

Derrygreenagh Power Project Environmental Impact Assessment Report

Chapter 9: Biodiversity

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9.0 BIODIVERSITY

9.1 Introduction

9.1.1 This Chapter of the Environmental Impact Assessment Report (EIAR) provides an Ecological Impact Assessment (EclA) of the potential impacts and the likely significant effects of the Proposed Development and Overall Project (as presented in Chapter 5: The Proposed Development and Overall Project) on the ecological environment.

9.1.2 The term biodiversity (or biological diversity), as defined at the United Nations (UN) Convention on Biological Diversity (CBD), is “*the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes genetic diversity within species, between species and of ecosystems*” (United Nations, 1992).

9.1.3 This Chapter follows Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022) as well as the Guidelines for Ecological Impact Assessment in the UK and Ireland (Chartered Institute of Ecology and Environmental Management (CIEEM), 2022). This Chapter aims to:

- Establish and present the baseline of the ecological environment and receptors for the Proposed Development and Overall Project;
- Identify and describe all potential impacts and likely significant ecological effects associated with the Proposed Development and Overall Project;
- Provide an assessment of the significance of impacts to ecological receptors;
- Set out mitigation measures required to ensure compliance with the EIA Directive (see Section 9.6) and to address any potentially significant ecological effects; and
- Provide an assessment of the significance (if any) of any residual and cumulative effects.

9.1.4 The Proposed Development and Overall Project comprises three development distinct areas, which have been assessed separately within this Chapter, followed by a cumulative assessment of the interaction of effects between all elements of the Proposed Development and Overall Project. The Proposed Development and Overall Project components consist of:

- **The Power Plant Area** – this is part of the Proposed Development and relates to the main thermal power plant area and gas AGI east of the R400 road (this will also be the Industrial Emissions (IE) Licence area which will be applied for under the Environment Protection Agency (EPA) Act (as amended), the process water discharge pipe will extend west of the R400 road before ultimate discharge south into the Yellow River;
- **The Electricity Grid Connection** – this is part of the Proposed Development and will consist of the 220kV substation west of the R400 road, pylon towers, overhead lines, undergrounding compound, underground cabling, associated cabling and connections to a new loop-in 400kV substation site and compound;
- **Gas Connection Corridor** – this is part of the Overall Project and will enable the Proposed Development to connect to the existing high pressure Gas Pipeline to the West (BGE/77), north of the Power Plant Area via AGI at tie-in location and underground routing of pipeline. The underground gas connection is not being applied for in the planning application for the Proposed Development (as it will be applied for by Gas Networks Ireland (GNI) under Section 39A of the Gas Act (as amended)), however the underground Gas Connection Corridor and construction

and operation is assessed in this EIAR as part of the Overall Project for completeness, as it will be integral to the operation of the Proposed Development.

- 9.1.5 The Proposed Development relates to the components for which planning permission is being sought. (i.e. the Power Plant Area and Electricity Grid Connection). The Overall Project relates to the Proposed Development, and to ensure a robust environmental assessment, includes the wider project context which includes the Gas Connection Corridor.
- 9.1.6 The Planning Application Site (the Site) relates to the planning application area (i.e., the 'red line boundary') where the Proposed Development is located.
- 9.1.7 A detailed description of the Proposed Development and the Overall Project presented in **Chapter 5**.
- 9.1.8 The Technical Team Lead for this Chapter is Dr Paul Lynas BSc (Hons) MRes CEnv MCIEEM. Field surveys were conducted by Dr Emma Boston BSc (Hons) MRSB MCIEEM, Seanin Maxwell BSc (Hons) MSc ACIEEM, Scott McCollum BSc (Hons) and Paul Donaghey BSc (Hons) MSc. The report was prepared by Dr Emma Boston; Seanin Maxwell, Dr Erfan Fadaei BSc (Hons) ACIEEM and Scott McCollum. Jenny Hunter BSc (Hons), MSc AMRSB, reviewed the report, and Dr Paul Lynas BSc (Hons) MRes CEnv MCIEEM verified the report.
- 9.1.9 Dr Paul Lynas BSc (Hons) CEnv MCIEEM is an Associate Director and leads the Belfast Ecology team. He is an all-round ecologist with over 18 years' experience of conservation and consultancy. habitats. Paul brings extensive experience to AECOM in a variety of ecological monitoring and survey techniques with wide ranging survey experience of terrestrial and aquatic systems. He has undertaken numerous flora and fauna assessments for both public and private sector clients, working in multi-disciplinary teams on many large infrastructure and small-scale projects, from roads to data centers to residential developments. A biography for Dr Lynas is presented in EIAR Appendix 1B (refer to EIAR Volume II).
- 9.1.10 Dr Emma Boston BSc (Hons) MCIEEM MRSB is a Principal Ecologist with over 18 years' professional experience in experience in research, conservation and consultancy. She has published 16 peer-reviewed publications from her research conducted across a number of international research institutions. Emma has experience in a variety of ecological survey methods and has worked independently and as part of a multidisciplinary environmental team as and ecological consultant. She has significant experience in the management and delivery of projects from their development to completion.
- 9.1.11 Jenny Hunter BSc (Hons) MSc AMRSB is a Principal Ecologist with over eight years' professional experience of ecological consultancy. Jenny has extensive field experience of a variety of species and habitat survey techniques. She is proficient in Phase 1 Habitat survey across a variety of habitats including detailed hedgerow assessments. She has extensive experience of protected species surveys for bat, badger, otter, pine marten, smooth newt, and wintering aquatic and seabirds, in addition to surveying for invasive species. Jenny leads AECOM Ecology's digital data capture, for high quality data collection in the field. She is constantly reviewing the use of this technology and training her colleagues in its use.
- 9.1.12 Dr Erfan Fadaei BSc (Hons) ACIEEM is a Senior Ecologist and has over nine years' experience carrying out a wide range of ecological surveys. Erfan is a competent habitat surveyor and has carried out numerous surveys using both Phase 1 and NVC methods. Erfan is proficient in the use of GIS and has significant experience of conducting various

ecological assessments, from Preliminary Ecological Appraisals to Ecological Impact Assessments.

- 9.1.13 Scott McCollum BSc (Hons) is a Consultant Ecologist with six years' professional experience of ecological consultancy. Scott has carried out ecological surveys for a variety of projects including road schemes, railway works, housing and other large-scale private sector developments. Scott has carried out numerous bat surveys, including roost assessments, roost surveys, and activity transects.
- 9.1.14 Paul Donaghey BSc (Hons) MSc is a Consultant Ecologist with four years' professional experience of ecological consultancy. Paul has been involved in a range of ecological surveys since starting with AECOM, including Phase 1 Habitat surveys and protected species surveys such as for badger, otter, bats, wintering and breeding birds and butterflies. Paul has been involved in numerous invasive species surveys for both large and small infrastructure projects for a variety of different sectors including power, transport, and housing.
- 9.1.15 Seanin Maxwell BSc (Hons) MSc ACIEEM is a Consultant Ecologist with over four years' professional experience in ecological consultancy. Seanin has carried out a range of ecological surveys, including bats, badger, smooth newt, reptiles, dormouse, and Phase 1 Habitat surveys. Seanin has been involved in a range of projects including residential, educational, and commercial schemes within the UK and Ireland.

9.2 Methodology

Scope of assessment and study area

Determining the Zone of Influence

9.2.1 The zone of influence (Zoi) is the area over which ecological features may be affected by biophysical changes as a result of a proposed project and associated activities. The Zoi can extend beyond the boundary of a proposed project, for example where there are hydrological links extending beyond the Site boundary. Activities associated with the construction and operation (and where applicable, decommissioning and restoration) phases should be separately identified, where relevant.

9.2.2 In relation to European sites, the Office of the Planning Regulator (OPR, 2021) states that *“the zone of influence of a proposed development [in this case the Proposed Development] is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European Site. This should be established on a case-by-case basis using the Source-Pathway-Receptor framework”*.

9.2.3 The ‘Source-Pathway-Receptor’ conceptual model is a standard tool in environmental assessment. For an effect to occur, all three elements of this mechanism must be in place. The absence or removal of one of the elements of the mechanism means there is no likelihood for the effect to occur. An example of this model is provided below:

- Source(s), e.g. piling;
- Pathway(s) e.g. vibrations; and,
- Receptor(s) e.g. otter holt at risk of collapse.

9.2.4 With respect to European sites, the model is focused solely on the qualifying features for which sites are designated themselves or features which support the qualifying features. However, the model is also useful more generally for defining where impacts and effects to ecological features may occur as a result of a project or development. Where a source-pathway-receptor relationship exists, the ecological receptor is within the Zoi.

9.2.5 The Zoi will vary for different ecological features depending on their sensitivity to any identified impact. It is therefore appropriate to identify different Zoi for different ecological features. The features affected could include habitats, species, and ecosystems (i.e., the processes on which they depend). Zoi are specified for different features, and types of potential impact.

9.2.6 As recommended by CIEEM (2022), professionally accredited or published studies have been used to determine Zoi for sites, habitats, and species. Having considered the Proposed Development and Overall Project, the Zoi has been determined for habitats, flora, and fauna in the context of the source-receptor-pathway, with a minimum 15km search distance (detailed in Table 1, Appendix 9A, refer to EIAR Volume II). In the context of determining the Zoi for potential pollution effects from the Proposed Development and Overall Project, a conservative approach has been adopted assuming that the Zoi includes all areas downstream of the Site within the same catchment.

Defining the Study Area

9.2.7 A desk study was carried out for the Proposed Development and Overall Project using a stratified approach based on the Zoi of the Proposed Development and Overall Project on different ecological features (Table 1, Appendix 9A, refer to EIAR Volume II). In this Chapter of the EIAR, the study area for cumulative effects includes at least the extent of the Zoi from the Site boundary.

9.2.8 Field surveys were carried out within the Proposed Development and the immediate surrounding lands to identify the presence of protected species as shown on Figure 9.1 (refer to EIAR Volume III). The survey area did not include the Gas Connection Corridor (defined in Chapter 1 and Chapter 5 of this EIAR) as third-party lands were inaccessible in this area.

Desk study

9.2.9 A desk study was carried out by AECOM on 14 and 27 April, 28 June 2023, and 23 October 2023 to identify relevant nature conservation designations, and records of protected and notable habitats and species potentially relevant to the Proposed Development and Overall Project.

9.2.10 Accordingly, the desk study identified any site with international nature conservation designations based on source-pathway-receptor links, considering factors such as hydrological connectivity and potential connection to the Site due to mobile qualifying features. International nature conservation sites comprise European sites (i.e., Special Protection Areas (SPA), Special Conservation Areas (SAC)) and Ramsar sites. The desk study also identified sites with national nature conservation designations within the Zol of source-pathway-receptor links to the Proposed Development and Overall Project Boundary such as National Heritage Areas (NHA) and proposed National Heritage Areas (pNHA). All distances are cited as the shortest distance from the Proposed Development and Overall Project Boundary 'as the crow flies', unless otherwise specified.

9.2.11 Data sources consulted comprised the Environmental Protection Agency (EPA) maps website (including Water Framework Ireland Map viewer for Overall information on surface water features in proximity of the Proposed Development and Overall Project), National Parks and Wildlife Service (NPWS) Protected Sites in Ireland website, National Biodiversity Data Centre (NBDC) database, Ordnance Survey Ireland (OSi) maps and aerial photography, and the Irish Red Lists (including Marnell *et al.*, 2009; Regan *et al.*, 2010, King *et al.*, 2011, Lockhart *et al.*, 2012, Nelson *et al.*, 2011; Nelson *et al.*, 2019; Gilbert *et al.*, 2021; Wyse Jackson *et al.*, 2016). A provisional inventory of Ancient and Long-established Woodland in Ireland (Perrin and Daly, 2010) with its associated map viewer was used to search for parcels of Ancient/Long-established Woodland within the Zol of the site.

9.2.12 With respect to the NBDC database search, CIEEM guidance recommends 1km as a minimum search area (CIEEM, 2017), however this has been extended to 2km or greater to account for species with long ranges/territories, e.g., otter *Lutra lutra*. A large number of records were received in the dataset. To increase relevance only protected species or species placed on red or amber conservation lists, with any sensitivity to identified impact pathways have been presented.

9.2.13 Previous ecological surveys were considered including data supporting consented development (19.PA0011), historical breeding bird and wintering bird survey data gathered from Bord na Móna subset from Derrygreenagh group of Bogs (Drumman Bog, Derryarkin Bog, Ballybeg Bog), Bord na Móna habitat mapping, and species records and potential ecological constraints across the project area.

Field surveys

9.2.14 Initial constraints surveys were carried out to inform the Proposed Development and the immediate surrounding lands (see Figure 9.1a), where accessible in September and October 2022 by Woodrow APEM Group, who also completed a Preliminary Roost Assessment (PRA) of trees, structures, and buildings within the site of the Proposed Development, following guidance published by the Bat Conservation Trust (BCT) (Collins, 2016), as well as survey for marsh fritillary *Euphydryas aurinia* butterfly.

- 9.2.15 BioSphere Environmental Services conducted both breeding and wintering bird surveys in 2021 and 2022 (see Table 9.1 and Figure 9.1d for details), and Triturus Environmental Ltd carried out aquatic surveys in 2022 (See Table 9.1 and Figure 9.1c for details).
- 9.2.16 Where necessary, further subsequent ecological surveys during the appropriate times of year were conducted for protected species by AECOM in 2023. These comprised Fossitt habitat surveys (see Section 9.3.15 below for more detail, and Figure 9.1b), and an assessment of the potential of habitats to support protected species such as bats, common frog *Rana temporaria* and smooth newt *Lissotriton vulgaris* and presence of other constraints such as invasive non-native species. A specific badger *Meles meles* survey was conducted in March 2023. Both bat roost and activity surveys were conducted by AECOM in 2023.
- 9.2.17 Table 9.1 details all ecological surveys conducted within the Proposed Development Site. All surveys were carried out during the appropriate season for such surveys, during suitable weather conditions, and at suitable times of day. The table also lists in which Appendix each specific report is presented.

Table 9. 1: Schedule of ecological surveys

SURVEY	DATE(S)	REPORT
Fossitt Habitat survey	27/09/2022, 29/09/2022, 11/10/2022, 24/10/2022	Appendix 9B Woodrow APEM Group
	15/08/2023, 16/08/2023, 17/08/2023	AECOM
Bat PRA (trees and structures)	13/09/2022, 27/10/2022	Appendix 9B Woodrow APEM Group
Bat roost surveys	26/09/2022, 27/09/2022	Appendix 9B Woodrow APEM Group
	06/06/2023, 07/06/2023, 04/05/2023, 05/05/2023, 02/08/2023, 03/08/2023	Appendix 9C AECOM
Bat activity surveys	08/06/2023, 06/07/2023, 01/08/2023	Appendix 9C AECOM
Badger survey	30/03/2023, 31/03/2023	Appendix 9E AECOM
Amphibian habitat assessment / frogspawn survey	30/03/2023, 31/03/2023	This Chapter AECOM
Smooth newt eDNA	06/06/2023, 07/06/2023	Appendix 9I AECOM
Wintering birds	Monthly visits during winter months October 2022-March 2023, and October 2021-March 2022.	Appendix 9G BioSphere Environmental Services
	Monthly visits during winter months October 2022-March 2023.	Appendix 9G Tobin
Breeding birds	<u>2021</u> 10, 12-13, 15-23 April, 7-8, 10, 12, 17-21, 23 May, 8-12, 15, 17, 22-23, 25-26 June, 9-10, 12, 14-16, 19-20, 22, 24 July, 8, 10, 12-13, 15-17, 21, 23-24 August, 8-10, 13-14, 19-21, 23-24 September.	Appendix 9F BioSphere Environmental Services

SURVEY	DATE(S)	REPORT
	<p><u>2022</u> 4, 6-8, 14, 16, 19, 22-23, 27 April, 4, 6-7, 12, 18-22, 24 May, 8-11, 22-25, 28 June, 11-15, 20, 23-24, 27-28 July, 5-6, 9-13, 19-20, 22 August, 7, 9, 12, 14, 16, 23-24, 26-27, 29 September.</p>	
Marsh fritillary	13/09/2022, 14/09/2022, 21/09/2022, 03/10/2022	Appendix 9B Woodrow APEM Group
Aquatic survey and fisheries (including electro-fishing, white-clawed crayfish <i>Austropotamobius pallipes</i> , macrophytes and aquatic byrophytes, invasive aquatic species, macro-invertebrates, otter)	31/08/2022, 01/09/2022, 02/09/2022, 22/09/2022, 23/09/2022.	Appendix 9D Triturus Environmental Ltd

Habitats and flora surveys

- 9.2.18 Surveys for habitats and rare, protected, and invasive plants were carried in September and October 2022 in the Proposed Development Site by Woodrow APEM Group (Table 9.1). The time of year was deemed sufficient to identify protected plants with suitable habitat in the area. The habitats were classified according to *A Guide to Habitats in Ireland* (Fossitt, 2000). Notes were made for each habitat of dominant, typical, and notable plant species, and any relevant ecological characteristics (particularly where relevant to habitat condition), which reflect conditions at the time of survey.
- 9.2.19 Habitats were also visually assessed to determine their potential value to nesting birds, invertebrates, and other taxa. Nomenclature was according to Stace (2019), with most mosses given scientific names only as these rarely have accepted and well-known common names.
- 9.2.20 For the PB1 Raised Bog Habitat, additional information on the vegetation present was obtained by setting out a 2m x 2m relevé (quadrat) and recording all vegetation within the defined area. The relevé location was ITM X 651061, Y 731207.
- 9.2.21 Full details of the habitat survey are given in Appendix 9B.

Bat surveys

Preliminary roost assessment

- 9.2.22 A ground-based PRA was conducted by Woodrow APEM Group in September and October 2022 on buildings, structures, and trees within the Proposed Development Site in accordance with guidance published by the BCT (Collins, 2016) (refer to Appendix 9B, EIAR Volume II) (Table 9.1).
- 9.2.23 Surveys were undertaken during daylight hours with the aid of binoculars and a high-powered torch. The exterior inspection sought to identify suitable bat roosting features, including potential entry/egress points, such as cracks in concrete/bricks, cavity walls, raised roof tiles/lead flashing, gaps, or cracks in soffits/facia boards. The search also sought to identify visible evidence of bat usage, including any bat specimens, droppings, staining, feeding remains etc. The design of the structures was also considered when

assessing their potential to support roosting bats (e.g., a traditional cavity wall and timber roof would typically have more potential than a steel frame and cladded structure).

9.2.24 Internal inspection was carried out on all buildings with the aid of a high-powered torch. The interior was systematically examined (where safe to do so) for any evidence of use by bats. Evidence includes any live or dead bats, audible squeaking, feeding remains, droppings, urine splashes, or fur oil staining. Particular attention was given to any potential entry/egress points identified during external inspection, as evidence of use tends to accumulate over time should bats be present.

9.2.25 The results were used to grade buildings/structures and trees as having Negligible, Low, Moderate, or High suitability for roosting bats in accordance with the BCT guidance (Collins, 2016).

9.2.26 Full details of the PRA methods are given in Appendix 9B.

Bat roost surveys

9.2.27 Bat emergence/re-entry surveys were conducted on buildings and structures identified as suitable for roosting bats within or in proximity to the Zol of the Proposed Development in 2022 and 2023, following BCT guidelines (Collins, 2016) for emergence surveys.

9.2.28 Full details of methods are presented in Appendix 9B and Appendix 9C.

Bat activity survey

9.2.29 Bat activity surveys were conducted using the transect method based on BCT guidelines (Collins, 2016), on 8 June, 6 July, and 1 August 2023, around the area of the proposed 400kV substation site at the southern end of the Electricity Grid Connection. Following standard methods, activity surveys commenced at sunset and continued for at least two hours after sunset. Suitable spot counts (i.e. listening points) were determined along the transect route where surveyors listened in a stationary position for five minutes.

9.2.30 Static detectors were deployed within the Power Plant Area between the 6-8 June, 4-6 July, and 2-4 August to gather data on activity in this area. Full details of methods are presented in Appendix 9C.

Otter survey

9.2.31 An otter survey was conducted at sites along all waterbodies and watercourses (e.g. streams, ditches, etc.) within the Proposed Development and at additional sites within the downstream river network in the area (Figure 9.1), to 150m (NRA, 2008). Disturbance of otter from construction works and operation is only likely to extend up to a distance of 150m for any holts at which breeding females or cubs are present (NRA, 2008). Therefore, 150m from the Proposed Development encompassed the likely Zol of the Proposed Development on otter.

9.2.32 The survey followed guidance in published literature (Chanin, 2003; Liles, 2003; NRA, 2009a). Surveyors searched for otter refuge sites including holts and layups, and any other evidence of otter, such as spraints (droppings), slides, and footprints. Suitable terrestrial habitats (e.g., woodland) were also searched for evidence of otter. Notes on the type and location were made for otter evidence recorded, in addition to the age, quantity, and visible constituents/composition of spraints.

9.2.33 Full details of the otter survey are given in Appendix 9D.

Badger survey

9.2.34 A badger survey was conducted in areas of suitable habitat for badger within 100m of the Proposed Development. Disturbance of any breeding location of badger from construction works is only likely to extend to 50m to (NRA, 2006) in most circumstances

and extends up to a distance of 150m where pile driving will occur. Therefore, badger survey to 100m was carried out as a precautionary measure, and up to 150m where possible.

9.2.35 This survey followed guidance in published literature (Harris *et al.*, 1989, NRA, 2009a) as good practice for badger survey. Habitats up to 100m of the Proposed Development Site which were considered potential badger habitat were systematically checked for signs of badger activity or habitation. These signs include the presence of main, annex, subsidiary, and outlier setts, foraging evidence (e.g., snuffle holes), latrines, access runs and trails, hairs caught on wires and bushes, tracks, and prints.

9.2.36 Full details of methods for the badger survey are presented in Appendix 9E (Confidential Appendix).

Amphibian surveys

Amphibian habitat assessment

9.2.37 Waterbodies within the Proposed Development were appraised for suitability for protected amphibians (i.e. common frog and smooth newt) by AECOM in March 2023 (Table 9.1).

9.2.38 Surveys were carried out following guidance from the (NRA, (2009a) and an adapted version of UK published guidelines (English Nature, 2001 and Natural England, 2015).

Frogspawn survey

9.2.39 Common frog surveys for spawn were carried out within suitable water features in the Proposed Development (excluding the pylon towers and overhead lines) by AECOM in March 2023 (Table 9.1). The number of spawn clumps and their diameter were recorded if encountered. Any tadpoles, juvenile or adult frogs that were observed during survey were also recorded.

Smooth newt eDNA survey

9.2.40 Environmental DNA (eDNA) sampling for smooth newt was carried out on three waterbodies (displayed in Figure 9.2) in proximity to the Proposed Development on 6 and 7 June 2023 by AECOM.

9.2.41 Samples were collected from the waterbodies following approved field and laboratory protocols. Waterbodies were not entered by surveyors during sample collection and new sterile equipment provided by SureScreen laboratory was used to collect each water sample to prevent contamination between waterbodies.

9.2.42 Up to twenty sub-samples of 30ml each were collected from around the periphery of each waterbody. These subsamples were then filtered through a DNA collection tube, with between 150-500ml of sample filtered. The DNA collection tube was then transported to SureScreen laboratory for analysis to aid in establishing the presence or likely absence of smooth newt eDNA.

Breeding bird surveys

9.2.43 Breeding bird surveys were conducted by BioSphere Environmental Services using transect surveys following Bibby *et al.*, (2000), and vantage point surveys in accordance with the Scottish Natural Heritage (SNH) guidance document *Assessment and mitigation of impacts of power lines* and guyed meteorological masts on birds (SNH, 2016), given the potential impacts associated with the Proposed Development, in particular the 220kV Overhead Line as part of the Electricity Grid Connection. SNH (2016) outlines that:

“The principles and methods of surveys required for assessing a power line development are broadly similar to those set out in the NatureScot Bird Survey

Guidance for Onshore Wind Farms. Advice on selecting target species is also relevant; species susceptible to wire impacts include waterfowl, waders, raptors and game birds, with passerines not normally of concern. Data should be recorded and presented as described (apart from the requirement for collision risk modelling ..., although the presentation of VP [vantage point] data should still include bird activity flight line maps at power line collision risk height to allow a qualitative assessment of risk). The Bird Survey Guidance for Onshore Wind Farms should therefore be used to plan an appropriate suite of surveys.”

- 9.2.44 Therefore, survey methods for birds have all complied with the SNH guidance document, Survey Methods for Use in Assessing the Impacts of Onshore Wind Farms on Bird Communities (SNH, 2017).
- 9.2.45 Surveys following standard methods and within the recommended timeframe for breeding birds were carried out during the 2021 and 2022 breeding seasons. Monthly visits took place between April and September in 2021 and 2022. The breeding surveys focused on the following groups of birds: waders, including lapwing *Vanellus vanellus*, ringed plover *Charadrius hiaticula* and snipe *Gallinago gallinago*; other waterbirds, including grebe species, teal *Anas crecca*, and gull species; merlin *Falco columbarius*, hen harrier *Circus cyaneus* and other birds of prey; red grouse; any other Annex I species on the Birds Directive; and any other Red or Amber listed species as listed in Gilbert *et al.* (2021).
- 9.2.46 A comprehensive range of breeding bird surveys has been completed since 2013. The data presented in this Chapter covers the 2021 and 2022 survey season, in line with the requirements of SNH guidance (SNH 2016) which stipulates that one year of survey is required for Overhead Power Lines (i.e. one breeding bird survey season and one wintering bird season).
- 9.2.47 Vantage point surveys were carried out in accordance with Survey Methods for Use in Assessing the Impacts of Onshore Wind Farms on Bird Communities (SNH, 2017). The purpose of these surveys was mainly to detect birds of prey and passing waterbirds (swans, geese, duck, waders etc.). The full duration of 36 hours of observations over the survey area was achieved as required by the method.
- 9.2.48 Birds were initially detected by sight and sound. A representative number of vantage points were established to provide views over large areas of the survey area and adjoining lands, with focus on expanses of habitats of potential value to birds. Ten vantage points were selected and surveyed in total, which included, three vantage points were used in Derryarkin Bog, four in Drumman Bog, and three in Ballybeg Bog. The vantage points were positioned on elevated ground where feasible to avoid screening by vegetation and provide the best visibility possible; these range from naturally higher ground (e.g., hillocks etc.) to roads/embankments. When a target species was sighted during a vantage point survey, the flightline was plotted on a field map with other survey parameters such as abundance, flight height, duration, and activity.
- 9.2.49 The transects selected typically followed identifiable tracks (including rail tracks) which made coverage quicker and also safer compared to across open bog. Furthermore, tracks are often slightly elevated which makes recording more efficient. The number of transects used was determined by the size of the site and the diversity of habitats present. Bird recording was normally within a zone 200-300m wide either side of the transect though the flat nature of the sites made larger sized or obvious birds (such as lapwing) at further distances easily visible. Although these transects and the 200-300m buffer only partially cover the Proposed Development, the vantage point positions covered the gaps in between, so birds were recorded across the entirety of the Proposed Development.

- 9.2.50 Full details of survey methods for breeding birds are presented in Appendix 9F. Biosphere transects and vantage points locations are displayed in Figure 9.1.

Wintering bird surveys

- 9.2.51 A suite of wintering bird surveys was carried out by BioSphere Environmental Services within the Bord na Móna Energy Park lands over the winter 2021-2022 period, which included areas of bog within the Proposed Development. In winter 2022-2023, Biosphere Environmental Services completed survey of Ballybeg Bog only, with Tobin Consulting Engineers completing the surveys of Derryarkin and Drumman Bogs. These surveys were carried out monthly between October 2021 and March 2022, and October 2022 and March 2023 (Table 9.1). The requirements of SNH guidance (SNH 2016) stipulates that one year of survey is sufficient for Overhead Power Lines (i.e. one breeding bird survey season and one wintering bird season), however two years of wintering bird surveys are presented in this Chapter. Additionally, historical surveys for wintering birds have been undertaken since 2013, and data from these historical surveys informed the conclusions of the 2021-2023 surveys.

- 9.2.52 The survey methods comprised transect surveys (Bibby *et al.* (2000)), and vantage point surveys (SNH 2016 and SNH 2017, as outlined in Paragraph 9.2.47). The transects followed the same route as the breeding bird survey, and the same vantage points were also used. Wetland birds (i.e., swans, geese, waders, and ducks) were a particular focus during surveys.

- 9.2.53 The wintering surveys focused on wetland birds primarily, particularly whooper swan *Cygnus cygnus* and Greenland white-fronted geese *Anser albifrons flavirostris*, but also included surveys to record the presence of raptors, any other Annex I species on the Birds Directive, and any other Red or Amber-listed species as listed in Gilbert *et al.* (2021).

- 9.2.54 Full details of survey methods for wintering birds are presented in Appendix 9G. Biosphere transects and vantage points locations are displayed in Figure 9.1.

Aquatic surveys

- 9.2.55 Aquatic surveys were carried out by Triturus Environmental Ltd. on 31 August, and 1, 2, 22, and 23 September 2022, by carrying out sampling at a number of locations. The survey effort focused on watercourses in the vicinity of the Proposed Development, with the following streams also relevant to the Overall Project: Rochfortbridge Stream, Castlejordan River and an unnamed tributary, Kiltonan Stream, Milltownpass River, Kinnegad River, Hightown River, Yellow River, Coolcor Stream, Clonin Stream, Road River and an unnamed tributary, Esker Stream, Rochfort Demesne Stream, Gallstown River, Derry River, Toberdaly Stream, and the Grand Canal.

- 9.2.56 Survey effort focused on both instream and riparian habitats at each aquatic sampling location. Surveys at each of these sites included a fisheries assessment (electro-fishing and/or fisheries habitat appraisal), white-clawed crayfish survey, macrophyte and aquatic bryophyte survey and (where suitable) biological water quality sampling (Q-sampling).

- 9.2.57 Habitat suitability for white-clawed crayfish and presence was assessed at each survey site in conjunction with eDNA sampling for the species at four strategically chosen riverine locations within the vicinity of the project. These water samples were also analysed for the disease crayfish plague *Aphanomyces astaci*.

- 9.2.58 In addition to the ecological characteristics of the site, a broad aquatic and riparian habitat assessment was conducted using elements of the method given in the Environment Agency's River Habitat Survey in Britain and Ireland Field Survey Guidance

Manual 2003 (Environment Agency, 2003) and Fossitt (2000). This broad characterisation informed the definition of the watercourses' conformity or departure from naturalness.

