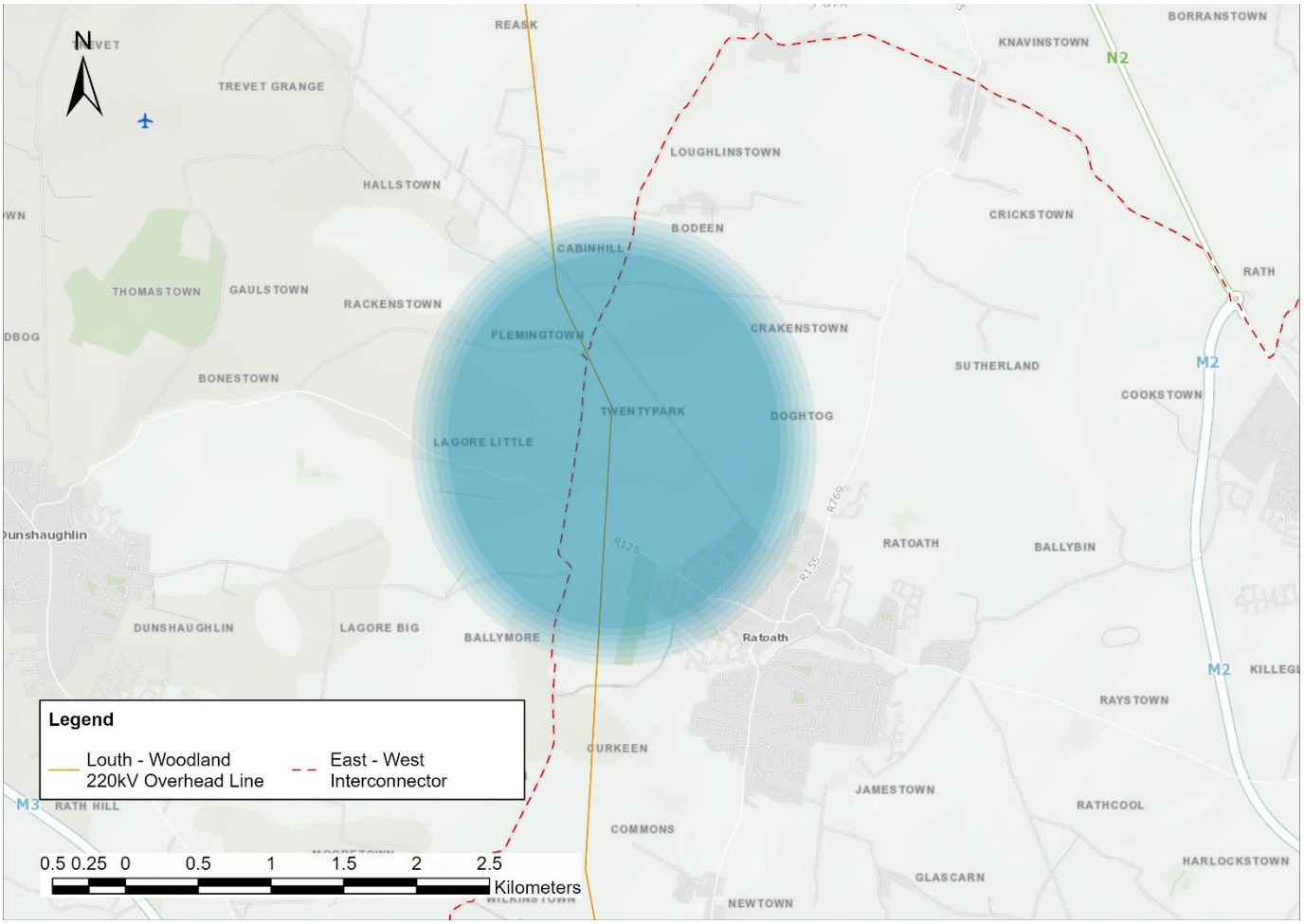

Figure 2-2 - Anticipated Area of Interest for the East Meath 220 kV Substation

2.5 Project Description

The CP1214 project is described as follows:

- New Fingal 400/220/110 kV transmission interface substation, situated west of Swords, with new 400 kV loop-in circuits from the Fingal 400 kV substation to the proposed CP1021 East Meath-North Dublin 400 kV UGC; and
- New 220 kV transmission circuit between the proposed East Meath 220 kV substation and the Fingal 400 kV substation (with the circuit abbreviation EME-FGL).

3. Report Purpose and Structure

3.1 Purpose of Environmental Constraints Report

This Environmental Constraints Report identifies, describes and maps environmental constraints that should be considered within the Study Area at later project development stages. This report assists with the identification and assessment of feasible technology solutions for proposed substations. Furthermore, at later project stages this constraints report will be used to identify substation site locations to meet project needs.

3.2 Report Structure

Chapter 5 details the constraints identified in the Study Area. Environmental topics described and mapped (where appropriate) were:

- Land Use (Section 5.1);
- Biodiversity (Section 5.2);
- Land, Soils and Geology (Section 5.3);
- Water (Section 5.4);
- Material Assets (Section 5.5);
- Air and Climate (Section 5.6);
- Noise and Vibration (Section 5.7);
- Landscape and Visual (Section 5.8); and
- Cultural Heritage (Section 5.9).

A review of Planning is given in Chapter 6.

4. Constraints Methodology

4.1 Study Area

The Study Area was defined such that it was appropriate to the scale of the proposed development thereby facilitating the subsequent identification of the nature and extent of constraints within the proposed Study Area. The Study Area is presented in Figure 4-1.

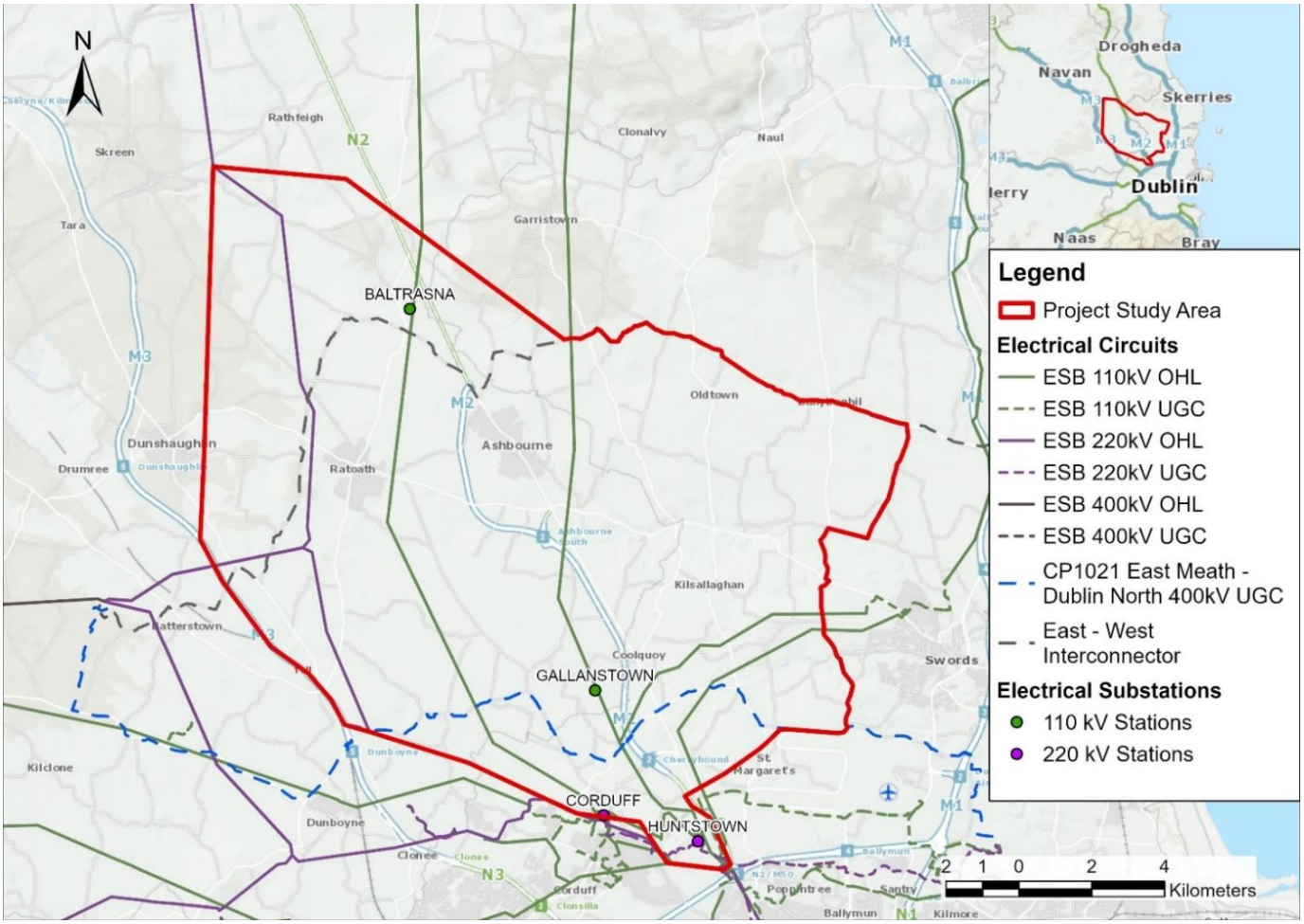

Figure 4-1 - CP1214 Step 3 Study Area

The identification of the Study Area was based primarily on a high-level assessment of the factors that present a significant constraint to the development of feasible solutions.

A desktop study, which was supplemented by site visits and windshield surveys, identified some key factors which influenced the identification of the Study Area from a technical development aspect:

- The existing route for Louth-Woodland 220 kV OHL circuit;
- The proposed route for CP1021 East Meath-North Dublin 400 kV UGC;
- The East-West Interconnector UGC circuit;
- The motorway network e.g., M1, M2, M3, M50;
- Dublin International Airport;
- Significant towns and settlements such as Dunboyne, Ratoath, Ashbourne, Blanchardstown and Mulhuddart;
- Consideration of OHL route options with the shortest and straightest possible routes; and
- Consideration of UGC route options including the use of public roads.

The proposed Study Area (see Figure 4-1) is situated within the boundaries of Meath County Council and Fingal County Council. The western boundary of the Study Area allows for possible new substation locations proximate to the existing Louth-Woodland 220 kV OHL. The areas south of the M3 namely, Dunboyne, Clonee and Mulhuddart

are not considered to be feasible for either OHL or UGC for a variety of reasons, namely the proliferation of existing utilities, residential and industrial buildings, and the significant disruption that would be brought to the area. It is considered that built-up industrial areas such as Ballycoolen and Cloghran are also significant constraints and therefore have been excluded from the Study Area. To the east, Dublin Airport and the Swords urban area pose a significant constraint to the identification of feasible circuit routes and have therefore been excluded.

Furthermore, to identify and map potential ecology constraints, a wider perspective is required. This is in line with EirGrid's 2020 "Ecology Guidelines for Electricity Transmission Projects" whereby EirGrid require that ecological constraints outside the Study Area (but within the potential zone of influence) should also be considered. New electricity transmission projects should consider, inter alia, the network of landscape features within the 'zone of influence' and the maintenance of connectivity within and between ecological sites. The ecology constraints assessment therefore extends beyond the Study Area boundary given in Figure 4-1. For Step 3, a 15 km radius was used to represent the Zone of Influence for ecology constraints (see Section 5.2). However, for highly mobile and/or migratory species (e.g., birds), a wider zone of influence should be considered in later stages of the project development process and a zone of influence of up to 50 km may be required once a better understanding of the ecology constraints is achieved. The assessment of the Technological Solutions will cover all likely significant constraints.

4.2 Desk-Based Review

To identify key environmental constraints (including those protected by European and National legislation), a desk-based review was conducted of all publicly available information. The methodology and sources for each environmental topic are listed under each individual section in Chapter 5.

This Constraints Study identifies any receptors that may be deemed to be particularly sensitive to the proposed development. The purpose is to identify any additional technical work that may be required based on the stated constraints, to identify any opportunities to minimise potential environmental effects, and/or to help achieve the key project objectives where relevant; these include Land Use, Biodiversity, Land, Soils and Geology, Water, Material Assets, Air and Climate, Noise and Vibration, Landscape and Visual, Cultural Heritage and Planning, as per the EirGrid (2021) Framework for Grid Development Multi-Criteria Analysis.

AtkinsRéalis have considered EirGrid's approaches to environmental protection set out in the Grid Implementation Plan (2017–2022)[1], the draft Grid Implementation Plan for 2023–2028, EirGrid's Transmission Development Plan (2021–2030), industry specific guidance on Cultural Heritage and Ecology, as well as EirGrid's published Evidence Based Environmental Studies:

- EirGrid (2015) Cultural Heritage Guidelines for Electricity Transmission Projects. A Standard Approach to Archaeological, Architectural and Cultural Heritage Impact Assessment of High Voltage Transmission Projects Cultural-Heritage-Guidance-for-Electricity-Transmission-Projects.pdf (eirgridgroup.com);
- EirGrid (2020) Ecology Guidelines for Electricity Transmission Projects: A Standard Approach to Ecological Impact Assessment of High Voltage Transmission Projects Ecology-Guidelines-for-Electricity-Transmission-Projects.pdf (eirgridgroup.com);
- EirGrid Transmission Development Plan 2023[2];
- EirGrid's (2022) Strategic Framework for Planning and Environmental Strategic-Framework-for-Planning-and-Environment.pdf (eirgridgroup.com).

[1] https://www.eirgridgroup.com/site-files/library/EirGrid/EirGrid-Grid-Implementation-Plan-2017-2022-Final.pdf

[2] Transmission Development Plan 2023 (eirgrid.ie)

- EirGrid's Evidence-Based Environmental Studies Environment and Biodiversity | In the Community | EirGrid; and,
- Fehily Timoney (2023) Grid Implementation Plan 2023–2028 for the electricity transmission system in Ireland.

4.3 Heat Mapping

A Heat Mapping exercise was done and was prepared in accordance with *Framework for Grid Development: Multi-Criteria Analysis* (EirGrid, 2021). The Heat Mapping exercise comprised 2no. steps; initial data preparation followed by a weighted overlay.

Initial data preparation involved using professional judgement to assign each environmental constraint a risk category (weighting) in accordance with EirGrid's colour code for options appraisal (See Figure 4-2; EirGrid, 2021). The relative performance per criterion is shown using a scaled colour-code comprising 5 scales. The relationship between the colour-code and performance is a function of the criterion being assessed and specifics of the project itself (EirGrid, 2021).

There are five risk ratings ranging from 'more significant/difficult risks to 'less significant / difficult risks. These risk ratings are categorised as:

- High: dark blue;
- Moderate-high: blue;
- Moderate: dark green;
- Low-moderate: green; and,
- Low: cream.

A buffer was also applied to each constraint depending on the nature of the constraint. These buffers generally reflect the potential level of risk/significance/sensitivity associated with each constraint and are presented alongside the risk for each constraint in Table 4-1. Separate Heat Maps were prepared to depict the environmental risks for Overhead Line (OHL), Underground Cable (UGC) and substations. These Heat Maps are presented in Appendix A.

Figure 4-2 - Risk category weighting (EirGrid, 2021)

Table 4-1 - Constraints used in Heat Mapping and Corresponding Assigned Risk for Overhead lines (OHL), Underground Cable (UGC) and Substations

Environmental Topic	Constraint / Designation Type	OHL Buffer (m)	OHL Risk	UGC Buffer (m)	UGC Risk	Substation Buffer (m)	Substation Risk
Biodiversity	Special Areas of Conservation (SAC)	200	Moderate	200	Moderate	200	Moderate
	Special Protection Areas (SPA)	200	Moderate	200	Moderate	200	Moderate
	Hydrological connectivity to SAC	100	Moderate-High	100	Moderate	100	Moderate-High
	Hydrological connectivity to SPA	100	Moderate-High	100	Moderate-High	100	Moderate
	Hydrological connectivity to Ramsar sites	100	Moderate	100	Moderate	100	Moderate
	Natural Heritage Areas (NHA)	200	Moderate	200	Moderate	200	Moderate
	Proposed Natural Heritage Areas (pNHA)	200	Moderate	200	Moderate	200	Moderate
	Annex I Habitats directly in the Study Area (Alkaline fens, Atlantic Salt Meadow)	200	Moderate	200	Moderate	200	Moderate
	Ancient or Long-Established Woodland	100	Moderate	100	Moderate	200	Moderate
	Ecological corridors	100	Moderate	100	Moderate	100	Moderate
	Nature Development Areas (Fingal County Council)	100	Moderate	100	Moderate	100	Moderate
	Wet Grassland (National Land Cover Data)	50	Moderate	50	Moderate	50	Moderate
	Amenity grassland (National Land Cover Data)	50	Moderate	50	Moderate	50	Moderate
	Hedgerows (National Land Cover Data)	50	Moderate	50	Moderate	50	Moderate
	Fens (National Land Cover Data)	50	Moderate	50	Moderate	50	Moderate
	Forest (Broadleaf Forest + Transitional Forest; National Land Cover Data)	100	Moderate	100	Moderate	100	Moderate
	Wetlands	50	High	50	High	50	High
Cultural Heritage	National Inventory of Architectural Heritage	50	Moderate	50	Moderate	50	Moderate
	Sites and Monuments Record (SMR) (Zone of Notification)	50	Moderate-High	50	Moderate-High	50	Moderate-High

Environmental Topic	Constraint / Designation Type	OHL Buffer (m)	OHL Risk	UGC Buffer (m)	UGC Risk	Substation Buffer (m)	Substation Risk
	Architectural Conservation Areas	50	Moderate-High	50	Moderate-High	50	Moderate-High
	County Record of Protected Structures	50	Moderate-High	50	Moderate-High	50	Moderate-High
Land Use	County Development Plan - Land Use Zoning for Town Centres	500	High	200	Moderate	500	High
	County Development Plan - Land Use Zoning for Green Belt (FCC)	1	Moderate	1	Moderate	1	Moderate
	Dublin Airport Inner Public Safety Zones	1	High	1	High	1	High
	Dublin Airport Outer Public Safety Zones	1	Low-Moderate	1	Low	1	Low-Moderate
	Dublin Airport Obstacle Free Zone ('All Developments' and 'All Buildings, structures, erections and works exceeding 10 metres in height')	1	High	1	High	1	Low
	Dublin Airport Obstacle Free Zone ('All Buildings, structures, erections and works exceeding 15 metres in height')	1	Moderate	1	Moderate	1	Low
	Dublin Airport Obstacle Free Zone ('All Buildings, structures, erections and works exceeding 45 metres in height')	1	Low	1	Low-Moderate	1	Low
	Control of Major Accident Hazards (COMAH)/Seveso Sites	50	Moderate	50	Moderate	50	Moderate
Surface Water	Surface Water Features (OSI + EPA)	100	Moderate	100	Moderate	100	Moderate
	Flood Zone A	50	High	50	High	50	High
	Flood Zone B	50	Moderate	50	Moderate	50	Moderate
Groundwater	Public Supply Source Protection Area (Inner & Outer)	50	Moderate	100	Moderate-High	100	Moderate-High
	Group Scheme Preliminary Source Protection Areas	50	Moderate	100	Moderate-High	100	Moderate-High
	Gravel Aquifers	100	Moderate-High	100	Moderate-High	100	Moderate-High
Soils & Geology	Peat (subsoils)	100	Moderate-High	100	Moderate-High	100	Moderate-High
	Exposed bedrock	100	Moderate-High	100	Moderate-High	100	Moderate-High

Environmental Topic	Constraint / Designation Type	OHL Buffer (m)	OHL Risk	UGC Buffer (m)	UGC Risk	Substation Buffer (m)	Substation Risk
	Mineral Localities	200	Moderate-High	200	Moderate-High	200	Moderate-High
	Quarries	50	Moderate-High	50	Moderate-High	50	Moderate-High
	Karst Features	100	Moderate-High	100	Moderate-High	100	Moderate-High
	Geological Heritage Sites (audited sites and unaudited sites)	100	Moderate-High	100	Moderate-High	100	Moderate-High
	Landslide Susceptibility (High and High [inferred])	100	High	50	High	100	High
Material Assets	Existing overhead lines (400 kV)	50	High	10	Moderate	50	High
	Existing overhead lines (220 kV)	50	High	10	Moderate	50	High
	Existing overhead lines (110 kV)	50	Low-Moderate	10	Low-Moderate	50	Moderate-High
	Existing overhead lines (38 kV)	50	Low-Moderate	10	Low-Moderate	50	Low-Moderate
	Existing underground (400 kV)	10	Moderate-High	10	High	10	High
	Existing underground (220 kV)	10	Moderate	10	Moderate-High	10	Moderate-High
	Existing underground (110 kV)	10	Moderate	10	Moderate-High	10	Moderate-High
	Existing underground (38 kV)	10	Low-Moderate	10	Moderate	10	Moderate
	Underground Cables (HVDC) - (EWIC Only)	10	Moderate-High	10	High	10	High
	Underground Cables (400 kV) - (CP1021 Only)	10	Moderate-High	10	High	10	High
	Gas networks (High Pressure)	10	High	10	High	50	High
	Gas networks (Medium Pressure)	10	Moderate-High	10	Moderate-High	50	Moderate-High
	Gas networks (Low Pressure)	10	Moderate	10	Moderate	50	Moderate
	Water distribution network	10	Moderate	10	Moderate	50	Moderate
	Sewer and stormwater network	10	Moderate	10	Moderate	50	Moderate

Environmental Topic	Constraint / Designation Type	OHL Buffer (m)	OHL Risk	UGC Buffer (m)	UGC Risk	Substation Buffer (m)	Substation Risk
Socio-Economic	Residential Properties	50	High	50	High	50	High
Material Assets	Airport	100	High	30	High	100	High
	Reservoir	50	Moderate-High	50	Moderate-High	50	Moderate-High
	Water Treatment Plant	1	Low-Moderate	1	Low-Moderate	1	Low-Moderate
	Wastewater Treatment Plant	1	Low-Moderate	1	Low-Moderate	1	Low-Moderate
	Electricity Substations (400, 220,110 kV, 38kV, LV)	1	High	1	High	1	High
	Major Tourism Sites	500	High	1	High	500	High
	Local Roads	1	Low	1	Low	1	Low
	Regional Roads	1	Low	1	Low	1	Low
	National Roads	1	Moderate-High	1	High	20	High
	Motorways	1	Moderate-High	1	High	20	High
Environmental Protection Agency Sites	Licenced facilities IE	10	Low	10	Low	10	Low
	Licenced facilities IPC	10	Low	10	Low	1	Low
	Licenced facilities Waste	10	Low	10	Low	1	Low
	Historic known landfills (EPA Certificates of Authorisation)	10	Low-Moderate	10	Low-Moderate	10	Low-Moderate

4.4 Limitations of Constraints Assessment

The environmental constraints report was prepared based on a review of current available desk-based information relevant to the Study Area. All desk-based sources are considered reliable. Nevertheless, the authenticity and reliability of information gathered from desk-based sources cannot be guaranteed. Also, it should be noted in relation to incorporating environmental constraints into the Heat Maps, data provided within this report and incorporated into the Heat Maps is from publicly available desk-based sources, which are considered reliable. Therefore, the information in this report and within the Heat Maps represents what was available from public sources at the time of preparing this report (July 2024). Due to the size of the Study Area; certain constraints could not be assessed, such as (but not limited to) contaminated land. These and/or other relevant constraints will be assessed when sub-study areas have been identified in later project development stages. Furthermore, this study is based on the study area setting and land use at the time of writing.

It was particularly difficult to explicitly incorporate several sources of relevant ecological data into the Heat Mapping exercise and there are multitude reasons for this. For example, spatial data for Annex I Habitats can be represented as polylines for linear habitats such as vegetated sea cliffs [1230] or orchid rich calcareous grasslands [6210] found along railway lines. However, equally, spatial data for these habitats can also be represented at a 10 km^2 or 50 km^2 spatial scale as both distribution and range data, as well as specific point data (i.e., a very specific known location). The various types and scales of spatial data available for any given Annex I Habitat are a function of the habitat type itself (e.g., some habitats are linear in their nature) but also reflect survey effort and knowledge of the extent and location of Annex I Habitats (i.e., "known" distribution or "best estimated" distribution) and the various data requirements for Article 17 reporting purposes. Furthermore, the NPWS collate data on Annex I Habitats from multitude surveys and data sets including scientific monitoring programs, scientific publications, local authority biodiversity data sets, the Environmental Protection Agency and Department of Agriculture, Food and the Marine meaning spatial data on Annex I Habitats is collected and stored in multitude ways (NPWS, 2019b).

From an ecological perspective, all types of spatial information are needed, and useful, to make an assessment on potential constraints associated with Annex I Habitat. It is possible therefore that within a given Study Area, any given Annex I Habitat (of which there are 61no. in Ireland) could have various types of spatial data at various spatial scales associated with it. While it is more straightforward to incorporate the boundaries of Special Areas of Conservation (SAC) into Heat Mapping exercise (which thereby implicitly accounts for Annex I Habitats found within a SAC) it is especially problematic for Annex I Habitats that are found outside of SAC (i.e., undesignated sites) and potentially within the Study Area. Its therefore generally challenging to explicitly incorporate spatial data on Annex I Habitats specifically into Heat Mapping exercises. For the purpose of the existing Heat Map in this constraints report, AtkinsRéalis initially inspected maps of all Annex I Habitats within the Study Area and examined all types of associated spatial data. In this instance, Alkaline Fen (7230) and Atlantic Salt Meadow (1330) were identified within the Study Area and the data associated with both habitat types was a detailed distribution polygon. It was therefore possible to explicitly include spatial data on these Annex I Habitats into the Heat Maps. However, distribution and range data at a 10 km^2 spatial scale was also available for Atlantic Salt Meadow habitat. This data was not explicitly incorporated into the Heat Maps because it could have an undue impact on the Heat Map results given the Study Area is approximately 24 km long and 20 km wide. The distribution of Atlantic Salt Meadow Annex I Habitat (amongst others) will need to be considered in later stages of the project development process and cannot be resolved at Step 3 (see Biodiversity 5.2).

As another example, it is not considered appropriate and/or useful at Step 3 to explicitly map observed bird species records/distributions/range within the Study Area and to explicitly incorporate this spatial data into the Heat Map. For example, species distribution and/or range data is often reported at a 10 km^2 resolution. In this constraints report, AtkinsRéalis have identified that within a 15 km Zone of Influence of the Study Area there are 44no. bird species that are qualifying interests for the 13no. Special Protected Areas considered in this report. Furthermore, AtkinsRéalis also identified there are 17no. bird species listed on Annex I of the EU Birds Directive that are recorded within the Study Area and there are 50no. bird species found within the Study Area that are not listed as Annex I species of the

EU Birds Directive but have various conservation ratings including 22no. red listed waterbird and passerine species. If spatial data for all and/or a subset of these species at a 10 km^2 spatial resolution was incorporated into the Heat Maps, it would create an unduly cumbersome Heat Map that would not be particularly useful for progressing to Stage 4. These are just two examples of limitations with using ecology data in Heat Maps. Caution is therefore required when interpreting the ecological components of the Heat Maps at Step 3.

The EirGrid (2021) 'Framework for Grid Development Multi-Criteria Analysis' were assessed for this report. However, given the current Study Area spans two administrative areas (Fingal and Meath), additional information may need to be assessed at later project development stages with respect to requirements in relevant local authorities' development plans. Furthermore, given the different requirements and data availability in Fingal and Meath respective development plans, it is challenging to incorporate consistent information into the Heat Maps for both local authorities. AtkinsRéalis have included a subset of spatial data in the Heat Maps from the relevant development plans and there was a general tendency for more detailed spatial data for Fingal. It should be noted that a subset of the spatial data from the relevant development plans are not fully examined within this report (beyond scope at this stage) and this is stated in the relevant sections.

There is a limitation with not carrying out early engagement with consultees and stakeholders, especially with the local authorities in relation to obtaining information on future developments within the study area.

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5. Environmental Constraints Assessment

5.1 Land Use

5.1.1 National Land Cover Data

The following land cover types (NLC, 2018) were identified in the Study Area:

- Wet grassland, Dry grassland, Improved Grasslands, Cultivated land, Amenity Grassland
- Treelines, Hedgerows, Transitional Forest, Scrub, Mixed Forest, Coniferous Forest, Broadleaf Forest and Woodland
- Rivers and Streams, Lakes and Ponds, Artificial Waterbodies
- Ways, Other Artificial Surfaces, Buildings
- Fens
- Exposed Rocks and Sediments, Bare soil and disturbed ground

The NLC (2018) dataset was also used to inspect the distribution of ecologically sensitive habitats such as peatlands and wet grasslands (see Section 5.2).

5.1.2 Land Use Zoning

The Fingal Development Plan (2023–2029)[3] identifies several land-use zoning objectives for the Study Area:

- RU – Rural: Protect and promote in a balanced way, the development of agriculture and rural related enterprise, biodiversity, the rural landscape, and the built and cultural heritage;
- RV – Rural Village: Protect and promote the character of the Rural Village and promote a vibrant community in accordance with an approved land use plan, and the availability of physical and community infrastructure;
- RB – Rural Business: Provide for and facilitate rural-related business which has a demonstrated need for a rural location;
- GB – Green Belt: Protect and provide for a Greenbelt;
- FP – Food Park: Provide for and facilitate the development of a Food Industry Park;
- GE – General Employment: Provide opportunities for general enterprise and employment;
- HT – High Technology: Provide for office, research and development and high technology/high technology manufacturing type employment in a high quality built and landscaped environment;
- HI – Heavy Industry: Provide for heavy industry;
- OS – Open Space: Preserve and provide for open space and recreational amenities;
- NSC – National Sports Campus: Provide for and facilitate the development of a National Sports Campus;
- RA – Residential Area: Provide for new residential communities subject to the provision of the necessary social and physical infrastructure;
- RS – Residential: Provide for residential development and protect and improve residential amenity;

[3] Fingal Development Plan 2023–2029 Interim Publication.pdf

- CI – Community Infrastructure: Provide for and protect civic, religious, community, education, health care and social infrastructure; and,
- HA – High Amenity: Protect and enhance high amenity areas.

Meath County Development Plan (2021–2027)[4] identifies 4no. towns within County Meath which are allocated land-use zoning objectives; Kilbride, Ashbourne, Ratoath and the eastern portion of Dunboyne (located in the Study Area; Table 5-1).

Table 5-1 - Land-use zoning for Kilbride, Ashbourne, Ratoath and Dunboyne (County Meath)

Kilbride	Ashbourne	Ratoath	Dunboyne
▪ E2/E3 - General Enterprise and Employment/ Warehousing and Distribution; ▪ A1 - Existing Residential ▪ E2 - General Enterprise and Employment; ▪ G1 - Community Infrastructure; ▪ A2 - New Residential; ▪ B1 - Commercial Town or Village Centre; ▪ F1 - Open Space; and, ▪ C1 - Mixed Use.	▪ D1 - Tourism; ▪ E1 - Strategic Employment Zones (High Technology Uses); ▪ WL - White Lands; ▪ A1 - Existing Residential; ▪ C1 - Mixed Use; ▪ E2 - General Enterprise and Employment; ▪ A2 - New Residential; ▪ G1 - Community Infrastructure; ▪ B1 - Commercial Town or Village Centre; and, ▪ F1 - Open Space.	▪ D1 - Tourism; ▪ WL - White Lands; ▪ A1 - Existing Residential; ▪ C1 - Mixed Use; ▪ E2 - General Enterprise and Employment; ▪ A2 - New Residential; ▪ G1 - Community Infrastructure; ▪ B1 - Commercial Town or Village Centre; and, ▪ F1 - Open Space.	▪ E2/E3 - General Enterprise and Employment/ Warehousing and Distribution; ▪ A1 - Existing Residential; ▪ E2 - General Enterprise and Employment; ▪ F1 - Open Space; and, ▪ C1 - Mixed Use.

5.1.3 Major tourist areas

Known major tourist areas within the study area are:

- Emerald Park;
- Fairyhouse Racecourse;
- St. Margaret's Golf & Country Club;
- Corrstown Golf Club Black Bush Golf Club;
- Roganstown Golf Course;
- Hollystown Golf Course; and,
- Ashbourne Golf Course.

[4] https://meath.maps.arcgis.com/apps/instant/portfolio/index.html?appid=84a669c14a84416c92b3583ffd774e58

5.1.4 Industrial Land Use

EPA licenced waste facilities, EPA Integrated Pollution Control (IPC) licenced facilities, EPA Industrial Emissions (IED) licenced facilities exist in the study area. There are 3no. IPC licence facilities within Ashbourne, 1no. IED licenced facilities within Oldtown, with most EPA IPC facilities, EPA IED licensed facilities and waste facilities located in the south of the study area.

2no. Water Treatment Plants (WPT) exist within the study area:

- Rath (Reservoir) WTP; and,
- Curragha WTP.

There are 3no. Wastewater Treatment Plan (WwTP) is within the study area:

- Toberburr WwTP;
- Ballyboghil WwTP; and,
- Oldtown WwTP.

There is 1no. Control of Major Accident Hazards (COMAH)/Seveso Site within the study area: Gensys Power Ltd. located at Huntstown Power Station, Huntstown Quarry, Finglas, Dublin, which is a Lower Tier Establishment.

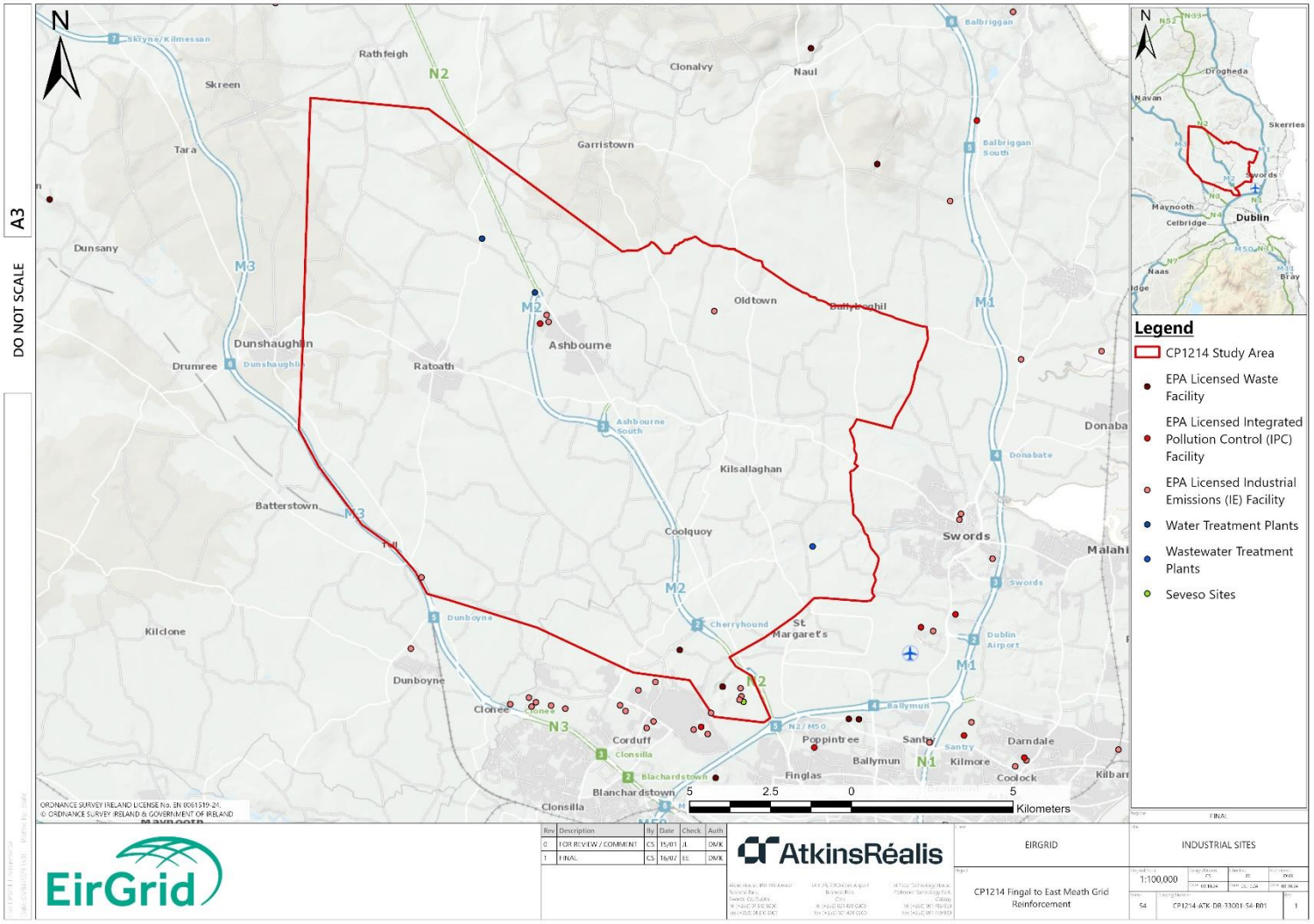

Figure 5-1 - Industrial sites in the Study Area

5.1.5 Dublin Airport Zoning

Dublin Airport Inner Public Safety Zones, Dublin Airport Outer Public Safety Zones and the Dublin Airport Obstacle Free Zones ('All Developments' and 'All Buildings', structures, erections and works exceeding 10 metres in height, 15 metres in height and 45 metres in height) were not explicitly quantified in this constraints assessment.

The Dublin Airport Public Safety Zones and Obstacle Free Zones are included within the Heat Maps (Appendix A) to aid in the Technical Feasibility study. The Dublin Airport zoning will be further described and assessed within the Technical Feasibility Study.

5.2 Biodiversity

The construction of new electricity transmission infrastructure and the upgrade of existing infrastructure can potentially result in significant impacts to ecology and biodiversity (EirGrid, 2020). Identifying where ecological constraints might exist and where there are potential opportunities for development is a key part of the planning process. EirGrid consider a Constraints Study as Step 3 in the level of ecological consideration required in the project development process. Step 3 is regarded as the optimum stage at which to identify key significant environmental constraints, including nature conservation sites, high value habitat types (e.g., Annex I Habitats) and areas important for species outside of designated sites with the aim of avoiding them at the next stage of the development process. Ecological constraints are used to identify potential issues or constraints that could restrict the options within the Study Area (EirGrid, 2020). The assessment of various technology solutions is required as part of Step 3 in a constraints study (EirGrid, 2020). These technology solutions together with a wider constraint study are assessed in Step 3 to determine the best performing solution (technology and corresponding study area; EirGrid, 2020). The aim of Step 3 is to identify constraints so that they are avoided at the next stage of the process. The objectives of a constraints study, as identified by EirGrid (2020) are to:

- Identify ecological constraints within the study area;
- Facilitate consultation with stakeholders on study area and constraints; and
- Evaluate and identify ecological constraints to be avoided at the next stage of the process.

5.2.1 Establishing a Zone of Influence

EirGrid require that ecological constraints outside the Study Area (but within the potential zone of influence) should also be considered. New electricity transmission projects should consider, inter alia, the network of landscape features within the 'zone of influence' (ZoI) and the maintenance of connectivity within and between ecological sites. The 'ZoI' for a project is the area over which ecological features may be affected by biophysical changes from the proposed project and associated activities zone. This is likely to extend beyond the project site (EirGrid, 2020).

At this stage, a 15 km ZoI was applied around the boundaries of the Study Area. A 15 km ZoI was established because there is hydrological connectivity to several Natura 2000 sites that exist outside the boundaries of the Study Area and these Natura 2000 sites are 18 km downstream. It is expected that the ZoI will be refined in subsequent Project Stages. In addition, the Heat Maps do not explicitly account for data outside the boundaries of the Study Area and so the risk to Natura 2000 sites (as an example) is not explicitly captured in the Heat Maps. Hydrological connectivity to Natura 2000 sites was included as a data layer in the Heat Maps to capture potential risks to Natura 2000 sites, NHA, pNHA and Ramsar sites. There are limitations with this as the network of field drains etc. indicate that hydrological connectivity to Natura 2000 sites might be greater than is represented from EPA River Basin Cycle 3 watercourses.

5.2.2 Methodology

5.2.2.1 Scope of Biodiversity Constraints Assessment

The checklist of items for consideration in an Ecology Constraints report as outlined in EirGrid's Ecology Guidelines for Electricity Transmission Projects (2020) are:

1. List and map all Nature Conservation Sites including proposed and candidate sites within the Study Area – SAC, SPAs, NHAs (and pNHAs), nature reserves etc. including a summary of the key information related to the respective sites.
2. List and map all Nature Conservation Sites within an appropriate distance of the study area, including a summary of key information related to the respective sites.
3. Documented bird sites (Irish Wetland Bird Surveys [I-WeBS] or other data e.g., Important Bird Areas).
4. Documented locations of rare and protected species (outside of Nature Conservation Sites).
5. Documented watercourses and associated fisheries value (i.e., salmonid status).
6. List other sites of ecological importance identified from aerial photography.
7. Note major ecological features to be avoided.
8. Highlight any issues for special attention in later phases.
9. Preparation of ecology section and map detailing all ecological constraints within the study area.

Given the scale of the Study Area (approx. 24 km long and 20 km wide; Figure 4-1), a high-level ecological constraints assessment was done. This checklist, together with an initial inspection of databases and key documents identified several potential constraints which were then selected to be considered in more detail. These were:

- Internationally Designated Conservation Sites:
  - These were Natura 2000 sites i.e., Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) and included a synopsis of each site and the qualifying interests (QI).
  - Ramsar sites (wetlands that are of significant value to nature) were also identified.
  - Article 17/Annex I Habitats in the EU Habitats Directive that are present within the Study Area and adjacent to the Study Area. Annex I Habitats were inspected outside of designated sites (i.e., Natura 2000 sites). Annex I Habitats were mapped within the Study Area and adjacent to the Study Area. Annex I Habitats within the 15 km ZoI were not considered as given the scale of the project it was not considered appropriate for Step 3. Detailed points, lines and polygon data for Annex I Habitats was used for most habitat types. However, the current distribution and current range mapping which represents the "known" or "best estimate" of national distributions of EU Annex I Habitats was used when required (NPWS, 2019a).
- Sites of National Conservation Value:
  - Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs).
  - Wildfowl sanctuaries were also identified. These sanctuaries are areas that have been excluded from the 'Open Season Order' so that game birds can rest and feed undisturbed. There are 68no. sanctuaries in the State. Shooting of game birds is not allowed in these sanctuaries[5].
- Key documented species were then identified within the Study Area and key species examined including:
  - Species of fauna protected under Annex IV of the EU Habitats Directive[6].
  - Relevant species of fauna protected under the Irish Wildlife Acts 1976-2012.

5 Wildfowl Sanctuaries | National Parks & Wildlife Service (npws.ie)

6 Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora.

- The Current Distribution and Current Range Mapping from NBDC and NPWS datasets represents the "known" or "best estimate" of national distributions of EU Annex II and IV species. Data was downloaded for the Ordnance Survey Ireland Grid Squares at 10 km resolution that encompass the entirety Study Area. These grid squares are O15, O14, O05, O04, N94, N95, N96.

- To better understand the potential constraints associated with bird species the following studies were undertaken:
  - Interrogated the QI's (i.e., the bird species) that are listed in the SPA within a 15 km radius of the Study Area.
  - Identified bird species that are not QI for each SPA but are listed as of ecological interest from Natura 2000 Standard Data Forms for relevant SPA.
  - Identified Annex I EU Birds Directive species within the Study Area and listed their conservation rating (i.e., Birds of Conservation Concern in Ireland 2020–2026 Red, Amber or Green conservation ratings[7]).
  - Inspected Irish Wetland Bird Survey data for site counts within the Study Area.
- Aquatic environment. This section included:
  - Overview of relevant rivers.
  - Hydrological connectivity to Internationally and Nationally designated conservation sites.
  - Rivers designated under the Salmonid Regulations (S.I. No. 293 of 1988). These regulations designate the waters capable of supporting salmon (*Salmo salar*), trout (*Salmo trutta*), char (*Salvelinus*) and whitefish (*Coregonus*) as protected.
  - Available records of relevant protected aquatic species within the Study Area.

Identification of wetland habitats within the Study Area as well as wetland site evaluation in a geographical context. This data was sourced from Wetlands Surveys Ireland (WSI, 2024).

- Other known sites of Ecological Value (woodlands and hedgerows).
- From this, a summary of potential ecological constraints was developed.

5.2.2.2 Currently Out of Scope

County and/or local scale ecological features were not explicitly quantified in this constraints assessment. This is because the level of ecological consideration required increases as EirGrid progress through the 6 Steps in the project development process (EirGrid, 2020). County and/or local spatial scales were not considered appropriate for assessment at Step 3 given the extent of the Study Area, the potential scale of the development and the uncertainty at this stage regarding technology solutions and route selection (see Section 1). However, AtkinsRéalis have presented narratives for key aspects of the environment that were considered by EirGrid in their reviews on the effects of the construction and presence of high voltage transmission lines on Ireland's ecology namely Bats (2015), Habitats (2016a), Birds (2016b), Water Quality and Aquatic Ecology (2016c). These narratives were largely extracted from the relevant County Development Plans and Biodiversity Action Plans and are indicative of what might need to be considered in subsequent stages.

AtkinsRéalis did not explicitly examine Important Bird Areas sites (maintained by BirdLife International). It should be noted that the boundaries of Important Bird Areas may extend into the Study Area and beyond the boundaries of SPAs, but GIS data was not available for this report to determine this. This data may need to be considered at a later stage[8].

[7] Birds of Conservation Concern in Ireland - BirdWatch Ireland

[8] BirdLife Data Zone

5.2.2.3 Desktop Review

A desktop review of all available resources and information was undertaken to establish the baseline of the existing environment and to identify key habitats and species including those protected by International and National legislation. A 15 km buffer was considered as the ZoI of the Study Area. The ZoI approximates the potential area over which ecological features may be subject to effects because of the proposed project and associated activities.

A diversity of online databases was used to inform the biodiversity constraints namely:

- BirdWatch Ireland Home Page | BirdWatch Ireland
- Inland Fisheries Ireland Eastern River Basin District River surveys 2017 | Inland Fisheries Ireland (wfdfish.ie)
- Irish Wetland Bird Survey (IWeBS)
- Map of Irish Wetlands (arcgis.com)
- National Biodiversity Data Centre (NBDC) Biodiversity Maps (https://maps.biodiversityireland.ie/Map)
- National Parks and Wildlife Service (NPWS) MapViewer Maps and Data | National Parks & Wildlife Service (npws.ie)
- Natura 2000 Standard Data Form EUNIS -Sites (europa.eu)
- Ramsar sites information service.
- Wetland Survey Ireland (bird count data)
- Wetland Survey Ireland Home Page | Wetland Surveys Ireland

A review of the following published and unpublished reports was also undertaken as part of the desktop study:

- County Meath (2015) County Meath Biodiversity Action Plan (2015-2020) Microsoft Word - County Meath Biodiversity Plan 2015-2020 Final plan.docx
- County Meath (2021) Meath County Development Plan (2021–2027) Meath County Development Plan | Meath.ie
- Denyer, J., Eakin, M., & Gill, M. (2023). Guidelines for the Assessment of Annex I Priority Petrifying Springs in Ireland. Irish Wildlife Manuals, No. 142. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland. IWM142.pdf (npws.ie)
- Department of Housing, Planning and Local Government (DHLGH, 2022). Draft River Basin Management Plan for Ireland (2022–2027)
- EirGrid (2015) EirGrid Evidence Based Environmental Studies - Study 5: Birds
- EirGrid (2016a) EirGrid Evidence Based Environmental Studies - Study 4: Habitats
- EirGrid (2016b) EirGrid Evidence Based Environmental Studies - Study 3: Bats
- EirGrid (2020) Ecology Guidelines for Electricity Transmission Projects: A Standard Approach to Ecological Impact Assessment of High Voltage Transmission Projects Ecology-Guidelines-for-Electricity-Transmission-Projects.pdf (eirgridgroup.com)
- EirGrid. (2016c) Evidence Based Environmental Studies - Study 6: Water Quality & Aquatic Ecology
- Environmental Protection Agency (EPA; 2022). Guidelines on the Information to be contained in Environmental Impact Assessment Reports (August 2022)
- Fehily Timoney (2023) Grid Implementation Plan 2023–2028 for the electricity transmission system in Ireland;
- Fingal (2023a) Fingal Biodiversity Action Plan (2023–2030). October 2023. Fingal County Council - 'Fingal Biodiversity Action Plan 2023–2030' Report
- Fingal (2023b) Fingal Development Plan (2023–2029) Fingal Development Plan 2023–2029 | Fingal County Council
- Gilbert, G., Stanbury, A. & Lewis, L. (2021) Birds of Conservation Concern in Ireland 4: 2020–2026. Irish Birds 43, 1-22.

- JBA (2018) Office of Public Works Arterial Drainage Maintenance Works – Broadmeadow & Ward Arterial Drainage Scheme 2019-2023. Stage 2: Natura Impacts Statement (2018). Prepared by JBA consulting.
- Marnell, F., Kingston, N. & Looney, D. (2009) Ireland Red List No. 3: Terrestrial Mammals, National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.
- McCourt, S. & Kelly, D. L. (2007) Fingal Hedgerow Survey Report. Report prepared for Fingal County Council
- Meath Biodiversity Action Plan 2025–2030 Discussion Paper. Pre-draft Public Consultation. 15 April–27 May 2024. 22 pg. Meath County Council.
- NPWS (2019a) The Status of EU Protected Habitats and Species in Ireland 2019[9]. Volume 1: Summary Overview. NPWS_2019_Vol1_Summary_Article17.pdf
- NPWS (2019b) The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments. Article 17 Reports 2019 | National Parks & Wildlife Service (npws.ie)
- O'Rourke, F., Byrne, C., & Smith, G. (2023). Land Use Evidence Review Phase 1 Synthesis Report. Government of Ireland.
- Smith, G.F., Delaney, E., O'Hora, K., and O'Donoghue, P. (2011) County Meath Tree, Woodland and Hedgerow Survey. Report prepared for Meath County Council. Atkins, Dublin.
- Triturus (2021) Broad Meadow River Biodiversity Management Plan for Rathoath County Meath (2021). Report prepared by Triturus Environmental Ltd. for Rathoath Tidy Towns. November 2021. Broadmeadow River Biodiversity Management Plan for Ratoath Co Meath 2021 – Actions for Biodiversity (actionforbiodiversity.ie)

5.2.3 Receiving Environment

The Study Area spans the counties Dublin (Fingal County Council [FCC]) and Meath County Council [MCC]. The Fingal Biodiversity Action Plan (2023–2030) describes the biodiversity in the Fingal area as: *"Fingal contains a wide diversity of habitats and species, but the pattern of loss of this natural heritage mirrors the global pattern as our local habitats are lost and subject to degradation and species numbers have declined. The coastline is our most important wildlife resource, with most of the protected sites and protected wildlife species in the county found here. The Fingal Landscape comprises of a rich patchwork of arable fields and grasslands divided by a network of hedgerows".*

Focal areas for the Fingal (2023–2030) Biodiversity Action Plan are:

- Core Biodiversity Conservation Areas: Ramsar sites, Natura 2000 sites (Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), Natural Heritage Areas (NHAs), proposed Natural Heritage Areas (pNHAs), Statutory Nature Reserves, Refuges for Fauna, Annex I Habitats outside designated sites, habitats of protected or rare flora.
- Ecological Buffer Zones.
- Nature Development Areas.
- Ecological Corridors along major Rivers.

The County Meath Biodiversity Action Plan (2015–2020)[10] describes the landscape of Meath (which is within the western boundaries of the Study Area) as: *"The county retains a strong connection with traditional agriculture and the landscape supports a wide range of ecological habitats. Hedgerows are considered to be a prominent feature of the landscape; a recent survey estimated there are over 22,000 km of hedgerow in the county (Smith et al., 2011). Many*

[9] NPWS_2019_Vol1_Summary_Article17.pdf
[10] Note: The County Meath Biodiversity Action Plan is currently being reviewed.

have grown tall and form an extensive network of tree lines, which gives the intensive agricultural landscape a wooded appearance from ground level".

The Meath Biodiversity Action Plan Discussion Paper (2025–2030)[11] was in draft at the time of writing. Additional information may come to light which can be considered in later project stages.

5.2.4 Internationally Designated Conservation Sites (Natura 2000 Sites)

The Natura 2000 network is comprised of both SACs and SPAs These sites are designated for the protection of biodiversity across the European Union. SACs are designated under the EU Habitats Directive (92/43/EEC), as transcribed into Irish law by the European Communities (Birds and Natural Habitats) Regulations, 2011, while SPAs are designated under the EU Birds Directive (79/4089/EEC; and as amended 2009/147/EC). SACs are sites of international importance due to the presence of Annex I Habitats and/or Annex II species listed under the EU Habitats Directive (92/43/EEC).

SPAs are designated for the protection of bird species listed on Annex I of the Bird Directive (2009/147/EC), regularly occurring populations of migratory species and areas of international importance for migratory birds. Wetlands, especially those of international importance are also protected within SPAs.

Ramsar sites are wetland sites designated to be of international importance under the Ramsar Convention an intergovernmental environmental treaty established by UNESCO. Biosphere reserves are nominated by national governments and remain under the sovereign jurisdiction of the states where they are located. Biosphere Reserves are designated under the Intergovernmental Man and the Biosphere Programme by the Director-General of UNESCO[12].

5.2.4.1 Special Areas of Conservation

There are no SACs within the boundaries of the Study Area (Appendix B). Within the ZoI (i.e., a 15 km buffer of the Study Area), 11no. SACs were identified (Appendix B). The QI's for each SAC are given in Appendix B and a brief description of each SAC is given below. Other features of ecological importance for each SAC (but not QI) are also given in Appendix B. These include Red Data Book Plant and Bryophyte Species.

- **Malahide Estuary (also known as Broadmeadow Estuary) SAC (000205)** is located <5 km from, and downstream of, the eastern boundary of the Study Area. This SAC is designated for several Annex I coastal and dune habitats. Salt marshes are well represented, particularly Atlantic salt meadows and Salicornia flats. Most of the sand dune system is managed for a golf course but significant areas of fixed dunes and shifting white dunes remain[13]. The overall conservation status of Malahide Estuary SAC is unfavourable-inadequate (FCC, 2023). This SAC also has populations of 1no. Red Data Book plant species.
- **Rogerstown Estuary SAC (000208)** has extensive intertidal sand and mud flats and is designated for Annex I coastal and dune habitats. Rogerstown Estuary is one of six estuaries in Ireland with a bad ecological status classification by the EPA. Persistent eutrophication has driven excessive algal growth, causing the smothering and subsequent loss of intertidal seagrass beds. This SAC also has populations of 3no. Red Data Book plant species[14].
- **Rye Water Valley/Carton SAC (001398)** is designated for Annex I bog/mire habitats. The QI of Petrifying springs with tufa formation give rise to a calcareous marsh, the habitat for the narrow-mouthed whorl snail (*Vertigo*

[11] Pre-draft Public Consultation.
[12] What are biosphere reserves? | UNESCO
[13] N2K IE0000205 dataforms (europa.eu)
[14] N2K IE0000208 dataforms (europa.eu)

angustior) and Desmoulin's whorl snail (*Vertigo moulinsiana*), both QI and Annex II species. Other ecological interests for this SAC include rare or locally uncommon plant and insect species. 4no. Red Data Book plant species have been recorded here. Two of these species are legally protected (Hairy St John's-wort [*Hypericum hirsutum*] and Hairy violet [*Viola hirta*]). The woods at the eastern end of the site have long-eared owl (*Asio otus*)[15].

- **Baldoyle Bay SAC (000199)** is designated for Annex I coastal habitats. It is a relatively small estuarine/bay system that receives the flows of the Mayne and Sluice Rivers that drain an agricultural/suburban catchment. The inner part of the site is sheltered from the sea by a large sand dune peninsula, though most of the dunes are now used as a golf course. The overall conservation status of the Baldoyle Bay SAC is favourable (FCC, 2023). It has two Red Data Book plant species. Meadow Barley (*Hordeum secalinum*) and Borrer's Saltmarsh-grass (*Puccinellia fasciculata*)[16]. Baldoyle Bay is also a Ramsar site and a Nature Reserve.
- **North Dublin Bay SAC (000206)** is designated for Annex I coastal and dune habitats. It has an excellent diversity of coastal habitats. The North Bull Island dune system is one of the most important systems on the east coast and is one of the few in Ireland that is actively accreting[17]. Petalworth, a type of liverwort are also a QI and an Annex II species. The site has five Red Data Book vascular plant species and four Red Data Book bryophyte species and is nationally important for three insect species.
- **Rockabill to Dalkey Island SAC (003000)** is a key habitat for the Annex II and Annex IV species the harbour porpoise within the Irish Sea and is designated for reef habitat. This SAC compasses a range of comparatively shallow marine habitats, including diverse seabed structures, reefs, islets and islands. It borders existing designated sites for Annexed species and habitats and is adjacent to a wide array of coastal features, e.g., mudflats, lagoons, estuaries, coastal cliffs, sea caves, several of which are also designated[18].
- **South Dublin Bay SAC (000210)** is designated for Annex I coastal and dune habitats. It is an inter-tidal site that possesses a fine and extensive example of intertidal flats. It has the largest stand of Zostera on the east coast. Several small streams and drains flow into the site[19].
- **Ireland Eye SAC (002193)** Island is designated for Annex I coastal habitats. It has a small, though significant, example of vegetated stony or shingle habitat of the type which fringes sandy beaches. It also contains an example of vegetated sea cliffs. Other ecological features include two Red Data Book species, Sea kale (*Crambe maritima*) and Black henbane (*Hyoscyamus niger*)[20].
- **River Boyne and River Blackwater SAC (002299)** is designated for Annex II species. The site is one of the most important in eastern Ireland for Atlantic Salmon (a QI) and has very extensive spawning grounds. The site also has an important population of River lamprey (QI), though the distribution or abundance of this species is not well known. Otter (QI, also an Annex VI species) are widespread throughout the site. This SAC is also designated for Annex I bog/mire and forest habitat. As well as Red Data Book animals, notably badger, pine marten and common frog, several Red Data Book plants occur within the site[21].
- **Howth Head SAC (000202)** is designated for Annex I coastal and heath/scrub habitat. The dry heath and sea cliff vegetation is extensive and well developed[22]. It also has very diverse flora with several Red Data Book species and species of very restricted Irish distribution.
- **Lambay Island SAC** is the largest east coast island 4 km off the Dublin coast. It provides year-round haul-out habitat for the Annex II seal species *Halichoerus grypus* (Grey Seal) and *Phoch Vitulina* (Harbour Seal) and includes regionally significant breeding and moulting sites. The foreshore surrounding the island holds examples of Reef habitat with typical biodiversity for the east coast[23].