9.2.59 Full details of aquatic survey methods are presented in Appendix 9D.

Marsh fritillary survey

9.2.60 Survey for marsh fritillary butterfly was carried out by Woodrow APEM Group. Surveys aimed to identify areas of suitable habitat, assess the habitat quality, and to identify larval webs (Table 9.1). Habitat condition assessments followed NBDC methods (NBDC, n.d.). Areas identified as containing potentially suitable habitat were mapped to include the extent of the observed habitat.

9.2.61 Where suitable breeding habitat was identified (e.g., the presence of devil's-bit scabious *Succisa pratensis*), larval web searches were conducted. During larval web searches, a zig-zag walk of the survey area was carried out to identify the presence of larval webs. Any larval webs found were photographed, and their locations recorded.

9.2.62 Full details of marsh fritillary survey methods by Woodrow APEM are presented in Appendix 9B.

9.2.63 AECOM carried out further surveys of potential marsh fritillary habitat within the Proposed Development in August 2023. This involved identifying and mapping patches of devil's-bit scabious within areas of grassland, without assessing habitat condition for marsh fritillary. However, no specific searches for larval webs were carried out during surveys in August 2023.

Impact assessment methods

9.2.64 The method employed for assessment of impacts on ecological features is that recommended by CIEEM in *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2022), the EPA (2022), and guidance issued by TII (NRA, 2009b) formerly NRA). The latter is commonly used in Ireland and provides detail on the use of a geographical scale of importance, which broadly concurs with CIEEM and EPA guidance.

Baseline conditions

9.2.65 The assessment first establishes the ecological baseline conditions which are determined by obtaining data on potentially affected ecological features through targeted desk study and field surveys. Ecological baseline conditions are those existing in the absence of a proposed project, in a 'do nothing' scenario. The impact assessment determines how the conditions will change in relation to this baseline to facilitate a clear understanding of the effects of a project. Assessing the impacts and effects of the Proposed Development and Overall Project, and the associated activities, requires an understanding of the baseline conditions prior to and at the time of the project proceeding or specific activities taking place.

Valuing ecological features

9.2.66 An ecological feature is a site, habitat, or species with nature conservation importance. Only those ecological features that have been identified to be within the ZoI of the project, as 'important', and that could potentially be affected by the project, require detailed assessment – "*it is not necessary to carry out detailed assessment of ecological features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable*" (CIEEM, 2022). This is consistent with the EIA Directive (Directive 2011/92/EU as amended by Directive 2014/52/EU) which requires investigation of likely significant effects to be assessed, with reasoning clearly

documented, as accordingly emphasised by EPA (2022). NRA (2009b) prescribes a similar approach, stating that ecological features of less importance than Local (higher) should not be subject to detailed assessment.

9.2.67 Existing data and criteria are considered when determining the importance of ecological features. Where these are lacking, it is necessary to apply professional judgment. Factors considered include:

- Rarity, endemism, mobility and geographic range (particularly if this is changing);
- Size/extent, rate of decline, and vulnerability;
- Typicalness, species-richness, habitat structure and connectivity/fragmentation;
- Function/value to other features (e.g., habitats of notable species or buffers against impacts); and
- Restoration potential.

9.2.68 As per CIEEM guidance, the importance of ecological features is described within a geographic scale. Examples of the types of ecological features which might fall into the importance categories are given in Table 9.2, which is based on the CIEEM (2022) and NRA (2009b). For the purposes of this assessment ‘Local’ is defined as the area within 5km of the Proposed Development and Overall Project.

Table 9. 2: Geographic value criteria

GEOGRAPHICAL RECEPTOR VALUE	CRITERIA / EXAMPLES
International (very high)	<ul style="list-style-type: none"> • Internationally designated nature conservation site (or candidate/ proposed international site), or site satisfying criteria for such designation, or feature essential to maintaining such sites. • Sustainable area (or part of a larger sustainable area) of best examples of Annex I habitat. • A regularly-occurring internationally-significant population (e.g. 1% of the national population, or potentially less for critical parts of wider populations or those at a critical life-cycle stage) of internationally important species listed on Annex I of the Birds Directive or Annex II of the Habitats Directive.
National (high)	<ul style="list-style-type: none"> • Nationally designated nature conservation site (or proposed such site), or site satisfying criteria for such designation. • Sustainable area of good quality Annex I habitat not deemed to be of international importance, or of national priority habitat, which is a significant proportion of the resource. • Regularly-occurring nationally significant population (e.g. 1% of the national population, or potentially less for critical parts of wider populations or those at a critical life-cycle stage) of species listed or protected under the Wildlife Acts or Red Data lists, or site supporting one.
County (medium)	<ul style="list-style-type: none"> • County designated nature conservation site (or proposed such site). • Sustainable area of Annex I habitat or national priority habitat not deemed to be of higher importance (e.g. lower quality, highly fragmented, small and/ or low restoration potential), or priority habitat under a Local Biodiversity Action Plan if this exists and applies at county level.

GEOGRAPHICAL RECEPTOR VALUE	CRITERIA / EXAMPLES
	<ul style="list-style-type: none"> Regularly-occurring county significant population (e.g. 1% of county resource, or potentially less for critical parts of wider populations or those at a critical life-cycle stage) of species listed or protected under the Habitats/Birds Directives, Wildlife Acts, Red Data lists or Local Biodiversity Action Plan (if this exists and applies at county level), or site supporting one.
Local (higher)	<ul style="list-style-type: none"> Priority habitat of insufficient size or quality for higher importance or degraded with low restoration potential. Habitat providing significant biodiversity or important ecological corridors in a local context. Small sustainable population of notable species not qualifying for higher importance or uncommon locally.
Site / Local (lower)	<ul style="list-style-type: none"> Common, heavily-managed or modified habitat, and common and widespread species.

Source: Adapted from CIEEM (2022) and NRA (2009b).

Characterising ecological impacts and effects

9.2.69 Impacts may occur during the construction, operational (including maintenance), and decommissioning phases of a development. The effects of these impacts may be direct or indirect (also termed secondary). Direct effects are attributable to an action associated with a development. Indirect effects are often produced away from a development or as a result of other initial impacts.

Construction impacts and effects

9.2.70 A number of construction phase impacts have the potential to disturb protected species. Potential impacts and effects to biodiversity from the Proposed Development and Overall Project include, but are not limited to: habitat loss, noise, and visual disturbance to hibernating, breeding, or foraging populations of fauna species, or the potential for suspended solids, oils, fuels, paints, or other contaminants to be carried into watercourses, particularly following topsoil stripping.

9.2.71 Several factors influence the potential significance of effects, including the time of year and the potential for unforeseen events such as extreme weather, as well as potential cumulative impacts with other ongoing activities or developments.

Operational phase impacts and effects

9.2.72 Operational impacts consider the effects of the Proposed Development and Overall Project throughout its lifetime. Impacts and effects to ecological receptors may be most significant throughout the initial years of operation. Prior to the re-establishment and growth of removed vegetation, and before the establishment of breeding and/or non-breeding populations of protected and notable species in areas which have been disturbed or displaced.

Decommissioning phase impacts and effects

9.2.73 Effects arising from the process of decommissioning of the Proposed Development and Overall Project are considered on a precautionary basis to be of a similar nature and duration to those arising from the construction process.

9.2.74 It is envisaged that the Power Plant Area will have a design life of at least 25 years. At the end of the design life, the Power Plant Area would either be decommissioned, or the lifetime could potentially be extended. Decommissioning or extension of the lifetime of the asset would therefore be expected to commence at some point after 2052.

- 9.2.75 At the end of its operating life, all above-ground equipment associated with the Power Plant Area will be decommissioned and removed from the site. A Decommissioning Plan will be produced and agreed with the EPA as part of the permit surrender process ahead of any permit surrender.
- 9.2.76 The Electricity Grid Connection will be managed by the transmission asset operators (TAO) and transmission service operators (TSO) (ESBN and EirGrid for electricity) as part of the national grid electricity. When the Electricity Grid Connection will be decommissioned depends on the asset owner’s operational requirement and asset management policy.
- 9.2.77 The Gas Connection Corridor will be managed by the TAO and TSO (GNI for gas) as part of the national gas networks. When the gas pipeline will be decommissioned depends on the asset owner’s operational requirement and asset management policy.

Significance of effects

- 9.2.78 As per EPA (2022) guidance significance of effects is usually understood to mean the importance of the outcome of the effects (the consequences of the change). Significance is determined by a combination of (objective) scientific and subjective (social) concerns. Note that in CIEEM guidance (2002) there is a distinction between impact and effect. An impact is an action on an ecological feature (e.g., hedgerow removal; loss of a bat roost). An effect is the outcome of that impact on an ecological feature (e.g., effect of hedgerow loss on breeding birds; effect of bat roost loss on the conservation status of the bat species). The EPA (2022) terminology with regards to the significance of effects is used through this Chapter.
- 9.2.79 Effects of the Proposed Development and Overall Project are likely for all ecological features; however only those effects that are likely to be significant require detailed descriptions. A description of effects is shown in Table 9.3.

Table 9. 3: Descriptions of effects

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

DESCRIPTOR	NOTES
	<p>Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.</p> <p>Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.</p> <p>Significant Effects An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.</p> <p>Very Significant An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.</p> <p>Profound Effects An effect which obliterates sensitive characteristics.</p>
<p>Describing the Extent and Context of Effects Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.</p>	<p>Extent Describe the size of the area, the number of sites and the proportion of a population affected by an effect.</p> <p>Context Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?)</p>
<p>Describing the Probability of Effects Descriptions of effects should establish how likely it is that the predicted effects will occur so that the competent authority can take a view of the balance of risk over advantage when making a decision.</p>	<p>Likely Effects The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.</p> <p>Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.</p>
<p>Describing the Duration and Frequency of Effects 'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.</p>	<p>Momentary Effects Effects lasting from seconds to minutes.</p> <p>Brief Effects Effects lasting less than a day.</p> <p>Temporary Effects Effects lasting less than a year.</p> <p>Short-term Effects Effects lasting one to seven years.</p> <p>Medium-term Effects Effects lasting seven to fifteen years.</p> <p>Long-term Effects Effects lasting fifteen to sixty years.</p> <p>Permanent Effects Effects lasting over sixty years.</p> <p>Reversible Effects</p>

DESCRIPTOR	NOTES
	<p>Effects that can be undone, for example through remediation or restoration.</p> <p>Frequency of Effects Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).</p>
Describing the Types of Effects	<p>Indirect Effects (a.k.a. Secondary or Off-site Effects) Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.</p> <p>Cumulative Effects The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.</p> <p>‘Do-nothing Effects’ The environment as it would be in the future should the subject project not be carried out.</p> <p>‘Worst-case’ Effects The effects arising from a project in the case where mitigation measures substantially fail.</p> <p>Indeterminable Effects When the full consequences of a change in the environment cannot be described.</p> <p>Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.</p> <p>Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.</p> <p>Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SO_x and NO_x to produce smog).</p>

Source: EPA (2022)

Determining significance

- 9.2.80 Significance is determined by comparing the character of the predicted effect to the sensitivity of the receiving environment can determine the significance of the effect. There are seven generalised degrees of effect significance that are commonly used in EIA: imperceptible, not significant, slight, moderate, significant, very significant, and profound (see Table 9.2).
- 9.2.81 Significant effects (i.e. slight to profound) are therefore those of sufficient importance to warrant assessment and reporting so that the decision maker is adequately informed of the environmental consequences of development.
- 9.2.82 Broadly, significant effects encompass impacts on the structure and function of defined sites, habitats, or ecosystems, and the conservation status of habitats and species. According to CIEEM (2022) guidance, significant effects should be qualified with

reference to an appropriate geographic scale. Effects were considered significant at a range of scales from International to Local (see Table 9.2). Whilst European case law is specific regarding significance in relation to European sites and Annex habitats, the scale of significance of an effect may not be the same as the geographic context in which the feature is considered important. For example, an effect on a nationally important population may not be significant to the national population.

- 9.2.83 The level of significance of an impact on the ecological integrity of the receptor or resource depends upon all the factors described above. Initially, consideration of the impact on ecological integrity does not take account of recommendations for mitigation or compensation that might subsequently be described. Residual impacts and their level of significance are determined after considering implementation of mitigation.

Assessment of cumulative impacts

- 9.2.84 Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location (CIEEM, 2022). More than one impact acting on a receptor simultaneously may have a cumulative impact that is greater than when the same impacts act in isolation. Cumulative impacts may entail the assessment of all the impacts of the Proposed Development and Overall Project upon a feature (e.g., impacts at the construction and operation stage), or the cumulative impacts of a variety of schemes that would affect the same area. The area affected may vary depending on the receptor being considered.
- 9.2.85 Cumulative effects are particularly important in EclA as many ecological features are already exposed to background levels of threat or pressure and may be close to critical thresholds where further impact could cause irreversible decline. Effects can also make habitats and species more vulnerable or sensitive to change.
- 9.2.86 Under EPA (2022), effects are assessed as likely or not likely, and note must be made of any transboundary effects (i.e. effects extending into other countries).

Assessment of residual effects

- 9.2.87 After assessing the impacts of the Proposed Development and Overall Project, attempts should be made to mitigate (preferably by avoidance) ecological impacts. Once measures to avoid and mitigate ecological impacts have been determined, assessment of the residual impacts was conducted to determine the significance of their effects on ecological features. Any residual impacts that will result in effects that are significant, and proposed compensatory measures, will be the factors considered against ecological objectives (legislation and policy) in determining the outcome of the application.

Limitations and assumptions

- 9.2.88 The aim of a desk study was to aid in characterising the baseline context of the Proposed Development and Overall Project and to provide background information that would not be captured by a single site survey alone. Information obtained during a desk study is dependent upon third parties (e.g. people, organisations) submitting records for the area of interest. As such, a lack of records for a particular habitat or species does not necessarily mean that the habitat or species does not occur in the study area. Likewise, the presence of records for particular habitats and species does not automatically mean that these still occur within the area of interest or are relevant in the context of the Proposed Development and Overall Project. Biological records can be received from a wide variety of sources and may or may not be comprehensive and from an accurate or reliable surveyor. However, if assessed in conjunction with field survey, they can contribute to a robust ecological assessment of a site.

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- 9.2.89 Where habitat boundaries coincide with discernible boundaries on recent aerial photographs (where available) the resolution is as determined by the accuracy of the aerial photographs. Otherwise, habitat mapping is as estimated in the field. Where areas of habitat are given from desk-based mapping searches, they are approximate and should be verified by measurement onsite.
- 9.2.90 One significant limitation is that the Gas Connection Corridor has not been subject to any field survey, with the exception of fisheries and aquatics sampling (refer to Appendix 9D, EIAR Volume II). Accordingly, the majority of data and impact assessment presented for the Gas Connection Corridor is from a desk-based assessment only. The exact location of the Gas Connection Corridor and associated infrastructure will be subject to detailed design by GNI under Section 39A of the Gas Act (as amended), along with a separate planning application at a later date to this planning application. An assessment of the Gas Connection Corridor has been carried out in so far as practicable given these limitations. For further information on the selection and consideration of the Gas Connection Corridor as a representative route, please refer to Chapter 1 of this EIAR.
- 9.2.91 All limitations relating to specific species surveys are detailed within the relevant Appendix (presented in Volume II of this EIAR) where Technical Reports for each species are presented.
- 9.2.92 No other limitations or constraints in regard to the surveys or findings presented within this Chapter were encountered.

9.3 Regulatory, policy and guidance framework

Legislative context

9.3.1 The following legislation is relevant and has been considered for the Proposed Development and Overall Project:

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (the Habitats Directive);
- Council Directive 2009/147/EC of 30 November 2009 on the conservation of wild birds (the Birds Directive);
- Council Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (as amended) (the Water Framework Directive);
- Regulation 1143/2014 of the European Parliament and of the Council of 22 October 2014 on the prevention and management of the introduction and spread of invasive alien species (the Invasive Alien Species Regulations);
- Convention on Wetlands of International Importance (the Ramsar Convention);
- The Planning & Development Act 2000 S.I. No. 30 of 2000 as amended; the Planning and Development (Amendment) Act 2010 S.I. No. 30 of 2010 as amended; The Planning & Development (Amendment) Act 2010 S.I. No. 16 of 2018 as amended (collectively known as the Planning Acts);
- The Planning and Development (Amendment) Regulations 2022;
- European Communities (Bird and Natural Habitats) Regulations 2011-2021 (the Habitats Regulations);
- Wildlife Act 1976 (no. 39 of 1976); Wildlife (Amendment) Act 2000 (no. 38 of 2000); Wildlife (Amendment) Act 2010 (no. 19 of 2010); Wildlife (Amendment) Act 2012 (no. 29 of 2012); Heritage Act 2018 (no. 15 of 2018), Part 3; Planning, Heritage and Broadcasting (Amendment) Act 2021 (no. 11 of 2021), Chapter 3 (collectively known as the Wildlife Acts);
- Flora (Protection) Order 2022 S.I. 235/2022 (the Flora Protection Order); and
- EC Environmental Objectives (Surface Waters) Regulations 2009 (S.I. No. 272 of 2009); EC Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 (SI No. 77 of 2019)
- The Environmental Impact Assessment (EIA) (EIA Directive 2014/52/EU) which relates to the assessment of the effects of certain public and private projects on the environment.

9.3.2 The above legislation has been considered when planning and completing this Chapter using the methods described in Section 9.3, when identifying impacts and effects from the Proposed Development and Overall Project, as discussed in Section 9.5, and when prescribing required mitigation, as discussed in Section 9.6. Compliance with legislation may require the obtainment of relevant protected species licenses prior to the implementation of the Proposed Development.

Planning policy and guidance

- 9.3.3 The Project Ireland 2040 National Planning Framework (NPF) sets out the Government's planning policies for Ireland and how these should be applied. NPF sets out that to achieve sustainable development, the planning system must incorporate an environmental objective, which should include:
- Integrated planning for green infrastructure and ecosystem services;
 - Enhancing the conservation status and improve the management of protected areas and protected species;
 - Use natural resources prudently;
 - Minimising waste and pollution; and
 - Mitigating and adapt to climate change, including moving to a low carbon economy.
- 9.3.4 The National Biodiversity Plan 2017-2021 for Ireland outlines seven main objectives to meet commitments under the Convention on Biological Diversity (CBD) and EU Biodiversity Strategy. These objectives include:
- Mainstreaming biodiversity into decision-making across all sectors;
 - Strengthening the knowledge base for conservation, management and sustainable use of biodiversity;
 - Increasing awareness and appreciation of biodiversity and ecosystem services;
 - Conserving and restore biodiversity and ecosystem services in the wider countryside;
 - Conserving and restore biodiversity and ecosystem services in the marine environment;
 - Expanding and improve management of protected areas and species; and
 - Strengthening international governance for biodiversity and ecosystem services.
- 9.3.5 The 4th National Biodiversity Plan for the period of 2023-2027 is currently under development and a draft has been made available for public consultation. The draft plan contains six objectives that address different themes to contribute to the vision of living in harmony with nature by the year 2050. These objectives are:
- Adopt a whole of government, whole of society approach to biodiversity;
 - Meet urgent conservation and restoration needs;
 - Secure nature's contribution to people;
 - Embed biodiversity at the heart of climate action;
 - Enhance the evidence base for action on biodiversity; and
 - Strengthen Ireland's contribution to international biodiversity initiatives.

County Development and Local Area Plans

- 9.3.6 Other relevant policies that have been referred to in order to inform this Chapter (refer to Chapter 2: Policy, EIAR Volume I for details on planning policy), these include:
- Offaly County Development Plan 2021-2027;
 - Offaly Heritage Plan 2023-27; and
 - Westmeath County Development Plan 2021-2027.

- 9.3.7 The Offaly County Development Plan 2021-2027 (CDP) The CDP sets out the aims, policies, and objectives for topics such as development, green infrastructure, and natural heritage for County Offaly in accordance with the Planning Acts. The strategic aim of this plan relative to the natural environment is set out in Chapter 4: Biodiversity and Landscape, and is to:
- Protect and enhance Offaly's natural assets of clean water, biodiversity, landscape, green infrastructure, heritage, and agricultural land.
- 9.3.8 Chapter 4 of the CDP also includes specific policy objectives for a number of themes and environmental features, including: designated and non-designated sites; peatlands, waterways, lakes and wetland landscapes; trees forestry and hedgerows; green infrastructure; invasive species; areas of high amenity; landscape, high nature value (HNV) farming projects; and wilderness corridors.
- 9.3.9 The Westmeath County Development Plan 2021-2027 is available in draft and sets out the County Council's proposed policies and objectives for the development of the County over the Plan period. The aims of this plan in relation to biodiversity is set out in Chapter 12. Natural Heritage and Green Infrastructure and is to continue to protect and enhance the County's natural heritage and biodiversity and ensure that networks of green infrastructure are identified, created, protected, and enhanced to provide a wide range of environmental, social, and economic benefits to communities.

Relevant guidance

- 9.3.10 This EiAR Chapter has been prepared with consideration of the following guidance documents:
- *Guidelines for Ecological Impact Assessment in the UK and Ireland* (CIEEM, 2018; updated 2022);
 - *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (EPA, 2022);
 - *Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment* (Department of Housing, Planning and Local Government, 2018);
 - *Guidelines for assessment of Ecological Impacts of National Road Schemes* (NRA, 2019b);
 - *Guidance – Assessment and mitigation of impacts of power lines and guyed meteorological masts on birds* (Scottish Natural Heritage, 2016);
 - *A Guide to Habitats in Ireland* (Fossitt, 2000);
 - *Best Practice Guidance for Habitat Survey and Mapping* (Smith et al., 2011);
 - *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters* (Inland Fisheries Ireland, 2016);
 - *Bat Surveys: Good Practice Guidelines, Third Edition* (Bat Conservation Trust, Collins 2016);
 - *Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities* (DEHLG, Rev. Feb. 2010);
 - *Ecology Guidelines for Electricity Transmission Projects, A Standard Approach to Ecological Impact Assessment of High Voltage Transmission Projects* (EirGrid, 2012).

9.4 Baseline ecological conditions (receiving environment) and constraints

Power Plant Area

Desk Study

Sites with statutory designations

- 9.4.1 A search for designated sites was carried out on 23 October 2023. There are eight European sites, comprising six SAC and two SPA, within the Zol of the Power Plant Area. Two of these sites (Raheenmore Bog and Lough Ennell) are also Ramsar sites. There are no other Ramsar sites within the Zol of the Power Plant Area. None of these sites fall within the Power Plant Area.
- 9.4.2 Six of the European sites are within the Zol due to their sensitivity to air pollution. River Boyne and River Blackwater SAC and SPA are hydrologically connected >25km downstream of the Power Plant Area, via the Mongagh River (Castlejordan_020 WFD waterbody (IE_EA_07C040100)).
- 9.4.3 There are ten nationally designated sites (i.e. NHA and pNHA) within the Zol of the Power Plant Area, as these sites have habitats that are sensitive to air pollution.
- 9.4.4 A summary of sites with statutory designations within the Zol of the Power Plant Area is presented in Table 9.4. European site locations relative to the Power Plant Area are displayed in Figure 9.3. NHA and pNHA sites are displayed in Figure 9.4.

Table 9. 4: Designated sites within the Zol of the Power Plant Area.

DESIGNATED SITE	REASON(S) FOR DESIGNATION	DISTANCE TO THE POWER PLANT AREA	REASON IN ZOI
European sites			
Raheenmore Bog SAC [000582]	<ul style="list-style-type: none"> • Active raised bogs [7110] • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the <i>Rhynchosporion</i> [7150] 	7.1km southwest	Qualifying habitats potentially sensitive to atmospheric pollutants released from the operational phase.
Lough Ennell SAC [000685]	<ul style="list-style-type: none"> • Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. [3140] • Alkaline fens [7230] 	10.2km northwest	Qualifying habitats potentially sensitive to atmospheric pollutants released from the operational phase.
Lough Ennell SPA [004044]	<ul style="list-style-type: none"> • Pochard <i>Aythya ferina</i> [A059] • Tufted duck <i>Aythya fuligula</i> [A061] • Coot <i>Fulica atra</i> [A125] • Wetland and waterbirds [A999] 	10.8km northwest	<p>Potential disturbance impacts to mobile SCI species during construction/operational/decommissioning.</p> <p>Potential loss of functionally linked habitat of mobile SCI species.</p> <p>Mobile SCI species with indirect sensitivity to atmospheric pollutants released from the operational stack and dust deposition in</p>

DESIGNATED SITE	REASON(S) FOR DESIGNATION	DISTANCE TO THE POWER PLANT AREA	REASON IN ZOI
			construction/decommissioning phases.
Split Hills and Long Hill Esker SAC [001831]	<ul style="list-style-type: none"> Semi-natural dry grasslands and scrubland facies on calcareous substrates (<i>Festuco-Brometalia</i>) (important orchid sites) [6210] 	11.1km west	Qualifying habitats potentially sensitive to atmospheric pollutants released from the operational stack.
Mount Hevey Bog SAC [002342]	<ul style="list-style-type: none"> Active raised bogs [7110] Degraded raised bogs still capable of natural regeneration [7120] Depressions on peat substrates of the <i>Rhynchosporion</i> [7150] 	13.9km northeast	Qualifying habitats potentially sensitive to atmospheric pollutants released from the operational stack.
Wooddown Bog SAC [002205]	<ul style="list-style-type: none"> Degraded raised bogs still capable of natural regeneration [7120] 	15km north	Qualifying habitats potentially sensitive to atmospheric pollutants released from the operational stack.
River Boyne and River Blackwater SAC [002299]	<ul style="list-style-type: none"> Alkaline fens [7230] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] River lamprey <i>Lampetra fluviatilis</i> [1099] Salmon <i>Salmo salar</i> [1106] Otter <i>Lutra lutra</i> [1355] 	16.6km northeast Hydrological connection - >25km downstream	<p>Qualifying habitats and species sensitive to waterborne pollution and spread of invasive non-native species (INNS) during construction/ decommissioning.</p> <p>Potential disturbance impacts to mobile QI species during construction/ operational/ decommissioning.</p> <p>Mobile QI species with indirect sensitivity to atmospheric pollutants released from the operational stack and dust deposition to functionally linked habitat in construction / decommissioning phases.</p>
River Boyne and River Blackwater SPA [004232]	<ul style="list-style-type: none"> Kingfisher <i>Alcedo atthis</i> [A229] 	16.6km northeast, >28.6km downstream	Mobile SCI species indirectly sensitive to waterborne pollution and spread of INNS during construction/ decommissioning phases.
Nationally designated sites			

DESIGNATED SITE	REASON(S) FOR DESIGNATION	DISTANCE TO THE POWER PLANT AREA	REASON IN ZOI
Milltownpass Bog NHA [002323]	<ul style="list-style-type: none"> • Peatlands 	5.4km north	Qualifying habitats potentially sensitive to atmospheric pollutants released from the operational stack.
Raheenmore Bog pNHA [000582]	<ul style="list-style-type: none"> • Peatlands 	7.1km southwest	Qualifying habitats potentially sensitive to atmospheric pollutants released from the operational stack.
Black Castle Bog NHA [000570]	<ul style="list-style-type: none"> • Peatlands 	7.5km southeast	Qualifying habitats potentially sensitive to atmospheric pollutants released from the operational stack.
Cloncrow Bog (New Forest) NHA [000677]	<ul style="list-style-type: none"> • Peatlands 	8.1km west	Qualifying habitats potentially sensitive to atmospheric pollutants released from the operational stack.
Lough Ennell pNHA [000685]	<ul style="list-style-type: none"> • Hard oligo-mesotrophic waters with benthic vegetation of Chara spp. • Alkaline fens • Pochard, tufted duck, coot 	9.9km northwest	Qualifying habitats potentially sensitive to atmospheric pollutants released from the operational stack.
Split Hills and Long Hill Esker pNHA [001831]	<ul style="list-style-type: none"> • Semi-natural grasslands dry 	11.1km west	Qualifying habitats potentially sensitive to atmospheric pollutants released from the operational stack.
Daingean Bog NHA [002033]	<ul style="list-style-type: none"> • Peatlands 	11.3km southwest	Qualifying habitats potentially sensitive to atmospheric pollutants released from the operational stack.
Nure Bog NHA [001725]	<ul style="list-style-type: none"> • Peatlands 	12.5km northwest	Qualifying habitats potentially sensitive to atmospheric pollutants released from the operational stack.
Mount Hevey Bog pNHA [001584]	<ul style="list-style-type: none"> • Peatlands 	13.6km northeast	Qualifying habitats potentially sensitive to atmospheric pollutants released from the operational stack.
Wooddown Bog NHA [00694]	<ul style="list-style-type: none"> • Peatlands 	14.4km north	Qualifying habitats potentially sensitive to atmospheric pollutants released from the operational stack.

Source: NPWS (2002a,b,c,e,f, 2015, 2016, 2018a,b, 2021, 2022b,d, 2023)

Ancient/Long-established Woodland

- 9.4.5 The nearest parcel of Long-established Woodland is Gaybrook Demense, located approximately 8.1km north of the Power Plant Area. There is no hydrological connection between the Power Plant Area and this parcel of Long-established Woodland.
- 9.4.6 The nearest parcel of Ancient/Long-established Woodland with hydrological connectivity is Rahin Wood, a Possible Ancient Woodland (PAW) located 11.6 km southeast of the Power Plant Area (>15km hydrologically via the River Castlejordan, which flows into the Boyne River). At this distance, Rahin Wood is outside the Zol of the Power Plant Area.
- 9.4.7 There are no parcels of Ancient/Long-established Woodland habitat within the Zol of the Power Plant Area. Ancient/Long-established Woodland is therefore not considered as part of this assessment.