[15] N2K IE0001398 dataforms (europa.eu)
[16] N2K IE0000199 dataforms (europa.eu)
[17] N2K IE0000206 dataforms (europa.eu)
[18] N2K IE0003000 dataforms (europa.eu)
[19] N2K IE0000210 dataforms (europa.eu)
[20] N2K IE0000206 dataforms (europa.eu)
[21] N2K IE0002299 dataforms (europa.eu)
[22] N2K IE0000202 dataforms (europa.eu)
[23] N2K IE0000204 dataforms (europa.eu)

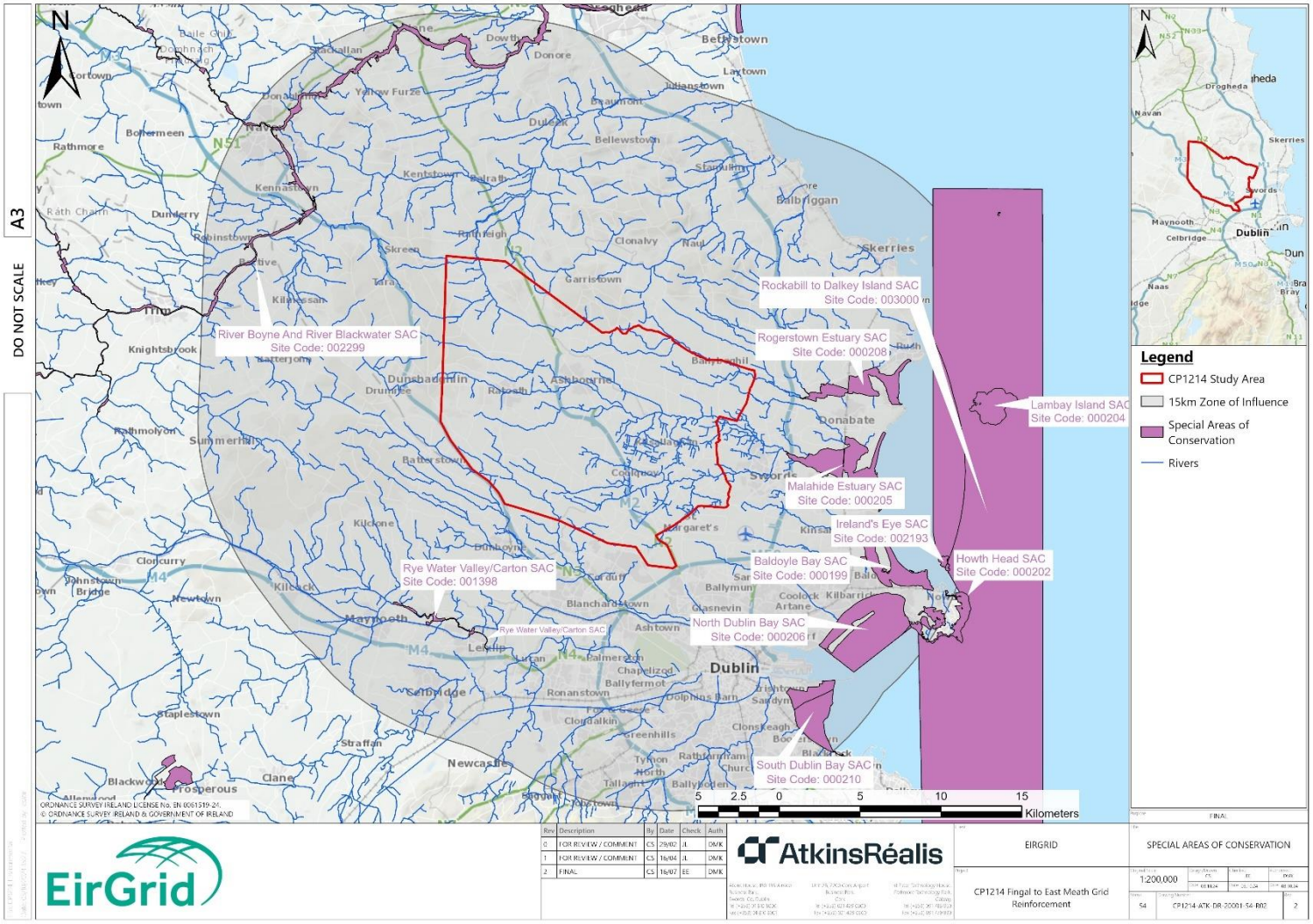

Figure 5-2 - Special Areas of Conservation within a 15 km radius of the Study Area

5.2.4.2 Special Protection Areas

There are no SPAs within the Study Area. 13no. SPAs are found within a 15 km radius of the Study Area. 44no. bird species are identified as QIs across the 13no. SPA. Of these 44no. species, 7no. are listed in Annex I of the EU Birds Directive that also have a Red/Amber listing of conservation concern. Brief descriptions of each SPA within a 15 km radius of the Study Area are as follows:

- **Malahide Estuary (also called Broadmeadow Estuary) SPA (004025)** is designated for nationally and internationally important wintering bird populations and wetland habitats. Regionally important populations of Bar-tailed godwit (*Limosa lapponica*) as well as the Golden Plover (*Pluvialis apricaria*) are found here. Both species are an Annex I species on the Birds Directive, and their conservation status is categorised as Red-listed (Table 2-2). This SPA is of high importance for wintering waterfowl, with an internationally important population of Light-bellied brent goose (*Branta bernicla hrota*) and nationally important populations of a further 14no. species[24]. Kingfisher (*Alcedo atthis*) nest in the lower reaches of the Broadmeadow River which drains into this SPA (JBA, 2018). Malahide Estuary is also a Ramsar site (site code 833; see Section 5.2.7.1).
- **Rogerstown Estuary SPA (004015)** is of high importance for wintering waterfowl, with an internationally important population of Light-bellied brent goose (*B. bernicla hrota*) that accounts for 5.9% of the national total. It supports nationally important populations of a further 15 species and notably Red knot (*Calidris canutus*; 8.6% of national total), Common shelduck (*Tadorna tadorna*; 5.3% of national total) and Grey plover (*Pluvialis squatarola*; 4.5% of national total). It is an important and regular site for a range of autumn passage migrants, especially Little stint (*Calidris minuta*), Curlew sandpiper (*Calidris ferruginea*), Ruff (*Philomachus pugnax*) and Green sandpiper (*Tringa ochropus*). Little terns (*Sterna albifrons*) have bred in the past but not recently. This SPA also includes populations of three Red Data Book plant species[25]. Rogerstown Estuary is also a Ramsar site (412; see Section 5.2.7.1).
- **South Dublin Bay and River Tolka Estuary SPA (004024)** has extensive intertidal flats which support wintering waterfowl which are part of the overall Dublin Bay population. It regularly has an internationally important population of Light-bellied brent goose (*B. bernicla hrota*) which feeds on Dwarf eelgrass in the autumn. It has nationally important numbers of a further 6no. species: Oystercatcher (*Haematopus ostralegus*), common ringed plover (*Charadrius hiaticula*), Red knot (*C. canutus*), Sanderling (*Calidris alba*), Dunlin (*Calidris alpina*) and Bar-tailed godwit (*L. lapponica*). It is an important site for wintering gulls, especially black-headed gull (*Larus ridibundus*) and Common gull (*Larus canus*). South Dublin Bay is the premier site in Ireland for Mediterranean gull (*Larus melanocephalus),* with up to 20no. birds present at times. This area is a regular autumn roosting ground for significant numbers of terns, including Roseate tern (*Sterna dougallii*), Common tern (*S. hirundo*) and Arctic tern (*S. paradisaea*)[26].
- **Baldoyle Bay SPA (004016)** has a good diversity of wintering waterfowl and notably an internationally important population of Light-bellied brent goose. It has nationally important populations of common shelduck (*T. tadorna*), Northern pintail (*Anas acuta*), common ringer plover (*C. hiaticula*), Golden plover (*P. apricaria*), Grey plover (*P. squatarola*) and Bar-tailed godwit (*L. lapponica*). At high tide the shallow waters regularly attract species such as Great crested grebe (*Podiceps cristatus*) and Red-breasted merganser (*Mergus serrator*). Little tern (*S. albifrons*) formerly bred at the site, but not since the early 1990's[27]. Baldoyle Bay is also a Ramsar site (site no. 413; see Section 5.2.7.1).
- **River Boyne and River Blackwater SPA (004232)** The River Boyne and River Blackwater Special Protection Area is of high ornithological importance as it supports a nationally important population of Kingfisher (*A. atthis*), a species that is listed on Annex I of the EU Birds Directive[28]. A survey in 2010 recorded 19 pairs of Kingfisher (based on 15 probable and 4 possible territories) here. A survey conducted in 2008 recorded 20-22 Kingfisher territories within the SPA. Other species include: Mute Swan (*Cygnus olor*), Teal (*Anas crecca*), Mallard (*Anas*

[24] N2K IE0000205 dataforms (europa.eu)
[25] N2K IE0004015 dataforms (europa.eu)
[26] N2K IE0004024 dataforms (europa.eu)
[27] N2K IE0004016 dataforms (europa.eu)
[28] SITE SYNOPSIS (npws.ie)

platyrhynchos), Cormorant (*Phalacrocorax carbo*), Grey Heron (*Ardea cinerea*), Moorhen (*Gallinula chloropus*), Snipe (*Gallinago gallinago*) and Sand Martin (*Riparia riparia*).

- **Marine North-West Irish Sea SPA (004236)** The North-west Irish Sea SPA constitutes an important resource for marine birds. The estuaries and bays that open into it along with connecting coastal stretches of intertidal and shallow subtidal habitats, provide safe feeding and roosting habitats for waterbirds throughout the winter and migration periods. These areas, along with more pelagic marine waters further offshore, provide additional supporting habitats (for foraging and other maintenance behaviours) for those seabirds that breed at colonies on the north-west Irish Sea's islands and coastal headlands. These marine areas are also important for seabirds outside the breeding period.
- **North Bull Island SPA (004006)** is considered among the top ten sites for wintering waterfowl in Ireland supporting internationally important populations of Light-bellied brent goose (*B. bernicla hrota*) and bar-tailed godwit. A further 14 species have populations of national importance, with particular notable numbers of common shelduck (*T. tadorna*; 8.5% of national total), Northern pintail (*Anas acuta*; 11.6% of national total), Grey plover (*P. squatarola*; 6.9% of national total), Red knot (*C. canutus*; 10.5% of national total). North Bull Island SPA is a regular site for passage waders such as Ruff (*Philomachus pugnax*), Curlew sandpiper (*C. ferruginea*) and Spotted redshank (*Tringa erythropus*). The site supports Short-eared owl (*Asio flammeus*) in winter. Formerly the site had an important colony of Little tern (*S. albifrons*) but breeding has not occurred in recent years. The site provides both feeding and roosting areas for the waterfowl species. Habitat quality for most of the estuarine habitats is very good[29]. North Bull Island is also a Ramsar site (site code 406; see Section 5.2.7.1) and a Wildfowl Sanctuary (WFS-19)[30].
- **Ireland's Eye SPA (004117)** is an important seabird colony, with 11no. species breeding regularly. It has nationally important populations of Cormorant (*P. carbo*), European herring gull (*L. argentatus*), Great black-backed gull (*Larus marinus)*, Black-legged kittiwake (*Rissa tridactyla*), Common murre (*Uria aalge*) and Razorbill (*Alca torda*). In addition, the island has a recently established colony of Northern gannet (*Sula bassana)*, which is one of only five in the country and the only one on the East coast. It also has regionally important populations of Northern fulmar (*Fulmarus glacialis)*, European shag (*Phalacrocorax aristotelis*), black guillemot (*Cepphus grille*) and a small colony of Atlantic puffin (*Fratercula arctica*). It is a traditional site for Peregrine falcon (*Falco peregrinus*), though this species only breeds in some years[31]. There is excellent diversity of breeding seabirds (up to 12no. species), with four species in numbers of national importance and also a recently established gannet (*Sula bassana*) colony, the only one on the east coast.
- **Skerries Islands SPA (004122)** The Skerries Islands SPA is of high ornithological importance for both breeding seabirds and wintering waterfowl. Internationally important populations of breeding Cormorant (*P. carbo*) and nationally important populations of two other breeding seabirds occur on the islands. The wintering population of Light-bellied Brent Goose is of international importance and four other species occur in nationally important numbers during the winter. Golden Plover (*P. apricaria*) and Short-eared Owl (*A. flammeus*), two species that are listed on Annex I of the EU Birds Directive, are also found here[32].
- **Howth Head Coast SPA (004113)** has important colonies of breeding seabirds, with nationally important populations of black-legged kittiwake (*R. tridactyla*), Razorbill (*A. torda*) and black guillemot (*C. grille*), and a regionally important population of common murre (*U. aalge*). he cliffs also support a breeding pair of Peregrine falcon (*F. peregrinus),* a species listed on Annex I of the EU Birds Directive although not a QI. A wide variety of seabirds nest on the marine cliffs[33].
- **The River Nanny Estuary and Shore SPA (004158)** comprises the River Nanny estuary and sections of the shoreline to the north and south of the estuary (c.3 km in length). This is an important east coast site, with nationally important populations of European golden plover, Eurasian oystercatcher, Common ringer plover, Red knot, Sanderling, and European herring gull. The population of Red knot and Sanderling are of particular note as

[29] N2K IE0004006 dataforms (europa.eu)
[30] Wildfowl Sanctuaries | National Parks & Wildlife Service (npws.ie)
[31] N2K IE0004117 dataforms (europa.eu)
[32] N2K IE0004122 dataforms (europa.eu)
[33] N2K IE0000202 dataforms (europa.eu)

they represent 4% and 3.8% of the respective all-Ireland totals. A range of other waterfowl species also occur, including Light-bellied brent goose, as well as Larus gulls. The site is particularly important as a roost area for birds but also provides feeding habitat[34].

- **Rockabill (004014)** SPA consists of two small, low-lying, granitic islets situated c.7 km off the Dublin coast. Rockabill is an internationally important tern colony and the most important in Ireland. It supports the largest colony of Roseate Tern in Ireland (c.88% of national total) and in north-west Europe, plus the largest colony of Common Tern in the country (c.35% of national total) and a significant colony of Arctic Tern. Rockabill also supports a nationally important population of Black guillemot and a small colony of Black-legged kittiwake. The site is a known location for the observation of bird migration. Owing to its importance, Rockabill is a designated Refuge for Fauna[35].
- **Lambay Island SPA (004069)** is one of the most important seabird colonies in Ireland, with 12no. species breeding regularly. It supports internationally important populations of Cormorant, European shag, Guillemot and Razorbill and nationally important populations of Fulmar, European Herring Gull, Lesser black-backed gull, Great black-backed gull and Kittiwake. Cliff habitat for nesting seabirds is very extensive and of high quality. Other notable breeding birds are Eurasian oystercatcher (largest concentration in the region), Common shelduck and Peregrine falcon. The island supports a nationally important wintering flock of Greylag goose and a range of other wintering waterfowl, though in relatively low numbers. The island was the subject of an intensive natural history study in 1905/06. Breeding and wintering birds are well-monitored[36].

The SPAs in the context of the Study Area are illustrated in Figure 5-3.

Table 5-2 - Bird species that are qualifying interests for Special Protection Areas within 15 km radius of the Study Area. These species are all listed in Annex I of the EU Birds Directive and have a Red or Amber Conservation Concern ranking

Bird species	Special Protection Area	EU Birds Directive Annex I	Birds of Conservation Concern in Ireland (2020–2026)
Bar-tailed godwit	Malahide Estuary SPA (004025); Baldoyle Bay SPA (004016); North Bull Island SPA (004006); South Dublin Bay and River Tolka Estuary SPA (004024)	Yes	Red
Golden Plover	Malahide Estuary SPA (004025); Baldoyle Bay SPA (004016); North Bull Island SPA (004006)	Yes	Red
Arctic Tern	South Dublin Bay and River Tolka Estuary SPA (004024); Marine North-West Irish Sea SPA (004236)	Yes	Amber
Common Tern	South Dublin Bay and River Tolka Estuary SPA (004024); Marine North-West Irish Sea SPA (004236)	Yes	Amber
Kingfisher	River Boyne and River Blackwater SPA (004232)	Yes	Amber
Little Gull	Marine North-West Irish Sea SPA (004236)	Yes	Amber
Little Tern	Marine North-West Irish Sea SPA (004236)	Yes	Amber

[34] N2K IE0004158 dataforms (europa.eu)
[35] N2K IE0004014 dataforms (europa.eu)
[36] N2K IE0004069 dataforms (europa.eu)

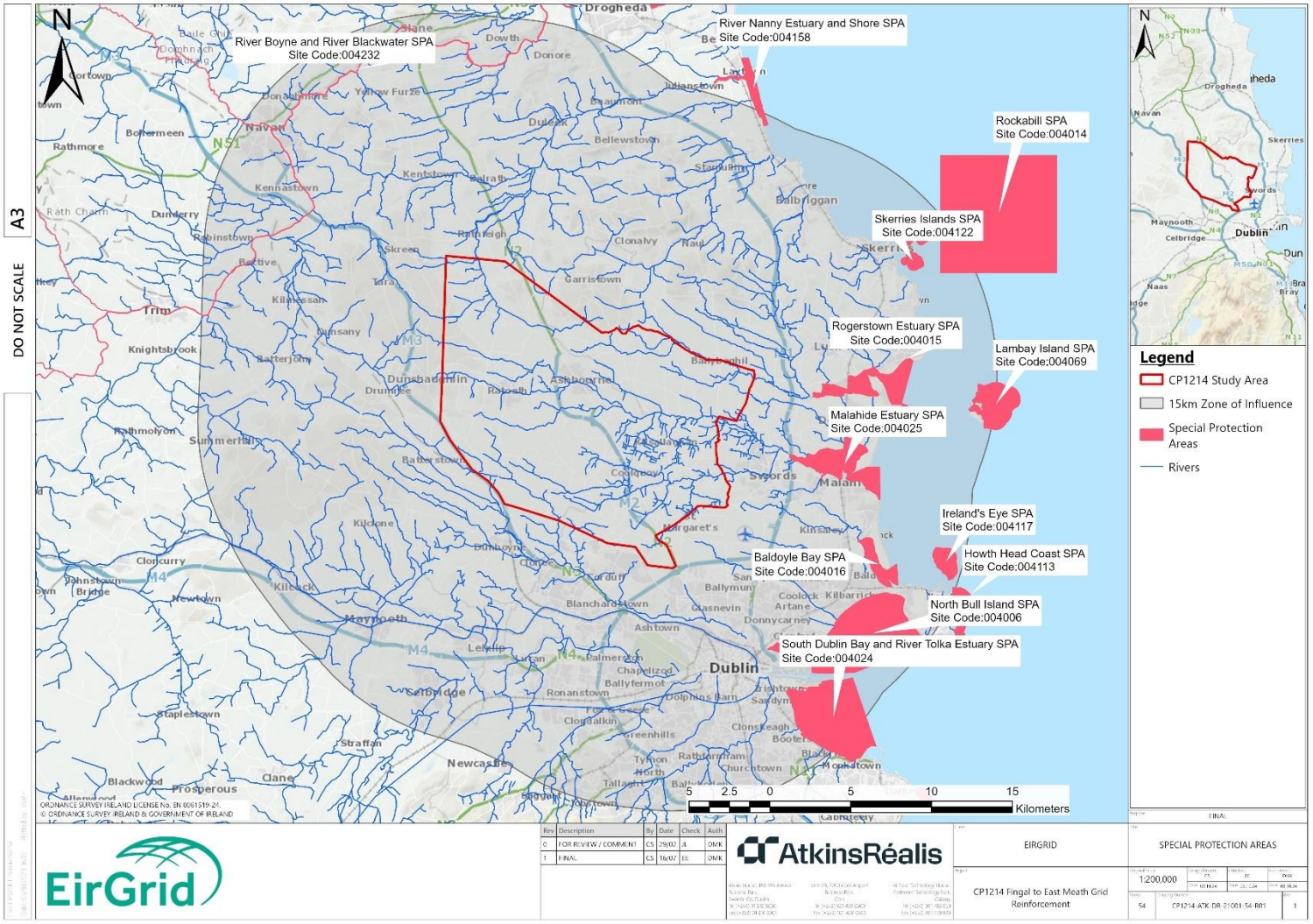

Figure 5-3 - Special Protection Areas within a 15 km radius of the Study Area

5.2.4.3 Article 17/Annex I Habitats

Several habitats listed in Annex I of the Habitats Directive can occur in sites outside of designated sites. Annex I Habitat is habitat protected under the Habitats Directive. The overall objective of the Habitats Directive is to achieve and maintain favourable conservation status for all habitats and species of community interest; and to contribute towards maintaining biodiversity of natural habitats and of wild flora and fauna in member states. To this end, EU member states are obliged to monitor the conservation status of habitats and species. As all habitats (as listed in Annex I) and species of community are included, the monitoring requirements obliged to be undertaken by member states is not restricted to European sites (SACs and SPAs) but encompasses the total national resource of each habitat. Consequently, data on Annex I Habitat must be collected both within and outside the Natura 2000 network. In addition, member states are obliged, as detailed in Article 17 of the Habitats Directive, to report to the EU commission every six years on the implementation of measures taken towards meeting the objectives of the directive. Annex I Habitats are categorised into the following general habitat categories: Bogs, mires and fens, Coastal habitats, Dune habitats, Forests, Freshwater habitats, Grasslands, Heath and Scrub and Rocky habitats.

From the best information available, there are 2no. Annex I Habitats within the Study Area. **Alkaline fen (7230)** is found between Dunshaughlin and Rathoath. Alkaline fens are "*groundwater-fed, generally peat-forming systems with extensive areas of species-rich small sedge and brown moss communities. They occur in areas where there is a high-water table and a base-rich, often calcareous water supply. The Overall Status is assessed as Bad with a deteriorating trend due to losses of area and habitat quality, as well as the pressures and threats faced by the habitat*" (NPWS, 2019a). There is the potential for this habitat to be suitable for Marsh Fritillary (*Euphydryas aurinia*), an Annex II Species of the EU Habitats Directive. They are not recorded within the Study Area, but records exist within the 15 km ZoI.

Atlantic Salt Meadows (1330) are found to the west of Forest Great, just north of Dublin airport in the very eastern boundary of the Study Area. The NPWS (2019a) describe Atlantic salt meadows as "*generally occupy the widest part of the saltmarsh gradient. They also contain a distinctive topography with an intricate network of creeks and salt pans occurring on medium and large-sized saltmarshes. Atlantic salt meadows contain several distinctive zones that are related to elevation and submergence frequency. This habitat is also important for other wildlife including wintering waders and wildfowl. Atlantic salt meadows are distributed around most of the coastline of Ireland. The intricate topography of the Irish coastline with many inlets has created an abundance of sites that are sheltered and allow muddy sediments to accumulate, leading to the development of saltmarsh".*

Adjacent to the Study Area, **Alluvial Woodland (91E0)** is located in Brackenstown. This Annex I Habitat is approximately ~570 metres from the eastern boundary of the Study Area (at Knocksedan) and is located on both banks of the Ward River. Alluvial Woodland (91E0) can also be found approximately 2.3 km from the Study Area to the South-East.

"A number of variants of Alluvial woodland habitat exist, of which riparian forests of ash (Fraxinus excelsior) and alder (Alnus glutinosa) (Alno-Padion) of temperate and Boreal Europe lowland and hill watercourses are the most common in Ireland. All types occur on heavy soils which are periodically inundated by the annual rise of river levels but otherwise well-drained and aerated during low water" (NPWS, 2019a).

Hydrophilous Tall-Herb Swamp (6430) is found 3.5 km from the Study Area to the South-East. The NPWS (2019a) states: one type of Hydrophilous Tall-Herb Swamp is described as:

"*a lowland community of watercourses, particularly unmanaged edges of slow-moving rivers and the margins of lakes, which is dominated by tall hydrophilous herbs such as wild angelica (Angelica sylvestris), meadowsweet (Filipendula ulmaria), yellow iris (Iris pseudacorus), yellow loosestrife (Lysimachia vulgaris), purple-loosestrife (Lythrum salicaria) and common valerian (Valeriana officinalis)" (NPWS, 2019a). Pressures on the habitat include invasive species; and agricultural intensification and drainage in the lowlands. The Overall Status is assessed as Bad with a deteriorating*

trend. This change in trend since the 2013 report represents a genuine decline due to range contraction and a decline in structure and functions".

According to the Fingal Biodiversity Action Plan (2023–2030), in the Fingal region, most Annex I Habitats are found along the coast and include sand-dunes, shingle and gravel banks and shores, orchid rich grasslands, petrifying springs, and vegetated sea cliffs (FCC, 2023a). Undesignated Annex I Habitats namely Annual vegetation of drift lines, Perennial vegetation of stone Banks, Petrifying springs*[37], Vegetated sea cliffs and calcareous grassland* are all Annex I Habitats identified by Fingal Council as "Core Areas" for the Ecological Network (FCC, 2023a).

The extent of undesignated Annex I Habitats (i.e., Annex I Habitats outside of Natura 2000 sites) in County Meath is not apparent in their 2015–2020 biodiversity plans, and no Annex I Habitats in undesignated sites are identified in the County Development Plan (2021–2027) or the 2015–2020 Biodiversity Action Plan.

5.2.5 Sites of National Conservation Value

5.2.5.1 National Heritage Areas and Proposed National Heritage Areas

A Natural Heritage Area (NHA) is the basic designation for wildlife under the Wildlife Amendment Act (2000). Natural Heritage Area sites are selected by having special scientific significance for one or more species, communities, habitats, landforms or geological features, or for a variety of natural attributes.

There are no NHA or pNHA within the Study Area. Within a 15 km ZoI of the Study Area there is 1no. NHA which is Skerries Islands NHA (001218). Additional data from the NPWS was not available for this NHA presumably because it lies within the Skerries Islands SPA (004122). The QI's for this SPA are given in Appendix C.

Within a 15 km ZoI there are 32no. pNHA (listed in Appendix D). The pNHA sites which are not within or adjacent to the Study Area are not considered further in this assessment of possible ecological constraints. Hydrological connectivity to pNHAs is examined in Section 5.2.8.

5.2.6 Key Documented Species

This section of the report outlines key species that have been recorded within the Study Area where data was readily available and is not an exhaustive list. Species recorded from the Study Area include:

Otter

Otter (*Lutra lutra*) have been recorded throughout the study area (NBDC, 2024). The most recent sightings were in 2016 (around Ashbourne) from the Mammals of Ireland 2016–2025 survey (NBDC, 2024). This near threatened[38] species is protected under Annex II and IV of the Habitats Directive as well as the Wildlife Acts. This affords this species strict protection wherever it occurs. There is a high likelihood for this species to occur within watercourses and riparian habitats within the Study Area. Indeed, the Fingal Biodiversity Plan states that otters are found along all rivers in Fingal (FCC, 2023) and there is also evidence of otters throughout Meath (MCC, 2015)

Pine Marten

Pine Marten (*Martes martes*) is a protected species under Annex V of the Habitats Directive and the Wildlife Acts They have recorded in the Study Area with recent sightings in 2021 within the Mammals of Ireland 2016–2025 survey

[37] * indicates a priority habitat in the Fingal Biodiversity Action Plan 2023–2030.
[38] Marnell, F., Kingston, N. & Looney, D. (2009) Ireland Red List No. 3: Terrestrial Mammals, National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

(NBDC, 2014). This species creates their dens in natural tree cavities and woodland habitats are suitable habitat for this protected mammal.

Bats

All bat species in Ireland are protected under Annex IV of the Habitats Directive and the Wildlife Acts, affording them protection wherever they occur. Suitable bat roosting habitat is likely found throughout the Study Area in the form of mature trees, buildings and structures that have cracks, holes or crevices. At least eight of the ten bat species recorded within Ireland have been recorded within County Meath (MCC, 2015).

There are 4no. Annex IV bat species recorded within the Study Area; Daubenton's bat (*Myotis daubentoniid*), Leisler's bat (*Nyctalus leisleri*), Soprano pipistrelle (*Pipistrellus pygmaeus*) and Brown long-eared bat (*Plecotus auratus*; NBDC, 2024). Common pipistrelle (*Pipistrellus pipistrellus*) and whiskered bats (*Myotis mystacinus*) are found in the Fingal region and are likely within the Study Area (FCC, 2023a). Indeed, 7no. species are recorded from the 10 km ordnance grid squares including those listed above as well as Whiskered bat (*M. mystacinus*) and Nathusius' Pipistrelle (*Pipistrellus nathusii*; NBDC, 2024).

The old trees and buildings in the woodlands and demesnes offer plenty of roosting sites for bats such as the Leisler's bat, Brown long-eared bat, Whiskered bat and the Common and Soprano Pipistrelles (FCC, 2023a). The lower reaches of the Ward and Broadmeadow Rivers are considered as having high habitat suitability for several bat species including Common pipistrelle, Soprano pipistrelle, Leisler's and Daubenton's (NBDC, 2024). The Lesser Horseshoe bat is not found in the Study Area. The Lesser Horseshoe bat is the only bat species in Ireland for which SACs are designated for.

Irish hare

The Irish hare (*Lepus timidus ssp. hibernicus*) is protected species under Annex V of the Habitats Directive and the Wildlilfe Act. They are considered a key species for County Meath occurring in both upland and lowland habitats (MCC, 2015). Irish hare are one of many target species identified for Nature Development Areas in Fingal Biodiversity Action Plan (FCC, 2023a).

Common Frog

Common Frog (*Rana temporaria*) is a protected species under Annex V of the Habitats Directive and the Wildlife Act and is recorded throughout the Study Area (NBDC, 2024). Habitats within the Study Area that might support common frog populations include any wet grassland, ponded areas, wetlands and wet woodlands and it is considered that local frog populations are likely to be using the lands within the study area.

Badger

Badger (*Meles meles*) is a protected species under the Wildlife Acts and is recorded throughout the study area. Recent sightings in 2022 were near Priesttown as part of the Kilbride Biodiversity Action Plan Surveys (NBDC, 2024). The Meath Biodiversity Action Plan (2015–2020) states that '*Badger density is high*' in County Meath, '*probably in large part, due to the extensive hedgerow resource'*. There are likely numerous habitats within the Study Area that may support badger populations such as woodland, scrub, dry earth banks and hedges and it is considered that local badger populations are likely to be using the lands within the study area and badger setts may be present within suitable habitats.

West European Hedgehog

West European Hedgehog (*Erinaceus europaeus*) is a protected species under the Wildlife Acts and is recorded throughout the study area with the more recently sighting in 2015 within the Atlas of Mammals in Ireland 2010–2015 (NBDC, 2024). This species is becoming rarer across Ireland. There is potential for this species to occur within the woodland, hedgerow, grassland and riparian areas within the Study Area.

5.2.7 Birds

5.2.7.1 Bird Species Recorded from Study Area

Annex I bird species listed on the EU Birds Directive that are recorded within the Study Area (NBDC, 2024)[39] are given in Table 5-3. There are 5no. red listed bird species, 10no. amber listed species and 2no. green listed species. Bird species that are not listed as Annex I species of the EU Birds Directive but are a conservation concern are given in Table E-1. 12no. red listed waterbird species and 5no. red listed passerine species are found within the Study Area. 19no. Amber listed waterbird species and 8no. Amber listed passerine species are recorded within the Study Area while there are 5no. green listed water bird species and 1no. green listed passerine species (Pheasant [*Phasianus colchicus*]) are also found within the Study Area but do not have a conservation rating assigned (Table E-1; Gilbert et al. 2021).

Narratives regarding bird more generally relevant to the wider Study Area are given below.

The Meath County Council Biodiversity Action Plan (2015–2020) states that:

"Several protected bird species appear among Meath's bird fauna. An example is the bar-tailed godwit whose habitat is low-lying shores. The golden plover is considered a key species for conservation in the East Border Region Regional Biodiversity Framework document. This species is typical of lowlands in coastal areas during the winter months. Found along lowland rivers like the Boyne, the kingfisher has a patchy distribution in Ireland which potentially can make them difficult to detect (in particular in the west and north-west). The framework document also considers knot (Calidris canutus) a key species for conservation which feed on estuaries, both during migration and in winter. Therefore, the population is vulnerable to any coastal changes such as the construction of barrages, sea-level rises and human disturbance. The latest Bird Atlas 2007-2011 has highlighted that winter numbers have increased in Ireland. Other relevant species to be considered include: long-eared owl (A. otus), woodcock (S. rusticola), blackcap (Sylvia atricapilla), kestrel (F. tinnunculus), curlew (N. arquata), shelduck (T. tadorna), oystercatcher (H. ostralegus), grey plover (P. squatarola), lapwing (V. vanellus), sanderling (C. alba), turnstone (A. interpres) and redshank (T. totanus)".