Species records

- 9.4.8 The NBDC dataset of records within 2km of the Power Plant Area was obtained on 7 August 2023, comprising records representing 42 species. These are presented in Table 1, Appendix 9H (refer to EIAR Volume II).
- 9.4.9 Fourteen records of badger were returned by the NBDC database within 2km of the Power Plant Area. Other protected mammal species returned by the NBDC database comprised otter (three records), red squirrel *Sciurus vulgaris* (one record from 2012) hedgehog *Erinaceus europaeus* (three records), pine marten *Martes martes* (one record), stoat *Mustela erminea* (three records), Irish hare *Lepus timidus* subsp. *hibernicus*, (four records), soprano pipistrelle *Pipistrellus pygmaeus* (one record), and Daubenton's bat *Myotis daubentonii* (one record).
- 9.4.10 Twenty-six notable bird species were returned by the NBDC database search within 2km of the Power Plant Area. Two of these species are listed on Annex I of the Birds Directive, kingfisher *Alcedo atthis* and whooper swan. Of these notable species, seven are Red-listed species (which include species such as snipe and lapwing) and 17 are Amber-listed species (including barn swallow *Hirundo rustica* and willow warbler *Phylloscopus trochilus*) according to the Birds of Conservation Concern in Ireland (BoCCI) (Gilbert *et al.* 2021). Several bird species have been noted during BNM ecological surveys at Drumman including cormorant *Phalacrocorax carbo*, curlew *Numenius arquata*, kingfisher, lapwing, mallard *Anas platyrhynchos*, mute swan *Cygnus olor*, snipe, black-headed gull *Larus ridibundus*, lesser black-backed gull *Larus fuscus*, passerines such as meadow pipit *Anthus pratensis*, reed bunting *Emberiza schoeniclus* stonecaht *Saxicola rubicola*, blackbird *Turdus merula*, goldfinch *Carduelis carduelis*, lesser redpoll *Carduelis flammae cabaret*, linnets *Carduelis cannabina*, robin *Erithacus rubecula*, wren *Troglodytes troglodytes* have also been recorded on the site, as well as magpie *Pica pica*, rook *Corvus frugilegus* and hooded crow *Corvus cornix* (see Appendix 9J).
- 9.4.11 The data search also returned records of one endangered insect, wall butterfly *Lasiommata megera*, and one near threatened insect, large red-tailed bumblebee *Bombus (Melanobombus) lapidarius*. Four records of the protected species white-clawed crayfish were also returned.
- 9.4.12 Records of scheduled, high impact invasive mammals were returned by NBDC, comprising American mink *Mustela vison* and brown rat *Rattus norvegicus*. Records of the high impact, but not scheduled, fallow deer *Dama dama* were also returned. A record of one medium impact, (though not scheduled) invasive mollusc species was returned, Jenkins' spire snail *Potamopyrgus antipodarum*.

- 9.4.13 No records of protected or notable plant species, fish species, reptiles, or amphibians, or records of invasive plant species were returned from the search of the NBDC database.

Field surveys

Habitats

- 9.4.14 Habitats identified during the survey within the Power Plant Area are described in the following paragraphs and are presented in Figure 9.5. Habitats are presented in order of Fossitt (2020) classification. Full details of the habitat survey carried out by Woodrow APEM are presented and discussed in Appendix 9B.

Acid oligotrophic lake (FL2)

- 9.4.15 A number of lakes are located in the north and east of the site and vary in size. Seasonal fluctuations in rainfall and the water table will likely influence the depth and area of these lakes, and indeed may influence the number of lakes present. The water was brown in colour due to the peaty substrate. Species include bulrush *Typha* spp., common cottongrass *Eriophorum angustifolium*, and sharp-flowered rush *Juncus acutiflorus*. Some of these waterbodies supported assemblages of several dragonfly species.

Lowland depositing river (FW2)

- 9.4.16 A short stretch of lowland depositing river was recorded. The Mongagh River (also known as the Kiltonan Stream) is a tributary of the Yellow River ((Castlejordan)_010, 020 and 030 WFD waterbodies) and flows eastwards before joining the Yellow River south of Castlejordan. It has been historically straightened and over-deepened with a very deep, steep trapezoidal channel and bankfull heights of up to 8m. The river averaged 1.5-2m wide in a heavily vegetated two-stage channel of up to 8m wide. The depth was a homogenous 0.5m. The profile comprised deep slow-flowing depositional glide with no riffle or pool areas. The substrata, given historical excavation, comprised compacted clay with very localised boulder and superficial gravels. Macrophyte cover was very high (>95%) with abundant fool's watercress *Helosciadum nodiflorum*, watercress *Nasturtium officinale*, and water mint *Mentha aquatica*. Branched bur-reed *Sparganium erectum* was frequent instream and along channel margins. Broad-leaved pondweed *Potamogeton natans* and common duckweed *Lemna minor* were locally frequent with occasional water starwort *Callitriche* sp. And water plantain *Alisma plantago-aquatica*. Aquatic bryophytes were not recorded. Filamentous algae were present (10% cover), further indicating significant enrichment. The riparian zones (mostly dry meadow and grassy verge (GS2) habitat) supported abundant reed canary-grass *Phalaris arundinacea*, great willowherb *Epilobium hirsutum*, purple loosestrife *Lythrum salicaria*, and creeping bent *Agrostis stolonifera*, with scattered bramble *Rubus fruticosus* agg. And gorse *Ulex europeus* scrub (WS1). The sampling site was bordered by an active quarry to the south (ED3) and scrub and cutover bog (PB4) to the north.

Drainage ditches (FW4)

- 9.4.17 A network of deep drainage ditches transects the cutover bog habitats. Standing water is a consistent feature of these ditches. These ditches are partly unvegetated, but where present, species include common reed *Phragmites australis*, bulrush, and bulbous rush.

Reed and large sedge swamps (FS1)

- 9.4.18 In small patches in Drumman Bog, often in or beside drainage ditches, there are dense stands of bulrush. Often these had common duckweed on the water surface, water mint at edges, and some emergent water horsetail *Equisetum fluviatile*.

Amenity grassland (GA2)

- 9.4.19 Amenity grassland surrounds the Bord na Móna offices within the Power Plant Area. This grassland is improved, intensively maintained, and species-poor. Species include fescues *Festuca* spp., daisy *Bellis perennis*, dandelion *Taraxacum officinale* agg. And white clover *Trifolium repens*. Some non-native ornamental trees have been planted here.

Dry meadows and grassy verges (GS2)

- 9.4.20 Fairly small patches of this habitat were identified around the Bord na Móna offices in the Power Plant Area. Species include cock's-foot *Dactylis glomerata*, common knapweed *Centaurea nigra*, and purple moor grass *Molinia carulea*. The railway embankment has given rise to a linear grassy verge, which runs alongside the Drumman Bog. Another bank also bisects the area of Drumman Bog surveyed to the south. This grassy verge contains species such as devil's-bit scabious *Succisa pratensis*, bent grasses *Agrostis* spp., cock's-foot, false oat-grass *Arrhenatherum elatius*, plantains *Plantago* spp., thistles *Cirsium* spp., common hogweed *Heracleum sphondylium*, and yarrow *Achillea millefolium*.

Marsh (GM1)

- 9.4.21 This habitat comprises a waterlogged area that was damp underfoot, covering an area between two ditches on Drumman Bog, and merging into an area of reed and large sedge swamp. Common cottongrass was the most frequent species, with water mint, purple moor grass, willow *Salix* spp., and wild angelica *Angelica sylvestris* also present.

Cutover bog (PB4)

- 9.4.22 The majority of peatland systems recorded in the Power Plant Area, on the Drumman Bog are highly degraded, where the natural vegetation has been removed resulting in extensive areas of bare peat. Harvesting is likely to have been halted very recently in some areas and recolonization by native species is taking place. This results in a mosaic of habitats representing various stages in ecological succession, including bare peat, scrub, immature woodland, and bog woodland. The climax habitat type here will likely be bog woodland. Where these regenerating habitats align with the corresponding Fossitt classification they have been classified as such. The peat depth is no doubt variable but is generally deep (>80cm in places), so the peat resource has not been exhausted. In places the peat is loose and milled while in others it is more compact and drier.
- 9.4.23 For the purposes of mapping, a distinction is made between areas of cutover bog which are still mainly bare peat (PB4a) and cutover areas which are at least partly colonised by vegetation (PB4b). Species include: marsh woundwort *Stachys palustris*, willowherbs *Epilobium* spp., vetches *Vicia* spp., common chickweed *Stellaria media*, creeping buttercup *Ranunculus repens*, silverweed *Potentilla anserina*, redshank *Persicaria maculosa*, compact rush *Juncus conglomeratus*, soft-rush *Juncus effusus*, sharp-flowered rush, bulbous rush *Juncus bulbosus*, glaucous sedge *Carex flacca*, common cottongrass, downy birch *Betula pubescens*, silver birch *Betula pendula*, purple moor grass, heather *Calluna vulgaris*, Scots pine *Pinus sylvestris*, heath star moss *Campylopus introflexus*, and gorse.

Spoil and bare ground (ED2)

- 9.4.24 This comprises an area of spoil east of the discharge pipeline route that has been created from quarried material to the east. It falls away steeply to an area of water to the east.

Recolonising bare ground (ED3)

- 9.4.25 A continuation of the ED2 spoil and bare ground area southward, this area is a mixture of bare quarried material with plants such as creeping thistle *Cirsium arvense*, oxeye daisy *Leucanthemum vulgare*, common nettle *Urtica dioica*, broad-leaved dock *Rumex obtusifolius*, common knapweed, purple moor grass, dandelion, and wild carrot *Daucus carota*.

Buildings and artificial surfaces (BL3)

- 9.4.26 The Bord na Móna offices at Derrygreenagh Works are located to the northeast of the R400, within the Power Plant Area. This site contains the majority of the built land and artificial surfaces in the Proposed Development Site. There is an adjoining gravel roadway to the south-east.

Bog woodland (WN7)

- 9.4.27 Bog woodland occurs on areas of cutover bog. Downy birch was dominant and formed monoculture stands in places. An understorey was evident comprising heather, purple-moor grass, and bramble. Other species included pine *Pinus* sp., spruce *Picea* sp., and willow.

Mixed broadleaf/conifer woodland (WD2)

- 9.4.28 Mature woodland with a significant broadleaf and conifer component is categorised as mixed. This habitat type has broadleaf and conifer components reaching a minimum of 25% and a maximum of 75%. Species include downy birch (dominant), spruce (frequent), pine (rare), willows, purple moor grass, and bracken *Pteridium aquilinum*.

Scrub (WS1)

- 9.4.29 This is a transitional habitat which is dominated by shrubby and spinose species. Pockets of this habitat occur across the cutover bog, occasionally as a mosaic with developing woodland. Here it is likely to be the precursor to woodland habitat. Species include birch *Betula* spp., pine, bramble, gorse, hawthorn *Crataegus monogyna*, ash *Fraxinus excelsior*, willows, ivy *Hedera helix*, common nettle, elder *Sambucus nigra*, dog rose *Rosa canina*, bracken, and heather.

Immature woodland (WS2)

- 9.4.30 Immature woodland is defined as when young trees dominate but are less than 5m in height. Pockets of this habitat are found across the cutover bog and will grow to form native bog woodland. The dominant species here is downy birch with abundant willow. Scot's pine is present but rare. The understorey is composed of early colonising species associated with the peatland habitat, especially heather and common cottongrass. Species include downy birch, silver birch, willow, pine, bramble, common rush, common cottongrass, and heather.

Scrub and immature woodland mosaic (W)

- 9.4.31 This area had a mosaic of scrub and developing woodland. Scrub is often a transitional habitat, eventually progressing to woodland as larger trees become established. This habitat contained grey willow *Salix cinerea*, bilberry *Vaccinium myrtillus*, downy birch, gorse, bramble, occasional spruce, as well as sedges, grasses, and rushes such as common cottongrass, sweet vernal-grass *Anthoxanthum odoratum*, purple moor grass, and soft-rush.

Hedgerows (WL1)

- 9.4.32 A neatly maintained hedgerow bounds the Power Plant Area on the east side of the R400, bounding the Bord na Móna site office grounds. This is mostly composed of ornamental species, with hawthorn in some areas.

Treelines (WL2)

- 9.4.33 This habitat occurs when a single row of mature trees extends above 5m in height. There is a conifer treeline at the north of the Bord na Móna site office grounds. Species recorded include pine *Pinus* sp. and larch *Larix decidua*.

Protected plant species

- 9.4.34 No protected or notable plants were identified within the Power Plant Area. Protected plants are therefore not considered within the assessment of the Power Plant Area.

Invasive species

- 9.4.35 No invasive species (plants, e.g., Japanese Knotweed) were identified within the Power Plant Area.

BatsHabitat and roosting suitability

- 9.4.36 The PRA by Woodrow APEM assessed suitability for roosting bats within six buildings and one structure associated with the Power Plant Area (see Figure 9.6), as well as habitat suitability for the Power Plant Area.
- 9.4.37 Two buildings (B4 and B5) within the Power Plant Area were confirmed as bat roosts. Droppings were recorded in both buildings, with soprano pipistrelle and brown long-eared bats *Plecotus auritus* observed in situ in B4.
- 9.4.38 Another three buildings (B1, B2, B3, Figure 9.6) outwith but in the surrounding area of the Power Plant Area were confirmed as bat roosts due to the presence of dropping. In addition, the PRA identified a concrete railway bridge (S1) with Low bat roosting suitability associated with the Power Plant Area.
- 9.4.39 Survey by Woodrow APEM Group identified five trees with Low suitability for roosting bats in the Power Plant Area. As per BCT guidelines, trees with Low suitability do not require any further survey and have therefore not been subject to nocturnal survey to determine presence/likely absence of bats.
- 9.4.40 Woodrow APEM assessed the suitability of habitats within and surrounding the Power Plant Area to support foraging/commuting bats. The bog habitat is of Negligible to Low foraging/commuting suitability, and hardstanding areas are of Negligible suitability. Treelines with scrub towards the south and west of the Power Plant Area have Moderate suitability for commuting and foraging bats.
- 9.4.41 Full details of the PRA and habitat suitability assessment are presented in Appendix 9B and Appendix 9C.

Bat roosts

- 9.4.42 Eight bat roosts were confirmed, five in buildings / structures within the Power Plant Area, and two associated just outwith the Power Plant Area. Of these eight roosts, two soprano pipistrelle maternity roosts were confirmed within the Power Plant Area (B4a and S1) and a single Natterer's bat *Myotis nattereri* maternity roost confirmed adjacent (B2). All other roosts are considered to be day roosts or night roosts / feeding perches. Location of all buildings or structures containing roosts are shown Figure 9.6.
- 9.4.43 Building B4 was confirmed as a day roost of soprano pipistrelle, with a single bat noted emerging from a gap in a rolling shutter door. B4 is also considered to be a day roost of

brown long-eared bat based on the presence of two brown long-eared bats in situ and droppings observed during the PRA.

- 9.4.44 During the initial emergence survey by AECOM in June 2023, a further structure adjacent to B4 was identified as a bat roost (herein named B4a). Building B4a was confirmed as a soprano pipistrelle maternity roost from which a peak count of ten bats emerged.
- 9.4.45 Building B5, the main office building, was confirmed as a day roost of both common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle, with small numbers of bats observed emerging from apexes at the north, east and west of the building.
- 9.4.46 A total of 26 soprano pipistrelle bats were recorded emerging from Bridge S1 (a concrete road bridge carrying the R400 over the railway) which is therefore identified as another maternity roost.
- 9.4.47 Survey of buildings B1 and B3 (located outwith but within 75m of the Power Plant Area) did not identify bat roosts, with no bats observed emerging. However, droppings found internally in both buildings together with incidental bat activity recordings of brown long-eared bats dictate these are likely night feeding perches (and therefore considered a resting place, i.e. roost for brown long-eared bats).
- 9.4.48 Survey of B2 (located outwith but within 75m of the Power Plant Area) identified a Natterer's bat maternity roost from which eight bats emerged.
- 9.4.49 Full details of bat roosts and results from surveys within the Power Plant Area are presented and discussed in more detail in Appendix 9B and Appendix 9C.

Static detectors

- 9.4.50 Static detectors were deployed within the Power Plant Area at two separate locations for 1-2 nights monthly between June-August 2023. These were located at the north of the Power Plant Area within an area of scrub (SD01), and at the south of the Power Plant Area within a small woodland (SD02). Locations of static detectors are displayed in Figure 4, Appendix 9C. Overall activity at SD02 was high compared to SD01.
- 9.4.51 SD01 recorded a total of 319 no. registrations from five species plus unidentified *Myotis* species comprising, in order of abundance, soprano pipistrelle (158 no. registrations), common pipistrelle (105 no. registrations), Leisler's bat *Nyctalus leisleri* (50 no. registrations), Daubenton's bat (3 no. registrations), *Myotis* sp. (2 no. registrations) and brown long-eared bat (1 no. registration).
- 9.4.52 SD02 recorded 954 no. registrations from six species plus unidentified *Myotis* species comprising, in order of abundance, soprano pipistrelle (439 no. registrations), common pipistrelle (264 no. registrations), whiskered bat (114 no. registrations), *Myotis* sp. (60 no. registrations), Leisler's bat (58 no. registrations), Natterer's bat (16 no. registrations) and brown long-eared bat (3 no. registrations).
- 9.4.53 Full details of bat activity within the Power Plant Area are presented and discussed in Appendix 9C.

Badger

- 9.4.54 Two outlier badger setts were identified within 150m of the Power Plant Area, along with evidence such as trails, latrines, push-throughs, and snuffle holes, with most field evidence found in proximity to the setts. The setts were located within hedgerows at the edges of fields to the south of Derrygreenagh Works, which is the most suitable habitat for badger in this area. There is also some suitable habitat for setts in the area designated for peat storage, however no badger setts were found in this area.
- 9.4.55 Full details of badger evidence with respect to the Power Plant Area is presented in confidential Appendix 9E.

Otter

- 9.4.56 No signs of otter were identified within 150m of the Power Plant Area. The nearest otter evidence identified to the Power Plant Area was an otter spraint, approximately 0.9km to the northwest of the Power Plant Area on the Mongagh River (although outwith the survey area / Zol for otter, the spraint was incidentally identified during aquatic surveys by Triturus at aquatic survey site A3 (refer to Appendix 9D)). This location was regularly used for sprainting, suggested it is regularly used by commuting otter. However, no holts or layups were identified.
- 9.4.57 Spraints were also regularly recorded on the Yellow River (at ITM 649643, 736505) at the location where the process water pipeline will discharge into the watercourse. It has been modified and channelized which reduces its suitability as otter breeding habitat.
- 9.4.58 The proposed surface water discharge pipe to the north of the Power Plant Area terminates at a point along the Mongagh River near a busy quarry. The level of disturbance, particularly noise, from this existing quarry, decreases the likelihood of otter using this area. In addition to the Mongagh River, small ditches in this area may assist commuting otter.
- 9.4.59 There is suitable terrestrial habitat for otter within the Power Plant Area, particularly areas of bog and bog woodland at the north and east. However, habitat suitability at the north of the Power Plant Area may be limited by the presence of the busy quarry. Habitats at the west of the Power Plant Area, at Derrygreenagh Works, are considered unsuitable for use by otter, being dominated by hard standing.
- 9.4.60 Full details of otter surveys are presented in Appendix 9D, with evidence displayed in Figure 9.2.

Other protected mammals

- 9.4.61 Irish hare has been incidentally noted within the Power Plant Area during surveys carried out in 2023, on five separate occasions.
- 9.4.62 During a bat emergence survey in July 2023, a live pine marten was observed traversing an area of hard standing within the Power Plant Area, north of the existing Bord na Móna office building (i.e., B4). In addition, a pine marten dropping was found at the north of the Power Plant Area. A possible pine marten dropping was incidentally found in an area of coniferous woodland south (but within 100m) of the Power Plant Area in June 2023. The locations of these records are shown on Figure 9.2. There is suitable habitat within the Power Plant Area for this species, including during the breeding season (April to September). There was no evidence that they used any buildings or areas within the Power Plant Area as a den site.
- 9.4.63 The locations of incidental Irish hare and pine marten observations are presented in Figure 9.2.
- 9.4.64 No evidence of other protected mammals was recorded within the Power Plant Area or within 150m.
- 9.4.65 Though no observations or evidence was identified, NBDC records of hedgehog, stoat, and red squirrel were returned at distances of 0.5km, 0.7km, and 1.1km respectively. Given these nearby records, and that suitable habitat exists, such as areas of conifer trees and scrub, these three species may be present within the Power Plant Area.

Marsh fritillary

- 9.4.66 Woodrow APEM identified the larval food plant devil's-bit scabious and suitable correct habitat structure for marsh fritillary in small patches at the north of the Power Plant Area. One patch of 280m² was noted to be in good condition with devil's-bit scabious (i.e.,

larval food plant) present, with well-structured vegetation. There is also a cluster of smaller, suboptimal patches, totaling approximately 255m² in size.

- 9.4.67 Further patches of devil's-bit scabious were identified by AECOM within areas of revegetating grassland on cutover bog on the southeast of the Power Plant Area. This area is to be used as a permanent Peat Deposition Area. Locations of suitable marsh fritillary habitat and devil's-bit scabious patches are presented in Figure 9.2.
- 9.4.68 Surveys carried out by Woodrow APEM recorded no larval webs or adult butterflies from the Power Plant Area.
- 9.4.69 Full details of marsh fritillary surveys are presented in Appendix 9B.

Amphibians

- 9.4.70 Two large areas of standing water (Pond 2 and 3, Figure 9.2) were recorded within the Power Plant Area with smooth newt breeding potential and were subject to eDNA survey on 7 June 2023 for the presence and/or likely absence of smooth newt. These surveyed waterbodies/ponds are described below.
- 9.4.71 Pond 2 is on the northern edge of the Power Plant Area, within an area of cutover bog. Most of the edges drop steeply into a pool c. 1m in depth. It is a long, thin waterbody, c. 13m long and c. 10m wide. The banks are largely unvegetated, with only occasional gorse and birch at their edges.
- 9.4.72 Pond 3 is a drainage ditch used for historical peat extraction and is located on the eastern side of the Power Plant Area. The area has been out of peat production for a number of years, and the drain has begun to naturally revegetate. The water within this drain is therefore stagnant and choked by aquatic vegetation in areas. The banks of the drain have occasional willow and gorse, with frequent bramble and plants indicative of damp areas such as meadowsweet and soft-rush. The depth of the drainage ditch varies up to 1m, and the ditch is c. 1m wide.
- 9.4.73 eDNA surveys for smooth newt returned a positive result for both of these areas of standing water. Smooth newt can therefore be concluded to be present within both Pond 2 and Pond 3 in the Power Plant Area. Refer to Appendix 9I for the smooth newt eDNA analysis report.
- 9.4.74 No frogspawn was recorded within the Power Plant Area during surveys on 30 March 2023. However, common frog adults were incidentally within the Power Plant Area during survey by AECOM in June and August 2023. The locations of incidental common frog sightings are presented in Figure 9.2.
- 9.4.75 The numerous drainage ditches and small water bodies across the area of cut bog on the southeast of the Power Plant Area, and beyond to the north and east are also considered suitable for both smooth newt and common frog. These are likely to be continuous and connected to each other and Pond 2 and 3 at times of higher rainfall. Given how both smooth newt and common frog use the landscape, and distances over which they can move between waterbodies, it is considered on a precautionary basis, that all these waterbodies are likely to be occupied by one or both species at certain times of the year.

Breeding birds

- 9.4.76 A suite of breeding bird surveys was carried out within a survey area comprising the bogs surrounding the Power Plant Area, i.e., Derrarkin Bog and Drumman Bog, in the 2021 and 2022 survey seasons.
- 9.4.77 Breeding bird surveys were carried out covering Derrarkin and Drumman Bogs on the southwestern and northeastern sides of the Power Plant Area (see Figure 9.1). The

closest VP was 670m from the Power Plant Area and the closest transect was 1.1km away. Birds could be identified and observed flying over the Power Plant Area at these distances, well within the maximum survey distance recommended for VP surveys of 2km (SNH 2017).

- 9.4.78 Suitable habitat exists in the Power Plant Area for nesting birds in areas of trees, buildings, and scrub. Incidental nests were noted in buildings, for example the site office is in use by house martin *Delichon urbicum*, and the boiler house by barn swallow.
- 9.4.79 Monthly survey visits were carried out between April-September 2021 and 2022, with c. four days required each month in the relevant areas.
- 9.4.80 The following paragraphs provide a summary of birds found within 100m of the Power Plant Area. Within 100m of the Power Plant Area is the distance disturbance to birds is the most likely to occur, with visual disturbance generally screened by trees beyond this distance. Full results are provided in Appendix 9F.
- 9.4.81 During the breeding bird surveys in 2022, the birds noted in flight within 100m of the Power Plant Area were: little egret *Egretta garzetta* (two individuals flying north along the western edge of the Power Plant Area and turning east towards Drumman, once), sparrowhawk *Accipiter nisus* (a pair rising as they flew northeast towards the northwest of the Power Plant Area, and a male hunting flying east to west over the northern Power Plant Area), buzzard *Buteo buteo* (three records of one individual, crossing both north-south and east-west over the Power Plant Area), and lesser black-backed gull *Larus fuscus* (a group of seven individuals coming from a pond c. 590m to the east, and turning north over the most northern part of the Power Plant Area and crossing the Monagh River).
- 9.4.82 In 2021, the bird species observed within 100m of the Power Plant Area were: one male kestrel *Falco tinnunculus* hovering/hunting at the southeastern edge of the Power Plant Area, and one kestrel recorded commuting east to west over the north of the area, one male peregrine *Falco peregrinus* flying east to west, at the north of the area, one female sparrowhawk hunting east to west over the center of the site, six mute swan *Cygnus olor* commuting from a pond, located 850m to the east in an western direction over the discharge pipe route, five juvenile mute swans flying into Derryarkin from Drumman, and a party of three buzzards soaring in a general northwest direction away from the Power Plant Area. There was no indication that any of these species were breeding within or adjacent to the Power Plant Area.

Wintering birds

- 9.4.83 A suite of wintering bird surveys was carried out within the bogs surrounding the Power Plant Area, i.e., Derryarkin Bog and Drumman Bog in the 2021-2022 and 2022-2023 wintering periods. The main wintering bird features present in each of these two bogs will first be summarised, and then the interactions of the wintering bird species with the Power Plant Area will be discussed in relation to the 2021-2022 which allowed a picture of bird activity around the Power Plant Area to be constructed.
- 9.4.84 Derryarkin Bog is located immediately southwest of the Power Plant Area. The main winter bird population has been found to be wintering whooper swans. During the 2021-2022 winter season, the primary commuting corridor of whooper swans was between Derryarkin Bog and agricultural fields to the southwest of the bog, in the opposite direction to the Power Plant Area. In 2021-2022, their numbers peaked at 138 in December (>1% of county population). During the 2022-2023 winter bird survey season, whooper swans were recorded along the primary commuting corridor between Derryarkin Bog and agricultural fields to the southwest of the bog in abundances higher than 1% of the national population on one occasion only, on 19 October 2022, when 320

individuals were recorded in abundances higher than 1% of the county population on ten of the 28 survey dates (Tobin, 2023).

- 9.4.85 Drumman Bog is partially within and to the east of the Power Plant Area. A substantial flock of mute swans occurred in Drumman through the winter survey season, with a peak population of 80 individuals recorded during the 2021-2022 winter season, and a maximum population of 106 birds in the 2022-2023 season (recorded in October 2022). A large population of wintering golden plover were regularly recorded in Drumman Bog, with up to 400 recorded at Drumman in 2021-22, and 560 recorded in February 2023. Relatively low numbers of lapwing were recorded in 2021-22, with 200 individuals within the largest flock (recorded in late October 2021), increasing to 569 in February 2023. On three occasions they were recorded roosting on bare peat or within wetlands in 2021-2022. A variety of raptors occasionally visited this bog, with the most significant comprising two hen harriers roosting in January and February 2023 on Drumman Bog, c. 500m from the Power Plant Area.
- 9.4.86 The data from the 2021-2022 wintering season gives a good picture of bird activity around the Power Plant Area. During winter 2021-2022, the incidents of birds that occurred within 100m of the Power Plant Area were: one little egret flying into Derryarkin Bog to feed from just to the west of the Power Plant Area; one kestrel which hovered and dropped in the southern section of the Power Plant Area; 15 lesser black-backed gull (flying southwest from roosting location by a pond in Drumman); one merlin hunting as it flew east from the edge of the Power Plant Area; one sparrowhawk circling as it flew south over the discharge pipeline route towards the main Power Plant Area; one buzzard hunting as it flew west towards the north of the Power Plant Area; two peregrines circling northwest of the Power Plant Area; one peregrine flying southwest across the Power Plant Area; a flock of 12 mute swans flying towards Drumman from Derryarkin; and a flock of 200+ lapwing flying north towards Drumman, at the western edge of the Power Plant Area. Due to way the 2022-2023 data was presented a similar summary cannot be presented, however the species list suggest similar species were present. Although the main Derrygreenagh site is mostly unsuitable for these species, habitat in the Peat Deposition Area may be more suitable.
- 9.4.87 Full details of the wintering bird surveys are presented in Appendix 9G: Wintering Bird Reports (refer to EIAR Volume II).

Fisheries and aquatics

- 9.4.88 Two locations on the Mongagh River, and two locations further downstream in the Castlejordan River (see Figure 9.1), were surveyed for fish and other aquatic species. Salmonids and lamprey (*Lampræta* sp.) were recorded at various sites and white-clawed crayfish remains were found in otter spraint by the Mongagh River (at site A3, 930m upstream of the discharge pipe), and a positive eDNA result for white-clawed crayfish was also obtained for this species in the Yellow River at the hydrologically connected site C7, 11.5km further downstream. White-clawed crayfish was also recorded in a spraint at site X3, close to the water discharge location. This evidence suggests white-clawed crayfish use the streams in the area.
- 9.4.89 Full details of the aquatic surveys are presented in Appendix 9D: Aquatic Survey Reports (refer to EIAR Volume II).

Other protected and notable species

- 9.4.90 Three individual cryptic wood white *Leptidea juvernica* butterflies (identified to species based on their spatial distribution) were recorded by AECOM on 7 June 2023 in an area of grassland with scrub in the northeast of the Power Plant Area. Nearly all wood white butterflies in Ireland were confirmed to be cryptic wood white within the last 20 years and

this species is rated as least concern, with the remainder being wood white butterfly *Leptidea sinapis*, which only occurs in Ireland in the counties of Galway and Clare (Regan *et al.*, 2010) and is near threatened.

- 9.4.91 Suitable breeding habitat for cryptic wood white, such as grassland with abundant larval food plant (meadow vetchling *Lathyrus pratensis*) and adult nectar plants (bush vetch *Vicia sepium*) is present at the east of the Power Plant Area. Cryptic wood white is one of the few species that occurs in Ireland but not in Great Britain. As cryptic wood white is of least concern and not subject to legal protection, it is not further considered and assessed in this report.
- 9.4.92 There is no suitable habitat for common lizard within the Power Plant Area, and no lizards were incidentally recorded during walkover surveys. Common lizard is therefore not considered further in this Chapter.

Summary of Significant Ecological Features

- 9.4.93 As per the impact assessment methodology in (see Paragraph 9.2.64), significant ecological features are considered to be those valued at Local Importance (higher) or higher. Ecological features valued at Local (lower), Site Importance, or of no ecological value are not considered significant features and are not carried forward for impact assessment. Table 9.5 summarises all ecological features identified within the ZOI of potentially significant impacts for the Power Plant Area.