The Fingal Biodiversity plan (2023–2031) states that:

"The coastline of Fingal is characterised by the three large estuaries of Rogerstown, Malahide and Baldoyle. These estuaries with their extensive mudflats and saltmarshes are amongst the most important nature conservation areas in Fingal. Every year, up to 40.000 migratory birds spend the winter feeding and resting in the Fingal estuaries. Wading birds such as Black-tailed Godwit, Curlew and Snipe probe in the mud to look for the millions of tiny creatures that live there. Other birds such as the Brent Goose and Greylag Goose feed on the algae growing on the mudflats, while birds such as Cormorants feed on fish. The migratory birds also use the agricultural and amenity lands surrounding the estuaries as feeding sites during high tide"

"Long sandy beaches are important roosting sites for the large flocks of estuarine birds in autumn and wintertime. Breeding birds on our beaches have largely disappeared as a result of disturbance caused by dogs and people. However, the Little Tern has returned as a breeding bird. Ringed Plover has also benefitted from the protective measures for the Little Tern and is breeding in the same area. Throughout the year, birds such as Wagtails, Dunlin and Plovers can be observed running along the shore looking for insects in the rotting plant material that has washed up on the shore". "Rocky and soft sedimentary cliffs line much of the Fingal coast. The steep rocky cliffs of Howth Head are home to thousands of breeding seabirds such as Kittiwakes, Fulmars, and Guillemot". "The steep and soft sedimentary cliffs between Rush and Balbriggan hold several colonies of Fulmar and Sand martins that build their nest in these soft soils".

[39] Note: this list is not exhaustive.

Table 5-3 - Annex I (EU Birds Directive) species that are found within the 10 km Ordnance Survey Ireland grid squares which encompass the Study Area. Red, Amber and Green text denotes bird species conservation rating (Gilbert et al. 2021)

Waterbird Species	Designation	Passerine Species	Designation
Bar-tailed Godwit (*Limosa lapponica*)	Annex I EU Birds Directive; Wildlife Act	Red kite (*Milvus milvus*)	Annex I EU Birds Directive; Wildlife Act
European Golden Plover (*Pluvialis apricaria*)	Annex I EU Birds Directive; Wildlife Act	White-tailed Eagle (*Haliaeetus albicilla*)	Annex I EU Birds Directive; Wildlife Act
Slavonian Grebe (*Podiceps auritus*)	Annex I EU Birds Directive; Wildlife Act	Hen Harrier (*Circus cyaneus*)[40]	Annex I EU Birds Directive; Wildlife Act
Common Tern (*Sterna hirundo*)	Annex I EU Birds Directive; Wildlife Act	Merlin (*Falco columbarius*)	Annex I EU Birds Directive; Wildlife Act
Common Kingfisher (*Alcedo atthis*)	Annex I EU Birds Directive; Wildlife Act	Short-eared Owl (*Asio flammeus*)	Annex I EU Birds Directive; Wildlife Act
Dunlin (*Calidris alpina*)	Annex I EU Birds Directive; Wildlife Act	Peregrine Falcon (*Falco peregrinus*)	Annex I EU Birds Directive; Wildlife Act
Little Gull (*Larus minutus*)	Annex I EU Birds Directive; Wildlife Act		
Mediterranean Gull (*Larus melanocephalus*)	Annex I EU Birds Directive; Wildlife Act		
Ruff (*Philomachus pugnax*)	Annex I EU Birds Directive; Wildlife Act		
Whooper Swan (*Cygnus cygnus*)	Annex I EU Birds Directive; Wildlife Act		
Little Egret (*Egretta garzetta*)	Annex I EU Birds Directive; Wildlife Act		

[40] 2016 record from Birds of Ireland.

"*There are six islands located just off the Fingal coast. These are Ireland's Eye near Howth, Lambay near Rush, and Colt, St. Patrick, Shenick and Rockabill near Skerries. These islands are home to about 80.000 breeding seabirds during the summer months and these colonies are among the most important of Ireland's seabird colonies. Rockabill has the biggest breeding colony of Roseate Terns in North-western Europe. Lambay Island holds Irelands largest mixed seabird colony and is of international importance. The three large Cormorant colonies on Lambay, Irelands Eye and St. Patrick's Island collectively form a "supercolony" that comprises the largest aggregation of the species anywhere in Britain or Ireland. The most abundant sea birds are Guillemots and Kittiwakes. Satellite tagging studies show that seabirds undertake significant movements inland, as well as within the inshore and offshore areas to feed"*.

"Typical riverine birds such Kingfishers, Dippers and Wagtails have become a less common sight over the last 10 years".

"The woods are also home to about 25-30 common and widespread woodland bird species such as Thrushes, Blackbird, Wood Pigeon, Stock Dove, Black Cap and Sparrowhawk".

5.2.7.2 Bird Sites

There are no wetland sites within the Study Area designated under the Convention of Wetlands, i.e., Ramsar Sites. **Rogerstown Estuary (site no. 412) and Broadmeadow Estuary (site no. 833)** are the nearest Ramsar sites to the Study Area and are encompassed within the relevant SPAs.

The Irish Wetland Bird Survey (I-WeBS) undertakes surveys and counts of waterbirds across a wide range of wetlands throughout Ireland. There are no. I-WeBS count sites within the Study Area. The nearest I-WeBs site is the Broadmeadow (Malahide) Estuary (I-WeBs site code: 0U408) which encompasses the Malahide Estuary SPA (see Section 0).

Migratory birds use the agricultural and amenity lands surrounding the estuaries as feeding sites during high tide (FCC, 2023). Lands surrounding designated sites are of key importance as feeding and roosting grounds, particularly for migratory birds. For example, farmlands and amenity grasslands surrounding estuaries are considered of prime importance to Brent Geese. However, these lands are subject to pressures from development, recreational disturbance, and land use changes, which in turn may affect the Brent Geese population in the estuaries (FCC, 2023).

5.2.8 Aquatic Environment

The construction, operation, maintenance and decommissioning of transmission infrastructure can impact on the aquatic environment (EirGrid, 2016c). Most impacts are predicted to be from sediment, cement/concrete and hydrocarbons. Ecological constraints associated with the Aquatic Environment at Step 3 were therefore considered at a high level.

An overview of rivers within the Study Area, their water quality and Water Framework Directive (WFD) designation status is given in Section 5.4. There are 11no. rivers within the Study Area: the Broadmeadow[41], Hurley, Dunshaughlin Stream, Fairyhouse, Rathoath, Ward, Pinkeen, Tolka, Ballyboghil[42], Turvey, and Powerstown.

The Ballyboghil, Broadmeadow, Ward, Tolka are identified as some of the most important watercourses in the Fingal area (FCC, 2023b). Furthermore, the Ballyboghil, Ward and Broadmeadow Rivers are also considered important ecological corridors within the Fingal Development Plan and Biodiversity Action Plan (FCC, 2023a; FCC, 2023b). The Broadmeadow River was arterially drained in the 1960's and exhibits morphological characteristics typical of channelisation (Triturus 2021). The Ward River is also arterially drained (JBA, 2018). Rivers with significant hydro-

[41] Also called the Rathoath stream.
[42] Also called Ballyboughal.

morphological alterations such as the Broadmeadow and Ward rivers are a key focal area of the draft River Basin Management Plan (2022–2027) because these sites are continually failing to meet WFD requirements. Water quality for each of these sites is given in the Water Chapter (see 5.4).

Hydrological connectivity to sites of International and National importance

Inspection of the GIS maps shows there is hydrological connectivity to several Natura 2000 sites, pNHA, Ramsar Sites, Nature Reserves and Wildfowl Sanctuaries via surface water pathways[43].

The headwaters of the Hurley River (010) originate adjacent to the Study Area in the north-east. The Hurley River then flows in a north-easterly direction into the River Nanny which then enters the **River Nanny Estuary and Shore SPA (004158)**. This SPA is hydrologically connected to the Study Area via the Hurley River.

The headwaters of the Ballyboghil River originate in the north-eastern section of the Study Area. This river feeds into **Rogerstown Estuary SAC (000208) and Rogerstown Estuary SPA (004015)** and is therefore hydrologically connected to these Natura 2000 sites. There is also hydrological connectivity to Rogerstown Estuary pNHA[44], Rogerstown Estuary Ramsar site (site code 412), Rogerstown Nature Reserve and Wildfowl Sanctuary.

Dunshaughlin and Rathoath Rivers are found in the western section of the Study Area and feed into the Broadmeadow River just south of Ashbourne town. Fairyhouse Stream is in the centre of the Study Area and drains in an easterly direction into the Broadmeadow River. The mainstem of the Broadmeadow River then drains directly into **Malahide Estuary SAC (000205) and Malahide Estuary SPA (004025**). The Ward River dominates the southern section of the Study Area. This river meets the Broadmeadow River approximately 185 m upstream of the SAC Given the proximity of the Ward River confluence to the SAC it can be considered hydrologically connected to **Malahide Estuary SAC (000205) and Malahide Estuary SPA (004025).**

A tributary of the Tolka River (010; see Section 5.4.2) is situated within the south-western boundary of the Study Area. While the mainstem of the Tolka River is hydrologically connected to South Dublin Bay and River Tolka SPA (004024) and North Dublin Bay pNHA (000206[45]; discussed above), this tributary is considered hydrologically connected. Furthermore, the headwaters of Powerstown and the Pinkeen Rivers originate in the south-western section of the Study Area and feed into the Tolka River. Powerstown and Pinkeen Rivers are therefore considered hydrologically connected to Natura 2000 sites. A summary of hydrological connectivity to sites of various sites is given in Appendix E. Figure 5-7 shows surface water features in the Study Area.

Designated Salmonid Waters

There are no Designated Salmonid Waters under S.I. No. 293/1988 - European Communities (Quality of Salmonid Waters) Regulations 1988 with the Study Area. The nearest designated Salmonid Water under the EU Freshwater Fish Directive is the River Boyne[46].

However, the Fingal Development Plan (FCC, 2023b) identifies several rivers within the Study Area (i.e., Tolka, Pinkeen, Ward, Broadmeadow, Ballyboghil) and their tributaries as salmonid systems and these are therefore of particular significance. The **Tolka** catchment is also identified by IFI as supporting salmonid species along its length. The Ward River is considered as exceptional in supporting Atlantic Salmon (listed in Annex II of the Habitats Directive), Sea Trout and Brown Trout populations and salmon spawning grounds are found in the Ward River Valley Park (FCC, 2023b). Ecological corridors as identified in Fingal Biodiversity Action Plan (2023–2030) are important for Brook

[43] The Boyne Coast and Estuary SAC (001957) is not within the 15 km ZoI but is hydrologically linked via the River Boyne and Blackwater SAC which are within the 15km ZoI of the Study Area. It was not considered any further.
[44] Note: The NPWS does not provide any individual site synopsis for these Rogerstown Estuary pNHA (000208) as it is encompassed within the Natura 2000 Site.
[45] Note: The NPWS does not provide any individual site synopsis for these North Dublin Bay pNHA (000206) as it is encompassed within the Natura 2000 Site.
[46] N2K IE0002299 dataforms (europa.eu)

Lamprey, Atlantic Salmon, Brown Trout, all bat species, kingfisher, dipper, sand martin, common frog, common newt and green figworth (FCC, 2023a). The Turvey River has both brown trout and sea trout.

Aquatic species

Aquatic species identified in the Broadmeadow and Wards Rivers from 2017 IFI surveys were: "*Six fish species and sea trout (Salmo trutta trutta) were recorded across the 12 sites surveyed on the Broadmeadow and Ward River rivers in 2017. Brown trout (Salmo trutta) was the most abundant species captured followed by minnow. Four age classes of brown trout (0+, 1+, 2+ and 3+) were present. Flounder (Platichthys flesus) was due to its close proximity to the sea. Sea trout were recorded in both rivers. In general, brown trout densities were much higher in the Ward River, than in the Broadmeadow River. All sites surveyed on the Broadmeadow River and one site on the Ward River were assigned a fish ecological status of poor. Four sites on the Ward River achieved moderate status, while site 11 achieved good fish status*[47]".

2017 surveys of the Tolka River found: *"Six fish species were recorded at eight sites surveyed on the Tolka River Catchment in 2017. Minnow (Phoxinous phoxinous) was the most abundant species captured at all sites surveyed. Four age classes of brown trout (0+, 1+, 2+ and 3+) were present, with 1+ the most abundant cohort. Lamprey are also found. No juvenile salmon (S. salar) were recorded on this occasion. Six sites were assigned a fish ecological status of poor and one site (site 3) achieved moderate status[48]".*

No fish data was available for the Turvey River but IFI state that: "*The Turvey system is exceptional among most urban river systems in the area in supporting Sea trout in addition to resident Brown trout (both S. trutta) populations. The presence of these fish populations highlights the sensitivity of local watercourses and the Turvey catchment in general*"[49].

The Meath Biodiversity Plan (2015–2020) states that: *"The Atlantic salmon (S. salar), river lamprey (Lampetra fluviatilis) and the brook lamprey (Lampetra planeri) can be found in the river Boyne and the river Blackwater. Other fish species that can be found in Meath rivers include the native brown trout (Salmo trutta), three-spined stickleback (Gasterosteus aculeatus), European eel (Anguilla anguilla) and flounder (Platichthys flesus) and also the non-native roach (Rutilus rutilus), perch (Perca fluviatilis), stone loach (Barbatula barbatula), minnow (Phoxinus phoxinus) and gudgeon (Gobio gobio)".*

White-clawed Crayfish (*Austropotamobius pallipes*) are an Annex II Species in the EU Habitats Directive. While they are not recorded within the Study Area (NBDC 2024) they are recognised as important in Meath (MCC, 2015). The presence of this species in the Fingal region is unknown.

5.2.9 Wetland habitats

23no. wetland habitats were identified within the Study Area (Figure 5-4). The wetland habitats are largely artificial ponds associated with golf courses and only a few have reedswamp, river, marsh, wet grassland, scrub habitat (Table G-1). The WSI provides an evaluation of the various wetland sites in a geographical context (nationally importance, locally important etc.). Details of the 23no. wetland habitats, along with ecological ranking, are listed below in Appendix G. Freshwater wetlands are relatively uncommon in Fingal (FCC, 2023a) while freshwater wetlands such as fens, marsh and reed swamp are frequently associated with watercourses (MCC, 2015).

[47] ERBD_Broadmeadow_Ward_2017.pdf (wfdfish.ie)
[48] ERBD_Tolka_2017.pdf (wfdfish.ie)
[49] A8 Response to IFI.pdf (fingal.ie)

5.2.10 Other Known Sites of Ecological Value

5.2.10.1 Woodland Habitat

The National Survey of Native Woodlands (NSNW)[50], the Inventory of Ancient and Long-Established Woodlands of Ireland, NPWS and NBDC datasets identify areas of native woodland within and bordering the Study Area. A stand of mixed broadleaf woodland exists to the south-east of Dunshaughlin (in Ballymurphy townland) within the Study Area. This stand comprises; *Fraxinus excelsior - Hedera helix* woodland group, *Geum urbanum - Veronica montana* vegetation type). The Meath County Development Plan (2021–2027) states that: *"Although the County is one of the least wooded counties, its woodlands, hedgerows and individual trees contribute positively to biodiversity and landscape character. Woodlands tend to be small and highly fragmented for the most part and are more frequent near rivers, particularly along the lower stretches of the River Boyne. The most abundant native woodland habitat type in the County is Oak-Ash-Hazel woodland (WN2) reflecting the limestone derived soils. A large proportion of the County's woodlands are parklands associated with historic demesnes".* Meath currently has the lowest percentage area cover of woodland on record in Ireland at 4%, a statistic which includes coniferous, broadleaved, transitional and mixed forest (O'Rourke, Byrne, Smith, 2023).

5.2.10.2 Hedgerows and treelines

The Fingal Biodiversity Action plan (2023–2030) states that the: *"Fingal landscape comprises of a rich patchwork of arable fields and grasslands divided by a network of hedgerows. The most dominant trees and shrubs are Hawthorn, Dog Rose, Ash, Sycamore and Elm. Some unusual plants such as Short-styled Field Rose (Rosa Stylosa) which is a rare species in Ireland and Irish Whitebeam (Ireland's only endemic tree species) were also found during the Fingal hedgerow survey".*

The Meath County Development Plan (2021–2027) states that: *"Hedgerows are perhaps the most characteristic feature of the County's landscape and provide an important habitat for many species and act as a wildlife corridor in a landscape dominated by large tracts of intensive agriculture".* The County Meath Tree, Woodland and Hedgerow Survey (Smith et al. 2011) details the following for hedgerows within County Meath: *"Average hedgerow density in Meath (9.51 km/km^2) is substantially higher than that of neighbouring counties, with the exception of Cavan and Monaghan. A similar result was found by Smal (1995) in the Badger and Habitats Survey of Ireland, who estimated a hedgerow density of 9.33 km/km^2 for Meath. The greater density of hedgerows in Meath than most counties can be explained by the largely lowland agricultural landscape that dominates the county".*

Dominant species within Meath hedgerows include Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Hazel (*Corylus monogyna*), Privet (*Ligustrum vulgare*), Gorse (*Ulex europaeus*), Elder (*Sambucus nigra)* and Sycamore (*Acer pseudoplantanus*).

[50] National Survey of Native woodlands 2003-2008 (Perrin et al. 2008)

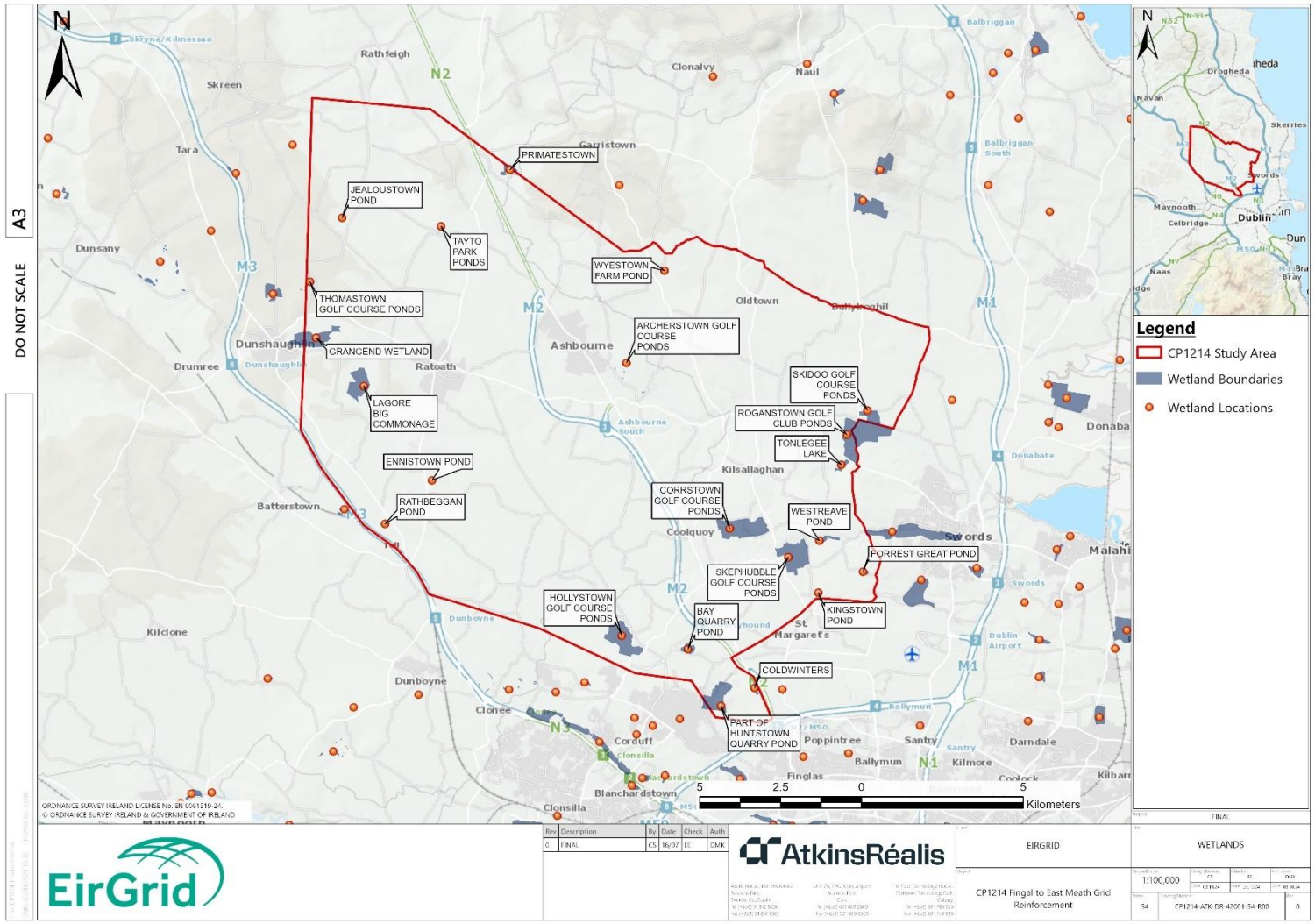

Figure 5-4 - Wetlands identified in the Study Area (WSI, 2024)

5.2.11 Potential Ecological Constraints

The aim of this constraints report is to establish an initial understanding of the baseline ecological conditions and to identify any ecological constraints from the proposed project (EirGrid, 2020). Electricity transmission line and underground cable projects are linear developments, and from an ecological perspective the anticipated effect of such developments are largely to birds, bats, water quality, aquatic environment, habitats and water (EirGrid, 2020). The Strategic Environmental Assessment for EirGrid's Grid Implementation Plan (IP) 2023–2028[51] highlights key considerations in relation to Biodiversity, Flora and Fauna. Relevant considerations highlighted with respect to the proposed (and future) work in this project are:

- Route selection and classification criteria are important in the development of the IP due to the largely linear nature of the developments associated with the IP;
- The potential for effects on non-designated biodiversity features e.g., important habitats and species outside designated sites - particularly in regard to fragmentation, barriers to movement and displacement;
- The potential for effects on protected areas: National and European sites (e.g., SAC, SPAs, Ramsar), National sites (e.g., NHAs) and other Natural Heritage Sites and Conservation Interest Sites e.g., refuge for fauna or flora, wildfowl reserves;
- The requirement for ecological protection can pose restrictions to existing/future transmission development;
- The potential to spread invasive species; and
- Potential for biodiversity enhancement.

Internationally and Nationally designated Sites for Conservation

AtkinsRéalis do not anticipate any ecological constraints associated with International and National designated sites for Conservation at Step 3 of project development. This is because there are no SACs, SPAs, NHAs or pNHAs within the Study Area.

There are 11no. SACs within 15 km of the Study Area[52].The QI Annex I Habitats for these SACs are coastal, dune, forest, bog/mires and heath habitat types. It is not anticipated there will be any ecological constraints associated with these Annex I QI Habitats for the SACs. Species that are also not expected to be ecological constraints, and are Annex II listed and QI for several of these SACs are harbour porpoise (*P. phocoena*), Petalwort (*P. ralfsii*), the narrow-mouthed whorl snail (*V. angustior)* and Desmoulin's whorl snail (*V. moulinsiana)*. However, river lamprey, Atlantic salmon and otter are all Annex II species (otter are also listed in Annex IV of the Habitats Directive) that are found within the Study Area and these records are all outside of designated sites. These species (amongst others) will need further consideration at Steps 4–6.

- There are 13no. SPAs within 15 km of the Study Area[53] and 44no. bird species listed as QI. Of the 44no. species listed as QI for the SPAs, 7no. bird species are listed in Annex I of the Birds Directive (little tern, little gull, bar-tailed godwit, golden plover, arctic tern, common tern and kingfisher). Furthermore, several bird species that are QI for these SPAs are also found within the Study Area as well as other Annex I species that are not QI for SPA (i.e., protected species outside of designated areas). Birds are discussed in greater detail below.

[51] EirGrid-SEA-Scoping-2022_Final_revised-for-consultation_CLEAN.pdf (eirgridgroup.com)
[52] Malahide Estuary SAC (000205), Rogerstown Estuary SAC (000208), Rye Water Valley/Carton SAC (001398), Baldoyle Bay SAC (000199), North Dublin Bay SAC (000206), Rockabill to Dalkey Island SAC (003000), South Dublin Bay SAC (000210), Ireland Eye SAC (002193), River Boyne and River Blackwater SAC (002299), Lambay Island SAC (000204) and Howth Head SAC (000202).
[53] Malahide Estuary SPA (004025), Rogerstown Estuary SPA (004015), South Dublin Bay and River Tolka Estuary SPA (004024), Baldoyle Bay SPA (004016), River Boyne and River Blackwater SPA (004232), Marine North-West Irish Sea SPA (004236), North Bull Island SPA (004006), Ireland's Eye SPA (004117), Skerries Islands SPA (004122), Howth Head Coast SPA (004113), Rockabill (004014) SPA and Lambay Island SPA (004069).

Article 17/Annex I Habitat

- There are 2no. known Annex I Habitat within the Study Area (Alkaline Fen [7230] and Atlantic Salt Meadows [1330]). Alkaline Fen habitat can be avoided through careful line selection in the next stages of the project. Atlantic Salt Meadow is found in the south-eastern corner of the Study Area. Given that spatial distribution data was available at the 10 km^2 grid square resolution for Atlantic Salt Meadow, it is possible this Annex I Habitat extends further into the Study Area than the discrete patch which has been identified immediately to the north of Dublin airport.
- Annex I Habitats directly adjacent to the Study Area (Alluvial Woodland 91E0) and Hydrophilous Tall-Herb Swamp (6430) are not expected to be an ecological constraint at this stage.
- No other Annex I Habitats were identified within the Study Area from the desktop study of available information. However, it is likely there are several unmapped Annex I Habitat within the Study Area and these certainly need further consideration. For example, undesignated Annex I Habitats in particular Petrifying springs (7220) and calcareous grassland (6210; both of which are priority habitats in the EU Habitats Directive) are identified by Fingal Council as "Core Areas" for the Ecological Network (FCC, 2023a) and are just some examples of the undesignated habitats that are to be expected within the Study Area.

According to Denyer et al. (2023): *"Petrifying springs are a specialised habitat that forms where calcareous waters deposit tufa (a porous rock made of calcium carbonate). The tufa formation may be small deposits around the bases of plants within the spring, or can comprise very large mounds and cascades. Petrifying springs are dominated by bryophytes (mosses and liverworts) and often support rare plant and animal species. They can occur in semi-natural habitats such as seepages on coastal cliffs, springs in upland fens and wooded springs, but are also found in artificial habitats such as quarries, water troughs, seepages on walls and in roadside ditches". As small, groundwater dependent wetland habitats, petrifying springs are very sensitive to changes in water quality and quantity and land management*".

"The ecological significance of petrifying springs is seldom confined to a point source; rather, there is often a continuum of intergrading hydrological conditions from the spring head, through a flushed slope and into small streams. Spring heads may be distinct point locations giving rise to small streams immediately below the point of emergence, or water may seep to the surface in a more diffuse pattern over a larger area" (NPWS, 2019a).

While petrifying springs are mainly found at the base of sedimentary sea cliffs in the northern part of the county (FCC, 2023a), and would therefore likely be outside of the extent of the Study Area, their presence within the Study Area cannot be discounted. Similarly, orchid-rich grassland is often found in the fixed dunes in Fingal and small fragments may exist in Fingal although they are typically associated with golf courses (FCC, 2023a). Other Annex I Habitats that may be within the Study Area include Hydrophilous Tall-Herb Swamp (6430), Alkaline Fens (7230) and Alluvial woodland (91E0). Vegetation of flowing waters [3260] is also undoubtedly found in rivers/streams within the Study Area.

The Fingal Biodiversity Plan states that for undesignated Annex I Habitats: *"Where development is proposed in or near Annex I Habitats, the development will have to demonstrate that it will have no significant adverse impact on the habitats of interest in these areas and their ecological integrity"* (FCC, 2023a).

Once route corridor options have been identified in Step 4, habitat surveys will be required given the uncertainty in undesignated Annex I Habitats within the Study Area.

Key Documented Species

There are several species listed in Annex II, IV and V of the EU Habitats Directive found throughout the Study Area including otter, several bat species, Atlantic salmon and lamprey. Many of these are dependent on aquatic habitats and/or the riparian corridors associated with aquatic environments. It is not possible at Step 3 of the project to resolve if these species are constraints and further consideration is needed at Steps 4–6. However, ecological corridors which

serve to enhance these species in Fingal is considered a key potential constraint for consideration and is discussed below.

Birds

Birds are considered one of the most vulnerable groups to electricity transmission infrastructure. Risks to birds include electrocution, collision and displacement/loss of habitat quality in breeding and wintering areas (EirGrid , 2016b). While the risk of electrocution from overhead transmission line of birds in Ireland is considered low, species considered to be disproportionately at risk of electrocution include larger species of raptor and wildfowl (swans and geese; EirGrid , 2016b). Large species such as swans, geese, and cranes are most at risk. Bird species considered 'poor fliers' such as grouse, pheasant, and rails are also at risk of collision (EirGrid , 2016b). Areas designated as SPAs for migratory waterfowl are particularly high risk as birds move about regularly in large groups between feeding and roosting areas (EirGrid, 2016b). In addition, high risk areas for birds which are close to waterbodies, river valleys and areas with large concentrations of birds (EirGrid , 2016b). Furthermore, species listed under Annex I of the EU Birds Directive (2009/147/EC), red listed birds of conservation concern (Gilbert et al., 2021), and migratory water birds are at particular risk when travelling between roosting/nesting and feeding sites.

Considering the proximity of the Study Area to several SPAs, hydrological connectivity to Natura 2000 sites (including SPAs) via surface water pathways within the Study Area, the identification of Annex I bird species within the Study Area as well as several bird species of conservation concern (i.e., red/amber conservation ranking) within the Study Area (Section 5.2.7), birds can be considered a key ecological constraint. Steps 4–6 in the project development process will undoubtably require more detailed consideration for bird species.

Ecological networks - Ecological corridors and connectivity

The delivery of the Ecological Network Across Fingal is one of the 6no. priority areas for action in the Fingal County Council Biodiversity Plan (2023–2030; FCC, 2023a) and about half all actions relate to the development and management of an Ecological Network across the area. The Ecological Network comprises four elements:

1. Core nature conservation sites. These are:
   a. Proposed designated sites under the EU Habitats (SAC) and Birds Directives (SPA).
   b. Proposed designated sites under the Irish Wildlife Act (NHA's).
   c. Sites with EU priority habitats listed in Annex I of the EU Habitats Directive.
   d. Marine habitat for EU marine priority species listed in Annex II of the EU Habitats Directive.
   e. Sites with nationally legally protected plant species under the Flora Protection Order and sites with Red Data Book and other nationally rare plant species.
2. Buffer zones around the core sites.
3. Nature development areas[54].
4. Ecological Corridors and stepping-stones.

A potential key constraint with this proposed project at Step 3 is with respect to ecological networks including ecological corridors and connectivity (Figure 5-5). Fingal (2023a) state that *"an ecological corridor is a functional passage between several nature conservation areas. Ecological corridors are usually linear landscape features such as rivers, hedgerows, open spaces and road verges. These corridors connect different populations and facilitate the spread and migration of species".* River corridors, their associated floodplains and adjoining farmland/parkland corridors are considered the most important ecological corridors in Fingal area and the Hurley, Ballyboghil, Ward,

[54] Nature development areas and areas and land-uses in the County with potential for biodiversity enhancement. These include Farmland Areas, Demesnes, Golf courses, Parkland, Quarries, Waterbodies, Areas suitable for newwoodland or forestry. These Nature Development Areas were not considered in this constraints report.

Broadmeadow and Tolka Rivers are all named Ecological Corridors in the Fingal Development Plan (2023–2029; FCC, 2023b). The purpose of these corridors is to protect the habitat of typical riverine species such as Otter, Trout and Salmon, Kingfisher, Dipper and Bats and to ensure free movement of terrestrial wildlife through the countryside and urban areas (FCC, 2023a). The Fingal Development Plan (FCC, 2023b) states that river corridors in Fingal should be a minimum of 48 m wide on either side of the river. Where the floodplain is wider than 48 m, the ecological corridors shall follow the line of the flood zone. The 96 m width extends along the main channel of all main rivers in Fingal but are wider where extensive floodplains occur along the river corridor[55].

The County Meath Development Plan (2021–2027) states: *"It is through the conservation of ecological infrastructure such as hedgerows and riparian corridors that we can develop a 'network of sites' to strengthen and enhance our green infrastructure. These allow for the migration and the exchange of species between conservation areas. To this end, and with a view to improving the ecological coherence of the Natura 2000 network, the Council will encourage the management of features of the landscape which are of major importance for wild fauna and flora".*

Objective HER OBJ 60 in the County Meath Development Plan (2021–2027) states:

"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".

Electricity transmission infrastructure is linear in nature akin to road and pipeline infrastructure (EirGrid, 2020) and the SEA for EirGrid's IP recognises the potential for fragmentation associated with linear infrastructure. A draft environmental objective as stated in the SEA document for grid implementation is:

B2 – *"Support Article 10 of the Habitats Directive with regard to the management of features of the landscape which – by virtue of their linear and continuous structure or their function as stepping-stones (designated or not) – are of major importance for wild fauna and flora and essential for the migration, dispersal and genetic exchange of wild species".*

Therefore, there is the potential that the proposed development could affect the integrity and function of ecological corridors and stepping-stones. Any development that intersects ecological corridors (such as rivers and or terrestrial/urban corridors) will likely compromise their integrity. Fingal (2023a) recognise that *"Preventing fragmentation of existing corridors that connect nature conservation areas is less expensive than having to restore connections in the future. It is therefore important that the existing corridors are protected from inappropriate development in the county development plan*" (FCC, 2023a). Ecological connectivity should be considered further in later stages of the project development process.

Ecology not considered at this stage on the project

Key features in the landscape requiring future consideration for Step 4 are the boundary hedgerows and river crossings. Treelines and rivers (including wooded riparian corridors) are some of the key ecological receptors requiring consideration. Furthermore, in urban areas, FCC aims to protect, develop and enhance terrestrial urban ecological corridors along existing linear features such as hedgerows where possible with a minimum width of 25 m (FCC, 2023b). These corridors comprise of a mixture of hedgerow, scrub, rank grassland, wildflower meadow, ponds, marshland and dead timber (FCC, 2023b). Urban ecological corridors will need consideration at later stages.

Green infrastructure (MCC, 2021; FCC, 2023b) and nature development zones (Figure 5-5; FCC, 2023b) were not explicitly considered at Step 3 (although nature development zones were included in the Heat Maps) but will need to be included in Steps 4–6. Green Infrastructure is a "strategically planned and managed network featuring areas with

[55] Tributary streams require a buffer zone of 10 m on either side of the stream.

high quality biodiversity (uplands, wetlands, peatlands, rivers and coast), farmed and wooded lands and other green spaces that conserve ecosystem values which provide essential services to society'.

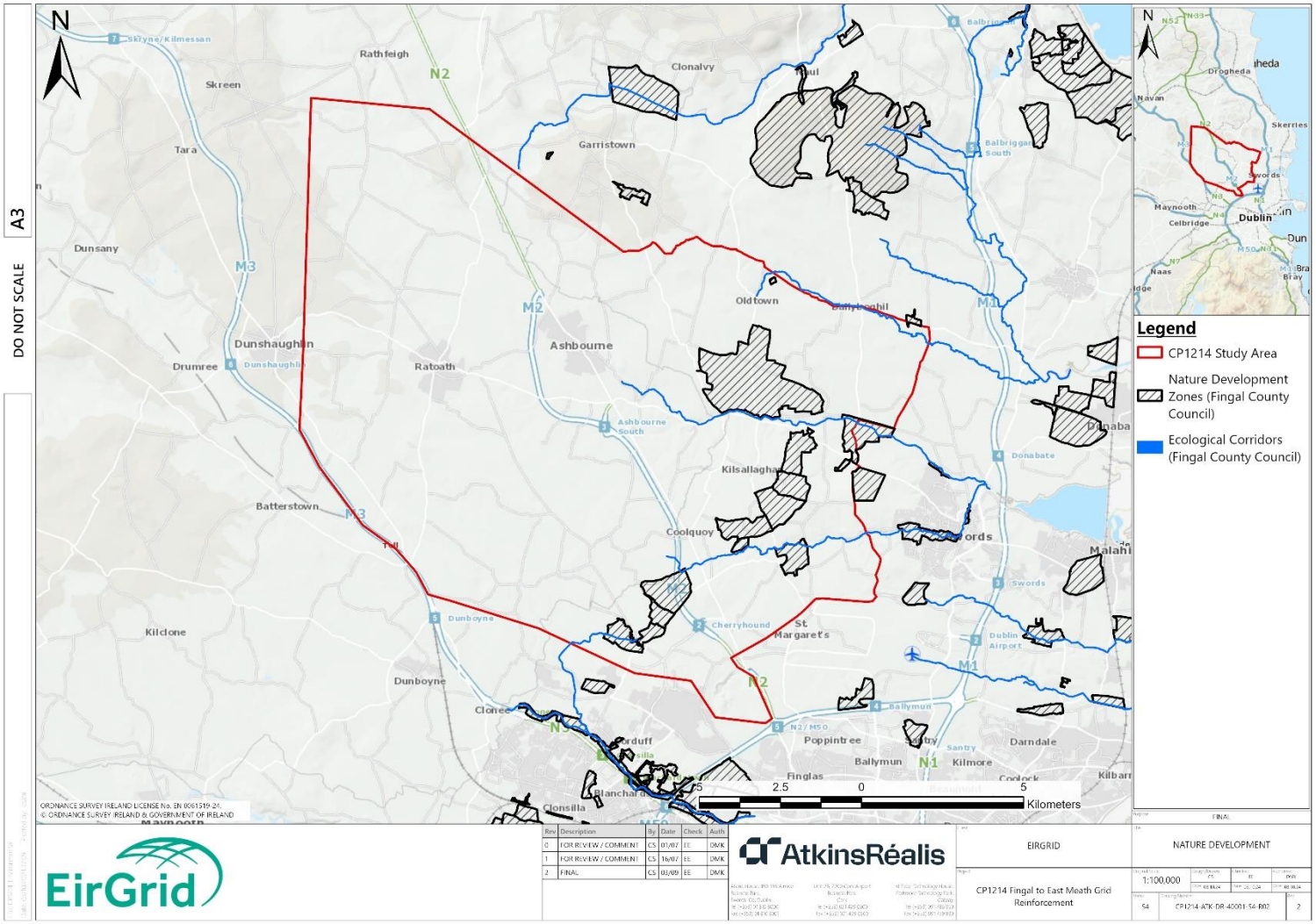

Figure 5-5 - Nature Development Zones and Ecological Corridors (Fingal County Council) identified in the Study Area

5.3 Land, Soils and Geology

5.3.1 Methodology

Publicly available information was reviewed from the following sources to identify potential land, soil and geology constraints in the Study Area:

- Geological Survey of Ireland (GSI, 2024),
- Geological Survey Ireland Spatial Resources[56]
- Environmental Protection Agency (EPA, 2024)[57];
- Fingal Development Plan (2023–2029); and,
- Meath Development Plan (2021–2027).
- EPA Extractive Industry Register and the GSI mineral database were consulted (January 2024) to determine whether there were/are any mineral sites within the study area.

5.3.2 Description of the Receiving Environment

5.3.2.1 Quaternary Sediments

The Study Area is largely underlain by limestone derived tills with minor portions of the following quaternary sediments:

- Till derived from Namurian sandstones and shales;
- Gravels derived from Limestones;
- Alluvium;
- Urban;
- Lacustrine sediments;
- Bedrock outcrop or subcrop; and,
- Cutover raised peat.

There is an area of cutover raised peat to the north of the study area. The presence of cutover raised peat has the potential to give rise to soft ground conditions. Deposits of alluvium are found within the vicinity of water courses. There is potential for Made Ground to be encountered beneath any lands which have previously been developed such as town centres, their environs and beneath existing roads. Depending on ground conditions and land use in these areas, the potential for contaminated ground will need to be considered. Furthermore, given the inherent heterogeneity associated with Made Ground, construction on such materials can give rise to soft ground conditions.

5.3.2.2 Teagasc Soils

The primary soil types as classified by Teagasc soils mapping (GSI, 2024), within the study area are:

- BminPD – Mineral poorly drained (Mainly basic)
- AminPD – Mineral poorly drained (Mainly acidic)

[56] Geological Survey Ireland Spatial Resources (arcgis.com)
[57] EPA Maps

- BminDW – Basic soils that are deep well drained
- AlluvMin – Mineral Alluvium
- BminSP – Shallow poorly drained mineral (Mainly basic)
- BminSW – Shallow well drained mineral (Mainly basic)
- Cut – Cutover/cutaway pea
- Lac – Lacustrine type soils
- AminDW – Deep well drained mineral (Mainly acidic); and,
- Made – Made Ground.

5.3.2.3 Bedrock Geology

The bedrock geology is predominantly underlain by Dark limestone & shale (calp) of the Lucan Formation. The northern section of the study area is underlain by Dark micrite & calcarenite, shale of the Loughshinny Formation, Shale, sandstone, limestone of the Walshestown Formation and a small portion of Calcarenite & calcisiltite of the Naul Formation (GSI, 2024). The southern section of the study area is underlain by Calcareous shale, limestone conglomerate of the Tober Colleen Formation, Argillaceous bioclastic limestone, shale of the Malahide Formation and Conglomerate, shale, limestone of the Rush Conglomerate Formation (GSI, 2024). There is a small portion of Massive un-bedded lime-mudstone of the Waulsortian Limestones Formation to the east of the study area. Portions of bedrock outcrop have been identified throughout the study area (GSI, 2024).

5.3.2.4 Karst

Karstification is a process whereby some of the pre-existing fissures and fractures in the limestone rock are slowly enlarged as groundwater passing through them dissolved away limestone. The main topographic features of karst areas are enclosed depressions, sinking streams, sparse or intermittent streams, bare rock exposures, collapse features, dry valleys, deep water tables in high topographic areas, caves and springs.

1no. karst feature has been identified within the study area; Borehole (GSI Reference: 2925SWK001), ca. 4 km north of Ashbourne town.

5.3.2.5 Landslide Susceptibility

The GSI provides a landslide susceptibility map which was created according to slope stability and spatial distribution of existing and potential landslides. Landslide susceptibility is predominantly ‘low’ within the study area (GSI, 2024). There are small portions of ‘low (inferred)’, ‘moderately low’ to ‘moderately high’ landslide susceptibility throughout.

5.3.2.6 Geological Heritage Areas

Geological heritage features are identified and classified by the GSI as geological features of county, national and/ or international importance.

There are 2no. County Geological Sites (CGS) located within the study area (GSI, 2024). Huntstown Quarry (Site code: DF022) is located in the southern section of the study area. Huntstown Quarry, under IGH theme: IGH 8 Lower Carboniferous, is a large working quarry which is a representative site for the Lower Carboniferous (Waulsortian) limestone with shale and micrite at the base of the Tober Colleen Formation (GSI, 2024).

A small portion of the Dunshauglin Quarry (Site code: MH026) is located in the western section of the study area. Dunshauglin Quarry (IGH theme; IGH 12 [Mesozoic and Cenozoic]) is unexposed at the surface and is a basin shaped body of silica derived from decalcified limestone, undated but possibly formed from Tertiary weathering (GSI, 2024).

5.3.2.7 Economic Geology

There is 1no. active quarry located within the study area; Huntstown Quarry (Quarry Number D 006), which is operated by Roadstone Limited for aggregates and fill materials. Processes within the quarry are excavation, blasting, crushing, grading etc (GSI, 2024).

There are also 3no. mineral locations (GSI, 2024) within the study area:

- Mineral Location Ref: 3032 located in Hunstown and described as 'non-metallic active quarry';
- Mineral Location Ref: 4778 located in Priest Town and described as ''non-metallic active quarry - disused limestone quarry'; and,
- Mineral Location Ref: 5596 located in Wyanstown and described as 'metallic'.

5.3.2.8 Landfills

There are no historic known landfills (EPA Certificates of Authorisation) within the study area.

5.4 Water

5.4.1 Methodology

A desk study was done to identify potential water-related constraints. The methodology and various data sources used are listed for hydrology, hydrogeology and flood risk below.

5.4.1.1 Hydrology (watercourses/waterbodies)

A review of watercourses and waterbodies within the study area was done using the EPA database of surface water features including rivers and lakes as well as water quality and risk status in accordance with the WFD (EPA, 2024). The purpose of the WFD is to protect and enhance all waters including rivers, lakes, estuaries, coastal waters and groundwater as well as water dependent wildlife and habitats. This involves improving or maintaining current water quality status with the aim of achieving 'good' water quality status for all waters; and mitigating against the risk of a decline in the water body quality status.

Datasets of watercourses and waterbodies were also examined from Ordinance Survey Ireland (OSI) databases. The OSI datasets include some additional small streams (not identified in EPA mapping) and field drains and ditches with connectivity to watercourses. The desk-based study involved reviewing information from the following sources:

- Environmental Protection Agency (EPA), 2024;
- Ordinance Survey Ireland (OSI); 2024;
- Geological Survey Ireland (GSI), 2024;
- Office Public Works (OPW), Flood Maps 2024;
- Meath County Development Plan (2021–2027); and,
- Fingal County Development Plan (2023–2029).

A review of any Drinking Water Rivers in accordance with European Communities (Drinking Water) (No. 2) Regulations 2007 (SI no. 278/2007) was also done (EPA, 2024).

5.4.1.2 Hydrogeology

Hydrogeology was reviewed using various databases and included reviewing groundwater bodies, groundwater vulnerability, groundwater abstractions and aquifer classification.

Groundwater vulnerability was reviewed for the Study Area. This is an indication of how easily the aquifer can become contaminated by human activity. It is dependent on the thickness and permeability of the overlying soils and depth to the water table. Groundwater vulnerability is organised into five categories: Low (L), Moderate (M), High (H), Extreme (E) and Rock at or near Surface or Karst (X). Groundwater vulnerability classification is primarily based on the permeability and thickness of subsoils (Table 5-4).

Table 5-4 - Groundwater vulnerability classification (GSI, 2020)

Depth to Rock (metres)	Hydrogeological Requirements for Vulnerability Categories				
	Diffuse Recharge			Point Recharge	Unsaturated Zone
	High Permeability (sand/gravel)	Moderate Permeability (sandy subsoil)	Low Permeability (e.g., clayey subsoil, clay, peat)	(swallow holes, loosing streams)	(Sand/gravel aquifers only)
0–3.0 m	Extreme	Extreme	Extreme	Extreme (30 m radius)	Extreme
3.0–5.0 m	High	High	High	N/A	High
5.0–10.0 m	High	High	Moderate	N/A	High
>10.0m	High	Moderate	Low	N/A	High
	(i) N/A= not applicable (ii) Release point of contaminants is assumed to be 1–2 m below ground surface (iii) Permeability classification relates to the engineering behaviour as described by BS5930 (iv) Outcrop and shallow subsoil (i.e., gravelly <1.0 m) areas are shown as a sub-category of extreme vulnerability (amended from Deakin and Daly (1999) and DELG/EPA/GSI (1999))				

A search of GSI groundwater well database was conducted to identify registered wells within the study area. Furthermore, the GSI maintains a record of groundwater abstractions consisting of wells and springs (although the database does not specify if the abstractions are currently operational). Additionally, data on groundwater abstractions used for group water schemes and public supply schemes, along with the designated groundwater source protection areas are maintained by GSI.

For aquifer classification in the Study Area, GSI databases were also used. The GIS has devised a system for classifying bedrock aquifers and gravel aquifers in Ireland based on the size and hydrogeological characteristics of these aquifers. The three main classifications for bedrock aquifers are Regionally Important Aquifers (R), Locally Important Aquifers (L) and Poor Aquifers (P), which are further subdivided based on the productivity of the aquifer. Gravel aquifers are classified as either Regionally Important (Rg) or Locally Important (Lg).

5.4.1.3 Flood risk

The Office of Public Works (OPW) guidance document for Flood Risk Assessments ensures that flood risk is a key consideration for developers, planning & regional authorities and the public in preparing and submitting development proposals. Fundamental to the Guidelines is the introduction of flood risk zoning and the classifications of different types of development having regard to their vulnerability. In the context of these guidelines, three flood zones are designated in the consideration of flood risk to a particular site (Table 5-5).

Table 5-5 - Definitions of Flood Zones

Flood Zone	Description
A	The probability of flooding from rivers and the sea is highest (greater than 1% or 1 in 100 for river flooding, or 0.5% or 1 in 200 for coastal flooding).
B	The probability of flooding from rivers and the sea is moderate (between 0.1% or 1 in 1000 years and 1% or 1 in 100 years for river flooding, and between 0.1% or 1 in 1000 year and 0.5% or 1 in 200 years for coastal flooding).
C	The probability of flooding from rivers and the sea is low (less than 0.1% or 1 in 1000 years for both river and coastal flooding). Flood Zone C covers all areas of the plan which are not in Zones A or B.

Figure 5-6 - Indicative Flood Zone Map (extract: The Planning System and Flood Risk Management)

Catchment Flood Risk Assessment Management (CFRAM)

The CFRAM maps show predictive flood extents based on a theoretical or designed flood event. The predictive modelling is completed for various Annual Exceedance Probabilities (%) or Return Periods (Year; Table 5-6).

Table 5-6 - CFRAM Flood Event Probabilities

Annual Exceedance Probability (%)	Odds of Occurrence in any Given Year	Return Period (Years)
10% (High Probability)	10:1	10
1% (Medium Probability) Fluvial/River Flood Maps	100:1	100
0.1% (Low Probability)	1000:1	1000

CFRAM Flood maps have been developed for the current scenario, and also for two potential future scenarios; the Mid-Range Future Scenario (MRFS) and the High-End Future Scenario (HEFS), taking into account the potential impacts of climate change and other possible future changes. For the purpose of this report, only the current scenario flood maps are examined.

5.4.2 Description of the Receiving Environment

5.4.2.1 Hydrology (watercourses/waterbodies)

The study area is located predominately within the Nanny-Delvin WFD Catchment Area (Catchment ID: 08), with a portion of the western section located within the Liffey and Dublin Bay WFD Catchment Area (Catchment ID: 09). There are numerous watercourses and waterbodies included within the OSI database. There are no lakes located within the study area. A list of surface water features within the study area are given in Table 5-7 (EPA, 2024).

There are no Drinking Water Rivers in accordance with European Communities (Drinking Water) (No. 2) Regulations 2007 (SI no. 278/2007) identified within the study area (EPA, 2024).

5.4.2.2 Hydrogeology

Groundwater Bodies: The study area is located within 4no. Groundwater Bodies (GWB):

- Swords GWB (European Code: IE_EA_G_011) in the southern area;
- Lusk-Bog of the Ring GWB (European Code: IE_EA_G_014) in the northern area;
- Dunshaughlin GWB (European Code: IE_EA_G_031) in the western area; and
- Dublin GWB (European Code: IE_EA_G_008) within the southern area.

The WFD groundwater quality status for the GWB's beneath the study area for the WFD period (2016–2021) are classified as 'good' (EPA, 2024).

Groundwater vulnerability: Groundwater vulnerability in the study area is predominately low, with groundwater vulnerability ranging from 'moderate, 'high', 'extreme' and 'rock at or near surface or karst' throughout the study area. The 'high', 'extreme' and 'rock at or near surface or karst' groundwater vulnerability may indicate that groundwater could potentially be vulnerable to contamination within some sections of the study area (GSI, 2024).

Aquifer Classification: There are no gravel aquifers underlying the study area (GSI, 2024). The study area is underlain by Locally Important bedrock aquifer (LI) which is Moderately Productive only in Local Zones within the southern portion of the study area, and most of the northern section is underlain by Locally Important bedrock aquifer which is Generally Moderately Productive (Lm; GSI, 2024). There is an area of poor bedrock aquifer which is Generally Unproductive except for Local Zones (Pl) underlain in both the north and south sections of the study area (GSI, 2024).

Groundwater Abstraction There are a number of registered wells located in the north and west of the study area (GSI, 2024). There is 1no. Public Supply Source Protection Area located in the north-eastern area of the study area Curragha Public Water Supply (GSI, 2024).

5.4.2.3 Flood Risk

There are 3no. rivers within the Study Area that have a High Probability flooding event (Ward River, Broadmeadow River and Ballyboghil River). These rivers have approximately a 1-in-a-10 chance of occurring or being exceeded in any given year. This is also referred to as an Annual Exceedance Probability (AEP) of 10%[58]. These rivers are also within Flood Zone A and Zone B of FCC Strategic Flood Risk Assessment[59]. Some areas within the study area are currently 'under review' (OPW, 2024). Flood Zone A and B are shown in Figure 5-9.

[58] Flood Maps - Floodinfo.ie
[59] Fingal Development Plan 2017-2023 - Strategic Flood Risk Assessment.pdf

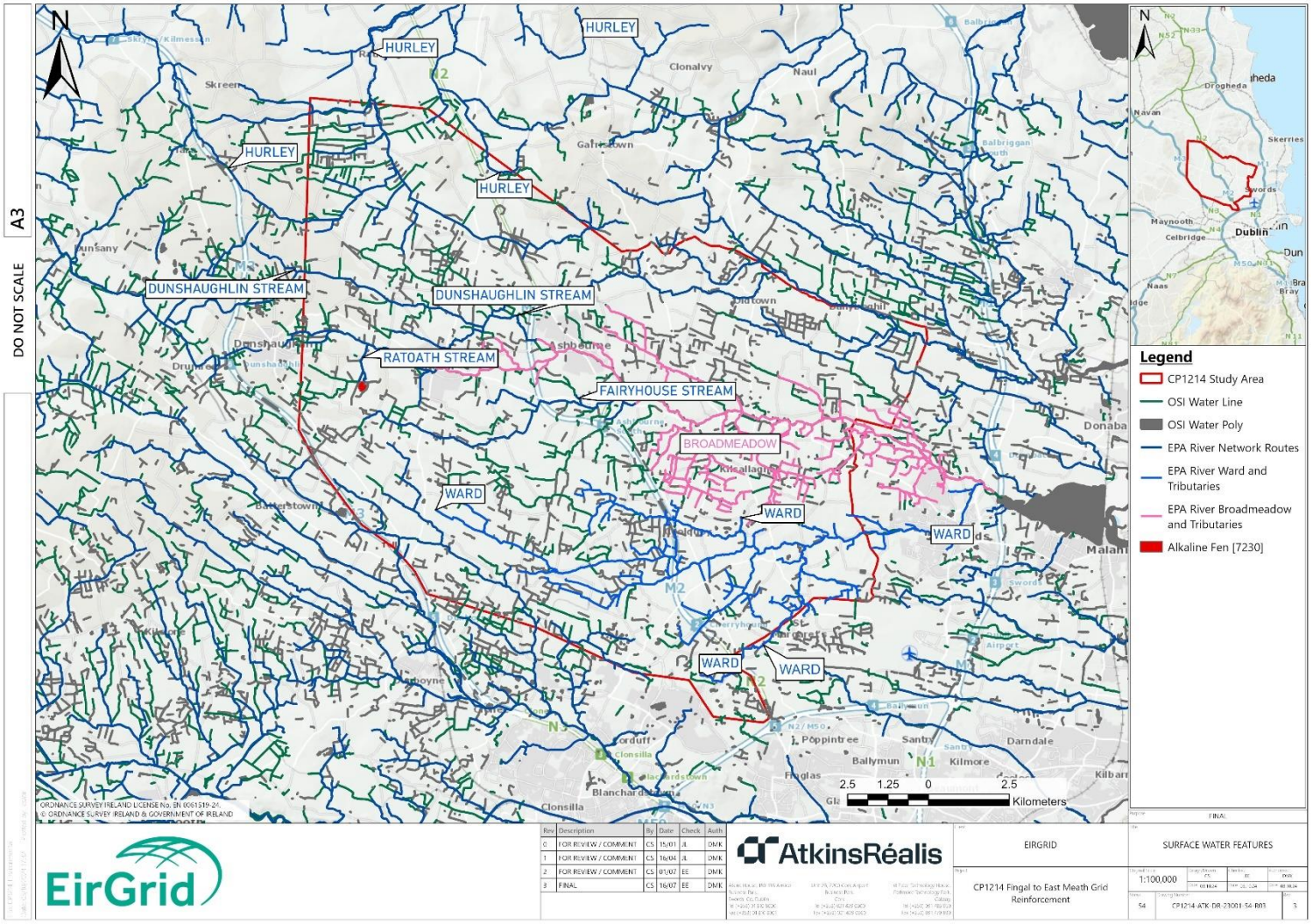

Figure 5-7 - Surface water features in the Study Area

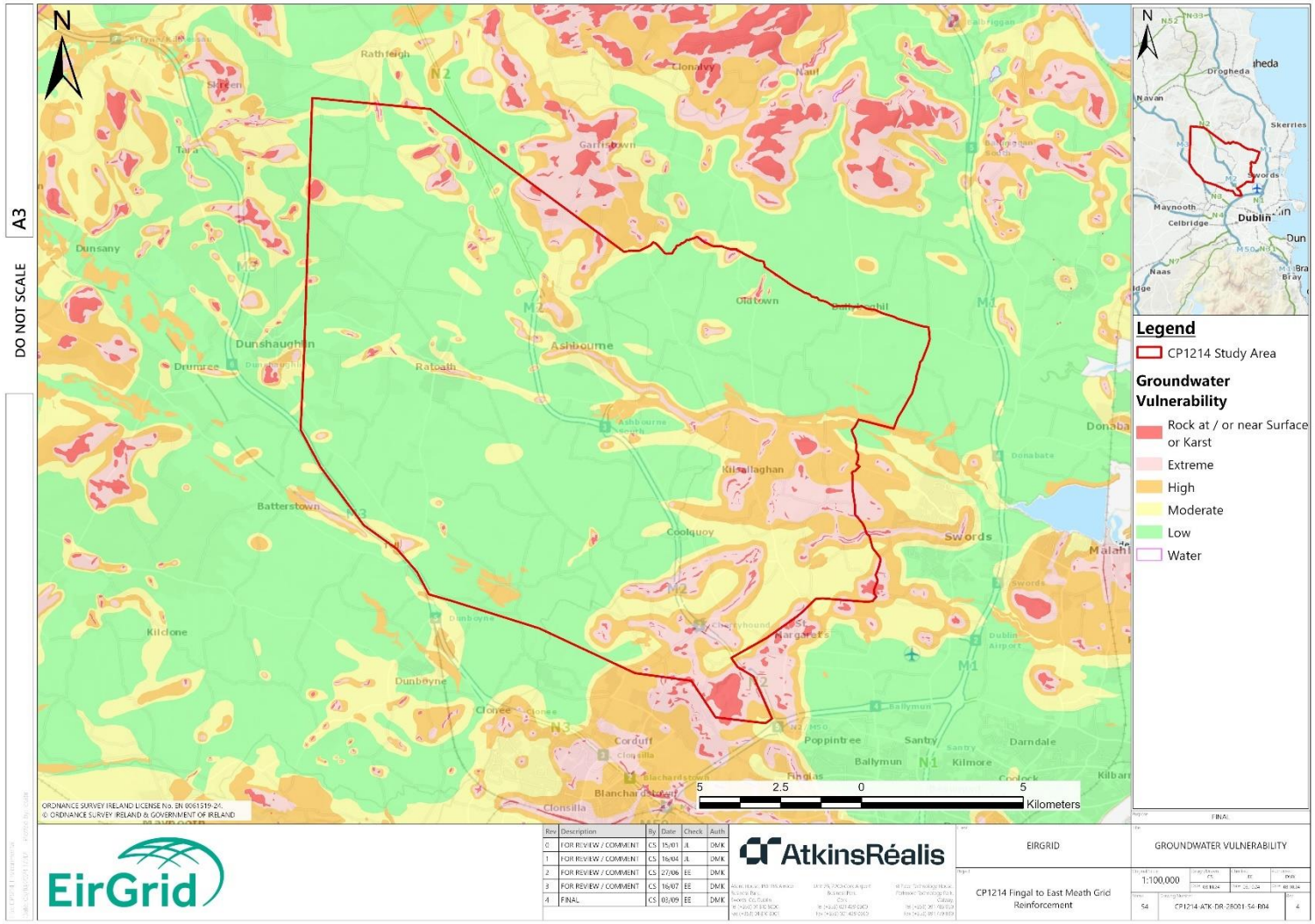

Figure 5-8 - Groundwater vulnerability in the Study Area

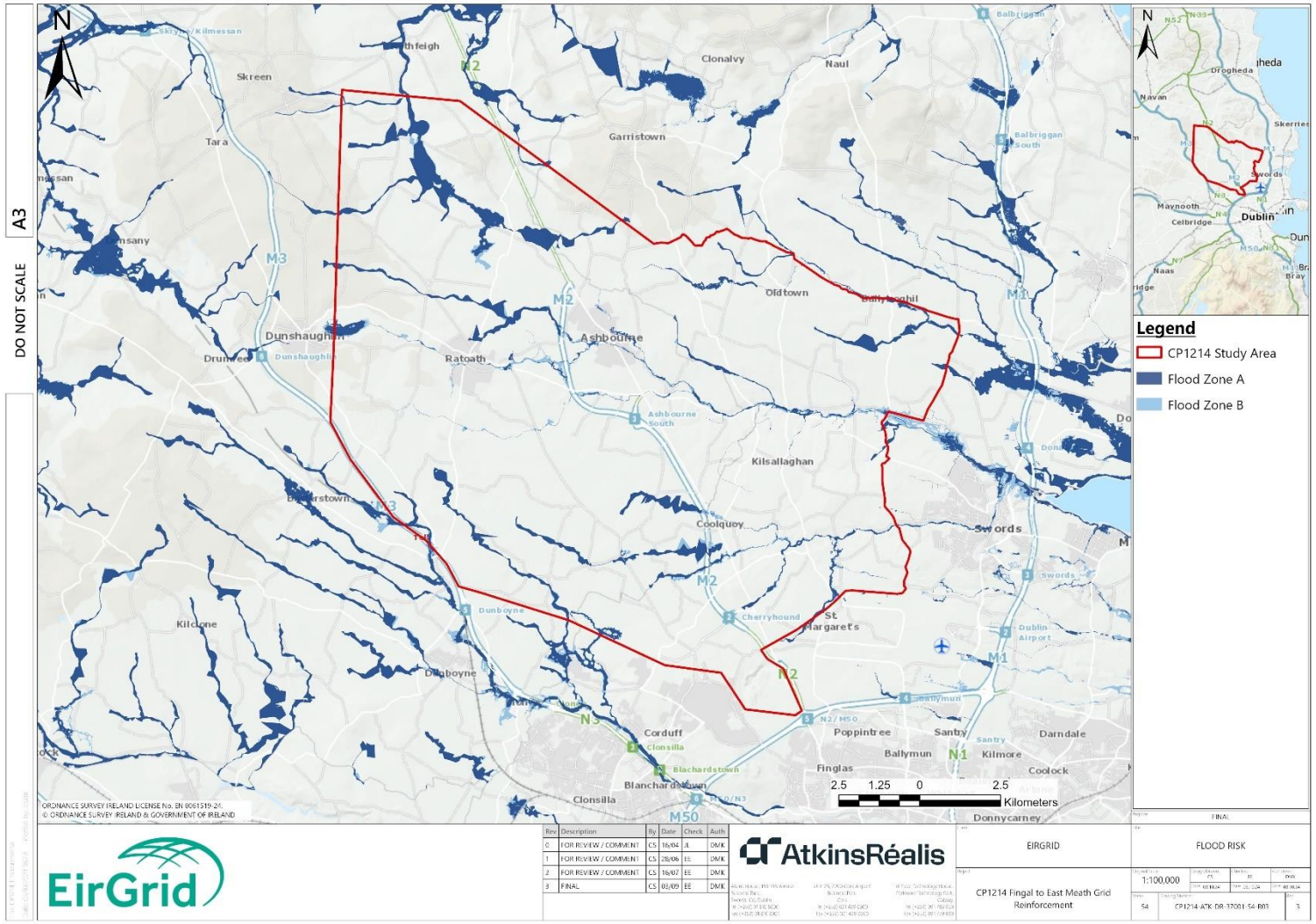

Figure 5-9 - Flood Zones A and B identified within the Study Area

Table 5-7 - EPA watercourses within the study area with designated WFD Status and Waterbody Risk

Waterbody Name	Code	Catchment	Waterbody WFD Status (2016–2021)	EPA assigned Waterbody Risk
BROADMEADOW_020	IE_EA_08B020600	08_Nanny-Delvin	Poor	At Risk
BROADMEADOW_030	IE_EA_08B020700	08_Nanny-Delvin	Moderate	At Risk
BROADMEADOW_040	IE_EA_08B020800	08_Nanny-Delvin	Poor	At Risk
BALLYBOGHIL_010	IE_EA_08B012200	08_Nanny-Delvin	Poor	At Risk
HURLEY_010	IE_EA_08H010200	08_Nanny-Delvin	Moderate	At Risk
HURLEY_020	IE_EA_08H010280	08_Nanny-Delvin	Good	Not at Risk
HURLEY_030	IE_EA_08H010400	08_Nanny-Delvin	Moderate	At Risk
DUNSHAUGHLIN STREAM_010	IE_EA_08D030300	08_Nanny-Delvin	Poor	At Risk
FAIRYHOUSE STREAM_010	IE_EA_08F010500	08_Nanny-Delvin	Good	Under Review
RATOATH STREAM_010	IE_EA_08R010150	08_Nanny-Delvin	Poor	At Risk
WARD_010	IE_EA_08W010050	08_Nanny-Delvin	Poor	Under Review
WARD_020	IE_EA_08W010070	08_Nanny-Delvin	Moderate	At Risk
WARD_030	IE_EA_08W010300	08_Nanny-Delvin	Moderate	At Risk
PINKEEN_010	IE_EA_09P020500	09 Liffey and Dublin Bay	Moderate	At Risk
TOLKA_010	IE_EA_09T010300	09 Liffey and Dublin Bay	Poor	At Risk
POWERSTOWN (Dublin)_010	IE_EA_09P210700	09 Liffey and Dublin Bay	Poor	At Risk
TURVEY _010	IE_EA_08T020700	08 Nanny-Delvin	Poor	At Risk

5.5 Material Assets

5.5.1 Methodology

A desktop review of material assets within the study area was done and utility information within the study area reviewed to establish locations of service infrastructure. Stormwater networks were not available at the time of writing.