Table 9. 5: Evaluation of significant ecological features for the Power Plant Area

FEATURES	HIGHEST ECOLOGICAL VALUATION WITHIN ZOI	AT RISK OF LIKELY SIGNIFICANT EFFECTS?	SIGNIFICANT ECOLOGICAL FEATURE?
Designated sites			
European sites (SAC, SPA)	International	Yes	Yes
National sites (NHA, pNHA)	National	Yes	Yes
Habitats and flora			
Acid oligotrophic lake (FL2)	Local (higher)	Yes	Yes
Reed and large sedge swamps (FS1)	Local (higher)	Yes	Yes
Drainage ditch (FW4)	Local (higher)	Yes	Yes
Amenity grassland (GA2)	Local (lower)	Yes	No
Marsh (GM1)	Local (higher)	Yes	Yes
Dry meadows and grassy verges (GS2)	Local (higher)	Yes	Yes
Cutover bog (PB4a)	Local (higher)	Yes	Yes
Cutover bog (PB4b)	Local (higher)	Yes	Yes
Spoil and bare ground (ED2)	Local (lower)	Yes	No
Recolonising bare ground (ED3)	Local (lower)	Yes	No
Buildings and artificial surfaces (BL3)	n/a	No	No
Bog woodland (WN7)	Local (higher)	Yes	Yes
Mixed broadleaved/conifer woodland (WD2)	Local (higher)	Yes	Yes

FEATURES	HIGHEST ECOLOGICAL VALUATION WITHIN ZOI	AT RISK OF LIKELY SIGNIFICANT EFFECTS?	SIGNIFICANT ECOLOGICAL FEATURE?
Scrub and Immature woodland mosaic (W)	Local (higher)	Yes	Yes
Scrub (WS1)	Local (higher)	Yes	Yes
Immature woodland (WS2)	Local (higher)	Yes	Yes
Treelines (WL2)	Local (higher)	Yes	Yes
Protected and notable species			
Bats	County	Yes	Yes
Badger	Local (higher)	Yes	Yes
Otter	County	Yes	Yes
Pine marten	Local (higher)	Yes	Yes
Irish hare	Local (higher)	Yes	Yes
Hedgehog	Local (higher)	Yes	Yes
Red squirrel	Local (higher)	Yes	Yes
Stoat	Local (higher)	Yes	Yes
Amphibians	County	Yes	Yes
Marsh fritillary	County	Yes	Yes
Cryptic wood white	Local (lower)	Yes	No
Wintering birds	County	Yes	Yes
Breeding birds	County	Yes	Yes
Fisheries and aquatic	County	Yes	Yes

Electricity Grid Connection

Desk study

Sites with statutory designations

- 9.4.94 As per the impact assessment methodology in (see Paragraph 9.2.64), significant ecological features are considered to be those valued at Local Importance (higher) or higher. Ecological features valued at Local (lower), Site Importance, or of no ecological value are not considered significant features and are not carried forward for impact assessment. Table 9.5 summarises all ecological features identified within the ZOI of potentially significant impacts for the Power Plant Area.
- 9.4.95 A search for designated sites was carried out on 23 October 2023. There are three European sites, comprising two SPA and one SAC, within the ZOI of the Electricity Grid Connection. One of these sites (Lough Ennell SPA) is also a Ramsar site. None of these sites fall within the boundary of the Electricity Grid Connection.
- 9.4.96 Lough Ennell SPA, is within the ZOI due to having mobile bird species which could occur close to the Electricity Grid Connection. River Boyne and River Blackwater SAC and SPA are hydrologically connected c. 25.5km downstream of the site, via the Yellow River, and are within the same catchment of the Electricity Grid Connection. The Rochfortbridge Stream and a tributary of the Derry River (Castlejordan_010 WFD waterbody

IE_EA_07C040050) are both within the Site, and join the Mongagh River, which flows into the Yellow River and finally into the River Boyne before entering the European sites.

9.4.97 There are two sites with a national nature conservation designation located within the Zol of the Electricity Grid Connection. Grand Canal pNHA is located c. 65m south of the Site and is hydrologically linked. Like Lough Ennel SPA, the pNHA of the same name also has mobile bird species associated which may occur within the Zol of the Electricity Grid Connection.

9.4.98 A summary of the European and national designated sites is presented in Table 9.6 and locations relative to the Electricity Grid Connection are displayed in Figures 9.4 and 9.7.

Table 9. 6: Designated sites within the Zol of the Electricity Grid Connection.

DESIGNATED SITE	REASON(S) FOR DESIGNATION	DISTANCE TO THE ELECTRICITY GRID CONNECTION	REASON IN ZOI
European sites			
Lough Ennell SPA [004044]	<ul style="list-style-type: none"> • Pochard <i>Aythya ferina</i> [A059] • Tufted duck <i>Aythya fuligula</i> [A061] • Coot <i>Fulica atra</i> [A125] • Wetland and waterbirds [A999] 	11.1km northwest	<p>Potential disturbance impacts to mobile SCI species during construction/operation /decommissioning.</p> <p>Mobile species with indirect sensitivity to dust deposition to functionally linked habitats during construction/operation/decommissioning phases.</p> <p>Risk of mortality of mobile SCI species from collision with powerlines during operational phase.</p>
River Boyne and River Blackwater SAC [002299]	<ul style="list-style-type: none"> • Alkaline fens [7230] • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] • River lamprey <i>Lampetra fluviatilis</i> [1099] • Salmon <i>Salmo salar</i> [1106] • Otte <i>Lutra lutra</i> [1355] 	17.3km northeast, Hydrological link - >25km downstream	<p>Qualifying habitats and species sensitive to waterborne pollution and spread of INNS during construction / decommissioning.</p> <p>Potential disturbance impacts to mobile QI species during construction/operation /decommissioning.</p> <p>Mobile QI species with indirect sensitivity to dust deposition to</p>

DESIGNATED SITE	REASON(S) FOR DESIGNATION	DISTANCE TO THE ELECTRICITY GRID CONNECTION	REASON IN ZOI
			functionally linked habitat in construction/operational/decommissioning phases.
River Boyne and River Blackwater SPA [004232]	<ul style="list-style-type: none"> Kingfisher <i>Alcedo atthis</i> [A229] 	17.3km northeast Hydrological link >25km downstream	Mobile SCI species indirectly sensitive to waterborne pollution and spread of INNS during construction/decommissioning phases.
Nationally designated sites			
Grand Canal pNHA [002104]	<ul style="list-style-type: none"> A man-made waterway, the pNHA comprises the canal channel and its banks Habitats include hedgerow, tall herbs, calcareous grassland, reed fringe, open water, scrub, and woodland 	65m south	Potential for waterborne pollution to qualifying habitats arising in the construction and decommissioning phases.
Lough Ennell pNHA [000685]	<ul style="list-style-type: none"> Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. Alkaline fens Pochard, tufted duck, coot 	10.8km northwest	Potential disturbance impacts to mobile qualifying species during construction/operational/decommissioning. Mobile qualifying species with indirect sensitivity to dust deposition to functionally linked habitats during construction/operational/decommissioning phases Risk of mortality of qualifying species from collision with powerlines during operational phase.

Source: NPWS (2009, 2021, 2022b,d).

Ancient/Long-established Woodland

9.4.99 There are no parcels of Ancient/Long-established Woodland habitat within the Zol of the Electricity Grid Connection. The nearest parcel of Long-established Woodland is Gaybrook Demense, located approximately 8.8km north of the Electricity Grid Connection. Ancient/Long-established Woodland is therefore not considered further.

Species records

9.4.100 The NBDC dataset of records within 2km of the Electricity Grid Connection was obtained on 8 August 2023, comprising 161 records representing 58 species. These are presented in Table 2, Appendix 9H (refer to EIAR Volume II).

9.4.101 Twenty-one records of badger were returned by the NBDC database within 2km of the Electricity Grid Connection. Other protected mammal species returned by the NBDC database comprised otter (14 records), red squirrel (three records), hedgehog (three records), pine marten (five records), stoat (one record), Irish hare (11 records), soprano pipistrelle (one record), and Daubenton's bat (one record).

9.4.102 One record of each smooth newt and common lizard were returned.

9.4.103 Records of three scheduled, high impact invasive mammals were also returned by NBDC, comprising three records of American mink, one grey squirrel *Sciurus carolinensis* and one brown rat record. Two records of the high impact, but not scheduled fallow deer were also returned, as well as six records of the medium impact but not scheduled rabbit *Oryctolagus cuniculus*.

9.4.104 Twenty-nine notable bird species were returned by the NBDC database search within 2km of the Electricity Grid Connection. One of these species, whooper swan, is listed on Annex I of the Birds Directive. Of these notable species, nine are Red-listed species (e.g., meadow pipit *Anthus pratensis* and lapwing) and 17 are Amber-listed species (e.g., barn swallow and skylark *Alauda arvensis*) according to the BoCCI (Gilbert et al. 2021). Several bird species have been noted during BNMBNM ecological surveys at Derryarkin Bog including, snipe, lapwing, wren, meadow pipit, hooded crow, heron *Ardea cinerea*, mallard, meadow pipit, thrush *Turdus philomelos*, blackbird, reed bunting, goldfinch, lesser black-backed gull, black-headed gull, mute swan and curlew. Within Ballybeg bog, species noted using these cutover bogs as breeding grounds, wintering grounds or both, consisted of kestrel, whooper swan, wigeon, teal *Anas crecca*, snipe, mallard, heron, moorhen, skylark *Alauda arvensis*, wood pigeon *Columba palumbus*, meadow pipit, blackbird, hooded crow, magpie, reed bunting, goldfinch, barn swallow, wheatear and chaffinch *Fringilla coelebs*, have all been recorded during BNMBNM ecology surveys (See Appendix 9J).

9.4.105 The data search also returned records of one endangered insect, wall butterfly, and four near threatened insects: small heath *Coenonympha pamphilus*, dingy skipper *Erynnis tages*, the mayfly *Kageronia fuscogrisea*, and large red-tailed bumblebee. One record of ear pond snail *Radix auricularia*, a vulnerable species, was returned. Four records of white-clawed crayfish were returned.

9.4.106 A record of one high impact invasive mollusc species was returned: zebra mussel *Dreissena polymorpha*, as well as the medium impact invasive mollusc species Jenkins' spire snail. However, none of these invasive species are scheduled. One record of ear pond snail *Radix Auricularia*, a vulnerable species, was returned.

9.4.107 Records of the high impact invasive plants Japanese knotweed *Reynoutria japonica* and rhododendron *Rhododendron ponticum* were returned, as were records of the medium impact butterfly-bush *Buddleja davidii* and sycamore. No other records of invasive, or protected or notable plant species were returned.

9.4.108 No records of protected or notable plant or fish species were returned from the search of the NBDC databases.

Field survey

Habitats

9.4.109 Habitats identified within the Electrical Grid Connection are described in detail in the following subsections and are presented in Figure 9.8 (refer to EIAR Volume III). Habitats are presented in order of Fossitt (2020) classification. Full details of the habitat survey are presented and discussed in Appendix 9B.

Acid oligotrophic lake (FL2)

9.4.110 A number of waterbodies are located across the Electricity Grid Connection and vary in size from 3m² to c. 1.6ha. Seasonal fluctuations in rainfall and the water table will likely influence the depth and area of these lakes, and indeed may influence the number of waterbodies present. The water was brown in colour due to the peaty substrate. Species noted included bulrush, common cottongrass, and sharp-flowered rush. Some of these water bodies support assemblages of several dragonfly species.

Lowland depositing river (FW2)

9.4.111 A short stretch of lowland depositing river was recorded where the Yellow River crosses the Proposed Development Site (along the Electricity Grid Connection), and also the Castletown Tara Stream (010 WFD waterbody (IE_EA_07C080190)), more commonly referred to as the Coolcor stream.

9.4.112 The Yellow River runs west to east between Derryarkin Bog and Ballybeg Bog before crossing the R400. The Yellow River has historically been extensively deepened, resulting in an over-deepened trapezoidal channel with 8-10m bank heights and poor hydromorphology. The river along the survey sites averages a width of 6m and a depth of 0.3-1.2m. The profile comprised deep, slow-flowing glide and localised pools (no riffles). The substrata were dominated by mixed coarse gravels bedded in deep silt and peat, with occasional boulders. The gravels were also moderately compacted. The site supported abundant branched bur-reed and broad-leaved pondweed with occasional fool's watercress and water mint. Occasional boulders supported the thalloid liverwort endive peltia *Pellia endiviifolia*. No filamentous green algae were present but localised red algae (rhodophytes) were present. The riparian areas supported dense bramble and gorse scrub (WS1) with hedge bindweed *Calystegia sepium*, great willowherb, wild angelica, reed canary-grass, and grey willow. This area was bordered by cutover bog (PB4) and a peat settlement pond.

9.4.113 The Coolcor Stream has been canalised and flows west to east through Ballybeg Bog. This lowland depositing stream has historically been extensively straightened and deepened, with resulting steep trapezoidal banks (3-5m bankfull heights) and poor hydromorphology. The heavily modified, canalised stream averaged 2-6m wide and 0.5m to >1.5m deep at the time of survey. Peat staining was very high at the time of survey. The bed comprised 100% deep peat with slumping of banks evident. This slumping contributed some mixed gravels and clay to the channel margins. Macrophytes included water plantain, common duckweed, and watercress. This area was bordered by extensive areas of cutover bog.

Drainage ditches (FW4)

9.4.114 A network of deep drainage ditches transects the cutover bog habitats (including Ballybeg Bog). These ditches are partly unvegetated, but some vegetation occurs in places. Standing water is a consistent feature of these ditches. Species include common reed, bulrush, and bulbous rush.

Improved grassland (GA1)

- 9.4.115 This category includes all highly modified grasslands which are intensively managed for agriculture. Seeded grasses are dominant, with poor overall diversity. Poaching was often noted, possibly indicative of overstocking. Species include rye-grasses *Lolium* spp. and white clover.

Amenity grassland (GA2)

- 9.4.116 There is a small area of amenity grassland beside the R400 road at the northeast of the Electricity Grid Connection Site. Species include fescues, daisy, white clover, and dandelion.

Dry meadows and grassy verges (GS2)

- 9.4.117 An extensive area of calcareous and neutral grassland was identified in a previous survey with abundant orchids and devil's-bit scabious noted along the eastern entrance to the Ballybeg Bog (Douglas, no date). However, as grazing is a characteristic feature of this habitat type, and no evidence of grazing was observed, this has been reclassified as dry meadows and grassy verges (GS2). The railway embankment has given rise to a linear grassy verge, which runs alongside the Ballybeg and Derryarkin Bogs. Species include bent grasses *Agrostis* spp., cock's-foot, false oat-grass, plantains *Plantago* spp., knapweed *Centaurea* spp., thistles *Cirsium* spp., common hogweed, yarrow, and devil's-bit scabious.

- 9.4.118 To the northeast of Derryarkin Bog, beside the railway and the R400 there is a diverse grassland area, partially on stone. Species recorded include purple moor grass, wavy hair-grass *Avenella flexuosa*, quaking-grass *Briza media*, common bird's-foot-trefoil *Lotus corniculatus*, scarlet pimpernel *Lysimachia arvensis*, ribwort plantain *Plantago lanceolata*, yarrow, wild carrot, eyebright *Euphrasia officinalis* agg., common century *Centaureum erythraea*, oxeye daisy, devil's-bit scabious, and bee orchid *Ophrys apifera*.

Raised bog (PB1)

- 9.4.119 A remnant area of raised bog is present (shown in Figure 9.2), just north of the Grand Canal. This habitat is c. 45m from the Electricity Grid Connection at its closest point. The habitat is relatively intact, despite the industrial peat-harvesting that has taken place to the north of the area, which is evident from the vertical banks. The hydrology remains good with the ground wet and slightly shaking underfoot. The bog shows good structural diversity with hummocks and hollows observed. Species diversity remains high and includes heather (dominant), purple moor grass (frequent), bog cotton *Eriophorum vaginatum*, cross-leaved heath *Erica tetralix*, tormentil *Potentilla erecta*, with moss species includes *Sphagnum papillosum*, *Sphagnum rubellum*, *Sphagnum capillifolium*, *Sphagnum subnitens*, *Sphagnum cuspidatum*, *Sphagnum tenellum*, *Hypnum jutlandicum*, and *Polytrichum commune*. Some encroaching scrub was also noted here. This area of raised bog remnant is considered Annex I habitat Active raised bogs (7110).

Cutover bog (PB4)

- 9.4.120 The majority of peatland systems recorded in the Electricity Grid Connection area are within the Ballybeg Bog and are considered to be highly degraded, where the natural vegetation has been removed resulting in extensive areas of bare peat. While peat extraction has ceased for many years, there are some smaller areas within Ballybeg bog where peat harvesting continued more recently, before all peat production across these bogs was formally ceased in 2020. These small areas in Ballybeg Bog which continued peat extraction until 2020 comprise cutover bog habitat (PB4) which is gradually recolonising with native vegetation. This has resulted in a mosaic of habitats representing various stages in ecological succession, including bare peat, scrub, immature woodland, and bog woodland. The climax habitat type here will likely be bog woodland. Where these

regenerating habitats align with the corresponding Fossitt classification they have been categorised as such.

9.4.121 The peat depth is variable but is generally deep (>80cm in places), so the peat resource has not been exhausted in all areas. In places the peat is loose and milled while in others it is more compact and dry. For the purposes of mapping, a distinction is made between areas of cutover bog which are still mainly bare peat (PB4a) and cutover areas which are at least partly recolonised by vegetation (PB4b). Species include marsh woundwort, willowherbs, vetches, chickweed, creeping buttercup, silverweed, redshank, compact rush, common rush, sharp-flowered rush, bulbous rush, glaucous sedge, common cottongrass, downy birch, silver birch, purple moor grass, heather, Scot's pine, heath star moss, and gorse.

9.4.122 The Cutaway Bog Decommissioning and Rehabilitation Plan for Ballybeg Bog rates the majority of the current cutaway bog habitat as Local (lower) Importance to Local (higher) Importance, where mosaic habitats are present (Bord na Móna, 2023b). However, with rehabilitation plans in place we would consider the PB4a cutaway bog habitat should be considered of Local (higher) importance.

Spoil and bare ground (ED2)

9.4.123 There is a small area of agricultural grassland (c. 0.24 ha) at the south of the Electricity Grid Connection beside the railway line, which has been and is currently in use for the storage of silage bales. Frequent use of heavy machinery onsite has resulted in the loss of vegetation, as well as ground poaching and waterlogging. As such, the land was classified as spoil and bare ground (ED2). There is also an area of bare ground to the northeast of Derryarkin Bog, at the very northeast of the Electricity Grid Connection, beside the R400 Road, c.0.49ha in size.

Bog woodland (WN7)

9.4.124 Bog woodland (1.32 ha) has been recorded on areas of cutover bog within Ballybeg Bog. Downy birch was dominant and forms monoculture stands in places. An understorey was evident comprising heather, purple moor grass, and bramble. Other species included willow, pine, and spruce. The habitat on site does not correspond to the Annex I habitat Bog woodland (91D0) as this Annex I habitat only occurs on intact raised bog, which the WN7 habitat on site is not.

Mixed broadleaf/conifer woodland (WD2)

9.4.125 Mature woodland (0.50 ha) at the north of the Electricity Grid Connection, close to the proposed 220kV substation, with a significant broadleaf and conifer component is categorised as mixed. This habitat type has broadleaf and conifer components reaching a minimum of 25% and a maximum of 75%. Species include downy birch (dominant), spruce (frequent), pine (rare), willows, purple moor grass, bracken, and heather.

Immature woodland (WS2)

9.4.126 When young trees dominate but are less than 5m in height the habitat is categorised as immature woodland. Pockets of this habitat are found across the cutover bog and will grow to form native bog woodland. The dominant species here is downy birch with abundant willow. Scot's pine is rare. The understorey is composed of early colonising species associated with the peatland habitat, especially heather and cotton grass. Species include downy birch, silver birch, willow, pine, bramble, common rush, common cottongrass, and heather.

Scrub (WS1)

- 9.4.127 This is a transitional habitat which is dominated by shrubby and spinose species (0.46 ha). Pockets of this habitat occur across the cutover bog, occasionally as a mosaic with developing woodland. Here it is likely to be the precursor to woodland habitat. Species include birch, pine, bramble, gorse, hawthorn, ash, willows, ivy, common nettle, elder, dog rose, bracken, and heather.

Hedgerows (WL1)

- 9.4.128 Hedgerows form linear strips of shrubs and occasional trees at the margins of field boundaries (0.43 ha), largely in and around the location of the proposed 400kV substation. They are mostly planted and are generally dominated by native species. Many of the hedgerows noted were topped hawthorn hedgerows with mature ash trees. Others are less managed with bramble, willow, and birch. Species include hawthorn, ash, bramble, willows, rowan *Sorbus aucuparia*, gorse, bracken, and downy birch.

Treelines (WL2)

- 9.4.129 This habitat occurs along field boundaries when a single row of mature trees extends above 5m in height (0.90 ha). These occur mainly in and around the location of the proposed 400kV substation. Species include larch, rowan, pine, ash, alder *Alnus glutinosa*, and downy birch.

Protected plant species

- 9.4.130 No protected or notable plants were identified within the Electricity Grid Connection site. Protected plants are therefore not considered further in respect of the Electricity Grid Connection.

Invasive species

- 9.4.131 No invasive species were identified within the Electricity Grid Connection Site itself or within its Zol. However, two invasive aquatic plant species Nuttall's pondweed *Elodea nuttallii* and New Zealand pigmyweed *Crassula helmsii* were recorded nearby in the Grand Canal, both at two locations (ITM 650889, 730911 (c. 95 m south of the Electricity Grid Connection) and ITM 651780, 731377 (c. 970m east)) however at these distances they are outside the Zol for invasive species but were picked up as incidental records during the aquatic surveys.

- 9.4.132 Both species are listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011-2021 (S.I. 477/2011). Both species are considered high-risk invasive species in Ireland (O'Flynn et al., 2014).

- 9.4.133 Full details of invasive aquatic plant species are presented and discussed in Appendix 9D.

BatsHabitat and roosting suitability

- 9.4.134 The Electricity Grid Connection area is predominantly cutover bog habitat which is of Negligible to Low foraging / commuting suitability for bats as assessed by Woodrow/APEM. These areas were therefore not deemed of sufficient quality to warrant a bat survey. To the south of the Electricity Grid Connection Site are agricultural fields with hedgerows and mature trees, which have Low to Moderate suitability for commuting and foraging bats.

- 9.4.135 There are no further trees, buildings, or structures with bat roosting suitability within the Electricity Grid Connection.

- 9.4.136 Full details of the PRA and habitat suitability assessment are presented in Appendix 9B.

Bat roosts

- 9.4.137 A single building, B6 (Figure 9.6), to the north of the Electricity Grid Connection Site was identified by Woodrow APEM Group as a confirmed roost due to the presence of feeding remains and droppings.
- 9.4.138 During emergence surveys carried out by AECOM in 2023, a single soprano pipistrelle was observed emerging from building B6 on one occasion. B6 is therefore considered to be a day roost.
- 9.4.139 Full details of bat roosts and results from surveys within the Site are presented and discussed in more detail in Appendix 9B and Appendix 9C.

Activity surveys

- 9.4.140 A transect route was walked monthly between June-August 2023. Three bat species were recorded across all transect surveys: common and soprano pipistrelle and Leisler's bat.
- 9.4.141 Bat activity was generally low. Common pipistrelle was the most commonly encountered bat across all surveys, with 199 no. registrations (81.9% of total registrations) recorded across surveys. The next most frequently encountered species was soprano pipistrelle with 42 no. registrations (17.3% of total registrations), followed by Leisler's bat with 2 no. registrations (0.8% of total registrations).
- 9.4.142 Bat activity was concentrated on linear hedgerow corridors to the east and south of the transect route.
- 9.4.143 Full details of bat activity within the Site are presented and discussed in Appendix 9C.

Badger

- 9.4.144 Three badger setts were identified within the ZOI of the Electricity Grid Connection. A subsidiary sett (BA03) was identified approximately 6m north of the proposed contractor's compound (immediately north of the 400kV substation) and two outlier setts were identified; one within the Electricity Grid Connection area (c. 46m west of the proposed 400kV substation) (BA04), and the other (BA02) approximately 50m southeast of the proposed 220kV substation compound at the north of the Electricity Grid Connection. Badger trails, latrines, push-throughs, and snuffle holes were also identified, and were mostly found in proximity to the setts. In general, cutover bog habitat within the Electricity Grid Connection is considered unsuitable for sett creation, although badger may use this habitat to commute and forage within vegetated areas of cutover bog. Suitable habitat for badger sett creation is found within parcels of woodland throughout the Electricity Grid Connection and field boundary hedgerows in agricultural fields to the south, in the area of the 400kV substation. Full details of the badger survey are given in confidential Appendix 9E.

Otter

- 9.4.145 An otter spraint was recorded at a culvert crossing on the Yellow River, within the Electricity Grid Connection area (ITM 649643, 736505).
- 9.4.146 A potential otter holt was identified at the top of a peaty embankment adjoining a pipe culvert on the Coolcor Stream (ITM 650601, 733322), c. 9m outside the Electricity Grid Connection area. However, the potential holt did not appear active during 2022 surveys or when visited during the badger survey in 2023.
- 9.4.147 No other evidence of otter (e.g., tracks, holts etc.) was identified within 150m of the Electricity Grid Connection. Areas with the best quality otter habitat within proximity to the Electricity Grid Connection are the Yellow River (which intersects the Electricity Grid Connection), and the Grand Canal which is located 65 m to the south. Small streams

and ditches are found within the Electricity Grid Connection Site which are suitable for commuting and foraging otter, but no evidence of otter was recorded within these areas.

9.4.148 Full details of the otter survey are given in Appendix 9D.

Other protected mammals

9.4.149 Irish hare has been incidentally noted within the Electricity Grid Connection area during surveys carried out in 2023, including within habitats south of the Yellow River, east of the Coolcor Stream, and on the edge of scrub in Derryarkin Bog.

9.4.150 During a site walkover by AECOM in July 2023, a live pine marten was observed traversing an area of scrub within the Electricity Grid Connection area. A potential pine marten dropping was found in an area of coniferous woodland in proximity to the north of the Electricity Grid Connection Site in June 2023, and there is suitable habitat on site for this species.

9.4.151 No evidence of other protected mammals was recorded within the Electricity Grid Connection Site or within 150m of this Site.

9.4.152 Though no observations or evidence was identified, NBDC records of red squirrel, stoat, and hedgehog were returned at distances of 0.7km, 0.7km, and 1.0 km respectively. Given these nearby records, and that suitable habitat exists, such as conifer plantation.

9.4.153 The locations of incidental Irish hare and pine marten evidence / sightings are presented in Figure 9.2.

Marsh fritillary

9.4.154 Woodrow APEM identified suitable habitat for marsh fritillary at locations in proximity to the Electricity Grid Connection, with the larval food plant devil's-bit scabious present and suitable correct habitat structure present. 0.54ha of habitat within the Electricity Grid Connection was rated as good habitat, and 0.10ha as very good habitat.

9.4.155 Larval web searches carried out by Woodrow APEM identified marsh fritillary larvae present at some of these locations (i.e., confirming breeding), close to the 220kV buried cable route as part of the Electrical Grid Connection, to the south of Ballybeg Bog (Figure 9.2).

9.4.156 Full details of marsh fritillary survey are presented and discussed in Appendix 9B.

Amphibians

9.4.157 An area of standing water with smooth newt breeding potential (Pond 1) was subject to eDNA survey surveyed for the presence and / or likely absence of smooth newt on 6 June 2023. Pond 1 is described in the following paragraph, and its location is shown on Figure 9.2.

9.4.158 Pond 1 is a large, flooded area on open cutover bog with some emergent vegetation. It is west of the R400 and south of the railway line. At the edges, the pool varies between 10-50cm in depth, but is c. 1m in the deeper parts. Willow and other vegetation indicative of wetland was growing on the southern side of the pool, restricting access. The pool opened out into a larger waterbody to the southwest.

9.4.159 eDNA surveys for smooth newt returned a positive result for this waterbody. Smooth newt can therefore be concluded to be present within Pond 1. Full details are presented in the smooth newt eDNA analysis report (Appendix 9I).

9.4.160 No frogspawn was recorded on site during field surveys 30-31 March 2023, however, adult common frog was incidentally noted within various locations in the Electricity Grid Connection area during field surveys later in 2023.

9.4.161 In addition, further waterbodies with potential to support breeding amphibians were noted elsewhere in the Electricity Grid Connection Area during follow-up surveys by AECOM in September 2022. However, these were not subject to eDNA survey given the time of year as eDNA surveys are not effective outwith the breeding season as newts leave the waterbodies. The locations of these other waterbodies are shown on Figure 9.2. On a precautionary basis, given the abundant suitable terrestrial habitat, similarity to locations where amphibians were recorded, and connectivity between the confirmed smooth newt pond and these wetland/waterbodies areas, it is considered on a precautionary basis, that all these waterbodies are likely to be occupied by one or both species at certain times of the year.

Breeding birds

9.4.162 Breeding bird surveys were carried out covering Derryarkin and Ballybeg Bogs, within which the Electricity Grid Connection sits for much of its footprint, therefore the birds and habitats found in these areas are relevant to the Proposed Development and within the Zol.

9.4.163 Monthly survey visits were carried out between April-September 2021 and 2022, with c. four days required each month in the relevant areas. Full details of surveys and start and end times are given in Appendix 9F. Transect routes and VP are displayed in Figure 9.1

9.4.164 Derryarkin Bog contains extensive suitable habitat for breeding birds, with wetland habitats, regenerating bog, and developing scrub. Of particular note are the regular populations of breeding lapwing and snipe (both Red-listed), along with other wetland species including mute swan, great crested grebe *Podiceps cristatus*, teal, tufted duck, coot, and common sandpiper *Actitis hypoleucos*.

9.4.165 A pair of coot bred successfully at Derryarkin quarry pond in 2022, and a flock of 72 tufted duck was noted on the large quarry pond at Deryarkin in April 2022, although there was no sign of breeding. A pair of mute swan successfully bred in 2022 in the quarry pond north of the Mongagh River in Derryarkin, and there were up to 17 non-breeding mute swans recorded on four occasions throughout the summer period, though only within 100m of the Electricity Grid Connection in on two occasions. One whooper swan summered in Derryarkin quarry pond in 2022 but was not recorded any closer to the Electricity Grid Connection. Other species noted flying within 100m of the Electricity Grid Connection in 2022 were: little egret (five times), sparrowhawk (three times), buzzard (five times), peregrine (once), kestrel (four times), and lapwing (three times).