5.5.2 Description of the Receiving Environment

5.5.2.1 Electricity

The ESB network consists of a mixture of overhead lines (OHL) and underground cabling (UGC) that distributes electricity around the country. There are numerous existing OHLs within the study area, as follows:

- There is 1no. 38 kV OHL located in the southeast section of the study area;
- There are 2no. 110 kV OHLs that run from north to south through the centre of the study area;
- There are 2no. 110 kV OHLs located in the southeast of the study area; and,
- There is 1no. 220 kV OHL located in the western section of the study area.

There are 5no. electrical substations within the study area, as follows:

- 110 kV substation Baltrasna;
- 38 kV substation Ashbourne;
- 110 kV substation Gallanstown;
- 220 kV substation Corduff; and
- 220 kV substation Huntstown.

There are a number of UGCs within the southern section of the study area; 220 kV, 110 kV and 38 kV.

5.5.2.2 Gas Networks Ireland

A review of the existing natural gas services within the study area was completed which revealed:

- There is 1no. high pressure centreline located to the north of the study area and runs north of Ashbourne and Ratoath;
- There is 1no. high pressure centreline located to the south of the study, along the R125;
- There is 1no. medium pressure centreline located to the north of the study area, along the R125, and runs through Ratoath town and Ashbourne town towards Swords town; and,
- There is 1no. medium pressure centreline located to the south of the study area within Hollywoodrath.

5.5.2.3 Uisce Éireann

Uisce Éireann is a state-owned company that manages the fresh water and foul water infrastructure of the state. There is a significant amount of Uisce Éireann infrastructure within the study area.

There are 10no. Pumping Stations within the study area:

- Hollystown Park Pumping Station
- Fairyhouse Road Pumping Station;
- Ashbourne Botlenecks Pumping Station;
- Powderlough Pumping Station;
- Ratoath Road Pumping Station;
- Cabinhill Pumping Station;
- Phibblestown Wood Pumping Station;
- Macetown Pumping Station;
- Mooretown/Oldtown Pumping Station; and,
- Dooroge Woods Pumping Station.

There are 7no. reservoirs within the study area:

- The Ward Tower Reservoir;
- Hollystown Reservoir;
- Yellow Walls Reservoir (East);
- Yellow Walls Reservoir;
- Roganstown Reservoir;
- Windmill Hill Reservoir; and,
- Cottrelstown Reservoir.

There are 2no. Water Treatment Plants (WPT) within the study area:

- Rath (Reservoir) WTP; and,
- Curragha WTP.

There are numerous sewer manholes, sewer stormwater and water distribution network within the study area, predominantly within Ratoath, Ashbourne, Sycamor housing estate, Ballyboughal, Oldtown, Toberburr housing estate, Hollywoodrath housing estate and Yellow Walls housing estate.

- There are 9no. discharge points within the study area:
  - Overflow discharge from Cherry Tree Drive WWNOC (Facility ID: SDP1001504);
  - Unknown (SW11-10\1:2500\1990) (Facility ID: SDP0000957);
  - Secondary Discharge Outfall from Toberburr WwTP (Discharge location: TPEFF0900D0024SW002) (Facility ID: SDP1000802);
  - Secondary Discharge Point for D0024-01 (Swords Agglomeration) (Discharge location: TPEFF0900D0024SW003) (Facility ID: SSTP0000803);
  - Outfall to open ditch culvert Unknown (Facility ID: SDP0000890);
  - Discharge point for Rowlestown Phase 1 (Facility ID: SDP0000959);
  - Primary Discharge Outfall for Oldtown WwTP (Discharge location: TPEFF0900A0106SW001 (Facility ID: SDP1000116);
  - Stormwater Overflow Outfall for Oldtown WwTP (Facility ID: SDP1001538); and,

- Outfall for Ballboghil Oldtown WwTP (Facility ID: SDP1001555).

There are gravity mains within Ratoath, Ashbourne and to the east and south of the study area.

There are 3no. Wastewater Treatment Plan (WwTP) is within the study area; Toberburr WwTP, Ballyboghil WwTP and Oldtown WwTP. Furthermore, there are several other water utility infrastructures within the study area.

5.5.2.4 Road Networks

Local, regional, and national road networks within the study area are:

- N2 / M2 runs in north-south direction through the study area;
- R125 runs in an east-west direction through Ratoath;
- R130 runs to the east of the study area;
- R122 runs to the northeast of the study area;
- R155 (Fairyhouse Road) which runs in a north-south direction from Ratoath;
- R135 runs through Ashbourne in a north-south direction through the study area; and,
- R147 runs to the west of the study area.

5.5.2.5 Airports

There are 2no. airports adjacent the study area:

- Dublin Airport is located adjacent to the study area to the west; and,
- Trevet Airport is located adjacent to the study area to the east within Dunshaughlin. This airport is a small airport with 1no. runway[60].

5.6 Air Quality

5.6.1 Methodology

A desktop review of the study area in relation to air quality was done using:

- Satellite Mapping (Google Earth, 2024);
- EPA Air Quality Monitoring Data (EPA, 2024); and
- EPA Maps of Licenced Facilities (EPA, 2024).

5.6.2 Description of the Receiving Environment

The existing environment within the study area is predominately rural in nature with urban areas such as Ashbourne, Ratoath and within the FCC administration area.

Four air quality zones have been defined in Ireland to assess and manage air quality (implemented under the Air Quality Standards Regulations 2011 [S.I. No. 180/2011] as amended [S.I. No. 659 of 2016]). The two key cities of

[60] https://metar-taf.com/EITT

Dublin and Cork have been classified as Zone A and Zone B respectively. Zone C comprises other cities and large towns across the country, with the remainder of the country (rural Ireland) classified as Zone D. The study area is split into 2no. zones, the majority of the study area is classified as '*Air Zone D: Rural Ireland'* and the southern section of the study area within the Fingal administration area is classified as *'Air Zone A: Dublin Conurbation* (EPA, 2024).

Air quality in each zone is assessed and classified (in accordance with upper and lower assessment thresholds as prescribed in the legislation for each pollutant) by the EPA. These pollutants are:

- Nitrogen dioxide (NO_2) – caused by traffic emissions, electricity generating stations and industry;
- Ozone (O_3) – a natural atmospheric component which acts as a greenhouse gas; and,
- Particulate Matter (PM) – air borne particles with a diameter of 10 µm (PM10) or 2.5 µm (PM2.5; predominantly caused by solid fuel burning and vehicular traffic).

Current ambient air monitoring data within the general area is summarised in Table 5-8.

Table 5-8 - Summary of Air Quality data in the general Study Area

Station Location	Station No.	Approximate distance from Study Area	Station Pollutants[61]				Current Air Quality[62]
			NO_2 µg/m³	SO_2 µg/m³	PM_{10} µg/m³	$PM_{2.5}$ µg/m³	
Blanchardstown	29	3.1 km Southwest	53.56	n/a	11.89	3.59	Good
Dublin Airport	55	2.6 km East	4.27	2.36	6.81	4.49	Good
Swords	61	3.1 km East	17.8	17.8	8.18	3.31	Good
Navan	68	13.5 km Northwest	65.68	n/a	9.11	6.72	Good

5.6.2.1 Meteorological data

Prevailing meteorological conditions are a key factor in assessing temporal and spatial variations in air quality. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e., traffic levels). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted.

In relation to PM_{10} (particulate matter less than 10 µm), the situation is more complex due to the range of sources of this pollutant, and thus measured levels of PM_{10} can be a non-linear function of wind speed. The nearest representative weather station collating detailed weather records is Dublin Airport meteorological station. Dublin Airport met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period. For data collated during five representative years (2018–2022), the predominant wind direction is westerly to south-westerly with a mean wind speed of 5.3 m/s over the period 1981–2010 (Met Éireann, 2024).

[61] The average Station Pollutant levels were obtained between 9th August 2023, 4th January 2024 and 12th January 2024 (https://airquality.ie/).
[62] Current air quality is based on continuous data recorded over a 24hour period (https://airquality.ie/: last accessed on 12/01/2024).

5.7 Noise and Vibration

5.7.1 Methodology

A desktop review of the proposed study area in relation to noise and vibration was informed using:

- Transport Infrastructure Ireland National Strategic Noise Maps (TII, 2021[63]); and,
- Environmental Protection Agency Maps (EPA, 2024).

5.7.2 Description of the Receiving Environment

The primary source of noise in the constraints study area and its surrounds (TII, 2021; EPA, 2024) are the main road networks which include the following:

- N2/M2 runs in north-south direction through the study area;
- R125 runs in an east-west direction through Ratoath;
- R130 runs to the east of the study area;
- R122 runs to the northeast of the study area;
- R155 (Fairyhouse Road) which runs in a north-south direction from Ratoath;
- R135 runs through Ashbourne in a north-south direction through the study area; and,
- R147 runs to the west of the study area.

Dublin Airport is located to the west of the study area and is also considered a source of noise within the study area.

Trevet Airport is located adjacent to the study area to the east within Dunshaughlin which is also a potential noise source within the study area. This airport is a small airport with 1no. runway[64].

Based on available baseline noise mapping (TII, 2021; EPA, 2024) the majority of the noise sources from roads is from the M2/N2 which reports daytime (Lden) noise levels and night-time (Lnight) noise levels greater than 75 dB, also there is noise emission associated from the M3, which is outside the study area. However, the reported daytime (Lden) noise levels and night-time (Lnight) noise levels are within the study area; noise levels ranging from 55–60 dB to greater than 65–70 dB during the day from the M3. Furthermore, there are local and regional roads within the study area which create noise emissions.

There is a potential vibration source from operations at Huntstown Quarry located in the southern section of the study area (GSI, 2024).

5.8 Landscape and Visual

This section provides a description of the receiving environment with respect to landscape and visual considerations and potential landscape and visual constraints which should be considered within the study area.

[63] Strategic noise maps are made every 5 years by noise mapping bodies designated under the European Communities (Environmental Noise) Regulations, S.I. No. 549 of 2018, which transposed EC Directive 2002/49/EC into Irish legislation. These strategic noise maps were prepared for Round 4 (2022), representing the annual average situation during 2021.
[64] https://metar-taf.com/EITT

5.8.1 Methodology

A desk-based review of information from the following sources was done:

- Environmental Protection Agency (EPA) 2024;
- National Landscape Strategy for Ireland (2015–2025)[65]; and
- Development Plans (DP) and County Development Plans (CDP):
  - Fingal Development Plan (2023–2029);
  - Meath County Development Plan (2013–2019); and
  - Meath County Development Plan (2021–2027).

5.8.2 Description of the Receiving Environment

The study area is located within the Fingal County Council (FCC) and Meath County Council (MCC) areas. Both FCC and MCC have formally documented Landscape Character Assessments (LCA) within their County Development Plans (CDP) and have classified landscape within their administrative areas based on their values and sensitivities[66]. The LCA for Meath was prepared as part of the CDP (2013–2019).

5.8.2.1 Local Landscape Character Area and Sensitivity Assessment

5.8.2.1.1 Fingal Development Plan (2023–2029)

There are 6no. Landscape Character Types (LCT) identified in the LCA for Fingal DP. Each character type has been given a value through the consideration of elements such as aesthetics, ecology, historical, cultural, religious or mythological. A value can range from low, medium, high and exceptional. The following LCT[67] have been identified:

- 'High Lying Agriculture' LCT in the northeast which is classified as high landscape sensitivity with high landscape value;
- 'River Valleys and Canals' LCT in the southern section which is classified as high landscape sensitivity with high landscape value; and,
- A mixture of 'Rollings Hills with tree belts' and 'Low Lying Agriculture' LCT make up the remaining portion of the study area within Fingal Local Authority which are classified as medium landscape sensitivity and low landscape sensitivity respectively, with both classifying as modest landscape value.

5.8.2.1.2 Meath County Development Plan (2013–2019)

As LCA was produced for the Meath CDP (2013–2019) which identifies 4no. LCT within the boundaries of the Study Area that are in County Meath which are: Lowland Landscapes within areas of Low, High and Very High LCA and ranging from Moderate to High sensitivity, with moderate to high sensitivity[68].

[65] https://www.gov.ie/en/publication/8a59b-national-landscape-strategy/
[66] The LCA for Meath was prepared as part of the CDP (2013–2019) and so this outdated development plan was referenced.
[67] https://www.arcgis.com/apps/webappviewer/index.html?id=b97f2adda903489cadb77378565df29b
[68] consult.meath.ie/en/system/files/materials/33/Appendix 5-landscape-character-assessment-maps_0.pdf

5.8.2.2 Protected Views

There are numerous listed protected views and prospects in County Meath which range from local, regional, national and international significance (Meath CDP, 2021–2027)[69]. There are also a number of mapped preserved views within Fingal County (Fingal CDP, 2023–2029).

5.8.2.3 Tree Preservation Orders

Tree Preservation Orders (TPOs) may be made under Section 205 of the Planning and Development Act 2000, (as amended). A TPO can be made if it appears to the Planning Authority to be desirable and appropriate in the interest of amenity or the environment and can apply to a tree, trees, group of trees or woodland.

There is 1no. location with a Tree Preservation Order (TPO) at Brackenstown/Brazil. There are no TPOs in the MCC administration area within the study area[70].

5.9 Cultural Heritage

5.9.1 Methodology

The desk-based assessment examined archaeological, architectural and cultural heritage features within the study area.

- Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs Historic Environment viewer databases[71] including:
  - National Monuments Service (NMS);
  - National Monuments Service – Zones of Notification (ZoN);
  - National Inventory of Architectural Heritage (NIAH);
  - Sites and Monuments Record (SMR); and
  - Record of Monuments and Places (RMP).
- Ordnance Survey of Ireland historical maps and aerial photography including:
  - Historic 6" maps 1913,72
  - Historic 6" map 191473
  - Historic Map 191574
- County Development Plans:
  - Fingal County Development Plan (CDP) (2023–2029); and
  - Meath County Development Plan (CDP) (2021–2027).

Cultural Heritage Features identified are shown in Figure 5-10.

[69] A.10 Protected Views and Prospects | Meath County Council Online Consultation Portal
[70] Layout: Tree Preservation Orders Map 9.3 (meath.ie)
[71] Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, 2020. Historic Environment Viewer. Available at: https://webgis.archaeology.ie/historicenvironment/ Accessed 21/12/23
[72] https://webservices.archaeology.ie/arcgis/rest/services/NM/RMP/MapServer/0/939/attachments/897 Accessed 21/12/23
[73] https://webservices.archaeology.ie/arcgis/rest/services/NM/RMP/MapServer/0/943/attachments/901 Accessed 21/12/23
[74] https://webservices.archaeology.ie/arcgis/rest/services/NM/RMP/MapServer/0/1387/attachments/1343 Accessed 21/12/23

5.9.2 Archaeological Features (National Monuments)

There are +350no. SMR listed features within the study area including clusters of features in the towns of Ashbourne, and Ratoath, and along the M2. There are also large numbers of archaeological features spread across the southeast section of the study area, just north of Dublin Airport.

The towns of Ratoath and Killsallaghan are both within large Zones of Notification (ZoN). Sites within Ratoath include a church (ME044-034003-), graveyard (ME044-034017-), font (ME044-034002-) and cross (ME044-034008-). Numerous excavations have taken place in Ratoath (ME044-034013-, ME044-034009-, ME044-034016-). Sites within Kilsallaghan include a church (DU011-011001-), castle-tower house (DU011-011004-) and battlefield (DU011-100----) (NMS, 2024).

National monuments within state care and include those which are in the ownership or guardianship of the Minister for the Environment, Heritage and Local Government[75]. There does not appear to be any National monuments in State care within the study area[76].

5.9.3 Architectural Heritage Features

There are ca. 30no. NIAH listed features within the study area, with the largest cluster situated in Ratoath, Co. Meath. There are 12no. NIAH listed features within Ratoath, which includes: Holy Trinity Catholic Church (NIAH No. 14336006), a church outbuilding (NIAH No. 14336008) and a curate's house (NIAH No. 1436007).

There are 4no. NIAH listed features within the town of Rowlestown: Rowlestown House (NIAH No. 11327007), farm (NIAH No. 11327006), graveyard (NIAH No. 11327005) and Saint Brigid's Catholic Church (NIAH No. 11327001). These sites are within an important Architectural Conservation Area (ACA).

Being listed in the NIAH database does not ensure legal protection: *These structures are protected by being included on the Record of Protected Structures (RPS) which each local authority is required to maintain as part of its Development Plan* (NIAH, 2023).

Some of these features are also listed in the Fingal DP and Meath DP Record of Protected Structures (RPS). To understand the difference between the NIAH and RPS, it should be noted that: *The purpose of the NIAH is to identify, record, and evaluate the post-1700 architectural heritage of Ireland, uniformly and consistently as an aid in the protection and conservation of the built heritage. NIAH surveys provide the basis for the recommendations of the Minister for Housing, Local Government and Heritage to the planning authorities for the inclusion of particular structures in their Record of Protected Structures (RPS)…… The RPS is a mechanism for the statutory protection of the architectural heritage and forms part of each local authority's development plan*[77].

5.9.4 County Record of Protected Structures

Features listed in the Fingal DP (2023–2029) and Meath DP (2021–2027) RPS are spread across the study area, with the largest cluster situated in Ratoath, Co. Meath. There are over 50no. RPS listed features within the study area, many of which are also listed in the NIAH. There are clusters of RPS within Meath CDP listed features in Ashbourne and Ratoath, and Fingal CDP listed features in Fieldstown and Rowlestown. Listed features in Ashbourne include a graveyard (RPS No. 91456) and Parish Hall (RPS No. 91455). Listed features in Fieldstown include St. Catherine's Well (RPS No. 327), St. Catherine's Church (RPS No. 326) and Fieldstown Bridge (RPS No. 902). There is one ACA

[75] https://data.oireachtas.ie/ie/oireachtas/debates/questions/supportingDocumentation/2020-07-28_pq282-28-07-20_en.pdf Accessed 21/12/23
[76] https://www.archaeology.ie/national-monuments/search-by-county Accessed 21/12/2023
[77] https://www.buildingsofireland.ie/about-us/

within the site. Rowlestown is listed as an ACA in the Fingal CDP (2017–2023)[78]. RPS listed features within this ACA, include Rowlestown Bridge (RPS No. 333), and a Mill Complex and Miller's House (RPS No. 334).

Architectural Conservation Areas and Record of Protected Structures for Meath Council County are not included within the Heat Map and Constraint Maps[79].

[78] https://data.fingal.ie/datasets/development-plan-2017-2023-aca-architectural-conservation-area-fcc/explore?location=53.470562%2C-6.285764%2C12.22
[79] Information needs to be acquired from the local authority.

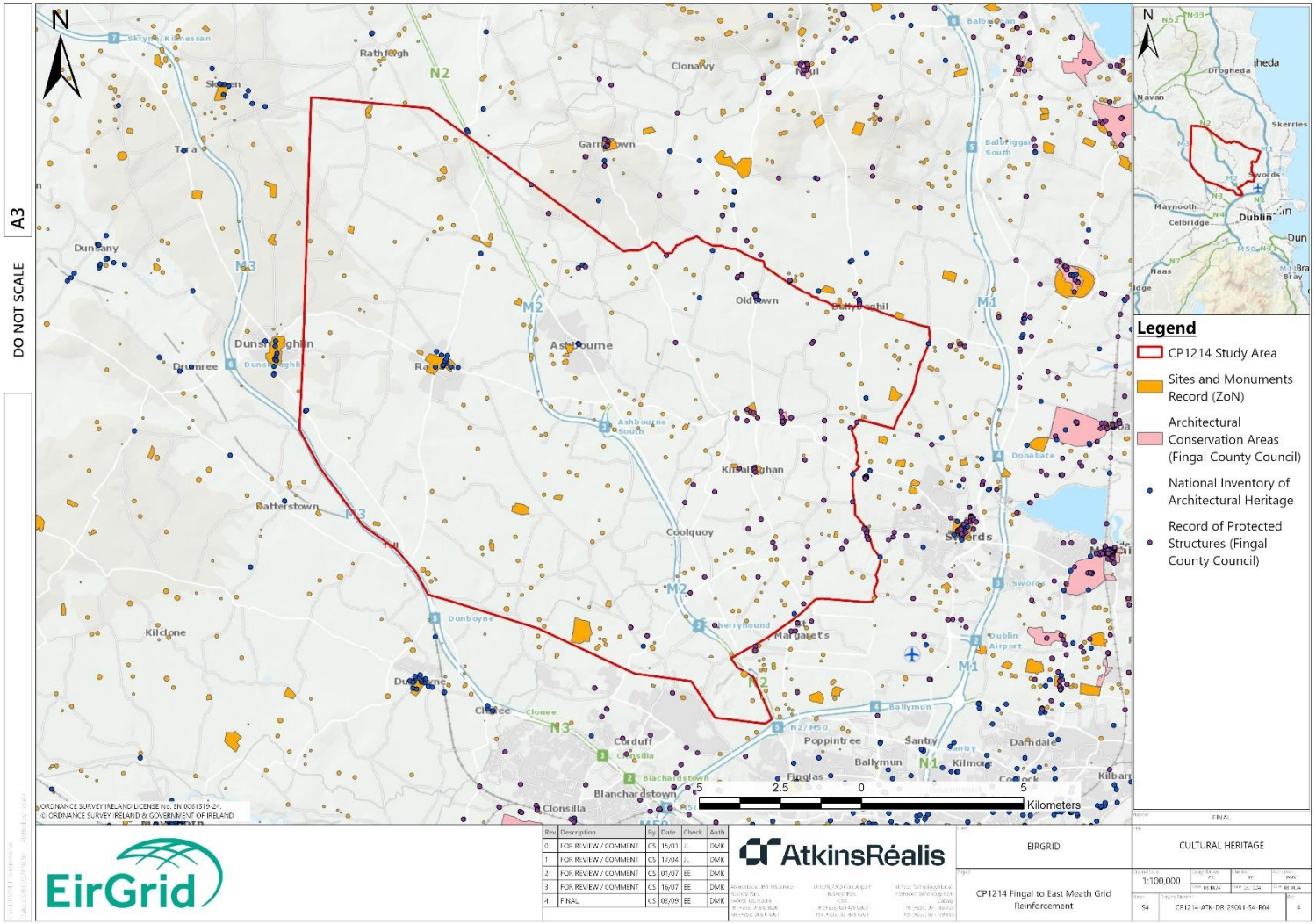

Figure 5-10 - Cultural Heritage features in the Study Area

6. Planning

A review of planning applications was undertaken in January 2024 as part of this constraints report to review developments that have been consented but not yet constructed. Also, a review of any major infrastructure developments and/or strategic plans or projects which are in the pre-planning stages e.g., MetroLink or have applied for planning but not yet consented was carried out. This review was completed using FCC's online planning viewers, MCC's online planning viewers, An Bord Pleanála[80] website, Transport Infrastructure Ireland website[81], Uisce Éireann[82], MyPlan[83] and google searches.

6.1 Future EirGrid Projects

EirGrid provided details of their known future projects within the study area which include:

- East West Interconnector 400 kV Under Ground Circuit; and,
- CP1021 East Meath-Dublin North 400 kV Under Ground Circuit.

EirGrid submitted the planning application (2360249) to the local authority on the 31st of August 2023. The proposed development is for the consent and approval of the Electricity Supply Board (ESB) that intends to apply to Meath County Council for permission for works associated with the proposed uprate of the existing Louth – Woodland 220 kV overhead line (OHL) between the existing Louth 220 kV substation in the townland of Monavallet, County Louth and the existing Woodland 220 kV substation in the townland of Woodland, County Meath. The Louth–Woodland 220 kV OHL is approximately 61.5 km long and comprises 207no. steel lattice tower structures. The existing circuit is located within the functional area of Louth County Council and Meath County Council. Approximately 38.5 km of the existing OHL circuit is located within the functional area of Meath County Council and approximately 23 km is within the functional area of Louth County Council.

6.2 Wind Farm Developments

The North Irish Sea Array is a proposed wind farm development[84] which is currently at the design stage and is proposed to include ca. 35–46 turbines that will connect to the Belcamp Station.