9.4.166 A pair of coot bred successfully at Derryarkin quarry pond in 2021, with up to 14 tufted duck present at the quarry ponds, but with no evidence of breeding. A mute swan pair bred successfully in the large quarry pond as well. In 2021, birds noted within 100m of the proposed Electricity Grid Connection Site on Derryarkin Bog were: one sparrowhawk (three times), one kestrel (four times), one buzzard (three times), one peregrine (twice), one little egret (six times), groups of three and five mute swan, and lapwing (three groups of 40-50+).

9.4.167 Habitats within Ballybeg Bog include re-vegetated cutaway bog with areas of scrub and woodland, and bare peat. Sparrowhawk breed in the woodland, with kestrel, peregrine, and buzzard all hunting in this area. Birds noted flying within 100m of the Electricity Grid Connection in Ballybeg Bog in 2022 were sparrowhawk, buzzard, peregrine, and kestrel. Flocks of three and five mute swans were noted flying north, parallel to the Electricity Grid Connection, but further than 100 m away. In 2021, the species noted flying within 100m of the Electricity Grid Connection were buzzard (three times), kestrel (five times), little egret (once), lapwing (two flocks of 6-7), mute swan (a flock of three), and sparrowhawk (four times).

9.4.168 The agricultural landscape at the southern end of the Electricity Grid Connection provides suitable habitat for birds of the open countryside and hedgerow species.

9.4.169 Full details of the breeding bird surveys are presented in Appendix 9F.

Wintering birds

9.4.170 A suite of wintering bird surveys was carried out in 2021-2022 and 2022-2023 within a survey area comprising Derryarkin Bog and Ballybeg Bog, within which the majority of the Electricity Grid Connection will be built.

9.4.171 Derryarkin Bog is at the northern part of the Electricity Grid Connection area. Its main feature is wintering whooper swans. The main movement of the whooper swans is between Derryarkin Bog and fields to the southwest. The peak number of whooper swans was 102 in January 2022, with a flock of 225 recorded in the vicinity in January 2023.

9.4.172 Ballybeg Bog is in the centre and south of the Electricity Grid Connection area. Findings in winter 2022-23 largely were in line with previous surveys. Both whooper swan and mute swan were recorded passing over the site, (whooper swan once flying north to south and three times flying south to north, maximum flock size 12, and mute swan twice, flying north to south and east to west maximum flock size four) as was golden plover (flock of 200 near Derryarkin), lapwing (largest flock 200+ near Derryarkin), and a single little egret. Small numbers of snipe occur on site, and birds of prey visit on occasion, such as the Annex I species peregrine. Redwing also occurs on site during winter.

9.4.173 Birds recorded within 100m of the entire overhead line route of the Electricity Grid Connection in winter 2021-2022 include buzzard (four times), golden plover (flocks of 28, 40, 50+, 150+, 200+, and 400+ noted), hen harrier (one hunting west to east across the Electricity Grid Connection), kestrel (twice), lapwing (flocks of 18, 20+, 22, 28, 33, 34, 200+, little egret (three passes of 1-2), mute swan (one movement of a group of seven west to east across the Electricity Grid Connection), peregrine falcon (three passes of 1-2), sparrowhawk (three passes of 1-2), whooper swans (five flocks of 7-34).

9.4.174 Full details of the wintering bird surveys are presented in Appendix 9G.

Fisheries and aquatics

9.4.175 Two sampling sites (displayed in Figure 9.1), both along the Grand Canal located to the south of the Electricity Grid Connection area, show that the Grand Canal is an important freshwater environment for a range of high conservation value aquatic species including red-listed European eel *Anguilla anguilla* and vulnerable diving water beetle dinghy skipper *Laccophilus hylinus*.

9.4.176 Waterbodies evaluated as having ecological value include the Yellow River and Coolcor Stream, where salmonids, lamprey *Lampreta* sp., and evidence of otter were recorded.

9.4.177 Other areas were evaluated as having limited ecological value, such as other parts of the Coolcor Stream. Primarily their low aquatic ecological evaluation related to poor hydromorphology because of historical drainage pressures, their small size, poor flow regimes and the absence of aquatic species including fish and or habitats of high ecological value. Full details of aquatic surveys are given in Appendix 9D.

Other protected and notable species

9.4.178 There is no suitable habitat for common lizard in proximity to the Electricity Grid Connection area, and no lizards were incidentally recorded during walkover surveys. Common lizard is therefore not considered further in this Chapter. No other protected or notable species were noted in this area.

Summary of Significant Ecological Features

9.4.179 As per the impact assessment methodology significant ecological features are considered to be those valued at Local Importance (Higher) or higher. Ecological features valued at Local (lower), Site Importance, or of negligible value are not considered significant features and are not carried forward for impact assessment. Table 9.7 summarises all significant ecological features identified within the ZoI of potentially significant impacts for the Electricity Grid Connection.

Table 9. 7: Evaluation of significant ecological features for the Electricity Grid Connection.

FEATURES	HIGHEST ECOLOGICAL VALUATION WITHIN ZOI	AT RISK OF LIKELY SIGNIFICANT EFFECTS?	SIGNIFICANT ECOLOGICAL FEATURE?
Designated sites			
European sites (SAC, SPA)	International	Yes	Yes
National sites (NHA, pNHA)	National	Yes	Yes
Habitats and flora			
Acid oligotrophic lake (FL2)	Local (higher)	Yes	Yes
Improved agricultural grassland (GA1)	Local (lower)	Yes	No
Dry meadows and grassy verges (GS2)	Local (higher)	Yes	Yes
Cutover bog (PB4a)	Local (higher)	Yes	Yes
Cutover bog (PB4b)	Local (higher)	Yes	Yes
Bog woodland (WN7)	Local (higher)	Yes	Yes
Scrub (WS1)	Local (higher)	Yes	Yes
Conifer plantation (WD4)	Local (lower)	Yes	No
Hedgerow (WL1)	Local (higher)	Yes	Yes
Protected and notable species			
Bats	County	Yes	Yes
Badger	Local (higher)	Yes	Yes
Otter	County	Yes	Yes
Pine marten	Local (higher)	Yes	Yes
Irish hare	Local (higher)	Yes	Yes
Hedgehog	Local (higher)	Yes	Yes
Stoat	Local (higher)	Yes	Yes
Red squirrel	Local (higher)	Yes	Yes
Amphibians	County	Yes	Yes
Marsh fritillary	County	Yes	Yes
Wintering birds	County	Yes	Yes
Breeding birds	National	Yes	Yes
Fisheries and aquatic	National	Yes	Yes

Gas Connection Corridor

Desk study

Sites with statutory designations

- 9.4.180 A search for designated sites was carried out on 23 October 2023. There are nine European sites, comprising four SPA and five SAC, within the Zol of the Gas Connection Corridor. One of these sites (Lough Ennell SPA) is also a Ramsar site. None of these sites fall within the Gas Connection Corridor.
- 9.4.181 River Boyne and River Blackwater SAC and SPA are within the same water catchment as part of the Gas Connection Corridor, and are hydrologically connected 29km downstream of the site, via the Mongagh River and Yellow River.
- 9.4.182 The Gas Connection Corridor is also hydrologically connected to Lough Ennell SPA and SAC, and the River Brosna to the River Shannon, which connects hydrologically, at some distance to the River Shannon Callows SAC, Middle Shannon Callows SPA, Lough Derg North-east Shore SAC, Lough Derg SPA, and Lower River Shannon SAC.
- 9.4.183 There is one site with a national nature conservation designation located within the Zol of the Gas Connection Corridor. Lough Ennell pNHA is designated for mobile bird species (pochard, tufted duck, coot), and is also hydrologically linked to the Gas Connection Corridor.
- 9.4.184 A summary of the European designated sites is presented in and locations of designated sites relative to the Gas Connection Corridor are displayed in Figure 9.4 and Figure 9.9.

Table 9. 8: Designated sites within the Zol of the Gas Connection Corridor.

DESIGNATED SITE	REASON(S) FOR DESIGNATION	DISTANCE TO THE GAS CONNECTION CORRIDOR	REASON IN ZOI
European sites			
Lough Ennell SAC [000685]	<ul style="list-style-type: none"> • Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. [3140] • Alkaline fens [7230] 	1.8km northwest Hydrological link: 3.1km downstream	Qualifying habitats sensitive to waterborne pollution and spread of INNS during construction and decommissioning.
Lough Ennell SPA [004044]	<ul style="list-style-type: none"> • Pochard <i>Aythya ferina</i> [A059] • Tufted duck <i>Aythya fuligula</i> [A061] • Coot <i>Fulica atra</i> [A125] • Wetland and waterbirds [A999] 	2.5km northwest Hydrological link: 3.8km downstream	Potential disturbance impacts to mobile SCI species during construction and decommissioning phase. Potential loss of functionally linked habitat of mobile SCI species. Qualifying habitats and species sensitive to

DESIGNATED SITE	REASON(S) FOR DESIGNATION	DISTANCE TO THE GAS CONNECTION CORRIDOR	REASON IN ZOI
			<p>waterborne pollution and spread of INNS during construction and decommissioning phase.</p> <p>Mobile SCI species with indirect sensitivity to dust deposition to functionally linked habitat in construction and decommissioning phase.</p>
River Boyne and River Blackwater SAC [002299]	<ul style="list-style-type: none"> Alkaline fens [7230] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] River lamprey <i>Lampetra fluviatilis</i> [1099] Salmon <i>Salmo salar</i> [1106] Otter <i>Lutra lutra</i> [1355] 	<p>16.5km northeast</p> <p>Hydrological link: 29.0km downstream</p>	<p>Qualifying habitats and species sensitive to waterborne and spread of INNS pollution during construction and decommissioning.</p> <p>Potential disturbance impacts to mobile QI species during construction and decommissioning.</p> <p>Mobile species with indirect sensitivity to dust deposition to functionally linked habitat in construction and decommissioning phase.</p>
River Boyne and River Blackwater SPA [004232]	<ul style="list-style-type: none"> Kingfisher <i>Alcedo atthis</i> [A229] 	<p>16.5km northeast</p> <p>hydrological link: 29.0km downstream</p>	<p>Mobile SCI species indirectly sensitive to waterborne pollution and spread of INNS during construction and decommissioning.</p>
River Shannon Callows SAC [00216]	<ul style="list-style-type: none"> Molinia meadows on calcareous, peaty or clayey-silt-laden soils 	<p>Hydrological link: 70.6km</p>	<p>Qualifying habitats and species sensitive to</p>

DESIGNATED SITE	REASON(S) FOR DESIGNATION	DISTANCE TO THE GAS CONNECTION CORRIDOR	REASON IN ZOI
	<p>(<i>Molinion caeruleae</i>) [6410]</p> <ul style="list-style-type: none"> • Lowland hay meadows (<i>Alopecurus pratensis</i>, <i>Sanguisorba officinalis</i>) [6510] • Alkaline fens [7230] • Limestone pavements [8240] • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] • <i>Lutra lutra</i> (Otter) [1355] 		<p>waterborne pollution and spread of INNS during construction and decommissioning.</p> <p>Potential disturbance impacts to mobile QI species during construction and decommissioning.</p> <p>Mobile species with indirect sensitivity to dust deposition to functionally linked habitat in construction and decommissioning phase.</p>
<p>Middle Shannon Callows SPA [004096]</p>	<ul style="list-style-type: none"> • Whooper Swan <i>Cygnus cygnus</i> [A038] • Wigeon <i>Anas penelope</i> [A050] • Corncrake <i>Crex crex</i> [A122] • Golden Plover <i>Pluvialis apricaria</i> [A140] • Lapwing <i>Vanellus vanellus</i> [A142] • Black-tailed Godwit <i>Limosa limosa</i> [A156] • Black-headed Gull <i>Chroicocephalus ridibundus</i> [A179] • Wetland and Waterbirds [A999] 	<p>Hydrological link: 70.6km</p>	<p>Potential disturbance impacts to mobile SCI species during construction and decommissioning phase.</p> <p>Potential loss of functionally linked habitat of mobile SCI species.</p> <p>Qualifying habitats and species sensitive to waterborne pollution and spread of INNS during construction and decommissioning phase.</p> <p>Mobile SCI species with indirect sensitivity to dust deposition to functionally linked habitat in construction and</p>

DESIGNATED SITE	REASON(S) FOR DESIGNATION	DISTANCE TO THE GAS CONNECTION CORRIDOR	REASON IN ZOI
Lough Derg, North-east Shore SAC [002241]	<ul style="list-style-type: none"> • <i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130] • Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i> [7210] • Alkaline fens [7230] • Limestone pavements [8240] • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] • <i>Taxus baccata</i> woods of the British Isles [91J0] 	Hydrological link: 96.8km	<p>decommissioning phase.</p> <p>Qualifying habitats sensitive to waterborne pollution and spread of INNS during construction and decommissioning.</p>
Lough Derg (Shannon) SPA [004058]	<ul style="list-style-type: none"> • Cormorant <i>Phalacrocorax carbo</i> [A017] • Tufted duck <i>Aythya fuligula</i> [A061] • Goldeneye <i>Bucephala clangula</i> [A067] • Common tern <i>Sterna hirundo</i> [A193] • Wetland and waterbirds [A999] 	Hydrological link: 96.8km	<p>Potential disturbance impacts to mobile SCI species during construction and decommissioning phase.</p> <p>Potential loss of functionally linked habitat of mobile SCI species.</p> <p>Qualifying habitats and species sensitive to waterborne pollution and spread of INNS during construction and decommissioning phase.</p> <p>Mobile SCI species with indirect sensitivity to dust deposition to functionally linked habitat in construction and</p>

DESIGNATED SITE	REASON(S) FOR DESIGNATION	DISTANCE TO THE GAS CONNECTION CORRIDOR	REASON IN ZOI
			decommissioning phase.
Lower River Shannon SAC [002165]	<ul style="list-style-type: none"> • Sandbanks which are slightly covered by sea water all the time [1110] • Estuaries [1130] • Mudflats and sandflats not covered by seawater at low tide [1140] • Coastal lagoons [1150] • Large shallow inlets and bays [1160] • Reefs [1170] • Perennial vegetation of stony banks [1220] • Vegetated sea cliffs of the Atlantic and Baltic coasts [1230] • <i>Salicornia</i> and other annuals colonising mud and sand [1310] • Atlantic salt meadows (<i>Glaucopuccinellietalia maritimae</i>) [1330] • Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] • Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation [3260] • Molinia meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410] • Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i>, <i>Alnion incanae</i>, <i>Salicion albae</i>) [91E0] • Freshwater pearl mussel <i>Margaritifera margaritifera</i> [1029] • Sea lamprey <i>Petromyzon marinus</i> [1095] 	Hydrological link: 132.7km	<p>Qualifying habitats and species sensitive to waterborne pollution and spread of INNS during construction and decommissioning phase.</p> <p>Potential disturbance impacts to mobile QI species during construction decommissioning phase.</p> <p>Mobile species with indirect sensitivity to dust deposition to functionally linked habitat in construction phase.</p>

DESIGNATED SITE	REASON(S) FOR DESIGNATION	DISTANCE TO THE GAS CONNECTION CORRIDOR	REASON IN ZOI
	<ul style="list-style-type: none"> • Brook lamprey <i>Lampetra planeri</i> [1096] • River lamprey <i>Lampetra fluviatilis</i> [1099] • Salmon <i>Salmo salar</i> [1106] • Common bottlenose dolphin <i>Tursiops truncatus</i> [1349] • Otter <i>Lutra lutra</i> [1355] 		
Nationally designated sites			
Lough Ennell pNHA [000685]	<ul style="list-style-type: none"> • Hard oligo-mesotrophic waters with benthic vegetation of <i>Chara</i> spp. • Alkaline fens • Pochard, tufted duck, coot 	1.8km northwest Hydrological link: 3.1km downstream	

Source: NPWS (2012, 2018a, 2019, 2021, 2022a,b,c,d,e).

Ancient/Long-established Woodland

9.4.185 There are no parcels of Ancient/Long-established Woodland within the Zoi of the Gas Connection Corridor. The nearest parcel of Long-established Woodland is Gaybrook Demesne, located approximately 5.2km northeast of the Gas Connection Corridor. Ancient/Long-established Woodland is therefore not considered further in this Chapter following this Section.

Species records

9.4.186 The NBDC dataset of records within 2km of the Gas Connection Corridor was obtained on 28 June 2023, comprising 1,494 records representing 117 species. These are presented in Table 3, Appendix 9H (refer to EIAR Volume II).

9.4.187 Twenty records of badger were returned by the NBDC database within 2km of the Gas Connection Corridor. The other protected mammal species returned by the NBDC database comprised otter (nine records), red squirrel (one record), hedgehog (five records), pine marten (five records), stoat (four records), Irish hare (eight records), soprano pipistrelle (two records), and Daubenton’s bat (one record).

9.4.188 Twelve records of common frog records were returned by the NBDC database within 2km of the Gas Connection Corridor, with the most recent record from 2018. No other amphibian records were returned.

9.4.189 The data search returned 17 records of the marsh fritillary. Other insect records included the small heath and wall butterflies, the brown may dun mayfly *Kageronia fuscogrisea*, and the large red-tailed bumblebee.

9.4.190 Four records of white-clawed crayfish were returned.

9.4.191 Seventy-two notable bird species were returned by the NBDC database search within the Gas Connection Corridor. All but three of these birds are either Red or Amber listed according to the BoCCI (Gilbert *et al.* 2021). Eleven of these notable bird species are on

Annex I of the Birds Directive: whooper swan, kingfisher, peregrine, merlin, little egret, Greenland white-fronted goose, gadwall *Mareca strepera*, nightjar *Caprimulgus europaeus*, dunlin *Calidris alpina*, corncrake *Crex crex*, and common tern *Sterna hirundo*.

- 9.4.192 Nine vulnerable mollusc species, three near threatened species, and three endangered mollusc species, were also returned, however, all these records were from 1977.
- 9.4.193 Records of three scheduled, high impact invasive mammals were also returned by NBDC, comprising American mink, brown rat, and grey squirrel. Records of the non-scheduled, but high impact fallow deer were also returned. Records of the medium impact but non-scheduled European rabbit and greater white-toothed shrew *Crocidura russula* were also returned. The medium impact invasive reptile species Cumberland slider *Trachemys scripta* subsp. *troostii* was recorded within 2km of the Gas Connection Corridor, with one record from 2016. Records of four medium impact (but not scheduled) invasive mollusc species were returned, with the most recent being Jenkins' spire snail in 2012.
- 9.4.194 There was a record of sycamore *Acer pseudoplatanus*, a medium impact invasive species.
- 9.4.195 No records of protected or notable plant, reptile, or fish species were returned from the search of the NBDC databases.

Field survey

Otter

- 9.4.196 There are several streams present on aerial imagery which the Gas Connection Corridor bisects. Baseline aquatic surveys have been carried out at four sampling sites within the Gas Connection Corridor boundary, comprising aquatic survey sites A1, A2, A3 and E1 (see Figure 9.1). Surveys were also carried out at several aquatic survey sites downstream of the Gas Connection Corridor. It is worth noting, however, that the full extent and distribution of aquatic habitats within the Gas Connection Corridor is unknown.
- 9.4.197 No resting places (i.e., holts or layups) were identified at aquatic survey sites within the Gas Connection Corridor. Site A3 was identified as a regular otter sprainting site. No signs of otter were identified at any of the other aquatic survey sites.

Fisheries and aquatics

- 9.4.198 There are several streams present on aerial imagery which the Gas Connection Corridor bisects. Baseline aquatic surveys have been carried out at four sampling sites within the Gas Connection Corridor boundary, comprising aquatic survey sites A1, A2, A3 and E1 (see Figure 9.1). Surveys were also carried out at several aquatic survey sites downstream of the Gas Connection Corridor. It is worth noting, however, that the full extent and distribution of aquatic habitats within the Gas Connection Corridor is unknown.
- 9.4.199 Aquatic survey site A1 is on the Rochfortbridge Stream supported *Lampetra* sp. at a low abundance. No aquatic species of high conservation value were recorded at survey site X2b, located approximately 2.1km downstream of A1.
- 9.4.200 A low abundance of brown trout was recorded at aquatic survey site A3, located on the Kiltonan Stream. In addition, aquatic survey site A3 is a regular otter sprainting site, with white-clawed crayfish remains recorded in a spraint. However, no white-clawed crayfish were recorded at this location.

- 9.4.201 Aquatic survey site E1 is on the upper reaches of the Rochfort Demense Stream and did not support any aquatic species of higher conservation value. However, a medium abundance of brown trout was recorded at aquatic survey site E2, located approximately 1.6km downstream of E1.
- 9.4.202 No aquatic species of higher conservation value were recorded at aquatic survey site A2, located on the Castlejordan river.
- 9.4.203 No white-clawed crayfish, rare or protected macrophytes, aquatic bryophytes, or macro-invertebrates were recorded at these sampling sites within the Gas Connection Corridor boundary.
- 9.4.204 Full details of aquatic surveys are given in Appendix 9D.

9.5 Predicted Impacts and Assessment of Associated Effects

Do nothing scenario

9.5.1 The ‘Do-Nothing’ scenario is described by the EPA (2022) as “a general description of the evolution of the key environmental factors of the site and environs if the proposed project did not proceed”. Should the Proposed Development and Overall Project not proceed, no significant changes to habitats or habitat condition in the short term are likely to occur under the current site management regime. The site would continue to revegetate naturally, and trees and woody vegetation would mature further to provide greater suitability for faunal species, such as bats and breeding birds. The potential value of habitats within the Site to species of conservation value such as badger, smooth newt, marsh fritillary, and birds would remain, provided that the current management was maintained.

9.5.2 If the Proposed Development and the Overall Project were not to proceed, environmental monitoring and site management would continue, as required under the conditions of the IPC Licence (P0501-01). Rehabilitation Plans, see Appendix 9J, would be implemented following the successful decommissioning of the bogs, in accordance with Condition 10 of the IPC Licence requirement, which is presented below:

***10.1** – Following termination of use or involvement of all or part of the site in the licensed activity, the licensee shall:*

- ***10.1.1** – Decommission, render safe or remove for disposal/recovery, any soil, subsoils, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution.*
- ***10.1.2** – Implement the agreed cutaway bog rehabilitation plan.*

***10.2** – Cutaway Bog Rehabilitation Plan:*

- ***10.2.1** – The licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for permanent rehabilitation of the cutaway boglands within the licensed area. This plan shall be submitted to the Agency for agreement within eighteen months of the date of grant of this licence.*
- ***10.2.2** – The plan shall be reviewed every two years and proposed amendments thereto notified to the Agency for agreement as part of the AER. No amendments may be implemented without the written agreement of the Agency.”*

9.5.3 The overall aim of the Rehabilitation Plans is environmental stabilisation of the former peat production areas, putting the bogs comprising the site on a trajectory towards becoming naturally functioning peatland systems. According to the rehabilitation plans, natural colonisation will form the basis for the environmental stabilisation of the bare peat areas. However, re-wetting of the cutaway bog, where possible, will also be a rehabilitation strategy and will be undertaken via actions such as drain blocking and cell bunding. The main target will be to maintain water-levels close to the peat surface, and to avoid the creation of large water bodies. Re-wetting and water levels close to the peat surface accelerates the re-vegetation processes, the development of vegetation cover and therefore environmental stabilisation.

9.5.4 Whilst it is anticipated that the combination of rehabilitation measures and natural colonisation will result in environmental stabilisation, according to the rehabilitation plans it will still take, in most cases, some time (30-50 years) for naturally functioning wetland and peatland ecosystems to fully re-establish. The majority of the peatland habitat within

the application site does not have the potential to develop active raised bog analogous to the priority EU Habitats Directive Annex I habitat within the foreseeable future (c. 50 years). Furthermore, only a small proportion of the bog has potential to develop *Sphagnum*-rich habitats in this timeframe. Nevertheless, re-wetting across the entire bog will improve overall habitat condition of the whole bog.

- 9.5.5 It is anticipated that a mosaic of peatland habitats will continue to colonise the site, including dry heath, scrub and bog woodland in drier areas and wet heath, poor fen and flush and potentially embryonic *Sphagnum* rich bog communities in the wetter areas.
- 9.5.6 In the absence of the Proposed Development, it is likely that faunal assemblages would be similar to those using the cutover habitats within the site today. This includes assemblages of bird species typical of cutover and raised bog habitats. Otter would likely continue to use the streams and rivers within and surrounding the site for commuting and foraging. The scrub and woodland habitats which would likely continue to colonise drier areas of the site would provide potential habitat for a range of bird species as well as badger, pine marten and other mammals. They would also provide linear foraging and commuting habitat for a range of bat species. The cutover habitats within the site, particularly grassland and heath, would provide suitable habitat for a range of invertebrates including the Annex II species marsh fritillary, where abundant devil's bit scabious is present.

Impact assessment for Power Plant Area

Construction phase impacts

Sites with statutory designations – European sites

- 9.5.7 There are eight European sites within the Zol of the Power Plant Area, and with possible source-pathway-receptor link. None of these sites fall within the Power Plant Area (See Table 9.6).
- 9.5.8 River Boyne and River Blackwater SAC and SPA, which are in the same location and overlap in area, are hydrologically linked to the Power Plant Area. The construction phase of the Power Plant Area has the potential to result in water quality impacts through the release of soil and sediments, potential spillage of oils, fuels, or other construction chemicals, mobilization of contaminants following disturbance to ground, or uncontrolled site run-off. Toxic and non-toxic pollutants may impact adjoining watercourses. Both River Boyne and River Blackwater SAC and SPA lies >25km and is not a viable pathway for pollution impacts at such a downstream distance, therefore direct water quality impacts on habitat features and species within the European site boundary are unlikely.
- 9.5.9 However, these adjoining watercourses may comprise functionally linked habitats for qualifying interest species (river lamprey, Atlantic salmon, otter) of the SAC which may be present outside the SAC boundary, and the potential localised impacts of negative water quality impacts may cause effects to such species where they occur outwith the boundary. Lamprey *Lampetra* sp were recorded c. 100 m from the Proposed Development at site A4 and otter were recorded at site A3, 0.9 km northwest (refer to Appendix 9D: Aquatic Survey Reports). In the absence of mitigation to safeguard watercourses, potential water-based pollution impacts to mobile species of the River Boyne and River Blackwater SAC will be **Negative, Short-Term**, and **Significant** at an International geographic scale.
- 9.5.10 River Boyne and River Blackwater SPA is designated for kingfisher, a territorial species which rarely moves beyond the boundary of its territories which can extend up to 13km in length (Hagemelijer & Blair (1997)). Therefore, kingfisher associated with the SPA population are unlikely to occur within the Zol of water-based pollution that may arise

from the construction phase. No impacts to kingfisher, and by extension River Boyne and River Blackwater SPA, are likely to occur.

- 9.5.11 The Power Plant Area is physically separated from the other European sites identified within the Zol (the closest European sites, Lough Ennell SAC/SPA are located >7km away). As a result, no impacts or effects due to disturbance (noise, visual, vibration) of qualifying species within any European site boundary (i.e. no direct or indirect impacts) are anticipated. However, tufted duck and coot, mobile Special Conservation Interest (SCI) species of Lough Ennell SPA (>10 km from the Power Plant Area) have been recorded. Only a single pair of coot were recorded during the breeding season, while with peak counts of 140 and 163 tufted duck were recorded at Drumman Bog, approximately c. 950 m to the north of the Power Plant Area. This is beyond the average response threshold for most waterbirds (100m – 150m) (Goodship & Furness, 2022). As an example, of noise disturbance from Cutts et al. (2019) from a plant generating 100dB(A) at around source will provide a likely ‘acceptable’ receptor dose of 70dB(A) at c. 20m distance, and a source of 90dB(A) would be below the impact threshold at c. 10m. In addition, most of Drumman Bog will remain physically undisturbed by construction and there will remain numerous alternative lakes and ponds in the surrounding landscape which provide habitat for this species. In addition, most waterfowl and waders, including tufted duck and coot, will travel much smaller distances from their core areas to roost or feed at night or high tide, typically 0.5-2km (Knight, 2019), and therefore the Site is unlikely to host species associated with the SPA populations. No impacts associated with disturbance or loss of functionally-linked habitat to tufted duck or coot, and by extension Lough Ennell SPA, are likely to occur.
- 9.5.12 There will be no impacts associated with disturbance to mobile species of River Boyne and River Blackwater SAC (river lamprey, Atlantic salmon, otter), given that the closest watercourse to the Power Plant Area is the River Castlejordan (at approximately 0.53km distance) hydrologically linked to the River Boyne and River Blackwater SAC.
- 9.5.13 No European sites are located within the 50m screening distance for dust impacts or the 200m screening distance from roads to be used by construction traffic (IAQM, 2014). The habitats within and surrounding the Power Plant Area are not sensitive to dust or other airborne pollutants in such a way that they would become unsuitable for SCI species of Lough Ennell SPA, or any other SPA, or cause effects to the species themselves. None of the waterbodies in proximity to the Power Plant Area, (for example the River Castlejordan (at approximately 0.53km distance), that are hydrologically connected to the River Boyne and River Blackwater SAC lie within the relative 50m screening distance for negative dust impacts. No impacts or effects associated with construction airborne pollution are likely.
- 9.5.14 Any construction activities have the potential to facilitate the dispersal of INNS through the introduction of seeds and plant fragments transported by construction machinery and clothing/footwear of construction workers. Given the proximity of construction works to the closest watercourse, River Castlejordan (at approximately 0.53km distance), which are upstream of European sites, the risk of INNS introduction cannot be excluded to River Boyne and River Blackwater SAC and SPA. In the absence of mitigation, the physical spread of invasive species will be a **Negative, Short-Term, and Significant** event, lasting during the length of the construction period, however, impacts of invasive species themselves on European sites may be **Medium to Long-Term** at an International geographic scale.
- 9.5.15 Full details of assessment of the assessment of impacts and likely significant effects to European sites are presented in the Appropriate Assessment (AA) Screening Report and Natura Impact Statement (NIS) (AECOM, 2023).

Sites with statutory designations – national sites

- 9.5.16 There are ten nationally designated sites within the ZOI of the Power Plant Area. None of these sites fall within the Power Plant Area.
- 9.5.17 No national sites are located within the 50m screening distance for dust impacts or the 200m screening distance from roads to be used by construction traffic (IAQM, 2014). The closest is Lough Ennell pNHA, with a hydrological link: 3.1km downstream. No construction-phase impacts related to air quality are predicted for national sites.
- 9.5.18 There are no hydrological connections, and therefore no valid source-pathway-receptor pathways for other construction phase impacts, such as noise and light disturbance, identified between any nationally designated sites and the Power Plant Area. Therefore, no impacts or effects associated with the construction phase are predicted for national sites.