[80] https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1
[81] https://www.tii.ie/projects/
[82] https://www.water.ie/projects/
[83] https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=9cf2a09799d74d8e9316a3d3a4d3a8de
[84] https://northirishseaarray.ie/the-project/project-details/

Table 6-1 - Significant Projects within the Study Area

Applicant	Ref. No.	Location	Lodge Date (if appliable)	Description	Decision / Status of Project
Lightsource Renewable Energy Ireland Ltd.	AA181386	Muckerstown, Co. Meath	21/11/2018	A 10-year planning permission for a solar farm at this site in the townland of Muckerstown, Co. Meath. The development will consist of the construction operation and decommissioning of a photovoltaic solar farm comprising photovoltaic panels on ground mounted frames, a 38 kV DNO/Customer substation, GRP cabinet, inverter stations, switchgear substations, field transformers, auxillary transformer, monitoring house communications building, single storey storage shed, Battery containers, WC, Fencing, temporary construction compound, internal access tracks, CCTV Cameras, improvements to the existing entrance, underground cabling, landscaping, and all ancillary development works.	Granted permission – 24/01/2019
Collegian Property Limited	PL17.301151	Harlockstown, Ashbourne, Co. Meath.	14/03/2018	10-year permission for construction of a solar farm and all ancillary and associate site works.	Granted permission - 11/12/2018
JBM Solar Developments Ltd.	ABP - PL17.301023 (RA170644)	Fidorfe, Grange and part of Rathoath Manor, Co. Meath	23/02/2018	Solar PV Energy Development and all ancillary and associated site works.	Granted permission - 12/12/2018
JBM Solar Developments Ltd.	AA170600	Ballymacarney and Part of Baytown, The Ward, Co. Meath	30/05/2017	the development will consist of a 10 year permission for the construction of a Solar PV Energy Development comprising installation of Solar Photovoltaic (PV) panels on ground mounted frames/support structures within existing field boundaries; underground cabling and ducting; 21 no. inverter/transformer stations, 21 no. HV Cabins; 1 No. 110 kV Substation and associated infrastructure on hard standing inside palisade security fence; 2 no. customer control buildings (1 no. including associated hard standing adjoining the ESB Substation); 1	Granted permission - 02/01/2018

Applicant	Ref. No.	Location	Lodge Date (if appliable)	Description	Decision / Status of Project
				no. communications cabin; site perimeter (stock proof) security fencing (c. 74.54 hectares).	
Ballymacarney Renewable Energy Ltd.	300230-17 - F21A/0607	Kilsallaghan, Co. Dublin	05 Apr 2022 (F16A/0562 – previous in 20/09/17)	The proposed development seeks to amend the solar farm permitted on the site under ABP Ref. 300230-17; FCC Reg. Ref F16A/0562 and consists of a revised solar PV panel arrangement resulting in a decrease to the overall panel footprint extent; a reconfigured internal access route network resulting in a decrease to the overall network length; revised inverter/transformer types and arrangements; revised CCTV arrangement relocation of a permitted communications cabin; omission of 2 no. permitted substations; provision of a 1 no. spare parts container and 3 no. weather station poles; and all other ancillary works associated with the development above and below ground. F16A/0562: Development on a site of circa 42.58 hectares. The development will consist of a 10-year permission for the construction of a Solar PV Energy Development comprising installation of photovoltaic panels on ground mounted frames/support structures within existing field boundaries; underground cabling and ducting; 9 No. inverter/transformer stations with 6 No. HV Cabins; 1 No. communications and storage structure; 2 No. substations; perimeter (stock proof) security fencing; CCTV security cameras; site access tracks; landscaping and all associated ancillary site development works. A Temporary construction compound will also be provided.	Granted permission – 29/02/22
Raymond Coyle and Michael McDermott	ABP - PL17.301049	Reask, Ashbourne, Co. Meath.	27/02/2018	10-year permission for the construction of an up to 35MW solar photovoltaic (PV) farm.	Granted permission - 11/02/2019

Applicant	Ref. No.	Location	Lodge Date (if appliable)	Description	Decision / Status of Project
Energia Solar Holdings Ltd.	ABP - PL17.31 1066 (21180)	Mullinam, Paddock & Loughlinstown, Ratoath, Co. Meath	09/08/2021	Permission for a Solar PV Energy Development.	Granted permission - 31/05/2022
Killrue Solar Park Ltd.	PL17.31 1831 (21837)	Kilrue, Fleenstown Great, Peacockstown & Harlockstown Townlands, Kilbride, Co. Meath	01/11/2021	10 year planning permission the construction of, and a 40 year operation and subsequent decommissioning of a development consisting of a 265.8 hectare solar farm.	Granted Permission - 15/08/2022
Solar Farmers Limited (Part of Energia Group)	ABP - PL17.31 3032	On lands at Ballybin (E.D. Kilbrew), Ashbourne, Co Meath	16/03/2022	Solar PV Energy Development, to include solar panels mounted on steel support structures, associated cabling and ducting, 5 No. MV Power Stations, 1 No. Client Substation, 1 No. Temporary Construction Compound, access tracks, hardstanding area, boundary security fencing and security gates, CCTV, landscaping and ancillary works.	Granted permission - 04/01/2023
Dublin County Board GAA	FW22A/0 098	Townlands of Hollystown and Yellow Walls, On part of the former Hollystown golf course lands, Ratoath Road, Hollystown, Dublin 15, D15 C6258.	25/05/2022	A 10 Year permission for development of a site of c 9.3ha in the townlands of Hollystown and Yellow Walls on part of the former Hollystown Golf Course lands, Ratoath Road, Hollystown, Dublin 15, D15 C6258.	Granted permission -06/01/2023
Uisce Éireann	ABP - PA29S.3 01798	Ringsend Wastewater Treatment Plant, Pigeon House Road, Dublin 4 and Newtown, North Road (R135), Dublin 11	06/06/2018	10-year permission for development of the Ringsend wastewater treatment plant upgrade project including a regional biosolids storage facility.	Granted permission - 24/04/2019
Private	F17A/07 46	Jordanstown & Wolganstown, Oldtown, Co Dublin	13/12/2017	Permission to construct 4 No. Poultry Houses together with roofed/enclosed service yard, 1 No. office, 1 No. Generator Store, and 1 No. Bin/General Purpose Store along with all ancillary structures (to include gas storage tanks, soiled water tanks, meal storage bins, etc.) and associated site works (to include upgrading the existing	Granted permission – 30/06/2018

Applicant	Ref. No.	Location	Lodge Date (if appliable)	Description	Decision / Status of Project
				agricultural site entrance and internal laneway) associated with the above development.	
Earlsland Corporation Unlimited Company	FW22A/0066	A site (known as site A), located to the north of Northwest Logistics Park, (NWLP), Ballycoolin, Dublin 15	07/04/2022	Construction of a high technology manufacturing unit (for the manufacturing of high technology electrical components), with a total gross floor area (GFA) of c. 23,600sq.m (including ancillary office space of c. 2,318 sq.m) and associated development.	Granted permission - 01/06/2022
ESB	FW19A/0177	Townlands of Macestown Middle, Macestown South,Tyrellstown, Cruiserath, Buzzardstown, Godamendy Bay	29/10/2019	The Electricity Supply Board (ESB) intends to apply for planning permission for development on a site at this address: (a) Proposed underground cable route originating from the existing Macetown ESB station (on Damastown Avenue in the townland of Macetown Middle) , running in an easterly direction along Damastown Avenue and the R121 (in the townlands of Macetown Middle, Macetown South, Tyrrelstown, Cruiserath and Buzzardstown), to a permitted medium voltage (MV) substation located within a permitted data storage facility (An Bord Pleanála, Reg. Ref.:PL06F.248544 / FCC Reg. Ref.: FW17A/0025) in the townlands of Cruiserath and Tyrrelstown; (b) Proposed underground cable route originating from the existing Corduff ESB station (Corduff Road in the townlands of Goddamendy and Bay), running in a northerly direction along the Corduff Road, then a westerly direction along the N3-M2 Link Road, then running in a southerly and easterly direction along the R121 (in the townlands of Bay, Hollywoodrath, Cruiserath and Tyrrelstown) to a permitted MV substation located within a permitted data storage facility (An Bord Pleanála, Reg. Ref.:PL06F.248544 / FCC Reg. Ref.: FW17A/0025) in the townlands of Cruiserath and Tyrrelstown. The development will consist of: A c.1m wide trench of depth c. 1m within a 4m wide corridor, in which underground cable ducts and cables will be installed. The two separate underground cable	Granted permission - 30/01/2020

Applicant	Ref. No.	Location	Lodge Date (if appliable)	Description	Decision / Status of Project
				installations will consist of the following: (a) a c. 3 km MV underground cable and all ancillary electrical equipment connecting Macetown ESB station to a permitted MV substation located within a permitted data storage facility (An Bord Pleanála, Reg. Ref.:PL06F.248544 / FCC Reg. Ref.: FW17A/0025); (b) a c. 3.4 km MV underground cable and all ancillary electrical equipment connecting Corduff ESB station, to a permitted MV substation located within a permitted data storage facility (An Bord Pleanála, Reg. Ref.:PL06F.248544 / FCC Reg. Ref.: FW17A/0025).	
EngineNode Ltd.	VA17.30 8130	Bracetown, Gunnocks, Paddingstown, County Meath.	07/09/2020	220 kV substation with 2 underground transmission cables.	Granted Permission - 05/07/2021
Glenveagh Homes Ltd.	FW21A/0 042	Hollywoodrath Road (R121) in Hollystown Dublin 15	05/03/2021	The proposed development will consist of 69 no. houses comprising 52 no. 2-storey houses and 17 no. 3-storey houses, private open spaces and all associated works including new outfall sewer approx. 3 km in length, new vehicular entrance on the R121 along with footpath and cycle path, development of class 1 open public space and ancillary landscaped areas and suitable urban drainage systems (total site area of approx. 7.71ha).	Granted Permission - 20/07/2021
TLI Group Ltd.	FW21A/0 144	Townlands of Johnstown, Huntstown, Coldwinters & Balseskin, at Blanchardstown and Finglas, Co. Dublin, (Southeast of Huntstown Power Station, Johnstown, Dublin to Finglas 220 kV Substation, Balseskin).	2021	The development will consist of the installation of electrical infrastructure between Finglas substation and Huntstown Power Station to facilitate the retirement of existing Electricity Supply Board overhead powerlines and facilitate site clearance for the future development of a data centre and substation (subject to separate planning applications). This will include (i) the installation of approximately three underground cable circuits of 1.2 km length (110 kV) and one circuit 1.2 km length (38 kV) and associated underground ducting, joint bays and infrastructure between the existing ESB Finglas substation and an agreed location within Huntstown Power Station (ii)	Granted Permission - 05/10/2021

Applicant	Ref. No.	Location	Lodge Date (if appliable)	Description	Decision / Status of Project
				installation of one c.28 m double circuit 110 kV cable end tower and one c.17 single circuit 110 kV angle mast (iii) removal of 10 Nr. existing 110 kV timber polesets, 9 Nr. existing 38 kV timber polesets, 3 Nr. 38 kV lattice steel tower & associated overhead line electrical infrastructure; all associated and ancillary site development, landscaping and construction works, all within the townlands of Johnstown, Huntstown, Coldwinters & Balseskin at Blanchardstown & Finglas, County Dublin.	
Earlstand Corporation Unlimited Company	FW22A/0156	Mooretown and Northwest Logistics Park, Ballycoolin, Dublin 15	2022	The application is bound to the south, southwest, and to the east by existing, permitted and proposed development within Northwest Logistics Park situated on Kilshane Avenue, to the north and northwest by undeveloped greenfield lands and to the west by the Ratoath Road. Ten-year permission for development that will consist of the following: - Construction of 6 no. warehouses/logistics units including ancillary office/administration use and entrance/reception areas over two levels (Units 1-6) with a combined total floor gross area (GFA) of 50,934 sq.m; - Unit 1 is located within the south-western portion of the site (with a GFA of 16,457 sq.m.). Unit 2 is located in the southern portion of the site (with a GFA of 5,612 sq.m), Unit 3 is located in the south-eastern portion of the site (with a GFA of 5,621 sq.m), Unit 4 and Unit 5 are located in the centre of the site (with a GFA of 8,550 sq.m and 8,535 sq.m respectively), and Unit 6 is located in the northern portion of the site (with a GFA of 6,159 sq.m). - Unit 1 will have a parapet height of 17.59 metres, while all other units will have a parapet height of 17.49 metres. -Ancillary ESB substations (6 no. in total) are included for each of the proposed warehouses/logistics units. The	Granted Permission - 10/05/2023

Applicant	Ref. No.	Location	Lodge Date (if appliable)	Description	Decision / Status of Project
				gross floor area (GFA) of each substation is 25 sq.m. Unit 1 includes a sprinkler tank, valvehouse and pumphouse. - The proposal includes a new estate road entrance from Kilshane Avenue, access arrangements and internal road network to serve the proposed units., and pedestrian and cycle infrastructure. The units are served by a total of 501 no. car parking spaces, 230 no. cycle spaces, 80 no. heavy goods vehicle parking spaces (including loading bay parking), loading bays and service yard areas. - The proposed includes PV panels at roof level, hard and soft landscaping and planting, boundary treatments, public open spaces and woodland areas, security gates, cycle shelters, lighting, entrance signage, signage zones for each of the proposed units and all associated works including underground foul and storm water drainage network, attenuations rea, SUDS features and utility cables.	
Kilshane Energy Ltd.	VA07F.314894App	Lands at Kilshane Road, Kilshane, Finglas, Dublin 11	12/10/2022	Proposed development of a 220 kV Gas Insulated Switchgear (GIS) substation on lands at Kilshane Road, and an underground 220 kV transmission line connection to the existing Cruiserath 220 kV substation.	Granted Permission - 24/08/2023
Kingscroft Development Ltd.	23882	Jamestown, Ratoath, Co. Meath	12/09/2023	The proposed modifications relate to 6No. blocks (duplexes) and will consist of the following: Modifications to Blocks 1 & 5 plans to have 4No. 1 and 2 bed apartments on ground floor and 4No. 3-bed duplexes on the first & second floors of each block. (16 units), Modifications to Blocks 2, 3 & 4 plans to have 6No. 1 and 2 bed apartments on ground floor and 6No. 3-bed duplexes on the first & second floors of each block. (36 units), Modifications to Blocks 6 plans to have 4No. 1 and 2 bed apartments and 2No. duplexes on the ground floor and 4No. duplexes on the first & second floors of each block. (10 units). The density and number of units of the	Granted Permission - 03/11/2023

Applicant	Ref. No.	Location	Lodge Date (if appliable)	Description	Decision / Status of Project
				proposed modifications remain the same as the previously granted application. The modified 62No. residential units will comprise 21No. one bed units, 9No. two-bed units, and 32No. three-bed (Duplex) units. All other associated landscaping, boundary treatments, site development and service infrastructure works.	
Arnub Ltd & Aspect Homes (ADC) Ltd.	ABP - TA17.314550	Townlands of Baltrasna and Milltown, Ashbourne, Co. Meath	06/09/2022	Demolition of existing structures on site, construction of 702 no. residential units (420 no. houses, 38 no. duplexes, 244 no. apartments), creche and associated site works. (SHD)	Granted permission - 28/11/2023
Greater Dublin Drainage	ABP - PA06F.312131 (Old Number ABP-301908-18.)	Townlands of Clonshagh, Dubber and Newtown, County Fingal and Dublin City.	20/06/2018	Greater Dublin Drainage Project consisting of a new wastewater treatment plant, sludge hub centre, orbital sewer, outfall pipeline and regional biosolids storage facility. It should be noted that part of the wastewater infrastructure is proposed to be partially located within the southern section of the study area however, planning permission has not yet been granted for the project at this stage and the case is ongoing.	Case Ongoing
Iarnród Éireann	ABP-314232-22	40 km rail upgrade from Connolly Station and new Spencer Dock station in the east to M3 Parkway and a new.	29/07/2022	DART+ West Railway Order - Dublin City to Maynooth and M3 Parkway.	Lodged
ESB[85]	VA29N.317831	Various locations in North Dublin between Forrest Little, Belcamp, Clonshaugh and Harristown, Co. Dublin.	17/08/2023	Proposed development of three 110 kV electricity circuits.	Lodged - Case is due to be decided by 16/02/2024

[85] https://www.esbmetroundergroundcables.ie/home

Applicant	Ref. No.	Location	Lodge Date (if appliable)	Description	Decision / Status of Project
Huntstown Power Company Limited	VA06F.311528	Lands adjacent to Huntstown Power Station, North Road, Finglas, Dublin 11.	29/09/2021	Construction of a 2 storey 220 kV GIS substation known as 'Mooretown', 4 underground transmission cables and all associated and ancillary site development and construction works.	Lodged - Case is due to be decided by 08/04/2022
Kilshane Energy Ltd.	FW22A/0204	Kilshane Road, Kilshane, Finglas, Dublin 11.	30/06/2023	Gas Turbine Power Generation Station with an output of up to 293 Megawatts.	On 23 Jun 2023, a decision to grant permission was made by Fingal County Council on this application. An appeal has subsequently been lodged on 30 Jun 2023 and is now under consideration by An Bord Pleanála
Transport Infrastructure Ireland	NA29N.314724	The line is proposed to run from Estuary on Dublin's northside to Charlemont on the south of the city (this proposed development is not within the study area but it is a major development so important to note).	2022	Railway (Metrolink - Estuary to Charlemont via Dublin Airport)[86]. Metro Dublin is a proposed mass rapid transit development for Dublin. It is designed to meet the existing and growing demand for fast, reliable, integrated and sustainable mobility for the Greater Dublin Area.	Lodged - Requires Further Consideration
Meath County Council	N/A	Ashbourne Town	N/A	The new route ties in with the 1.1 km section in the town centre, it will also link up with the newly completed works on Milltown Rd and the St. Johnswood Road.	Pre-planning stage

[86] https://tii-gis.maps.arcgis.com/apps/instant/basic/index.html?appid=f87ac761c533446b8ddb554ce00fb921

Applicant	Ref. No.	Location	Lodge Date (if appliable)	Description	Decision / Status of Project
Meath County Council	N/A	From Dunboyne to Dublin County boundary (the route is not finalised).	N/A	Dunboyne and Clonee Pedestrian and Cycle Network. This proposed scheme aims to provide safe cycling and pedestrian facilities in the area. The plan is to create a route that stretches from the western end of the R156/7 Dunboyne Bypass, all the way to the Dublin County boundary on the southeastern side of Clonee, passing through the M3/Pace train station interchange[87].	Pre-planning stage
Meath County Council, with the National Transport Authority	N/A	Ratoath Town[88]	N/A	The plan is to retrofit the existing layout and make it more pedestrian and cyclist-friendly. This will be achieved by widening the footpaths, providing new pedestrian crossings (both uncontrolled and controlled), and upgrading bus stops. We'll add some street furniture and landscaping, and we'll resurface the road and footway pavements with new materials. We'll also remove unnecessary street signs and furniture and add in some cycle parking. All in all, this will create a street environment that prioritizes the safety and comfort of pedestrians and cyclists.	Pre-planning stage

[87] https://www.meath.ie/council/council-services/roads-and-travel/sustainable-transport-and-active-travel/cycling-and-walking-schemes
[88] https://www.meath.ie/media/12645

7. Summary and Conclusions

This Environmental Constraint report was completed as part of Step 3 for the CP1214 Fingal to East Meath Grid Reinforcement project for EirGrid's end-to-end process for grid infrastructure development projects. This report identifies, describes and maps environmental constraints that should be considered within the Study Area at later project development stages. Furthermore, this report assists with the identification and assessment of feasible technology solutions for proposed substations. At later project stages, this constraints report will be used to identify substation site locations and grid route corridors to meet project needs.

APPENDICES

Appendix A. Heat Maps of the Study Area

A3

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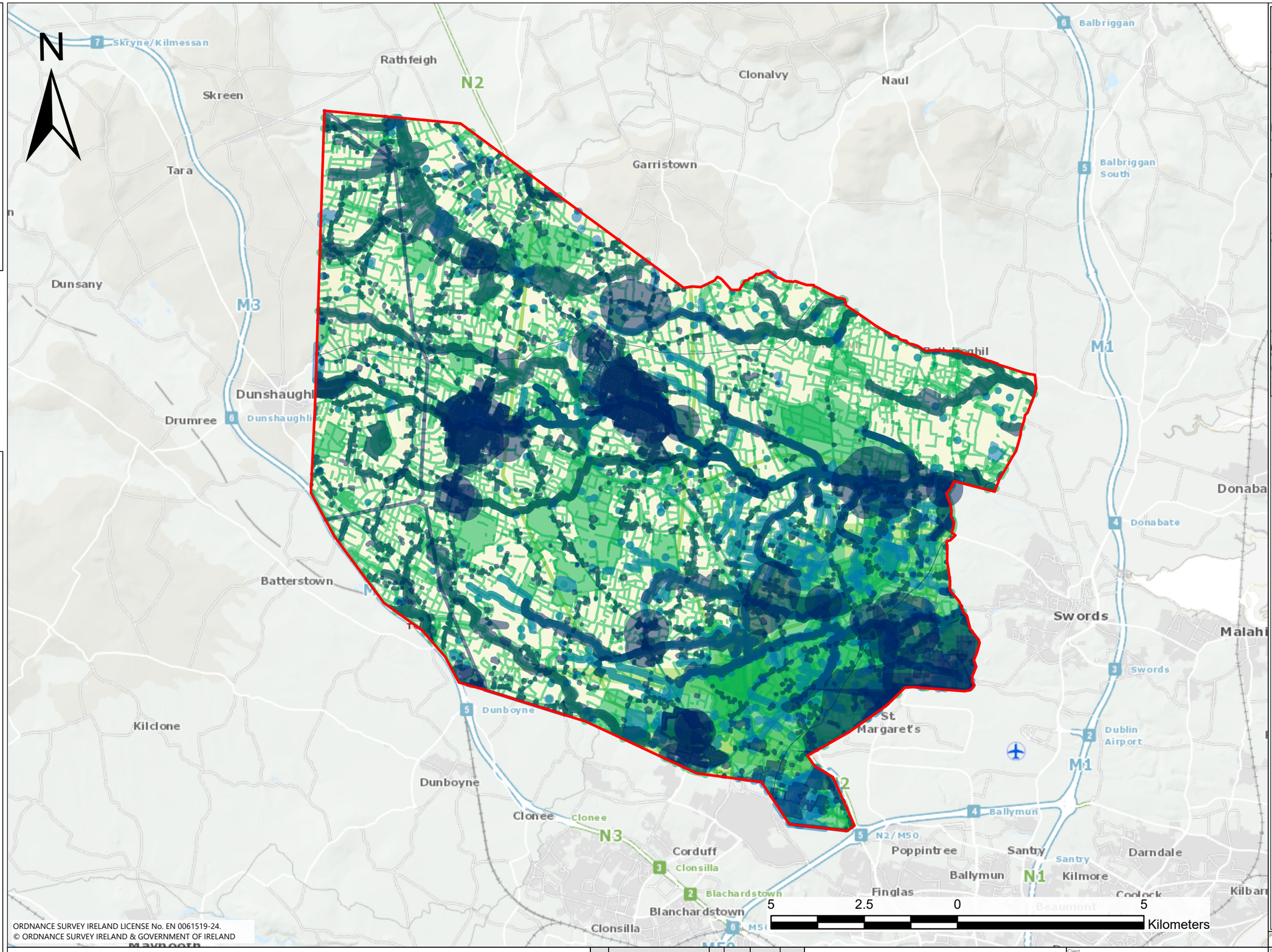

Legend

- Project Study Area

Risk

- High
- Low

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Rev	Description	By	Date	Check	Auth
0	FOR REVIEW / COMMENT	CS	11/01	JL	DMK
1	FOR REVIEW / COMMENT	CS	25/01	JL	DMK
2	FOR REVIEW / COMMENT	CS	16/07	EE	DMK
3	FINAL	CS	02/10	EE	DMK

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Client: EIRGRID

Project: CP1214 Fingal to East Meath Grid Reinforcement

Purpose: FINAL

Title: HEATMAP - OVERHEAD LINE RISK

Original Scale	Design/Drawn	Checked	Authorised
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	Date 02.10.24	Date 02.10.24	Date 02.10.24

Status	Drawing Number	Rev
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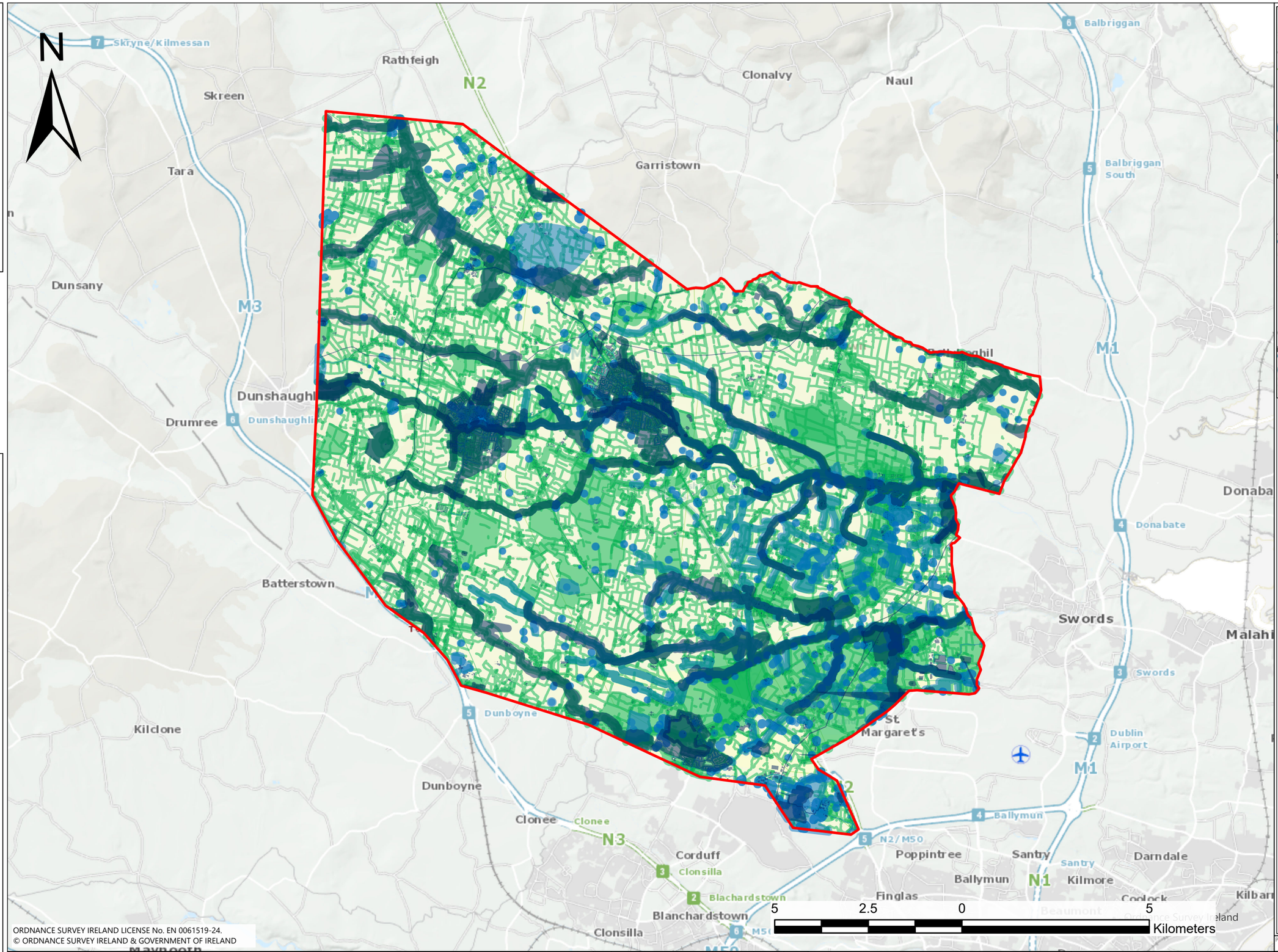

Legend

- Project Study Area

Risk

- High
- Low

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Rev	Description	By	Date	Check	Auth
0	FOR REVIEW / COMMENT	CS	11/01	JL	DMK
1	FOR REVIEW / COMMENT	CS	25/01	JL	DMK
2	FOR REVIEW / COMMENT	CS	16/07	EE	DMK
3	FINAL	CS	02/10	EE	DMK

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Client: EIRGRID

Project: CP1214 Fingal to East Meath Grid Reinforcement

Purpose: FINAL

Title: HEATMAP - UNDERGROUND CABLE RISK

Original Scale	Design/Drawn	Checked	Authorised
1:100,000	CS	EE	DMK
	Date 02.10.24	Date 02.10.24	Date 02.10.24

Status	Drawing Number	Rev
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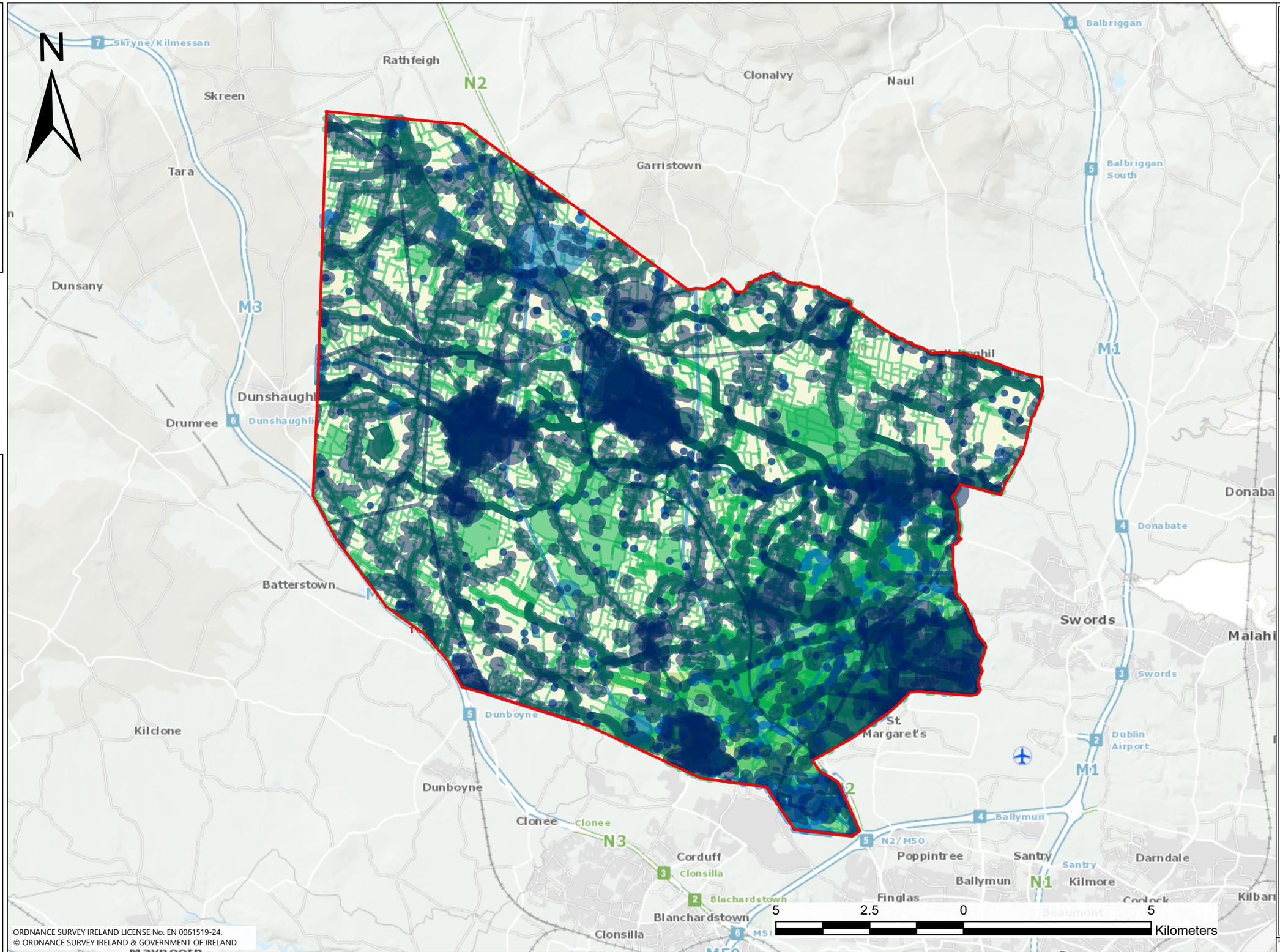

Legend

- Project Study Area

Risk

- High
- Low

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Rev	Description	By	Date	Check	Auth
0	FOR REVIEW / COMMENT	CS	11/01	JL	DMK
1	FOR REVIEW / COMMENT	CS	25/01	JL	DMK
2	FOR REVIEW / COMMENT	CS	26/04	JL	DMK
3	FOR REVIEW / COMMENT	CS	16/07	EE	DMK
4	FINAL	CS	02/10	EE	DMK