Habitats – habitat loss and damage

- 9.5.19 The Power Plant Area is predominantly located on a brownfield site known locally as Derrygreenagh Works, while a smaller area is located within area of cutover peat within Drumman Bog. The Derrygreenagh Works is dominated by existing buildings and artificial surfaces. These areas are immediately surrounded by areas of amenity grassland, dry meadows and grassy verges, cutover bog (mainly bare peat), scrub and immature woodland, and mixed woodland. In the north of the Power Plant Area, are areas of partly vegetated cutover bog, bog woodland, and an acid oligotrophic lake.
- 9.5.20 To facilitate the construction of the Power Plant Area, building clearance and vegetation clearance is required. This will result in habitat loss to facilitate the construction of the Power Plant Area, including contractor working areas, access tracks and site compounds, as well as the footprint of the new buildings/infrastructure. In the southeast section of the Power Plant Area, within the Drumman Bog, an area dominated by cutover peat will be used as a storage area for peat excavated during construction. The baseline extent of each habitat within the Power Plant Area is detailed in Table 9.9 and illustrated in Figure 9.5. These are dominant habitats (i.e. those habitat types occurring most in any one area) and are approximate only.
- 9.5.21 The greatest habitat loss, in terms of area, within the Power Plant Area, is cutover bog (9.3 ha of bare cutover bog (PB4a) and 11.4ha of cutover bog colonized by vegetation (PB4b)), with the vast majority of this habitat within the section on Drumman Bog to be used as a permanent storage area for excavated peat. Most of this habitat will be lost due to being covered or damaged permanently, however, it will be left for recolonization by vegetation in the long-term. The next most extensive habitat on the Power Plant Area is buildings and artificial surfaces (not considered in the impact assessment), which covers 5.23ha, which will be replaced by new buildings/infrastructure. All other habitats within the main Power Plant Area will be permanently lost or modified in the short to long-term, and the significance of the loss of each habitat type is described in Table 9.9.
- 9.5.22 There will be no loss of any EU Annex I habitat as a result of the construction of the Power Plant Area.

Table 9.9: Approximate extent (ha) of each habitat type within the Power Plant Area.

HABITAT	AREA (ha)	SIGNIFICANCE OF LOSS
Acid oligotrophic lake (FL2)	0.22	Negative, permanent, significant at the Local geographic scale
Reed and large sedge swamps (FS1)	0.17	Negative, permanent, significant at the Local geographic scale
Drainage ditch (FW4)	0.28*	Negative, permanent, significant at the Local geographic scale
Marsh (GM1)	0.08	Negative, permanent, significant at the Local geographic scale
Dry meadows and grassy verges (GS2)	4.33	Negative, short-term, significant at the Local geographic scale
Cutover bog (PB4a)	9.3	Negative, permanent, significant at the Local geographic scale
Cutover bog (PB4b)	11.4	Negative, permanent, significant at the Local geographic scale
Bog woodland (WN7)	3.06	Negative, long-term, significant at the Local geographic scale
Mixed broadleaved/conifer woodland (WD2)	0.25	Negative, permanent, significant at the Local geographic scale
Scrub and Immature woodland mosaic (W)	1.05	Negative, long-term, significant at the Local geographic scale
Scrub (WS1)	5.76	Negative, medium-term, significant at the Local geographic scale
Scrub (WS1)	0.23*	Negative, medium-term, significant at the Local geographic scale
Immature woodland (WS2)	0.66	Negative, permanent, significant at the Local geographic scale
Treelines (WL2)	0.11*	Negative, permanent, significant at the Local geographic scale

*Linear habitat distance given in linear km

9.5.23

Habitats – pollution and water quality

9.5.24 A network of drainage ditches traverses the cutover bog habitat, whilst numerous acid oligotrophic waterbodies intersperse bog habitat north of the Power Plant Area.

9.5.25 During construction there is an increased likelihood of pollution and/or sedimentation events due to construction traffic and plant movement, accidental spillages, deposition of dust and other sediments, and runoff associated with construction activities. It is noted that the network of drainage ditches are linked to nearby watercourses, such as the Mongagh River to the north. The process water pipeline will discharge directly into the Yellow River south of the main Power Plant Area. Installation of this pipe, and the construction activities described above, in the absence of mitigation, could result in negative impacts to water quality, and potentially retained or hydrologically connected habitats. Such likely significant impacts will only occur for the duration of the construction period (and shortly thereafter), and are reversible in the medium to long-term, depending on the extent of pollution events. In the absence of mitigation, pollution and water quality impacts associated with the construction phase of the Power Plant Area will have **Negative, Temporary, and Significant** effects at a Local geographic scale on habitats.

Invasive species

- 9.5.26 No Invasive Non-Native Species (INNS) were identified within the Power Plant Area or in its Zol. Nonetheless, construction has the potential to facilitate the dispersal of INNS through the introduction of seeds and plant fragments transported by construction machinery and clothing/footwear of construction workers from offsite. In addition, invasive species may be spread to habitats downstream where there is a direct hydrological connection (e.g. the River Castlejordan). Impacts of invasive species on habitats include outcompeting native flora, by forming dense stands. In the absence of mitigation, the physical spread of invasive species will be a **Negative, Short-Term, and Significant** event, lasting during the length of the construction period, however, impacts of spread of invasive species themselves may be medium to long-term at a Local geographic scale.

Bats

- 9.5.27 Eight bat roosts were confirmed, five in buildings / structures within the Power Plant Area, and two associated with the Power Plant Area (see Figure 9.6). Two of these buildings (B4 and B4a) will be demolished to facilitate construction. Building B5 and bridge S1 will be retained but are likely to be impacted by construction works, which may cause disturbance to roosting bats e.g. from construction noise, if carried out during the spring/summer roosting period.
- 9.5.28 Buildings B1, B2 and B3, which have also been identified to host bat roosts, are outside of the Power Plant Area and will not be directly or indirectly impacted by the construction works.
- 9.5.29 Potential construction phase impacts to bats include loss of confirmed bat roosts (including the loss of two maternity roosts of soprano pipistrelle, one occasional roost of brown long-eared bat), mortality risk or injury or disturbance to bats roosting within building which may be retained. Disturbance to roosts may also result in roost abandonment, which may be considered as loss of roost. Potential construction related impacts to bats and their roosts will result in **Permanent, Negative, and Significant** effects at County geographic scale.
- 9.5.30 In addition, habitat fragmentation and disturbance and displacement of bats from the area caused by artificial lighting, noise and vibrations through the duration of construction will be short-term. The removal of treelines around the Power Plant Area used by commuting and foraging bats will be permanent, while the areas of bog woodland, scrub and immature woodland within the Peat Deposition Area used by commuting and foraging bats will be long-term. Overall potential construction related impacts to foraging/commuting habitats for bats, given the extent, will result in **Short-Term Permanent, Negative, and Slight** effects at Local geographic scale.

Badger

- 9.5.31 Badger are present within the habitats surrounding the Power Plant Area, although no evidence of badger was recorded within the Power Plant Area itself.
- 9.5.32 Two outlier badger setts (BA01 and BA02) were identified located 95m and 84m south of the Derrygreenagh Works respectively. Badger also commutes and forages throughout the surrounding lands, as evidenced by snuffle holes and a dung identified in a field approximately 90 m to the south of the Power Plant Area. There is suitable habitat for badger to excavate further setts within the Power Plant Area in the interim.
- 9.5.33 Construction works may also result in a risk of mortality or injury to badger, in addition to disturbance or displacement. While outlier setts BA01 and BA02 will be retained as they sit outside the Proposed Development area, piling works if required within 150m may risk damage or potential destruction (e.g. collapse) of setts, and require temporary exclusion.

In addition, new setts could be excavated within the Power Plant Area prior to construction activities commencing, and in such a case there is potential for construction works to impact these badgers and their setts.

- 9.5.34 In the absence of mitigation, potential construction phase impacts to badger include: loss of setts; physical damage and/or disturbance to badger setts and injury to or risk of mortality of badger within setts; disruption and/or displacement of badger by increased human presence, artificial lighting, noise, vibrations and fencing associated with site compounds and working areas; injury or entrapment due to any unsecured open trenching/excavation pits; and exposure to oils and other toxic materials. Pollution of badger drinking sources may also have an impact on foraging badgers.
- 9.5.35 Sett destruction and loss of habitat are a permanent impact, whilst disruption and displacement of badger via noise, vibrations, fencing etc. is short-term, lasting only the period of construction. Badger are active year-round, hence impacts to badger has the potential to occur at any time during construction. Impacts to breeding badger are unlikely given that badger generally use main setts for breeding and raising young, which are absent in the Power Plant Area or wider Zol.
- 9.5.36 Potential construction related impacts to badger in the absence of mitigation will result in **Short-Term** to **Permanent, Negative**, and **Significant** effects at Local geographic scale.

Otter

- 9.5.37 No evidence of otter was identified within the Power Plant Area. The Power Plant Area is considered negligible for breeding and / or resting places (i.e., holts and layups) due to a lack of suitable habitat e.g. watercourses.
- 9.5.38 The nearest watercourse to the Power Plant Area is the Mongagh River (aquatic survey sites A3 and A4), where an otter regular spraint site was identified at A3, approximately 900m to the northwest. It is considered that otter may opportunistically make use of terrestrial habitats within the surrounds of the Power Plant Area, particularly within waterbodies in bog habitat to the north.
- 9.5.39 A further regular spraint site was identified at site X3 on the Yellow River, at the location where the process water pipeline will discharge into the watercourse (see Figure 9.2).
- 9.5.40 In the absence of mitigation, construction phase impacts to otter include disruption/displacement of otter by increased human presence, noise, artificial lighting, vibrations, and fencing associated with site compounds and working areas; injury or entrapment due to any unsecured open trenching/excavation pits; and exposure to oils and other toxic materials. Water pollution to otter habitat can also cause impacts to otter, such as injury, mortality risk, or displacement.
- 9.5.41 All identified potential impacts in relation to the construction phase of the Power Plant Area are short-term. Otter is active year-round; hence impacts to otter may occur year-round. Potential construction phase impacts to otter populations in the absence of mitigation will result in a **Short-Term, Negative**, and **Moderate** effect at Local geographic scale for the duration of construction and potentially a short-term period thereafter.

Other protected mammals

- 9.5.42 Irish hare was observed on multiple occasions within the Power Plant Area, and grassland within the Power Plant Area provides suitable habitat for this species.
- 9.5.43 Pine marten droppings were identified north of the Power Plant Area, close to an area of trees and scrub and within a woodland to the south of the Power Plant Area. Woodland

and tree line habitats within this area are considered to offer some foraging opportunities, however, the habitat is considered largely suboptimal for refugia.

- 9.5.44 Other protected mammal species potentially present within the Power Plant Area include red squirrel, hedgehog, and stoat, although none of these were identified on site during surveys.
- 9.5.45 In the absence of mitigation, construction phase impacts to these species include loss of habitat; loss of breeding/resting sites; disturbance/displacement by increased human presence, noise, vibrations, and fencing associated with site compounds and working areas; mortality and/or injury or entrapment due to any unsecured open trenching/excavation pits; and risk of mortality and/or injury due to damage, disturbance, or destruction of resting sites, or exposure to oils and other toxic materials. Impacts are considered to have **Short-Term to Permanent, Negative, Significant** effects at Local geographic scale in the absence of mitigation.

Marsh fritillary

- 9.5.46 No marsh fritillary adult butterflies or larval webs were identified within the Power Plant Area, nor were any identified in the immediate surrounds of this area. However, several areas of suitable habitat and presence of larval foodplants (i.e. devils-bit scabious) were identified within the Power Plant Area, including an area of 272m² of good condition habitat at the northwestern corner of the Power Plant area. Although no butterflies or larval webs were identified, the transient and mobile nature of this species means these areas of suitable habitat cannot be disregarded for potential future breeding, particularly given the confirmed presence of marsh fritillary elsewhere within the wider area.
- 9.5.47 In the absence of mitigation, construction phase impacts associated with the Power Plant Area comprise loss of habitat and potential risk of injury or mortality of butterfly eggs and larvae which may be present within the grassland, although none have been identified to date. Marsh fritillary lay their eggs in the summer, after which larvae hatch and typically hibernate between late September and February or early March, before becoming chrysalises in April/May and emerge as adult butterflies two to three weeks later. During this time, larvae are largely immobile and are therefore particularly susceptible to disturbance and habitat loss/vegetation clearance. Adults are also susceptible to direct mortality and loss of suitable habitat to lay eggs.
- 9.5.48 Loss of marsh fritillary habitat will result in permanent, negative, significant effects at County geographic scale. All other construction phase impacts will likely result in **Negative, Short-Term** (occurring for the duration of the construction period), **Significant** effects at County geographic scale.

Amphibians

- 9.5.49 Smooth newt has been confirmed as present within two waterbodies within the Power Plant Area. eDNA confirmed presence only, and it is unknown whether these ponds support breeding populations, and no population size class assessment has been carried out. However, on a precautionary basis, given the large amount of suitable terrestrial habitat and areas of standing water present, it is considered likely that breeding populations of smooth newt are present within the Power Plant Area.
- 9.5.50 Common frog has been observed within the Power Plant Area, yet no frogspawn or tadpoles were noted during the site visits in Ponds 2 and 3. However, on a precautionary basis, given suitable terrestrial habitat and areas of standing water present, it is assumed that breeding population of common frog are present within the Power Plant Area.
- 9.5.51 Smooth newt and common frog are active outside of the hibernation period (October-February). However, during hibernation they can be found in frost-free places such as

under tree stumps, turf stacks or log piles, and frogs can hibernate in the bottom of ponds. Both species are particularly at risk during the breeding season, i.e., between February and June.

- 9.5.52 While Pond 2 will be retained following the construction of the Power Plant Area, Pond 3 will be removed to install the surface water discharge pipe. Pond 2 is immediately adjacent to the northern boundary of the Power Plant Area. The construction of a laydown area adjacent to Pond 2 will involve clearing existing habitats and replacing with hardstanding. The construction activities within the Power Plant Area, immediately adjacent to Pond 2, has the potential to impact smooth newt in Pond 2 through pollution and disturbance.
- 9.5.53 In the absence of mitigation, construction phase impacts to smooth newt and common frog include habitat loss and fragmentation of terrestrial and breeding habitat; disruption to breeding ponds; risk of injury or mortality of breeding adult frogs and newts as well as eggs and young in waterbodies and also to adults in terrestrial habitat; injury or entrapment due to any unsecured open trenching / excavation pits; and exposure to oils and other toxic materials. Water or light pollution to breeding habitat can also have a knock-on impact to smooth newt and common frog. Such impacts can result in displacement, injury, and mortality to this species without appropriate mitigation.
- 9.5.54 Depending on the scale and nature of potential impacts, effects could range from short-term to permanent. Construction works causing degradation of water quality and disturbance through the use of artificial lighting will result in short-term slight to significant negative effects, depending on the extent of pollution events, at County geographic scale. Removal of habitat and breeding ponds will likely result in **Permanent, Negative, Significant** effects on amphibian populations at County geographic scale. Mortality/injury and disturbance during the construction phase will result in **Short-Term, Negative, Moderate** effects at County geographic scale.

Breeding birds

- 9.5.55 The Power Plant Area currently has limited suitability for breeding birds in the existing Derrygreenagh Works, with much of the site currently supporting hardstanding or buildings. However, there are some areas of trees and scrub suitable for nesting birds, and several of the buildings have nesting opportunities for house martin and barn swallow.
- 9.5.56 The Peat Deposition Area to the southeast, within Drumman Bog, is revegetated cutaway bog with regenerating scrub and woodland and small waterbodies present. This offers suitable nesting opportunities for a variety of passerine species, including the red-listed meadow pipit, and amber-listed willow warbler and linnet, returned from the desktop search. As well as for species observed occasionally during vantage point surveys, consisting of kestrel, as well as sparrowhawk, and buzzard,. After the peat is stored on the site Peat Deposition Area, it will become less suitable for breeding birds than present in the short-term, however over time trees and scrub will recolonize the area.
- 9.5.57 Potential impacts of the construction phase of the Proposed Development on breeding birds comprise loss of breeding habitat, potential risk of injury or mortality of nesting birds, disturbance and injury to adults and their eggs and young, and potential displacement of species following removal of their nests.
- 9.5.58 Impacts would be limited to the breeding season (considered to be March to August inclusive). In the absence of mitigation, construction phase impacts will have **Short-Term to Permanent, Negative, Moderate** effects at Local geographic scale on populations of sparrowhawk and buzzard, as well as a variety of non-listed passerine birds which may breed in the vicinity of the Power Plant Area.. For those species listed or protected,

consisting of kestrel, meadow pipit, house martin, barn swallow, willow warbler and linnet, known to be present in the vicinity of the Power Plant Area during the breeding season, the construction phase impacts will have **Short-Term to Permanent, Negative, Moderate** effects at a County geographic scale.

Wintering birds

- 9.5.59 The Power Plant Area currently is of limited use or suitability to wintering birds in the main Derrygreenagh site. Wintering birds comprising, whooper and mute swans, lapwings and golden plover were recorded feeding within Drumman Bog, though in comparatively low numbers in the vicinity of the Power Plant Area, or within the proposed Peat Deposition Area. Other bird species occasionally recorded flying over and feeding in the vicinity of the Power Plant Area comprised raptors including hen harrier, peregrine falcon, kestrel, sparrowhawk and merlin. Little egret was recorded on one occasion, as well as lesser black-back gulls. Although it is possible that construction noise and lighting may result in short-term disturbance to some wintering birds, resulting in avoidance of the immediate vicinity of the Power Plant Area, it is nocturnal feeding species such as golden plover, found in significant numbers in Drumman Bog in particular that may be impacted, As such construction phase impacts on golden plover will result in **Short-Term, Negative, and Slight** effects at Local geographic scale.

Fisheries and aquatics

- 9.5.60 White-clawed crayfish remains were found in an otter spraint by the Mongagh River at Site A3, northwest of the Power Plant Area. A positive eDNA result was obtained for this species at site C7 on the Yellow River, approximately 11.5 km downstream of the Power Plant Area. Atlantic salmon and European eel were also recorded at this sampling site.
- 9.5.61 Construction phase impacts include release of sediment and other pollutants into watercourses. Such impacts may result in mortality or injury to fish and crayfish, behavioral changes, and deleterious impacts to fish spawning and fecundity. Any short-term obstruction or pollution may cause localised population effects if the timing coincides with upstream migration and spawning, or smolt downstream migration. These effects are **Short-Term, Negative, and Significant** at Local geographic scale.

Summary of Construction Phase Impacts

- 9.5.62 A summary of the significance of effects from construction phase impacts is presented in Table 9.10.

Table 9. 10: Summary of significance of effects from construction phase impacts for the Power Plant Area

POTENTIAL IMPACT	QUALITY OF EFFECTS	SIGNIFICANCE OF EFFECTS	DURATION OF EFFECTS	GEOGRAPHIC SIGNIFICANCE
European sites				
River Boyne and River Blackwater SAC: Waterborne pollution impacts to species outside the SAC boundary	Negative	Significant	Short-term	International
River Boyne and River Blackwater SAC / SPA: spread of invasive species during construction	Negative	Significant	Medium-term to long-term	International
National sites				
No construction phase impacts				
Habitats				
Habitat – loss and damage	Negative	Significant	Short-term to permanent	Local
Habitat– pollution and sedimentation	Negative	Significant	Temporary	Local
Spread of invasive species	Negative	Significant	Short-term to long-term	Local
Bats				
Loss of roosts	Negative	Significant	Permanent	County
Mortality risk or injury of bats within roosts	Negative	Significant	Short-term	County
Disturbance / displacement due to artificial lighting, noise, and vibrations	Negative	Significant	Short-term	County
Loss of foraging and commuting habitat	Negative	Slight	Permanent	Local
Habitat fragmentation and disturbance	Negative	Slight	Permanent	Local
Badger				
Loss of setts	Negative	Significant	Permanent	Local
Physical damage and/or disturbance to badger setts	Negative	Significant	Short-term	Local

POTENTIAL IMPACT	QUALITY OF EFFECTS	SIGNIFICANCE OF EFFECTS	DURATION OF EFFECTS	GEOGRAPHIC SIGNIFICANCE
Mortality risk or injury of badger in setts	Negative	Significant	Short-term	Local
Mortality risk or injury of badger in construction areas	Negative	Significant	Short-term	Local
Disturbance / displacement due to increased human presence, artificial lighting, noise, vibrations, and fencing	Negative	Significant	Short-term	Local
Otter				
Disturbance / displacement due to increased human presence, artificial lighting, noise, vibrations, and fencing	Negative	Moderate	Short-term	Local
Mortality risk or injury of otter in construction area	Negative	Moderate	Short-term	Local
Damage to otter habitat due to water pollution	Negative	Moderate	Short-term	Local
Other protected mammals				
Loss of breeding / resting sites	Negative	Significant	Permanent	Local
Habitat loss	Negative	Significant	Permanent	Local
Disturbance / displacement due to increased human presence, artificial lighting, noise, vibrations and fencing	Negative	Significant	Short-term	Local
Mortality risk or injury in construction areas	Negative	Significant	Short-term	Local
Marsh fritillary				
Habitat loss	Negative	Significant	Permanent	County
Mortality risk or injury of eggs, larvae and adult butterflies	Negative	Significant	Short-term	County
Amphibians				
Loss of a breeding waterbody	Negative	Significant	Permanent	County
Habitat loss and fragmentation of terrestrial habitat	Negative	Significant	Permanent	County

POTENTIAL IMPACT	QUALITY OF EFFECTS	SIGNIFICANCE OF EFFECTS	DURATION OF EFFECTS	GEOGRAPHIC SIGNIFICANCE
Damage to breeding waterbodies due to water pollution	Negative	Slight to significant	Short-term	County
Mortality risk or injury in waterbodies and terrestrial habitat	Negative	Moderate	Short-term	County
Mortality risk or injury in construction areas	Negative	Moderate	Short-term	County
Disturbance / displacement from waterbodies due to artificial lighting	Negative	Slight	Short-term	County
Breeding birds				
Loss of breeding habitat	Negative	Moderate	Permanent	Local to County
Mortality risk and injury to nesting birds	Negative	Moderate	Short-term	Local to County
Disturbance to adults and their eggs, young and nests, and displacement following removal of nests	Negative	Moderate	Short-term	Local to County
Wintering birds				
Disturbance / displacement due to construction noise.	Negative	Slight	Short-term	Local
Fisheries and aquatics				
Pollution / sedimentation of habitat	Negative	Significant	Short-term	Local
Mortality and injury	Negative	Significant	Short-term	Local
Disruption to spawning and fecundity	Negative	Significant	Short-term	Local
Temporary obstruction of fish passage	Negative	Significant	Short-term	Local

*Operational phase impacts***Sites with statutory Designations – European sites**

- 9.5.63 Construction phase impacts include release of sediment and other pollutants into watercourses. Such impacts may result in mortality or injury to fish and crayfish, behavioral changes, and deleterious impacts to fish spawning and fecundity. Any short-term obstruction or pollution may cause localised population effects if the timing coincides with upstream migration and spawning, or smolt downstream migration. These effects are **Short-Term, Negative, and Significant** at Local geographic scale.
- 9.5.64 The Power Plant Area is hydrologically linked with River Boyne and River Blackwater SAC and SPA via the River Castlejordan and River Boyne (hydrological distance of over 25km). There is potential for operational waterborne pollution generated in the Power Plant Area, for example through accidental distillate fuel spillages from the proposed tanks and pipelines, to enter local watercourses. Both River Boyne and River Blackwater SAC and SPA lies >25km and this is not a viable pathway for pollution impacts at such a downstream distance, therefore direct water quality impacts on habitat features and species within the European site boundary are unlikely.
- 9.5.65 River Boyne and River Blackwater SPA is designated for kingfisher, a territorial species which rarely moves beyond the boundary of its territories. Therefore, kingfisher associated with the SPA population are unlikely to occur within the Zol of water-based pollution that may arise from the operation phase. No impacts to kingfisher, and by extension River Boyne and River Blackwater SPA, are likely to occur.
- 9.5.66 The Power Plant Area is well-separated from the other European sites identified within the Zol (the closest European site is located >7km away). As a result, no impacts or effects due to disturbance (noise, visual, vibration) of qualifying species within any European site boundary (i.e. no direct impacts) of qualifying species within any European site boundary (i.e. no direct impacts) are likely during operation. Tufted duck and coot, mobile SCI species of Lough Ennell SPA has been recorded in Drummin Bog adjacent to the Power Plant Area (c. 950m from the Power Plant Area), although the Power Plant Area is considered to be well beyond the core foraging range for birds from the SPA (between 500m and 2km) (Knight, 2019). In addition, there are many alternative suitable waterbodies in the wider geographic area. Therefore, disturbance impacts to mobile species of Lough Ennell SPA outwith the SPA boundary can be excluded.
- 9.5.67 Otter, a mobile qualifying species of River Boyne and River Blackwater SAC, may commute and forage along functionally linked waterbodies (e.g. the Castlejordan River, at approximately 0.53km distance) nearby the Power Plant Area, though outside the Zol. However, during the operational phase there will be limited use of machinery and a limited number of personnel present (refer to Chapter 5, EIAR Volume I). Therefore, disturbance impacts to mobile species of River Boyne and River Blackwater SAC can be excluded.
- 9.5.68 According to the Air Pollution Information System (APIS)¹, the following European sites within 10km of the Power Plant Area may be vulnerable to atmospheric nitrogen deposition (Nox) and ammonia (NH₃): Lough Ennell SAC, Raheenmore Bog SAC, Split Hills and Long Hills Esker SAC, Mount Hevey Bog SAC and Wooddown Bog SAC. Following air quality modelling, it has been concluded that Nox concentrations will remain below the critical level for all sites, while NH₃ concentrations and nitrogen deposition will not exceed a maximum 1% of the critical load for all sites (for full details refer to Chapter 7 (EIAR Volume I) and the AA Screening Report and NIS (AECOM, 2023)).

¹ www.apis.ac.uk

- 9.5.69 Regarding the Lough Ennell SPA, APIS also highlights a sensitivity of pochard and tufted duck to NO_x , NH_3 and nitrogen deposition, but only where these are present in the context of saltmarsh. This habitat type is not present in the Lough Ennell SPA. As such air quality impacts to European sites are unlikely.
- 9.5.70 Watercourses in the vicinity of the Power Plant Area that are functionally linked to the River Boyne and River Blackwater SAC are potentially sensitive to dust generated by operational site traffic. However, the total number of operational vehicle movements at the Power Plant Area is likely to be small, with the total number of personnel employed between 45-50. Only a small portion of employees will be present within the site at any given time (e.g. three-person operations team supported by a small management / maintenance / administrative team), such that any dust generation will be minimal. It is also to be noted that the relevant functionally linked waterbodies are not within the relevant screening distances from access roads for dust and vehicle exhaust impacts.
- 9.5.71 Full details of the assessment of impacts and likely significant effects to European sites are presented in the AA Screening Report and NIS (AECOM, 2023).

Sites with statutory designations – national sites

- 9.5.72 There are no operational phase impacts that will impact any nationally protected site. Emissions of NO_x and NH_3 from the operation will be marginally higher than baseline background levels, however, these are negligible quantities (refer to Chapter 7, EIA, Volume I). The assessment concludes overall that the Proposed Development (i.e., Power Plant Area) will not give rise to significant adverse air quality effects on local NHA/pNHA identified within the ZOI. Therefore, no impacts or effects associated with the operation phase are predicted for national sites.

Habitats

- 9.5.73 Emissions of NO_x and NH_3 from the power plant operation will be marginally higher than baseline background levels, however, these are negligible quantities (Refer to Chapter 7, EIA, Volume I). The assessment concludes overall that the Proposed Development (i.e., Power Plant Area) will not give rise to significant adverse air quality effects on sensitive habitats surrounding the Proposed Development. By extension, emissions will not impact species that depend on these habitats. Effects related to operational airborne pollution will be **Long-Term, Neutral, and Not Significant** at Local geographic scale.
- 9.5.74 Accidental spillages may potentially result in a direct or indirect impact to surface water run-off (including accidental distillate fuel spillages from the proposed tanks and pipelines) should contaminants enter surface waters directly, in this case, the Mongagh River. The Yellow River is at distance from this area and is considered unlikely to be at risk of this potential impact, however foul waste-water discharge is planned for the Yellow River.
- 9.5.75 Discharge of foul wastewater water into the Yellow River and surface water from the Power Plant Area into the Mongagh River north of the Power Plant Area, in the absence of mitigation could result in **Temporary to Long-Term, Negative, Moderate** effects at Local scale.

Bats

- 9.5.76 Although artificial lighting is already present in the existing Power Plant Area (Derrygreenagh Works), additional and increased intensity of lighting in the vicinity of bat roost sites has the potential to disrupt roosts, disrupt foraging and commuting bats, and displace bats from roosts. No other operational phase impacts are predicted for bats.

9.5.77 As a result, the operational phase of the Power Plant Area has the potential to result in **Long-Term, Negative, Moderate** effects on roosting and foraging habitats bats, at Local geographic scale.

Badger

9.5.78 Although artificial lighting is already present in the existing Power Plant Area (Derrygreenagh Works), additional and increased intensity of lighting may disrupt badger commuting routes and cause displacement from habitats within the Power Plant Area. Increased noise, human presence and traffic during operation may also disrupt badger, although it is noted that the habitats within this area are already subject to disturbance from the existing use of the Power Plant Area, while the total number of personnel employed will be small (45-50), and only a small portion of employees will be present within the site at any given time (e.g. three-person operations team supported by a small management / maintenance / administrative team). No other operational phase impacts are predicted for badger.

9.5.79 In the absence of mitigation, operation phase impacts will be **Long-Term, Negative and Slight** at Local geographic scale.

Otter

9.5.80 Similar to badger, additional and increased intensity of lighting from the new thermal power plant may disrupt potential otter habitat and commuting routes within and surrounding the Power Plant Area (i.e., waterbodies, ditches).

9.5.81 Increased noise and human presence during operation may disrupt otter, although it is noted that the habitats within this area are already subject to a level of disturbance from the existing use of the Power Plant Area, and, as mentioned above, the low numbers of personnel on site at any one time, this is unlikely to pose a significant effect. Operational impacts from light and noise disturbance will have **Long-Term, Negative, Slight** effects at the Local geographic scale.

9.5.82 Discharge of foul wastewater water into the Yellow River and surface water from the Power Plant Area into the Mongagh River north of the Power Plant Area, could pose an indirect impact to otter. Such impacts will result in **Long-Term, Negative and Moderate** effects at Local scale.

9.5.83 No other operational phase impacts are predicted for otter.

Other protected mammals

9.5.84 Additional and increased intensity of lighting from the new thermal power plant may disturb other protected mammal species, including pine marten, Irish hare, stoat, or red squirrel which may be present within or adjacent to the Power Plant Area. There is the potential to disrupt commuting routes and cause displacement from habitats within the Power Plant Area. Increased human presence and traffic during operation may also disrupt these species, although it is noted that the habitats within this area are already subject to disturbance from the existing use of the site, and that the increase in traffic and personnel on site will be minimal. Operational impacts from light and noise disturbance will have **Long-Term, Negative, Slight** effects at Local geographic scale for these species.

9.5.85 There are no other operational phase impacts predicted that would negatively impact pine marten, Irish hare, stoat, or red squirrel.

Marsh fritillary

- 9.5.86 Emissions from the Power Plant Area operation will be marginally higher than baseline background levels, however, these are negligible quantities, not exceeding critical thresholds (refer to Chapter 7: Air Quality). In addition, the total number of operational vehicle movements within the Power Plant Area is likely to be small, with the total number of personnel employed between 40-50. Only a small proportion of employees will be present within the site at any given time (e.g., three-person operations team supported by a small management/maintenance/administrative team), such that any dust generation will be minimal (refer to Chapter 14: Traffic). Any resulting dust generation will be minimal and will have minimal impact marsh fritillary habitats surrounding the Proposed Development. Emissions and dust generation will result in **Long-Term, Neutral, Imperceptible** effects at a Local geographic scale.

Amphibians

- 9.5.87 Accidental spillages may potentially result in impacts to surface water run-off (including accidental distillate fuel spillages from the proposed tanks and pipelines) should contaminants enter surface waters directly, in this case, breeding ponds. Waterborne pollution impacts will result in **Temporary, Negative, Slight** effects at Local geographic scale.
- 9.5.88 Emissions to the air from the operation of the Power Plant Area will be marginally higher than baseline background levels, however, these are negligible quantities (refer to Chapter 7: Air). In addition, the total number of operational vehicle movements within the Power Plant Area is likely to be small, with the total number of personnel employed between 40-50. Only a small proportion of employees will be present within the site at any given time (e.g., three-person operations team supported by a small management / maintenance / administrative team), such that any dust generation will be minimal (refer to Chapter 14: traffic). Any resulting dust generation will be minimal and will not impact amphibian breeding or terrestrial habitats. Emissions and dust generation will result in **Long-Term, Neutral, Imperceptible** effects at a Local geographic scale.
- 9.5.89 New artificial lighting from the new thermal power plant has the potential to disturb/disrupt amphibians if it illuminates breeding habitat. However, any such disturbance should be set in the context of the frequent availability of similar breeding opportunities in the wider area which will remain undisturbed and continue to provide suitable breeding habitat. Operational phase lighting will result in **Long-Term, Negative, Slight** effects at a Local geographic scale.

Breeding birds

- 9.5.90 During operation the Power Plant Area will likely remain largely unsuitable for many breeding birds species, supporting mostly hardstanding or buildings, yet still may offer nesting opportunities for house martin and barn swallow, and potentially species such as peregrine falcon, which use tall structures for nest sites. There will remain areas of trees, scrub and waterbodies suitable for a variety of songbird passerine species, including the red-listed meadow pipit, and amber-listed willow warbler and linnet), which may be subject to increased noise, visual and, vibration disturbance from the Power Plant Area.
- 9.5.91 Operational phase impacts as a result of ongoing noise and visual disturbance to breeding birds known to be in the vicinity of the Power Plant Area, within Drumman Bog, consisting of sparrowhawk, buzzard and various passerine bird species, as well as for protected and listed species, kestrel, willow warbler, linnet, and meadow pipit will result in **Long-Term, Negative, Not Significant** effects at the Local geographic scale.

Wintering birds

- 9.5.92 During the operational phase, the Power Plant Area will continue to have limited suitability for the wintering birds species identified using the wider Drumman Bog, in particular whooper and mute swans, lapwings and golden plover. Other species identified in the area in winter, consisting of kestrel, sparrowhawk, hen harrier, peregrine falcon and merlin, as well as little egret and lesser black-backed gulls were found only occasionally to pass overhead. Operation phase impacts on the above-mentioned species, including the golden plover, are considered will have a **Permanent, Negative, Not Significant** effect at the Local geographic scale given they do not use the Power Plant Area given that wintering birds do not use the Power Plant Area for foraging or roosting.
- 9.5.93 New operational lighting however, has the potential to impact in particular, nocturnal feeding species such as golden plover.
- 9.5.94 Operational phase impacts on golden plover will result in **Long-Term, Negative, and Slight** effects at Local geographic scale.

Fisheries and aquatics

- 9.5.95 Operational phase impacts to salmonids and lamprey associated with the Mongagh River, and white clawed crayfish in both the Mongagh River and Yellow River, in the absence of mitigation, comprise foul wastewater discharge, and surface water run-off. Impacts on these species will be **Temporary, Negative** and **Significant** at Local scale, depending on the sensitivity.

Summary of Operational Phase Impacts

- 9.5.96 A summary of the significance of effects from operational phase impacts for the Power Plant Area is presented in Table 9.11.

Table 9. 11: Summary of significant effects due to Operation Phase Impacts on the Power Plant Area

POTENTIAL IMPACT	QUALITY OF EFFECTS	SIGNIFICANCE OF EFFECTS	DURATION OF EFFECTS	GEOGRAPHIC SIGNIFICANCE
European sites				
No operational phase impacts.				
National sites				
No operational phase impacts				
Habitats				
Airborne pollution impacts	Neutral	Not significant	Long-term	Local
Waterborne pollution impacts	Negative	Moderate	Temporary to long-term	Local
Bats				
Disturbance / displacement of bat roosts due to artificial lighting and noise	Negative	Moderate	Long-term	Local
Disturbance / displacement of foraging and commuting bats due to artificial lighting	Negative	Moderate	Long-term	Local
Badger				
Disturbance / displacement due to increased human presence and traffic	Negative	Slight	Long-term	Local
Disturbance / displacement due to new artificial lighting	Negative	Slight	Long-term	Local
Otter				
Disturbance / displacement due to increased human presence and traffic	Negative	Slight	Long-term	Local
Disturbance / displacement due to new artificial lighting	Negative	Slight	Long-term	Local
Damage to otter habitat due to water pollution	Negative	Moderate	Long-term	Local
Other protected mammals				
Disturbance / displacement due to increased human presence and traffic	Negative	Slight	Long-term	Local
Disturbance / displacement due to new artificial lighting	Negative	Slight	Long-term	Local

POTENTIAL IMPACT	QUALITY OF EFFECTS	SIGNIFICANCE OF EFFECTS	DURATION OF EFFECTS	GEOGRAPHIC SIGNIFICANCE
Marsh fritillary				
Airborne pollution impacts	Neutral	Imperceptible	Long-term	Local
Amphibians				
Waterborne pollution impacts	Negative	Slight	Temporary	Local
Airborne pollution impacts	Neutral	Imperceptible	Long-term	Local
Disturbance / disruption due to new artificial lighting	Negative	Slight	Long-term	Local
Breeding birds				
Disturbance / displacement due to noise, visual disturbance, and vibration	Negative	Not significant	Long-term	Local
Wintering birds				
Disturbance / displacement due to new artificial lighting	Negative	Non-significant	Long-term	Local
Fisheries and aquatics				
Pollution / sedimentation due to storm-water run-off	Negative	Significant	Temporary	Local

Decommissioning phase

- 9.5.97 The Power Plant Area will have a design life of at least 25 years. At the end of its design life, it is expected that the Power Plant would either be decommissioned, or the lifetime could potentially be extended if appropriate.
- 9.5.98 Effects arising from the process of decommissioning of the Power Plant Area are considered to be of a similar nature and duration to those arising from the construction process on a precautionary basis (i.e., worst case scenario), as in reality the decommissioning phase will take place over a much shorter duration and will not require many of the activities included for the construction phase such as concrete pours and piling.
- 9.5.99 A Decommissioning Plan (including a Decommissioning Environmental Management Plan and potentially a Closure, Restoration and Aftercare Management Plan (CRAMP)) will be prepared and agreed with the relevant authority prior to decommissioning. The Decommissioning Environmental Management Plan will consider in detail all likely environmental risks on the Site and contain guidance on how risks can be avoided or mitigated. Decommissioning activities for the Power Plant Area will be conducted in accordance with the appropriate guidance and legislation.
- 9.5.100 The operational requirements of the Power Plant Area may change during its design life and it will be subject to regular reviews to identify potential modifications and amendments that would allow the asset to have a future sustainable use beyond 25 years.

Impact assessment for Electricity Grid Connection*Construction phase***Sites with statutory designations – European sites**

- 9.5.101 There are three European sites within the Zol of the Electricity Grid Connection. None of these sites fall within the Electricity Grid Connection area.
- 9.5.102 River Boyne and River Blackwater SAC and SPA are hydrologically linked to the Electricity Grid Connection via the Yellow River (Castlejordan) and Castletown Tara Stream. However, due to the distance of the hydrological connection, >25 km downstream, this is not a viable pathway for potential pollution impacts, therefore direct water quality impacts on habitat features and species within the European site boundary are unlikely and are not predicted to occur.
- 9.5.103 However, these adjoining watercourses may comprise functionally linked habitats for qualifying interest species (river lamprey, Atlantic salmon, otter) of the SAC which may be present outside the SAC boundary, and the potential localised impacts of negative water quality impacts may cause effects to such species where they occur out with the boundary. In the absence of mitigation to safeguard watercourses, potential water-based pollution impacts to mobile species of the River Boyne and River Blackwater SAC will result in **Temporary, Negative, Significant** effects at an International geographic scale.
- 9.5.104 River Boyne and River Blackwater SPA is designated for QI kingfisher, which is a relatively sedentary species which rarely move beyond the boundary of their small territories. Therefore, kingfisher associated with the SPA population are unlikely to occur within the Zol of water-based pollution that may arise from the construction phase. No impacts to kingfisher, and by extension River Boyne and River Blackwater SPA, are likely to occur.
- 9.5.105 The Electricity Grid Connection is physically separated from the other European sites identified within the Zol (the closest European site is located >11km away). As a result,

no impacts or effects due to disturbance (noise, visual, vibration) of qualifying species within any European site boundary (i.e. no direct or indirect impacts) are considered likely. However, bog habitat in the vicinity of the Electricity Grid Connection is suitable for tufted duck, pochard and coot, which are three SCI species of Lough Ennell SPA (>11km from the Electricity Grid Connection). A peak count of 77 tufted ducks was recorded (5.9% of the designated population) at ponds within Derryarkin Bog within the Electricity Grid Connection, a single pair of breeding coot in 2021 and 2022, but no pochard. However, according to guidance produced by Natural England, all wintering birds (except for wintering waders, grazing wildfowl, wigeon and geese) typically forage or roost within 0.5-2km of their core areas (Knight, 2019), and therefore the Electricity Grid Connection is unlikely to host species from the SPA population. In addition, construction in the Electricity Grid Connection area will be limited to 20 months with construction activities staged/staggered within this time. Therefore, large sections of bog habitat within and outwith the Electricity Grid Connection area will remain physically undisturbed by construction and there will remain numerous alternative lakes and ponds in the surrounding landscape. No impacts associated with disturbance to tufted duck or coot, and by extension Lough Ennell SPA, are likely to occur.

- 9.5.106 The QIs of River Boyne and River Blackwater SAC depend on functionally linked waterbodies beyond the SAC boundary, such as the Yellow River (Castlejordan) and Castletown Tara Stream, both of which traverse the Electricity Grid Connection. It is unlikely that river lamprey and salmon are present this far upstream near the source of this river system. The nearest location where these species have been recorded is over 11km downstream, such that any noise, visual and vibration disturbance would be immaterial. However, otter, which have extensive home ranges of up to 40km (Forestry Commission and Natural England, 2013), and commute along and forage within the watercourses traversing the Electricity Grid Connection. Indeed, an otter spraint was recorded at a culvert crossing the Yellow River within the Electricity Grid Connection Area. In addition, a potential holt was identified at the top of a peaty embankment along the Castletown Tara Stream. However, based on the presence of cobwebs and the absence of any otter signs, the holt was concluded to be inactive in 2022 and 2023. Potential temporary disturbance impacts to otter associated with the River Boyne and River Blackwater SAC will result in **Short-Term, Negative** and **Slight** effects at an International geographic scale.
- 9.5.107 Due to the distance of the Electricity Grid Connection, no direct impacts of construction in relation to air quality are likely envisaged. No European sites are located within the 50m screening distance for dust impacts or the 200m screening distance from roads to be used by construction traffic (IAQM, 2014). The functionally linked habitats within and surrounding the Electricity Grid Connection that could support SCI species of Lough Ennell SPA are not sensitive to dust or other airborne pollutants in such a way that they would become unsuitable for these species.
- 9.5.108 As highlighted in Chapter 14 (Traffic, EIA Volume II), the electrical grid route will be accessed from several locations, including accesses to the 220kV station and local Quarry both off the R400. Furthermore, to provide internal access, several access roads will need to be constructed within the Electricity Grid Connection. However, these access routes do not lie within the 50m screening distance for dust generation from the relevant waterbodies or watercourses that are likely to be functionally linked to the River Boyne and River Blackwater SAC. Furthermore, the volume of construction traffic for specific construction activities will remain in the low double figures (for example, an Annual Average Daily Traffic (AADT) of 40 heavy goods vehicles (HGVs) is forecast in the construction period for the 400kV Station), well below the threshold of 100 AADT that is

used to screen development projects. No impacts or effects associated with construction airborne pollution are likely.

- 9.5.109 Any construction activities have the potential to facilitate the dispersal of INNS through the introduction of seeds and plant fragments transported by construction machinery and clothing/footwear of construction workers. Given the proximity of construction works to watercourses which are upstream of European sites, the risk of INNS introduction cannot be excluded to River Boyne and River Blackwater SAC and SPA. In the absence of mitigation, the physical spread of invasive species will be a **Negative, Short-Term and Significant** event, at an International geographic scale.
- 9.5.110 Full details of assessment of likely significant effects to European sites are presented in the AA Screening Report and NIS (AECOM, 2023).

Sites with statutory designations – national sites

- 9.5.111 Two national sites were identified within the ZoI of the Electricity Grid Connection. Grand Canal pNHA, located c. 65m to the south, whilst Lough Ennell pNHA is located c. 11km northwest.
- 9.5.112 Grand Canal pNHA is a man-made waterway, comprising the canal channel and its banks. Habitats present along the banks include hedgerows, tall herbs, calcareous grassland, reed fringe, open water, scrub, and woodland.
- 9.5.113 The 220kV underground cable will run to the south of the Electricity Grid Connection site, approximately 80m north of the pNHA site boundary. An access road will be constructed on top of the buried cable.
- 9.5.114 Neither national site is located within the 50m screening distance for dust impacts during the construction phase of the Electricity Grid Connection, however Grand Canal pNHA is within the 200m screening distance from roads to be used by construction traffic (IAQM, 2014). The impacts associated with air pollution during the construction phase of the Electricity Grid Connection are likely to have **Short-Term, Negative, Slight** effects on the Grand Canal pNHA at a National geographic scale in the absence of mitigation.
- 9.5.115 The construction phase of the Electricity Grid Connection has the potential to result in negative water quality impacts through the release of soil and sediments, potential spillage of oils, fuels, or other construction chemicals, mobilization of contaminants following disturbance to ground, or uncontrolled site run-off. Such potential construction phase impacts may impact marginal and aquatic habitats and water quality within the pNHA boundary. The impacts associated with water pollution during the construction phase of the Electricity Grid Connection are likely to have **Short-Term, Negative, Moderate** effects on the Grand Canal pNHA at a National geographic scale in the absence of mitigation.

Habitats – habitat loss and damage

- 9.5.116 With respect to the proposed 220kV substation of the Electricity Grid Connection, habitats in this area comprise cutover bog (both bare peat and partly vegetated), dry meadows and grassy verges, bog woodland, scrub, amenity grassland, 9-80ecolonized bare ground, and spoil and bare ground.
- 9.5.117 With respect to the proposed 400kV substation of the Electricity Grid Connection, habitats in this area are dominated by improved grassland in agricultural fields with associated field boundary hedgerows. Immediately to the east of the proposed 400 kV substation is scrub, spoil and bare ground, and bare peat. An area of raised bog, which is considered to qualify as the Annex I priority habitat Active Raised Bogs (7110), is also present approximately 120m east of the proposed substation.

- 9.5.118 The proposed 220kV overhead line and associated infrastructure including the undergrounding compound traverses a variety of habitats, including cutover bog (both bare peat and partly vegetated), dry meadows and grassy verges, acid oligotrophic lakes, scrub, spoil and bare ground, scrub and immature woodland mosaic, immature woodland, mixed woodland, and bog woodland.
- 9.5.119 To facilitate the construction of the proposed substations (the 220kV and 400kV), vegetation clearance and ultimately habitat loss will be required. Habitat loss will also be required to facilitate the construction of infrastructure related to the overhead lines, such as pylons and foundations. In addition, temporary construction compounds and construction access tracks will require temporary habitat removal. Peat removed as part of construction will be stored in permanent Peat Deposition Areas within the red line boundary of the Electricity Grid Connection Site.
- 9.5.120 The extent of each habitat within the Electricity Grid Connection is detailed in Table 9.12. These are dominant habitats (i.e. those habitat types occurring most in any one area) and are approximate only. Estimates of the extent of these areas under the overhead lines have not been calculated given the linear nature of this part of the Proposed Development.

Table 9. 12: Approximate extent (ha) of each habitat type within the Electricity Grid Connection

HABITAT	AREA (HA)	SIGNIFICANCE OF LOSS
Acid oligotrophic lakes (FL2)	1.5	Negative, permanent, significant at the Local geographic scale
Dry meadows and grassy verges (GS2)	1.02	Negative, short-term, significant at the Local geographic scale
Cutover bog (PB4a)	2.44	Negative, permanent, significant at the Local geographic scale
Cutover bog (PB4b)	2.38	Negative, permanent, significant at the Local geographic scale
Bog woodland (WN7)	1.32	Negative, long-term, significant at the Local geographic scale
Scrub (WS1)	0.46	Negative, medium-term, significant at the Local geographic scale
Mixed broadleaved/conifer woodland (WD2)	0.50	Negative, permanent, significant at the Local geographic scale
Hedgerow (WL1)	0.43*	Negative, medium-term, significant at the Local geographic scale
Hedgerow (WL1)	0.90*	Negative, medium-term, significant at the Local geographic scale

*Linear habitat distance given in linear km

- 9.5.121 Potential habitat loss to facilitate the substation impacts will be greatest (in terms of area lost) for cutover bog (PB4a and PB4b). Loss of habitats within the substation areas is **Permanent, Negative and Significant**, whilst habitat loss within the construction compounds, and peat and soil depositions areas will be **Short-Term to Long-Term, Negative and Significant** at the Local geographic scale.
- 9.5.122 Small areas of various habitats, whilst not presented in Table 9.12, include dry meadows and grassy verges, scrub, cutover bog, bog woodland will be permanently lost to construct the overhead pylons and access roads. In addition, small areas of various

habitats along the route of the buried 220kV cable (not presented in Table 9.12) will be in the medium to long-term (depending on habitat type). This will result in a **Medium to Long-Term, Negative, Significant** effect at the Local geographic scale.

- 9.5.123 No loss of any Annex I Priority Habitat is required to facilitate the construction of the Electricity Grid Connection. However, the area of raised bog, which qualifies as Annex I habitat, is c. 45m from the Electricity Grid Connection, and is therefore located within the 50m screening distance for dust impacts during the construction phase (IAQM, 2014). The impact on this habitat is likely to have **Temporary, Negative, Slight** effects at a National geographic scale.

Habitats – pollution and water quality

- 9.5.124 The Grand Canal is located c. 88m south of the Electricity Grid Connection site, and c. 400m south of the proposed 400kV substation. In addition, a network of drainage ditches traverses the cutover bog habitat, whilst numerous acid oligotrophic lakes intersperse bog along the route of the proposed overhead line.
- 9.5.125 During construction there is an increased likelihood of pollution events due to construction traffic and plant movement, accidental spillages, deposition of dust and other sediments, and runoff associated with construction activities. It is noted that the network of drainage ditches may be linked to nearby watercourses, including the Yellow River and the Grand Canal.
- 9.5.126 The impact of such activities will result in **Short-Term, Reversible, Negative, and Significant** effects to water quality and habitats at a National geographic scale for Annex I habitat Active Raised Bog (7110) and the Grand Canal, and Local geographic scale for the Yellow River, acid oligotrophic lake, and drainage ditches.

Invasive species

- 9.5.127 No INNS were identified within the Electricity Grid Connection or in its Zol. Nonetheless, construction has the potential to facilitate the dispersal of INNS through the introduction of seeds and plant fragments transported by construction machinery and clothing/footwear of construction workers from offsite. In addition, invasive species may be spread to habitats downstream where there is a direct hydrological connection exists (e.g. Yellow River, Castletown Tara Stream, Grand Canal via drainage ditches). Impacts of invasive species on habitats include outcompeting native flora, by forming dense stands. In the absence of mitigation, the physical spread of invasive species will result in **Negative, Short-Term, Significant** effects, lasting the duration of the construction period, however, impacts of spread of invasive species themselves may be medium to long-term at a Local geographic scale.

Bats

- 9.5.128 Although outside of the Electricity Grid Connection, Building B6 is immediately adjacent to the Planning Application Site. Building B6 hosts a day soprano pipistrelle roost, and while this building will be retained, potential construction phase impacts to the bat roost include disturbance and displacement (including roost lost through abandonment) caused by artificial construction lighting and increased noise and vibration, and minor loss of habitat. This will result in **Short-Term, Negative, Significant** effects at the Local geographical scale.
- 9.5.129 Construction works in the vicinity of treelines and hedgerows in the south of the Electricity Grid Connection has potential to disturb and displace foraging/commuting bats. This will result in **Short-Term, Negative, Slight** effects at the Local geographical scale.

Badger

- 9.5.130 Badger is active within the surrounds of the Electricity Grid Connection, with evidence identified associated both in the areas of proposed substation infrastructure and along the route of the proposed overhead line.
- 9.5.131 One outlier sett (BA02) was identified c. 100m from the proposed 220kV substation and 50m from the proposed development site boundary, within a woodland parcel. Given the distance of the Electricity Grid Connection from the sett, the sett is considered outside the Zol and therefore no impacts are predicted.
- 9.5.132 One subsidiary (BA03) and one outlier (BA04) badger setts were identified located c. 6m and c. 46m respectively from the proposed 400kV substation within hedgerows in agricultural fields. BA04 is also within the footprint of the permanent soil deposition area in addition to its proximity to the proposed 400kV substation. These will require closure to facilitate the development. In all the areas where badger is active there is potential habitat for badger to excavate further setts in the interim.
- 9.5.133 The Electricity Grid Connection will result in the loss of badger commuting and foraging habitat within the footprint of the proposed substations. Further habitat loss is likely to be required along the route of the buried 220kV cable, to facilitate the construction of infrastructure related to the overhead lines (e.g. pylons), and also contractor working areas, access tracks and site compounds. Such works may cause fragmentation to badger habitat, depending on the phasing of the works along the route.
- 9.5.134 Potential construction phase impacts to badger include: loss of two badger setts (BA03 and BA04), physical damage and/or disturbance to badger setts and injury to badger within setts; loss of badger commuting and foraging habitat; disruption and/or displacement of badger by increased human presence, artificial lighting, noise, vibrations and fencing associated with site compounds and working areas; injury or entrapment due to any unsecured open trenching or excavation pits; and exposure to oils and other toxic materials. Potential pollution of badger drinking sources could also impact local badgers.
- 9.5.135 Habitat loss in and around the substation sites is a permanent impact where this is required to facilitate the construction of the Electricity Grid Connection footprint. Destruction of setts and injury to badgers is a permanent potential impact arising from construction, whilst disruption and displacement of badger via noise, vibrations, fencing etc., and pollution of drinking sources are potential short-term impacts, lasting only the period of construction.
- 9.5.136 Badger are active year-round, hence impacts to badger has the potential to occur at any time during construction. Impacts to breeding badger can only occur between December to June (inclusive) during the time when pregnant sows prepare to give birth or when young cubs are present. While breeding badger typically use main setts, there is potential for pregnant badgers or cubs to be present in subsidiary setts.
- 9.5.137 Potential construction phase impacts to badger will result in **Short-Term to Permanent Negative, Significant** effects at a Local geographic scale.

Otter

- 9.5.138 In 2022, an otter holt was identified at the top of an embankment on the Coolcor Stream (aquatic survey site C3), along the route of the proposed overhead line element of the Electricity Grid Connection. This did not appear active during a following survey in 2023. The holt is located approximately 50m from the interface undergrounding compound, and 10m from the proposed route of the buried cable. In addition, spraint sites were identified along the Yellow River (aquatic survey site X3).

- 9.5.139 It is considered that otter may opportunistically make use of habitats within the surrounds of the Electricity Grid Connection, particularly within waterbodies within bog habitat.
- 9.5.140 Construction phase impacts to otter include potential destruction or disturbance of a resting place, and injury or mortality to any otters within; disruption / displacement of otter by increased human presence, noise, artificial lighting, vibrations, and fencing associated with site compounds and working areas; injury or entrapment due to any unsecured open trenching / excavation pits; and exposure to oils and other toxic materials. Water pollution to otter habitat can also have a knock-on impact to otter.
- 9.5.141 Destruction of breeding / resting sites is a permanent impact, whilst disruption and displacement to otter, injury or entrapment, exposure to toxic materials, and water pollution are short-term impacts, in relation to the construction phase. Otter is active year-round, hence impacts to otter may occur year-round. Potential construction phase impacts to otter in the absence of mitigation could result in **Short-Term to Permanent, Negative, Significant** effects at Local geographic scale.

Other protected mammals

- 9.5.142 Irish hare was observed on multiple occasions within lands associated with the Electricity Grid Connection. Other protected mammal species potentially present within the Electricity Grid Connection Area comprise red squirrel, pine marten, hedgehog, and stoat.
- 9.5.143 Construction phase impacts to these species include loss of habitat; loss of breeding/resting sites; disruption / displacement by increased human presence, noise, vibrations, and fencing associated with site compounds and working areas; mortality risk and / or injury or entrapment due to any unsecured open trenching / excavation pits; and mortality and / or injury due to exposure to oils and other toxic materials. Construction phase impacts could result in **Short-Term to Permanent, Negative, Significant** effects at Local geographic scale.

Marsh fritillary

- 9.5.144 Marsh fritillary was confirmed breeding, as larval webs were identified in five locations associated with the Electricity Grid Connection, located south of the proposed overhead line route, on or immediately adjacent to the proposed route of the buried 220KV cable. It is likely that habitats in these areas may be damaged or destroyed for installation of the buried cable and construction of the access road.
- 9.5.145 In addition, several areas of suitable habitat were identified within the 220 KV substation compound, to the east of the proposed interface undergrounding compound, and along the route of the buried cable, but which did not support larval webs at the time of survey. Although no larval webs were identified, the transient and mobile nature of this species mean these areas cannot be disregarded for future breeding and may support marsh fritillary at any time within areas of suitable habitat and vegetation composition.
- 9.5.146 Construction phase impacts of the Electricity Grid Connection include loss of habitat and potential risk of injury or mortality of eggs, larvae, and adult butterflies which may be present. Eggs and larvae are particularly susceptible to disturbance and habitat destruction. Adults are also susceptible to direct mortality and loss of suitable habitat to lay eggs. Construction phase impacts could result in **Short-Term to Permanent, Negative, Significant** effects at County geographic scale in the absence of mitigation.

Amphibians

- 9.5.147 Smooth newt has been confirmed as present in Pond 1 which is located within the 220KV substation compound.

- 9.5.148 eDNA confirmed presence only, and it is unknown whether Pond 1 supports breeding populations, and no population size class assessment has been carried out. However, on a precautionary basis, given the large areas of suitable terrestrial habitat and standing water present, it is likely that smooth newt exploits these habitats for terrestrial and breeding opportunities.
- 9.5.149 Given the location of Pond 1 within the substation compound and at the southern boundary of the proposed substation infrastructure, it is likely that this pond will be impacted. Any vegetation removal, pollution or disturbance within the vicinity of Pond 1 poses a threat to this species through habitat loss, potential fragmentation of terrestrial and breeding habitat, and direct injury or mortality.
- 9.5.150 Common frog adults have been identified within the Electricity Grid Connection, at the northern boundary of the field within which the 400KV substation is to be sited.
- 9.5.151 Construction phase impacts to smooth newt and common frog include potential loss or disruption to breeding ponds; injury or mortality of individuals in the terrestrial habitat to be removed; injury or entrapment due to any unsecured open trenching / excavation pits; and exposure to oils and other toxic materials. Water or light pollution to breeding habitat can also have a knock-on impact to smooth newt and common frog. Such impacts can result in injury or mortality to this species. Smooth newt and common frog are active outside of the hibernation (October-February), however, during hibernation they can be found in habitats on Site, such as under tree stumps, turf stacks or log piles and at the bottom of ponds in the case of frogs. Both species are particularly at risk during the breeding season, i.e., between February and June.
- 9.5.152 Removal and potential fragmentation of habitat are permanent impacts, whilst other impacts are short-term, lasting the duration of the construction phase.
- 9.5.153 Construction works causing degradation of water quality and disturbance through the use of artificial lighting will result in short-term slight to significant negative effects, depending on the extent of pollution events, at County geographic scale. Removal of habitat and breeding ponds will likely result in permanent, negative, significant effects on amphibian populations at County geographic scale. Mortality/injury risk and disturbance during the construction phase will result in **Short-Term, Negative, Moderate** effects at County geographic scale for amphibians in the absence of mitigation.

Breeding birds

- 9.5.154 The Electricity Grid Connection sits within the Derryarkin and Ballybeg Bogs. Derryarkin Bog contains suitable habitat, consisting of wetland habitats, regenerating bog, developing scrub, which support populations of breeding lapwing, snipe and meadow pipit (all red-listed), along with other wetland species including mute swan, great crested grebe, teal, tufted duck, coot (all amber-listed), and common sandpiper have been recorded, as well as records of sparrowhawk, buzzard, peregrine falcon (Annex I), and kestrel (red-listed). Ballybeg is largely revegetated cutaway bog with regenerating scrub and woodland, with kestrel, peregrine and buzzard observed hunting, and also records of skylark, wheatear, with mute swan, little egret (Annex I) and lapwing flying within 100m of the Electricity Grid Connection site.
- 9.5.155 Potential impacts of the construction phase of the Electricity Grid Connection to breeding birds within both bogs includes loss of breeding habitat, risk of injury or mortality of nesting birds, disturbance and injury to adults and their eggs, young and nests, and displacement of birds from the Site.
- 9.5.156 Impacts would be limited to the breeding season (considered to be March to August inclusive). In the absence of mitigation, construction phase impacts will have **Short-Term to Permanent, Negative, Moderate** effects on populations of sparrowhawk and

buzzard, as well as a variety of non-listed passerine birds present within these bogs (see Section 9.3.104) at Local geographic scale. For those species listed or protected, consisting of kestrel, meadow pipit, mute swan, great crested grebe, teal, tufted duck, coot, skylark and wheatear, known to be present in the vicinity of the electricity grid connection during the breeding season, the construction phase impacts will have **short-term to permanent, negative, moderate** effects at a county geographic scale.