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Fax (+353) 091 779 830

Client: EIRGRID

Project: CP1214 Fingal to East Meath Grid Reinforcement

Purpose: FINAL

Title: HEATMAP - SUBSTATION RISK

Original Scale	Design/Drawn	Checked	Authorised
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	Date 02.10.24	Date 02.10.24	Date 02.10.24

Status: S4

Drawing Number: CP1214-ATK-DR-10001-S4-R04

Rev: 4

File: CP1214_Heatmap_
Date: 02/10/2024 21:21
Plotted by: csatir

Appendix B. Special Areas of Conservation

Table B-1 - Special Areas of Conservation and their Qualifying Interests within a 15 km radius of the Study Area. Sites are listed with respect to distance from the Study Area

Site Name and Site Code	Distance from Study Area (km)	Qualifying Interests	Other species of ecological interest
Malahide Estuary SAC (000205)	4.2 km	Mudflats and sandflats not covered by seawater at low tide [1140] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	The site has Hairy Violet (*V. hirta*), a Red Data Book plant species.
Rogerstown Estuary SAC (000208)	5.2 km	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130]	Has populations of three Red Data Book plant species; Meadow Barley (*Hordeum secalinum*); Green winged Orchid (*Anacamptis morio*; previously known as *Orchis morio*) and Hairy Violet (V. hirta).
Rye Water Valley/Carton SAC (001398)	7.7 km	Petrifying springs with tufa formation (*Cratoneurion*) [7220]	Rare or locally uncommon plant and insect species are found here[89]. Four Red Data

[89] N2K IE0001398 dataforms (europa.eu)

Site Name and Site Code	Distance from Study Area (km)	Qualifying Interests	Other species of ecological interest
		Vertigo angustior (Narrow-mouthed Whorl Snail) [1014] *Vertigo moulinsiana* (Desmoulin's Whorl Snail) [1016]	Book plant species have been recorded from the site namely: Blue Fleabane (*Erigon acer*); Hairy St John's-wort (*Hypericum hirsutum*); Hairy violet (*V. hirta*); Green figwort (*Scrophularia umbrosa*). Long-eared owl (*A. otus*) and the dragonfly Keeled skimmer (*Orthetrum coerulescens*) are also observed here.
Baldoyle Bay SAC (000199)	8.9 km	Mudflats and sandflats not covered by seawater at low tide [1140] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410]	Has two Red Data Book plant species. Meadow Barley (*Hordeum secalinum*) and Borrer's Saltmarsh-grass (*Puccinellia fasciculata*)
North Dublin Bay SAC (000206)	10.1 km	Mudflats and sandflats not covered by seawater at low tide [1140] Annual vegetation of drift lines [1210] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] Mediterranean salt meadows (*Juncetalia maritimi*) [1410] Embryonic shifting dunes [2110] Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes) [2120] Fixed coastal dunes with herbaceous vegetation (grey dunes) [2130] Humid dune slacks [2190] *Petalophyllum ralfsii* (Petalwort) [1395]	The site has five Red Data Book vascular plant species and four Red Data Book bryophyte species. **Bryophytes:** *Bryum calaphyllum* *Bryum marratii* *Bryum uliginosum* *Bryum warneum* **Vascular plants:** Lesser Centaury (*Centaurium pulchellum*) Red hemp-nettle (*Galeopsis angustifolia*) Wild clary (*Salvia verbenaca*) Meadow saxifrage (*Saxifraga granulata*) Spring vetch (*Vicia lathyroides*) Insect species: *Chiloxanthus pilosus* *Hemichroa australis* *Nematus brevivalvis*

Site Name and Site Code	Distance from Study Area (km)	Qualifying Interests	Other species of ecological interest
			Nematus frenalis *Orthoceratium lacustre* *Salticella fasciata* *Sphaerophoria rueppellii* Irish hare (*Lepus timidus hibernicus*)
Rockabill to Dalkey Island SAC (003000)	10.2 km	Reefs [1170] *Phocoena phocoena* (Harbour Porpoise) [1351]	Contains two Annex II seal species – Harbour seal (*Phoca vitulina*), Grey seal (*Halichoerus grypus*) for which terrestrial haul-out sites occur in immediate proximity to the site. Bottlenose dolphin (*Tursiops truncatus*) has also occasionally been recorded in the area.
South Dublin Bay SAC (000210)	10.4 km	Mudflats and sandflats not covered by seawater at low tide [1140] Annual vegetation of drift lines [1210] Salicornia and other annuals colonising mud and sand [1310] Embryonic shifting dunes [2110]	No information provided.
River Boyne and River Blackwater SAC (002299)	13.1 km	Alkaline fens [7230] Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] *Lampetra fluviatilis* (River Lamprey) [1099] *Salmo salar* (Salmon) [1106] *Lutra lutra* (Otter) [1355]	Other ecological interests include: Amphibians - Common Frog (*Rana temporaria*) Mammals - Irish stoat (*Mustela erminea hibernica*); European badger (*M. meles*); European pine marten (*Martes martes*); Irish hare (*Lepus timidus hibernicus*). Plants - Round-fruited rush (*Juncus compressus*); Narrow leaved marsh orchid (*Dactylorhiza traunsteineri*); *Fowl bluegrass (Poa palustris*); Round-leaved wintergreen (*Pyrola rotundifolia*).

Site Name and Site Code	Distance from Study Area (km)	Qualifying Interests	Other species of ecological interest
Ireland Eye SAC (002193)	13.5 km	Perennial vegetation of stony banks [1220] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230]	Has two Red Data Book plant species, Sea kale (*Crambe maritima*) and Black henbane (*Hyoscyamus niger*).
Lambay Island SAC (000204)	13.5 km	Reefs [1170] Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] *Halichoerus grypus* (Grey Seal) [1364] *Phoca vitulina* (Harbour Seal) [1365]	Black rat (*Rattus rattus*)
Howth Head SAC (000202)	15.4 km	Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] European dry heaths [4030]	Plant species include: Pennyroyal (*Mentha pulegium*) Woodland arctic cudweed (*Omalotheca sylvatica*) Green winger orchid (*O. morio*) Little white bird's-foot (*Ornithopus perpusillus*) Rough poppy (*Papaver hybridum*) Curved hard-grass (*Parapholis incurve)* Common hedge nettle (*Stachys officinalis*) Hairy Violet (*V. hirta*) Insect species include: *Phaonia exolete* – Fly *Trechus rubens* – Ground beetle.

Appendix C. Special Protection Areas

Table C-1 - Special Protection Areas and their Qualifying Interests within a 15 km radius of the Study Area. Sites are listed with respect to distance from the Study Area

Site Name and Site Code	Distance from Study Area (km)	Qualifying Interests	Other ecological features
Malahide Estuary SPA (004025)	4.6 km	Great Crested Grebe (*Podiceps cristatus*) [A005] Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Shelduck (*Tadorna tadorna*) [A048] Pintail (*Anas acuta*) [A054] Goldeneye (*Bucephala clangula*) [A067] Red-breasted Merganser (*Mergus serrator*) [A069] Oystercatcher (*Haematopus ostralegus*) [A130] Golden Plover (*Pluvialis apricaria*) [A140] Grey Plover (*Pluvialis squatarola*) [A141] Knot (*Calidris canutus*) [A143] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa*) [A156] Bar-tailed Godwit (*Limosa lapponica*) [A157] Redshank (*Tringa totanus*) [A162] Wetland and Waterbirds [A999]	Supports a regular flock of non-breeding Mute Swan (*Cygnus olor*) Grey Heron (*Ardea cinerea*)
Rogerstown Estuary SPA (004015)	6.1 km	Greylag Goose (*Anser anser*) [A043] Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Shelduck (*Tadorna tadorna*) [A048] Shoveler (*Anas clypeata*) [A056] Oystercatcher (*Haematopus ostralegus*) [A130] Ringed Plover (*Charadrius hiaticula*) [A137] Grey Plover (*Pluvialis squatarola*) [A141] Knot (*Calidris canutus*) [A143] Dunlin (*Calidris alpina*) [A149]	Supports a regular flock of non-breeding Mute Swan (*Cygnus olor*) Grey Heron (*Ardea cinerea*)

Site Name and Site Code	Distance from Study Area (km)	Qualifying Interests	Other ecological features
		Black-tailed Godwit (*Limosa limosa*) [A156] Redshank (*Tringa totanus*) [A162] Wetland and Waterbirds [A999]	
South Dublin Bay and River Tolka Estuary SPA (004024)	7.7 km	Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Oystercatcher (*Haematopus ostralegus*) [A130] Ringed Plover (*Charadrius hiaticula*) [A137] Grey Plover (*Pluvialis squatarola*) [A141] Knot (*Calidris canutus*) [A143] Sanderling (*Calidris alba*) [A144] Dunlin (*Calidris alpina*) [A149] Bar-tailed Godwit (*Limosa lapponica*) [A157] Redshank (*Tringa totanus*) [A162] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Roseate Tern (*Sterna dougallii*) [A192] Common Tern (*Sterna hirundo*) [A193] Arctic Tern (*Sterna paradisaea*) [A194] Wetland and Waterbirds [A999]	European Herring Gull (*Larus argentatus*)
Baldoyle Bay SPA (004016)	8.4 km	Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Shelduck (*Tadorna tadorna*) [A048] Ringed Plover (*Charadrius hiaticula*) [A137] Golden Plover (*Pluvialis apricaria*) [A140] Grey Plover (*Pluvialis squatarola*) [A141] Bar-tailed Godwit (*Limosa lapponica*) [A157] Wetland and Waterbirds [A999]	Grey Heron (*Ardea cinerea*)
River Boyne and River Blackwater SPA (004232)	8.6 km	Kingfisher (*Alcedo atthis*) [A229]	Some of the grassland areas along the Boyne and Blackwater are used by a nationally important winter flock of Whooper Swan (*Cygnus cygnus*)

Site Name and Site Code	Distance from Study Area (km)	Qualifying Interests	Other ecological features
Marine North-West Irish Sea SPA (004236)	9.3 km	Red-throated Diver (*Gavia stellata*) [A001] Great Northern Diver (*Gavia immer*) [A003] Fulmar (*Fulmarus glacialis*) [A009] Manx Shearwater (*Puffinus puffinus*) [A013] Cormorant (*Phalacrocorax carbo*) [A017] Shag (*Phalacrocorax aristotelis*) [A018] Common Scoter (*Melanitta nigra*) [A065] Little Gull (*Larus minutus*) [A177] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Common Gull (*Larus canus*) [A182] Lesser Black-backed Gull (*Larus fuscus*) [A183] Herring Gull (*Larus argentatus*) [A184] Great Black-backed Gull (*Larus marinus*) [A187] Kittiwake (*Rissa tridactyla*) [A188] Roseate Tern (*Sterna dougallii*) [A192] Common Tern (*Sterna hirundo*) [A193] Arctic Tern (*Sterna paradisaea*) [A194] Little Tern (*Sterna albifrons*) [A195] Guillemot (*Uria aalge*) [A199] Razorbill (*Alca torda*) [A200] Puffin (*Fratercula arctica*) [A204]	Not listed
North Bull Island SPA (004006)	10.0 km	Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Shelduck (*Tadorna tadorna*) [A048] Teal (*Anas crecca*) [A052] Pintail (*Anas acuta*) [A054] Shoveler (*Anas clypeata*) [A056] Oystercatcher (*Haematopus ostralegus*) [A130] Golden Plover (*Pluvialis apricaria*) [A140] Grey Plover (*Pluvialis squatarola*) [A141]	Eurasian skylark (*Alauda arvensis*) Grey heron (*Ardea cinerea*) European Herring Gull (*Larus argentatus*) Great black-backed gull (*Larus marinus*)

Site Name and Site Code	Distance from Study Area (km)	Qualifying Interests	Other ecological features
		Knot (*Calidris canutus*) [A143] Sanderling (*Calidris alba*) [A144] Dunlin (*Calidris alpina*) [A149] Black-tailed Godwit (*Limosa limosa*) [A156] Bar-tailed Godwit (*Limosa lapponica*) [A157] Curlew (*Numenius arquata*) [A160] Redshank (*Tringa totanus*) [A162] Turnstone (*Arenaria interpres*) [A169] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Wetland and Waterbirds [A999]	
Rockabill (004014)	13.0 km	Purple Sandpiper (*Calidris maritima*) [A148] Roseate Tern (*Sterna dougallii*) [A192] Common Tern (*Sterna hirundo*) [A193] Arctic Tern (*Sterna paradisaea*) [A194]	Black guillemot (*Cepphus grylle*)
Ireland's Eye SPA (004117)	13.1 km	Cormorant (*Phalacrocorax carbo*) [A017] Herring Gull (*Larus argentatus)* [A184] Kittiwake (*Rissa tridactyla*) [A188] Guillemot (*Uria aalge*) [A199] Razorbill (*Alca torda*) [A200]	Black guillemot (*Cepphus grylle*) European Herring Gull (*Larus argentatus*) Great black-backed gull (*Larus marinus*) European shag (*Phalacrocorax aristotelis*)
Lambay Island (004069)	13.3 km	Fulmar (*Fulmarus glacialis*) [A009] Cormorant (*Phalacrocorax carbo*) [A017] Shag (*Phalacrocorax aristotelis*) [A018] Greylag Goose (*Anser anser*) [A043] Lesser Black-backed Gull (*Larus fuscus*) [A183] Herring Gull (*Larus argentatus*) [A184] Kittiwake (*Rissa tridactyla*) [A188] Guillemot (*Uria aalge*) [A199] Razorbill (*Alca torda*) [A200]	Black guillemot (*Cepphus grylle*) European Herring Gull (*Larus argentatus*) Great black-backed gull (*Larus marinus*) European shag (*Phalacrocorax aristotelis*)

Site Name and Site Code	Distance from Study Area (km)	Qualifying Interests	Other ecological features
		Puffin (*Fratercula arctica*) [A204]	
River Nanny Estuary and Shore SPA (004158)	14.7 km	Oystercatcher (*Haematopus ostralegus*) [A130] Ringed Plover (*Charadrius hiaticula*) [A137] Golden Plover (*Pluvialis apricaria*) [A140] Knot (*Calidris canutus*) [A143] Sanderling (*Calidris alba*) [A144] Herring Gull (*Larus argentatus*) [A184] Wetland and Waterbirds [A999]	Great black-backed gull (*Larus marinus*)
Skerries Islands SPA (004122)	15.0 km	Cormorant (*Phalacrocorax carbo*) [A017] Shag (*Phalacrocorax aristotelis*) [A018] Light-bellied Brent Goose (*Branta bernicla hrota*) [A046] Purple Sandpiper (*Calidris maritima*) [A148] Turnstone (*Arenaria interpres*) [A169] Herring Gull (*Larus argentatus*) [A184]	European Herring Gull (*Larus argentatus*) Great black-backed gull (*Larus marinus*) European shag (*Phalacrocorax aristotelis*)
Howth Head Coast SPA (004113)	15.0 km	Kittiwake (*Rissa tridactyla*) [A188]	Black Guillemot (*Cepphus grille*) Common raven (*Corvus corax*) European Herring Gull (*Larus argentatus*) Great black-backed gull (*Larus marinus*) Cormorant (*Phalacrocorax carbo*)

Appendix D. Natural & Proposed Natural Heritage Areas

Table D-1 - pNHA within 15 km buffer of the Study Area

pNHAs	pNHA Site Code	Distance from Study Area (km)
Balrath Woods	001579	5.4 km North
Thomastown Bog	001593	8.5 km North
Duleek Commons	001578	9.6 km North
Cromwells Bush Fen	001576	8.8 km North-East
Rossnaree Riverbank	001589	11.9 km North
Crewbane Marsh	000553	12.6 km North
Boyne Woods	001592	12.6 km North
Slane Riverbank	001591	13.5 km North
Dowth Wetland	001861	14.4 km North
Laytown Dunes/Nanny Estuary	000554	16.0 km (Adjacent)
Trim	001357	14.4 km West
Bog of the Ring	001204	10.0 km East
Knock Lake	001203	11.2 km East
Loughshinny Coast	002000	15.2 km East
Rogerstown Estuary	000208	5.25 km East
Portraine Shore	001215	10.5 km East
Malahide Estuary	000205	4.25 km East
Lambay Island	000204	13.4 km East

pNHAs	pNHA Site Code	Distance from Study Area (km)
Feltrim Hill	001208	4.3 km South-East
Sluice River Marsh	001763	7.5 km South-East
Santry Demense	000178	3.7 km South-East
Baldoyle Bay	000199	11.4 km South-East
Irelands Eye	000203	13.4 km South-East
Howth Head	000202	14.4 km South-East
North Dublin Bay	000206	7.6 km South-East
Royal Canal	002103	3.4 km South
Rye Water Valley/Carton	001398	9.0 km South-West
Liffey Valley	000128	5.9 km South
Grand Canal	002104	8.6 km South-East
South Dublin Bay	000210	10.5 km South-East
Booterstown Marsh	001205	13.0 km South-East
Dodder Valley	000991	13.0 km South

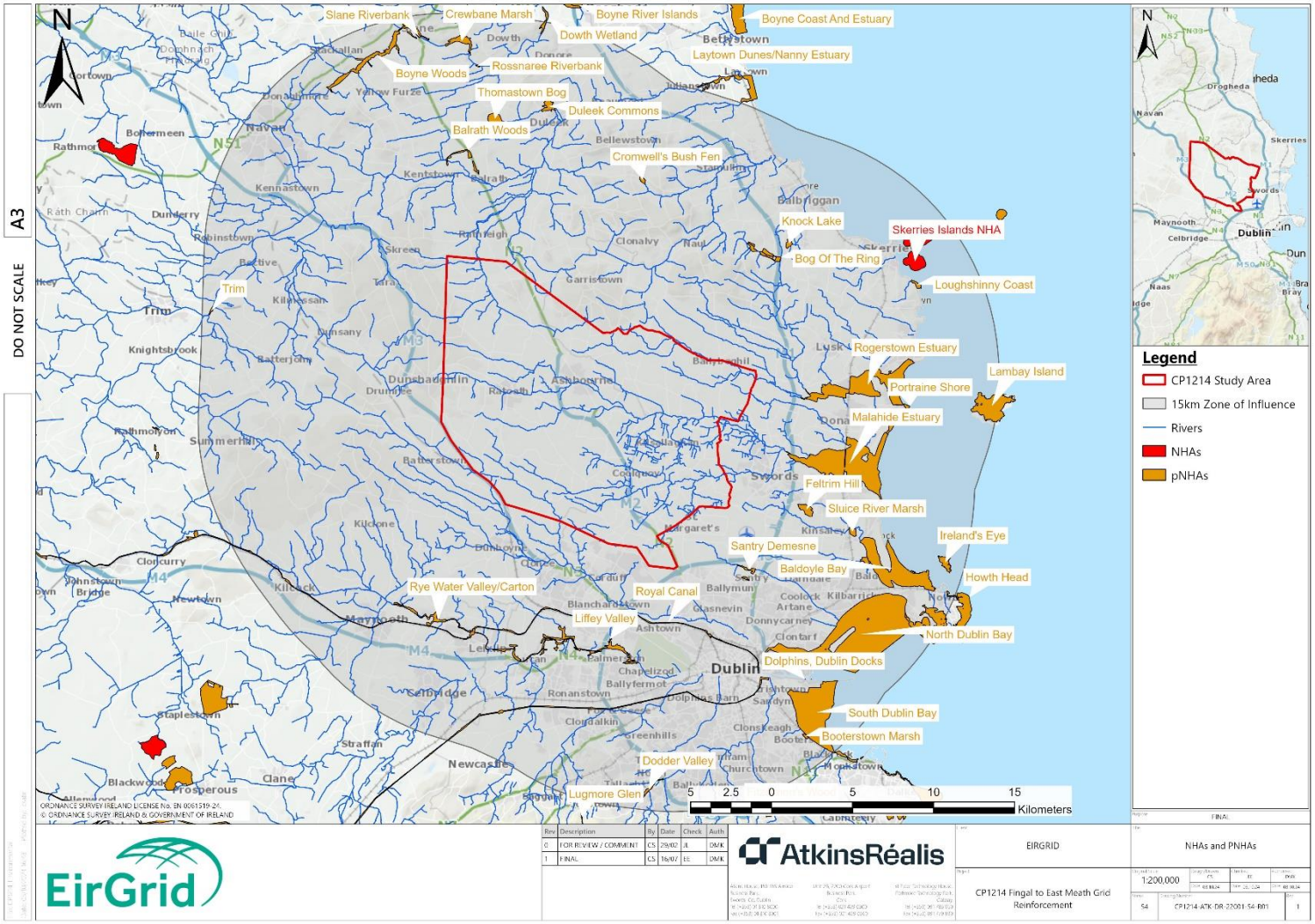

Figure D-1 - NHA and pNHA within 15 km buffer of the Study Area

Appendix E. Bird Species

Table E-1 - Bird species that are not listed in Annex I of the EU Habitats Directive that are found within the Study Area. Red, Amber and Green text denotes bird species conservation rating (Gilbert et al. 2021)

Waterbird species	Passerine species	Other
Common Goldeneye (*Bucephala clangula*)	Barn Owl (*Tyto alba*)	European Nightjar (*Caprimulgus europaeus*)
Common Pochard (*Aythya ferina*)	Common Kestrel (*Falco tinnunculus*)	Stock Pigeon (*Columba oenas*)
Common Redshank (*Tringa totanus*)	Common Swift (*Apus apus*)	Grey Partridge (*Perdix perdix*)
Common Snipe (*Gallinago gallinago*)	Twite (*Carduelis flavirostris*)	Common Swift (*Apus apus*)
Eurasian Curlew (*Numenius arquata*)	Yellowhammer (*Emberiza citrinella*)	Corn Crake (*Crex crex*)[90]
Eurasian Oystercatcher (*Haematopus ostralegus*)	Barn Swallow (*Hirundo rustica*)	Common Grasshopper Warbler (*Locustella naevia*)
Eurasian Woodcock (*Scolopax rusticola*)	Common Linnet (*Linnaria cannabina*)	Wood Lark (*Lullula arborea*)
Greater Scaup (*Aythya marila*)	Common Starling (*Sturnus vulgaris*)	Common Wood Pigeon (*Columba palumbus*)
Grey Plover (*Pluvialis squatarola*)	Eurasian Tree Sparrow (*Passer montanus*)	
Northern Lapwing (*Vanellus vanellus*)	House Martin (*Delichon urbicum*)	
Red Knot (*Calidris canutus*)	House Sparrow (*Passer domesticus*)	
Velvet Scoter (*Melanitta fusca*)	Northern Wheatear (*Oenanthe oenanthe*)	
Brent Goose (*Branta bernicla*)	Sand Martin (*Riparia riparia*)	
Black-headed Gull (*Larus ridibundus*)	Sky Lark (*Alauda arvensis*)	
Black-tailed Godwit (*Limosa limosa*)	Spotted Flycatcher (*Muscicapa striata*)	
Common Coot (*Fulica atra*)	Rock Dove (*Columba livia*)	

[90] Last record was in 1972.

Waterbird species	Passerine species	Other
Eurasian Teal (*Anas crecca*)		
Eurasian Wigeon (*Anas penelope*)		
Great Black-backed Gull (*Larus marinus*)		
Great Cormorant (*Phalacrocorax carbo*)		
Great Crested Grebe (*Podiceps cristatus*)		
Herring Gull (*Larus argentatus*)		
Jack Snipe (*Lymnocryptes minimus*)		
Lesser Black-backed Gull (*Larus fuscus*)		
Mallard *(Anas platyrhynchos*)		
Mew/Common Gull (*Larus canus*)		
Mute Swan (*Cygnus olor*)		
Northern Goshawk (*Accipiter gentilis*)		
Red-breasted Merganser (*Mergus serrator*)		
Ringed Plover (*Charadrius hiaticula*)		
Tufted Duck (*Aythya fuligula*)		
Common Greenshank (*Tringa nebularia*)		
Common Shelduck (*Tadorna tadorna*)		
Little Grebe (*Tachybaptus ruficollis*)		
Pink-footed Goose (*Anser brachyrhynchus*)		
Water Rail (*Rallus aquaticus*)		

Appendix F. Hydrological Connectivity to Protected Sites

Table F-1 - Hydrological connectivity to protected sites (including Natura 2000 sites)

Watercourse Name	Water management unit	Hydrological connectivity to NATURA 2000 Site	Natura 2000 site name	Connectivity to NHA/pNHA sites	Connectivity to Ramsar site	Connectivity to Nature Reserve	Connectivity to Wildfowl Sanctuary
Hurley River	Nanny	Yes	River Nanny Estuary and Shore SPA (004158).	No	No	No	No
Ballyboghil	Ballyboghil	Yes	Rogerstown Estuary SAC (000208) and SPA (004015)	Yes; Rogerstown pNHA (000208)	Yes; Rogerstown Estuary (Ramsar ID 412)	Yes; Rogerstown Estuary Nature Reserve	Yes; Rogerstown Estuary (WFS-20)
Dunshaughlin River	Broadmeadow	Yes	Malahide Estuary SAC (000205); Malahide Estuary SPA (004025)	No	Yes; Broadmeadow Estuary (Ramsar ID 833)	No	No
Rathoath River	Broadmeadow	Yes	Malahide Estuary SAC (000205); Malahide Estuary SPA (004025)	No	Yes; Broadmeadow Estuary (Ramsar ID 833)	No	No
Turvey	Donabate	Yes	Malahide Estuary SAC (000205);	Yes; Malahide Estuary pNHA (000205)	Yes; Broadmeadow Estuary (Ramsar ID 833)	No	No

Watercourse Name	Water management unit	Hydrological connectivity to NATURA 2000 Site	Natura 2000 site name	Connectivity to NHA/pNHA sites	Connectivity to Ramsar site	Connectivity to Nature Reserve	Connectivity to Wildfowl Sanctuary
			Malahide Estuary SPA (004025)				
Fairyhouse Stream	Broadmeadow	Yes	Malahide Estuary SAC (000205); Malahide Estuary SPA (004025)	No	Yes; Broadmeadow Estuary (Ramsar ID 833)	No	No
Broadmeadow River	Broadmeadow	Yes	Malahide Estuary SAC (000205); Malahide Estuary SPA (004025)	Yes; Malahide Estuary pNHA (000205)	Yes; Broadmeadow Estuary (Ramsar ID 833)	No	No
Ward	Broadmeadow	Yes	Malahide Estuary SAC (000205); Malahide Estuary SPA (004025)	Yes; Malahide Estuary pNHA (000205)	Yes; Broadmeadow Estuary (Ramsar ID 833)	No	No
Pinkeen	Tolka	Yes	South Dublin Bay and River Tolka SPA (004024)	Yes; North Dublin Bay pNHA (000206)	No	No	No

Watercourse Name	Water management unit	Hydrological connectivity to NATURA 2000 Site	Natura 2000 site name	Connectivity to NHA/pNHA sites	Connectivity to Ramsar site	Connectivity to Nature Reserve	Connectivity to Wildfowl Sanctuary
Powerstown	Tolka	Yes	South Dublin Bay and River Tolka SPA (004024)	Yes; North Dublin Bay pNHA (000206)	No	No	No
Tolka	Tolka	Yes	South Dublin Bay and River Tolka SPA (004024)	Yes; North Dublin Bay pNHA (000206)	Yes; Sandymount Strand/Tolka Estuary (Ramsar ID 832)	No	No

Appendix G. Summary of Wetland Characteristics

Table G-1 - Characteristics of wetlands in the Study Area

Name	Code	Main wetland type	Description	Evaluation[91]
Ennistown Pond	WMI_MH469	Scrub, wet grassland	Artificial pond	F Rating: Unknown
Rathbeggan Pond	MIW_MH468	Artificial pond, scrub	Not available	F Rating: Unknown
Lagore Big Commonage	WMI_MH382	River, wet grassland	Not available	C Rating: Local conservation value (high value)
Grangend Wetland	WMI_MH75	Reed swamp, river, marsh, wet grassland, scrub	The main habitat here is semi-improved wet grassland. The north-east corner is wetter and more diverse, with reed swamp, willow scrub and marshy habitat.	E Rating: Local conservation value (low value)
Thomastown Golf Course Ponds	MIW_MH379	Scrub	Series of artificial ponds in golf course setting	F Rating: Unknown value - survey required
Jealoustown Pond	WMI_MH483	Artificial pond, river, scrub, wet grassland,	Not available	F Rating: Unknown value - survey required
Cookstown Pond	WMI_MH482	Artificial pond, scrub	Not available	F Rating: Unknown value - survey required

[91] Map of Irish Wetlands - Map | Title (wetlandsurveysireland.com)

Name	Code	Main wetland type	Description	Evaluation[91]
Primatestown	MIW_MH375	Marsh, wet grassland, scrub, river	Not available	F Rating: Unknown value - survey required
Tayto Park Ponds	WMI_MH501	Artificial pond	Artificial ponds with ornamental planting within the Tayto Park.	F Rating: Unknown value - survey required
Wyestown Farm Pond	WMI_DU127	Lake	Not available	F Rating: Unknown value - survey required
Archerstown Golf Course Ponds	MIW_MH376	Artificial pond, reed swamp	Series of artificial ponds in golf course setting	F Rating: Unknown value - survey required
Roganstown Golf Club Ponds	WMI_DU118	Artificial pond	Approximately 13no. artificial ponds within golf course	F Rating: Unknown value - survey required
Skidoo Golf Course Ponds	WMI_DU119	Artificial pond	Two artificial ponds within golf course	F Rating: Unknown value - survey
Tonlegee Lake	WMI_DU117	Lake	Not available	F Rating: Unknown value - survey required
Corrstown Golf Course Ponds	WMI_DU116	Artificial pond, river, reed swamp, scrub	Approximately 7 artificial ponds within golf course, connected via stream	F Rating: Unknown value - survey required
Westreave Pond	WMI_DU110	Artificial pond, scrub, reed swamp, river	Pond with wooded margin and small areas of reedswamp	F Rating: Unknown value - survey required

Name	Code	Main wetland type	Description	Evaluation[91]
Skephubble Golf Course Ponds	WMI_DU111	Artificial pond	Artificial ponds within golf course	F Rating: Unknown value - survey required
Forrest Great Pond	WMI_DU109	Artificial pond	Not available	F Rating: Unknown value - survey required
Kingstown Pond	WMI_DU186	Artificial pond	Not available	F Rating: Unknown value - survey required
Bay Quarry Pond	WMI_DU114	Artificial pond	Artificial pond within quarry site	F Rating: Unknown value - survey required
Coldwinters	WMI_DU113	Lake, scrub	Not available	F Rating: Unknown value - survey required
Hollystown Golf Course Ponds	WMI_DU115	Artificial pond	Approximately 7no. artificial ponds within golf course with reedswamp areas	F Rating: Unknown value - survey required
Part of Huntstown Quarry Pond	WMI_DU112	Artificial pond	Artificial pond within active quarry site	F Rating: Unknown value - survey required

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