Wintering birds

- 9.5.157 Wintering whooper swans were recorded in large numbers moving between Derryarkin Bog and fields to the southwest during winter months, while at Ballybeg Bog, both whooper and mute swan were observed flying over within 100m of the entire overhead line route of the Electricity Grid Connection, as well as golden plover, lapwing and kestrel (all red-listed), little egret (Annex I), sparrowhawk, buzzard and hen harrier (Annex I). Other amber-listed species which have been recorded within the wetland areas of these bogs include mallard, wigeon, as well as black headed gulls and lesser black-back gulls.
- 9.5.158 Construction noise, visual disturbance, and artificial lighting may result in displacement of wintering birds and may result in birds temporarily avoiding the immediate vicinity of the Electricity Grid Connection. However, given that there is plenty of suitable alternative habitat in the wider area, impacts for those wintering birds which are listed above will result in **Short-Term, Negative, Slight** effects at a Local geographic scale.

Fisheries and aquatics

- 9.5.159 Construction phase impacts include release of sediment and other pollutants to watercourses and aquatic habitats, and temporary obstruction of fish passage. Such impacts may result in mortality or injury to fish and crayfish, behavioral changes, and deleterious impacts to fish spawning and fecundity. These impacts would likely be temporary, lasting the duration of the construction phase, and can occur at any time. Any short-term obstruction may cause population effects if the timing coincides with upstream migration and spawning, or smolt downstream migration.
- 9.5.160 Construction phase impacts on fisheries and aquatics will result in **Temporary, Negative Significant** effects at a National geographic scale for the Grand Canal, given its importance as a water corridor for a range of high conservation value species such as European eel, and at a Local geographic scale for the Yellow River and Coolcor Stream

Summary of Construction Phase Impacts

- 9.5.161 A summary of the significance of effects from construction phase impacts for the Electricity Grid Connection are presented in Table 9.13.

Table 9. 13: Summary of significant effects from Construction Phase Impacts for the Electricity Grid Connection

POTENTIAL IMPACT	QUALITY OF EFFECTS	SIGNIFICANCE OF EFFECTS	DURATION OF EFFECTS	GEOGRAPHIC SIGNIFICANCE
European sites				
River Boyne and River Blackwater SAC: Waterborne pollution impacts to species outside the SAC boundary	Negative	Significant	Temporary	International
Disturbance / displacement of QI or SCI species due to artificial lighting, noise, and/or the increased presence of personnel, plant, and machinery outside the SAC boundary	Negative	Slight	Short-term	International
River Boyne and River Blackwater SAC / SPA: spread of invasive species during construction	Negative	Significant	Medium-term to Long-term	International
National sites				
Air pollution impacts	Negative	Slight	Short-term	National
Habitat pollution / sedimentation	Negative	Moderate	Short-term	National
Habitats				
Habitat-- loss and damage	Negative	Significant	Short-term to permanent	Local
Air pollution impacts to Annex I habitat	Negative	Slight	Temporary	National
Habitat – pollution and sedimentation.	Negative	Significant	Temporary	National to Local
Spread of invasive species	Negative	Significant	Short-term to Long-term	Local
Bats				
Disturbance / displacement of roosting bats and due to artificial lighting, noise, and vibrations	Negative	Significant	Short-term	Local
Disturbance / displacement of foraging / commuting bats due to artificial lighting, noise, and vibrations	Negative	Slight	Short-term	Local

POTENTIAL IMPACT	QUALITY OF EFFECTS	SIGNIFICANCE OF EFFECTS	DURATION OF EFFECTS	GEOGRAPHIC SIGNIFICANCE
Badger				
Loss of setts	Negative	Significant	Permanent	Local
Physical damage and/or disturbance to badger setts	Negative	Significant	Short-term	Local
Mortality risk or injury of badger in setts	Negative	Significant	Short-term	Local
Loss and/or fragmentation of foraging and commuting habitat	Negative	Significant	Permanent	Local
Mortality risk or injury of badger in construction areas	Negative	Significant	Short-term	Local
Disturbance / displacement due to increased human presence, artificial lighting, noise, vibrations and fencing	Negative	Significant	Short-term	Local
Otter				
Loss of an otter breeding / resting site	Negative	Significant	Permanent	Local
Mortality risk or injury of otter within a breeding / resting site	Negative	Significant	Short-term	Local
Disturbance / displacement due to increased human presence, artificial lighting, noise, vibrations and fencing	Negative	Significant	Short-term	Local
Mortality risk or injury of otter in construction areas.	Negative	Significant	Short-term	Local
Damage to otter habitat due to water pollution	Negative	Significant	Short-term	Local
Other protected mammals				
Loss of breeding / resting sites	Negative	Significant	Permanent	Local
Habitat loss	Negative	Significant	Permanent	Local
Disturbance / displacement due to increased human presence, artificial lighting, noise, vibrations and fencing	Negative	Significant	Short-term	Local

POTENTIAL IMPACT	QUALITY OF EFFECTS	SIGNIFICANCE OF EFFECTS	DURATION OF EFFECTS	GEOGRAPHIC SIGNIFICANCE
Mortality risk or injury in construction areas	Negative	Significant	Short-term	Local
Marsh fritillary				
Habitat loss, including loss of breeding habitat	Negative	Significant	Permanent	County
Mortality risk or injury of eggs, larvae, and adult butterflies	Negative	Significant	Short-term	County
Amphibians				
Loss of a breeding waterbody	Negative	Significant	Permanent	County
Habitat loss and fragmentation of terrestrial habitat	Negative	Significant	Permanent	County
Damage to breeding waterbodies due to water pollution	Negative	Significant	Short-term	County
Mortality risk or injury in waterbodies and terrestrial habitat	Negative	Moderate	Short-term	County
Mortality risk or injury in construction areas	Negative	Moderate	Short-term	County
Disturbance / displacement from waterbodies due to artificial lighting	Negative	Slight	Short-term	County
Breeding birds				
Loss of breeding habitat.	Negative	Moderate	Permanent	Local to County
Mortality risk and injury to nesting birds.	Negative	Moderate	Short-term	Local to County
Disturbance to adults and their eggs, young and nests, and displacement following removal of nests.	Negative	Moderate	Short-term	Local to County
Wintering birds				
Disturbance / displacement due to construction noise, visual disturbance, and artificial lighting.	Negative	Slight	Short-term	Local
Fisheries and aquatics				
Pollution / sedimentation of habitat.	Negative	Significant	Temporary	National to Local
Temporary obstruction of fish passage.	Negative	Significant	Temporary	National to Local

*Operational phase***Sites with statutory designations – European sites**

- 9.5.162 Collision with overhead powerlines is a potential cause of death and injury for birds. Lough Ennell SPA is located approximately 11.1 km from the Electricity Grid Connection, with tufted duck, pochard and coot listed as Special Conservation Interests (SCIs) for the SPA. While no pochard were recorded, and only a single pair of coot breeding, large flocks of tufted duck occurred on the Roadstone quarry pond on two separate occasions. In addition, there is suitable supporting habitat for all three SCI species. The SCI species are likely to undertake regular commuting flights at lower heights, placing them at increased risk of collision with the 220KV overhead line which will be c. 45 m in height. (EirGrid, 2016). However, as outlined previously, all wintering birds (except for wintering waders, grazing wildfowl, wigeon and geese) typically forage or roost within 0.5-2km of their core areas (e.g. the SPA) (Knight, 2019). It is therefore considered unlikely that the tufted duck assemblage recorded on Derryarkin Bog is part of the designated SCI population in Lough Ennell SPA. As such, there are no impacts to the Lough Ennell SPA as a result of collision risk.
- 9.5.163 Operational activities will be very minor in nature and will involve infrequent visits by small numbers of personnel during the day to conduct operational and maintenance activities. Whilst tufted duck are likely to be present in surrounding habitats, they are unlikely to form part of the SCI population of Lough Ennell SPA.
- 9.5.164 The Electricity Grid Connection is hydrologically linked to River Boyne and River Blackwater SAC and SPA via the Yellow River and Castletown Tara Stream (hydrological distance of over 25km). There is potential for operational waterborne pollution generated in the Electricity Grid Connection, for example through accidental distillate fuel spillages from the proposed tanks and pipelines, to enter local watercourses. Both River Boyne and River Blackwater SAC and SPA lies >25km and there is no viable pathway for pollution impacts at such a downstream distance, therefore direct water quality impacts on habitat features and species within the European site boundary are unlikely given the dilution over that distance.
- 9.5.165 Otter, a mobile qualifying species of River Boyne and River Blackwater SAC, may commute and forage along functionally linked waterbodies traversed by the Electricity Grid Connection, however, operational activities will be limited to routine inspections and maintenance, which will be carried out during the day. It is highly unlikely that, even if present within the Electricity Grid Connection during these maintenance works, there would be any material disturbance to otters.
- 9.5.166 The habitats within and immediately surrounding the Electricity Grid Connection that could support tufted duck are not sensitive to dust or other airborne pollutants in such a way that they would become unsuitable for these species. Watercourses traversed by the Electricity Grid Connection that are functionally linked to the River Boyne and River Blackwater SAC are potentially sensitive to dust generated by operational site traffic. However, as highlighted in Chapter 5 (EiAR Volume I), the total number of operational vehicle movements within the Electricity Grid Connection is likely to be minimal, with substations being unmanned and periodic inspection / maintenance activities being restricted to 1-2 staff. Any dust generation is likely to be exceedingly low. As such there will be no operational air quality impacts to European sites.
- 9.5.167 Full details of assessment of likely significant effects to European sites are presented in the AA Screening Report and NIS (AECOM, 2023).

Sites with statutory designations – national sites

- 9.5.168 Lough Ennell pNHA covers the same areas as the Lough Ennell SPA, and is similarly designated for wintering pochard, tufted duck and coot. As outlined above in respect of Lough Ennell SPA, there is no risk of collision for avian populations associated with Lough Ennell (pNHA or SPA) with overhead lines during operation of the Electricity Grid Connection, due to the intervening distance.
- 9.5.169 Operational activities are likely to be very minor in nature and will involve infrequent visits by small numbers of personnel during the day to conduct operational and maintenance activities. Whilst tufted duck are likely to be present in surrounding habitats, they are unlikely to form part of the population of Lough Ennell pNHA.
- 9.5.170 The habitats within and immediately surrounding the Electricity Grid Connection that could support tufted duck are not sensitive to dust or other airborne pollutants in such a way that they would become unsuitable for these species.
- 9.5.171 Habitats associated with Grand Canal pNHA, located 65m south of the Electricity Grid Connection, could be impacted by dust generated from operational vehicles. However, as highlighted in Chapter 14, the total number of operational vehicle movements within the Electricity Grid Connection is likely to be minimal, with substations being unmanned and periodic inspection/maintenance activities being restricted to 1-2 staff. Any resulting dust generation is likely to be exceedingly low and will not cause material ecological impacts.
- 9.5.172 During the operational phase of the Electricity Grid Connection, impacts to groundwater or surface water are not envisaged, unless via routine or emergency maintenance of elements of the power transmission infrastructure (refer to Chapter 12: Water Environment). This could indirectly impact Grand Canal pNHA. Waterborne pollution impacts will result in **Temporary, Negative, Moderate** effects at a Local geographic scale.

Habitats

- 9.5.173 Emissions to air from the operation of the Electricity Grid Connection would be minimal and have been classified as **Negligible** (refer to Chapter 7: Air Quality). In addition, whilst dust could be generated from operational vehicles, the total number of operational vehicle movements within the Electricity Grid Connection is likely to be minimal, with substations unmanned and periodic inspection/maintenance activities being restricted to 1-2 staff (refer to Chapter 14: Traffic). Any resulting dust generation is likely to be exceedingly low, resulting in **Neutral, Imperceptible, Permanent** effects at a Local geographic scale.
- 9.5.174 During the operational phase, impacts to groundwater or surface water are not envisaged, unless via routine or emergency maintenance of elements of the power transmission infrastructure (refer to Chapter 12: Water Environment). This may potentially result in a direct or indirect impact to the watercourses and ditches which traverse the Electricity Grid Connection. Such waterborne pollution impacts will be unlikely, **Temporary, Negative, and Moderate** at a Local geographic scale.

Bats

- 9.5.175 Installation of artificial lighting associated with the 220KV substation in the vicinity of building B6 (a confirmed soprano pipistrelle roost) has the potential to disrupt the roost, and potentially displace bats (due to roost abandonment). Artificial lighting may also disrupt foraging and commuting bats and displace bats from the substation area. Artificial lighting around the 400KV substation also has potential to disturb bats foraging and commuting along hedgerows and treelines adjacent to the substation.

9.5.176 Operational phase impacts associated with the Electricity Grid Connection are envisaged to be permanent, as once operational, the substations and grid connection will be managed by EirGrid and ESB and will be important infrastructure within the National Grid network. Operational phase impacts from the Electrical Grid Connection on local bat populations will result in **Permanent, Negative, Moderate** effects at the Local geographical scale.

Badger

9.5.177 Two badger setts are located in proximity to the 400kV substation, approximately 6m north and 36m west. Another badger sett is located approximately 50m southeast of the 220kV substation.

9.5.178 New artificial lighting from both substations may disrupt badger commuting routes or displace them from the substation area. Increased human presence and traffic during operation may disrupt badger, although it is noted that the habitats within the surrounds of the proposed 220KV substation are already subject to disturbance from the existing use of the site and proximity to the R400 Regional Road. Therefore, badger populations are likely already habituated to anthropogenic activity in proximity to the 220KV substation and the intermittent maintenance of the substation, once operational, is unlikely to cause significant effects.

9.5.179 Operational phase impacts associated with the Electricity Grid Connection are envisaged to be permanent, as once operational, the substations and grid connection will be managed by EirGrid and ESB and will be important infrastructure within the National Grid network. Operational phase impacts from the Electrical Grid Connection on local badger populations will result in **Permanent, Negative, Slight** effects at a Local geographic scale.

Otter

9.5.180 New artificial lighting from both substations may disrupt potential otter habitat and commuting routes within and surrounding the Electricity Grid Connection (i.e., waterbodies, watercourses). Increased human presence during operation is unlikely to disrupt otter, as this species is generally more active at night and the substation will be unmanned with periodic and infrequent maintenance activities largely occurring during daylight hours.

9.5.181 Operational phase impacts associated with the Electricity Grid Connection are envisaged to be permanent, as once operational, the substations and grid connection will be managed by EirGrid and ESB and will be important infrastructure within the National Grid network. Operational phase impacts from the Electrical Grid Connection on local otter populations will result in **Permanent, Negative, Slight** effects at a Local geographic scale.

Other protected mammals

9.5.182 New artificial lighting from both substations has the potential to disturb pine marten, Irish hare, stoat, or red squirrel which may be present, disrupting commuting routes and causing displacement from habitats. Increased human presence and traffic during operation may also disrupt these species, although it is noted that the habitats within this area are already subject to disturbance from the existing use of the site and proximity to the R400 Regional Road.

9.5.183 Operational phase impacts associated with the Electricity Grid Connection are envisaged to be permanent, as once operational, the substations and grid connection will be managed by EirGrid and ESB and will be important infrastructure within the National Grid network. Operational phase impacts from the Electrical Grid Connection to pine marten,

Irish hare, stoat, or red squirrel populations will result in **Permanent, Negative, Slight** effects at a Local geographic scale.

Marsh fritillary

9.5.184 Emissions to the air from the operation of the Electricity Grid Connection will be negligible (refer to Chapter 7: Air Quality). The total number of operational vehicle movements within the Electricity Grid Connection is likely to be minimal, with substations unmanned and periodic inspection/maintenance activities being restricted to 1-2 staff (refer to Chapter 14: Traffic). Any resulting dust generation is likely to be exceedingly low and will not impact marsh fritillary directly or indirectly through impacts to habitats. Emissions and dust generation will result in **Neutral, Imperceptible, Permanent** effects at a Local geographic scale.

Amphibians

9.5.185 During the operational phase of the Electricity Grid Connection, impacts to groundwater or surface water are not envisaged, unless via routine or emergency maintenance of elements of the power transmission infrastructure (refer to Chapter 12: Water Environment). This could pose an indirect impact to amphibians within breeding ponds. Potential waterborne pollution impacts will result in unlikely, **Temporary, Negative, Moderate** effects at a Local geographic scale.

9.5.186 Emissions to the air from the operation of the Electricity Grid Connection will be negligible (refer to Chapter 7: Air Quality). In addition, the total number of operational vehicle movements within the Electricity Grid Connection is likely to be minimal, with substations unmanned and periodic inspection/maintenance activities being restricted to 1-2 staff (refer to Chapter 14: Traffic). Any resulting dust generation is likely to be exceedingly low and will not impact amphibian breeding or terrestrial habitats. Emissions and dust generation will result in **Neutral, Imperceptible, Permanent** effects at a Local geographic scale.

9.5.187 Installation of artificial light associated with the 220KV substation has the potential to disturb/disrupt amphibians if it illuminates breeding habitat. However, any such disturbance should be set in the context of the frequent availability of similar breeding opportunities in the wider area which will remain undisturbed and continue to provide suitable breeding habitat. Operational phase lighting will result in **Negative, Slight, Permanent** effects at a Local geographic scale.

Breeding birds

9.5.188 During operation, the 220KV overhead line may pose a risk of bird mortality through collision with overhead lines or pylons, and mortality through electrocution (SNH, 2016, EirGrid 2020) for breeding birds found within the Derryarkin and Ballybeg Bogs. The Electricity Grid Connection sits within the Derryarkin and Ballybeg Bogs. Derryarkin Bog contains suitable habitat including, wetland habitats, regenerating bog, developing scrub, which support populations of breeding lapwing, snipe and meadow pipit (all red-listed), along with other wetland species including mute swan, great crested grebe, teal, tufted duck, coot (all amber-listed), and common sandpiper have been recorded, as well as records of sparrowhawk, buzzard, peregrine (Annex I), and kestrel (red-listed). Ballybeg is largely revegetated cutaway bog with regenerating scrub and woodland, with kestrel, peregrine and buzzard observed hunting, and also records of skylark, wheatear, with mute swan, little egret (Annex I) and lapwing flying within 100m of the Electricity Grid Connection site.

9.5.189 There are a range of factors that contribute to determining collision mortality risk with power lines, including bird morphology, vision, age, and weather conditions. It is widely accepted that birds with high wing loading (i.e. ratio of body height to wing area) and

broad wings are significantly more vulnerable to collision, mainly because this limits their ability to swiftly react to unexpected obstacles (EirGrid, 2016, 2020).

- 9.5.190 Mute swan is a large bird with limited maneuverability in flight. It has been found that mute swans are most likely to collide with overhead lines during their first six months and then in their third year (Rose and Baillie, 1992). This may be due to the inexperience of young swans dispersing from natal areas into non-breeding flocks; with a further peak of collisions in the swans' third year possibly corresponding with birds dispersing from non-breeding flocks in search of a breeding territory (Rose and Baillie, 1992; EirGrid, 2016, 2020). In both 2021 and 2022 at Derryarkin bog, mute swans (amber-listed) spent the majority of their flight time at Band 1 Flight Height (0-25m), below the height of the proposed overhead line. In contrast, at Ballybeg Bog mute swans spent most of their flight time at Band 2 (25-175m) which places them at potential collision risk with the overhead line. Given the size and limited maneuverability of this species, combined with the confirmed presence of immature birds, it is considered mute swan is at elevated risk of mortality from collisions. Whooper swan (amber-listed) is also anticipated to have an elevated collision mortality risk due to its large size and limited maneuverability, although only a single individual summered on Derryarkin quarry pond, and it is not a species which typically breeds in Ireland.
- 9.5.191 Regular breeding populations of the wading species lapwing and snipe (both red-listed) were recorded at Derryarkin Bog in 2022. Lapwing were also noted flying within 100m of the Electricity Grid Connection both at Derryarkin Bog and Ballybeg Bog. However, lapwing is known to move in largely closely spaced flocks and were observed flying in groups of 40-50+ individuals in 2021. Flying in large flocks may increase the chance of collision with power lines, since the vision of birds at the back of the group may be obscured by individuals at the front (Prinsen et al., 2011). In addition, many of the recorded flocks of lapwing spent at least a third of the recorded flight duration at Band 2 Flight Height (25-175m), placing them at collision risk with the overhead line (c. 45m in height).
- 9.5.192 Heavy-bodied, fast fliers are generally vulnerable to collision, which is a characteristic typical of most waterfowl, coots, rails, grebes, and shorebirds (Avian Power Line Interaction Committee (APLIC), 2022). Numerous species from these groups were recorded at Derryarkin Bog, including great crested grebe, teal, tufted duck, coot, and common sandpiper.
- 9.5.193 Numerous raptor species have been recorded within 100m of the Electricity Grid Connection at Derryarkin Bog and Ballybeg Bog in 2022 and 2021, comprising sparrowhawk, buzzard, peregrine (Annex I) and kestrel (red-listed). For such predatory birds, the exposure to collision risk is in part related to the pursuit of prey (APLIC, 2000). Raptors are aerial hunters and typically have excellent maneuverability and very good vision, however, they may not perceive the presence of a power line soon enough because of the high speeds at which they chase prey (Bevanger, 1994). The raptor species most found beneath power poles in Europe include buzzard and kestrel (Lehman et al., 2007).
- 9.5.194 Rose and Baillie (1992) recommend that, unless there is evidence to the contrary, it should be assumed that all herons, swans, and raptor species are vulnerable to mortality from collisions (EirGrid, 2016).
- 9.5.195 As such, the assemblage of breeding birds associated with the Electricity Grid Connection are considered vulnerable to mortality from collision, electrocution and displacement. In the absence of mitigation, the impact of overhead lines during the operational phase of the Electricity Grid Connection could result in **Permanent, Negative, Significant** effects at a Local geographic scale for common sandpiper,

sparrowhawk and buzzard. And in **Permanent, Negative, Significant** effects at a County geographic scale for protected and listed species recorded in the vicinity, comprising mute and whooper swans, tufted duck, great crested grebe, teal, coot and the red-listed species lapwing, kestrel, as well as peregrine (Annex 1) and little egret (Annex 1) on a precautionary basis.

- 9.5.196 In addition to collision risk, Eirgrid (2020) highlights the potential risk that some bird species may be displaced from suitable habitat by the proximity of electricity transmission lines. Overhead transmission lines can act as a partial barrier to movement, resulting in an indirect loss of breeding habitat for ground-nesting waders and raptors requiring a large display area (EirGrid, 2016). This could result in **Permanent, Negative, Slight** effects at a Local geographic scale for common sandpiper, sparrowhawk and buzzard. And in **Permanent, Negative, Slight** effect at a County scale, in the case of the protected and listed species comprising mute and whooper swans, tufted duck, great crested grebe, teal, coot lapwing, kestrel, as well as peregrine (Annex 1) and little egret (Annex 1).

Wintering birds

- 9.5.197 During operation, the 220KV overhead line may pose a risk of mortality through collision with overhead lines, and mortality through electrocution from power lines or supporting structures (SNH, 2016).
- 9.5.198 The main wintering feature at Derryarkin Bog is wintering flocks of the Annex I species whooper swan (amber-listed). The primary flight paths of whooper swan is between Derryarkin Bog and fields to the southwest. Whooper swan were also observed passing over the site at Ballybeg Bog. In 2021-2022, whooper swan spent their entire flight duration at Derryarkin Bog at Band 1 (0-25m), below the height of the proposed overhead line (45m). In contrast, during 2021-2022 and 2022-2023 at Ballybeg Bog, whooper swan spent over a third and over half of their recorded flight duration at Band 2 (25-175m) respectively. This places them at collision risk with the overhead line. Mute swans (amber-listed) were also recorded flying over Ballybeg Bog, occasionally at Band 2 Flight Height. Given the large size and limited maneuverability of swan species, it is considered whooper swan and mute swan are of elevated risk of mortality from collisions.
- 9.5.199 Birds of prey, including buzzard, hen harrier (Annex I), kestrel (red-listed), peregrine falcon (Annex I) and sparrowhawk were recorded within 100m of the overhead line route. Derryarkin bog was regularly used by hen harrier for foraging. As discussed above in respect of breeding birds, whilst raptors generally have excellent maneuverability, they may be vulnerable to collisions with overhead lines because of the high speeds at which they chase prey (Bevanger, 1994).
- 9.5.200 Other wintering species recorded flying within 100m of the overhead line route include golden plover (Annex I), lapwing (red-listed) and little egret (Annex I). As discussed above in respect of breeding birds, heavy-bodied, fast flying fliers and birds which fly in large flocks are vulnerable to collision. Small numbers of snipe (red-listed) occur on site, which show considerable maneuverability, enabling them to change height/and or direction rapidly to avoid collision and as such they are expected to show good evasive action when needed.
- 9.5.201 The red-listed species redwing also occurs on site during winter, however, whilst some species of passerine are potentially vulnerable to overhead lines, these are not usually of concern (SNH, 2016).
- 9.5.202 The assemblage of wintering birds associated with the Electricity Grid Connection, in particular the regular population of whooper swans, mute swans, golden plover, lapwing, little egret, and birds of prey including buzzard, hen harrier, kestrel, sparrowhawk and

peregrine falcon are considered vulnerable to mortality from collision. In the absence of mitigation, mortality and injury from collision with powerlines, and potential displacement from suitable habitats in proximity to the overhead lines during the operational phase of the Electricity Grid Connection could result in a **Permanent, Negative, Significant** effect at a County geographic scale.

- 9.5.203 In addition to collision risk, there is the potential risk that some bird species may be displaced from suitable habitat by the proximity to the overhead lines (Eirgrid, 2020), which lead to indirect wintering habitat loss and can act as a partial barrier to movement. This could result in a **Permanent, Negative, Slight** effect at a County geographic scale for whooper and mute swan, golden plover, lapwing, little egret, peregrine and snipe.

Fisheries and aquatics

- 9.5.204 During the operational phase of the Electricity Grid Connection, impacts to surface water are not envisaged, unless via routine or emergency maintenance of elements of the power transmission infrastructure (refer to Chapter 12: Water Environment). Operational phase impacts to salmonids and lamprey associated with the Yellow River and Coolcor Stream will be unlikely, **Temporary, Negative, and Significant** at a Local scale.

Summary of Operational Phase Impacts

- 9.5.205 A summary of the significance of effects from operational phase impacts for the Electricity Grid Connection are presented in Table 9.14.

Table 9. 14: Summary of significant effects from Operational Phase Impacts for the Electricity Grid Connection

POTENTIAL IMPACT	QUALITY OF EFFECTS	SIGNIFICANCE OF EFFECTS	DURATION OF EFFECTS	GEOGRAPHIC SIGNIFICANCE
European sites				
No construction phase impacts				
National sites				
Waterborne pollution impacts	Negative	Moderate	Temporary	Local
Habitats				
Air pollution impacts	Neutral	Imperceptible	Permanent	Local
Waterborne pollution impacts	Negative	Moderate	Temporary	Local
Bats				
Disturbance / displacement of bat roosts due to artificial lighting	Negative	Moderate	Permanent	Local
Disturbance / displacement of foraging and commuting bats due to artificial lighting	Negative	Moderate	Permanent	Local
Badger				
Disturbance / displacement due to increased human presence and traffic.	Negative	Slight	Permanent	Local
Disturbance / displacement due to new artificial lighting.	Negative	Slight	Permanent	Local
Otter				
Disturbance / displacement due to increased human presence and traffic.	Negative	Slight	Permanent	Local
Disturbance / displacement due to new artificial lighting.	Negative	Slight	Permanent	Local
Damage to otter habitat due to water pollution.	Negative	Slight	Permanent	Local
Other protected mammals				

POTENTIAL IMPACT	QUALITY OF EFFECTS	SIGNIFICANCE OF EFFECTS	DURATION OF EFFECTS	GEOGRAPHIC SIGNIFICANCE
Disturbance / displacement due to increased human presence and traffic.	Negative	Slight	Permanent	Local
Disturbance / displacement due to new artificial lighting.	Negative	Slight	Permanent	Local
Marsh fritillary				
Air pollution impacts	Neutral	Imperceptible	Permanent	Local
Amphibians				
Waterborne pollution impacts	Negative	Moderate	Temporary	Local
Airborne pollution impacts	Neutral	Imperceptible	Permanent	Local
Disturbance / disruption due to new artificial lighting	Negative	Slight	Permanent	Local
Breeding birds				
Mortality risk and injury through collision with overhead lines or pylons	Negative	Significant	Permanent	Local to County
Displacement / habitat fragmentation due to presence of overhead lines or pylons	Negative	Slight	Permanent	Local to County
Wintering birds				
Mortality risk and injury through collision with overhead lines or pylons	Negative	Significant	Permanent	County
Displacement / habitat fragmentation due to presence of overhead lines or pylons	Negative	Slight	Permanent	County
Fisheries and aquatics				
Pollution / sedimentation of habitat	Negative	Significant	Temporary	Local

Decommissioning phase

- 9.5.206 The Electricity Grid Connection will be managed by the TAO and TSO (ESBNI and EirGrid for electricity) as part of the national grid electricity. When the Electricity Grid Connection will be decommissioned depends on the asset owner's operational requirement and asset management policy.
- 9.5.207 Decommissioning activities will be conducted in accordance with the appropriate guidance and legislation at the time of decommissioning.

Impact assessment for Gas Connection Corridor

- 9.5.208 The Gas Connection Corridor is not being applied for in the planning application for the Proposed Development (as it will be applied for by GNI under separate consenting processes). The Gas Connection Corridor is the preferred route, as indicated by GNI, at the time of writing but may be subject to change as part of the detailed design process to be carried out by GNI at a later date.

*Construction phase***Sites with statutory designations – European sites**

- 9.5.209 There are nine European sites within the ZOI of the Gas Connection Corridor. None of these sites fall within the Gas Connection Corridor. The closest of these is Lough Ennell SAC and SPA, located 1.8km northwest and at a hydrological connection of 3.1km downstream of the Site. River Boyne and River Blackwater SAC and SPA are also hydrologically linked to the Site at a distance of c. 29km, via the Mongagh River. The other five sites are associated with the River Shannon, which are hydrologically connected to another part of the Gas Connection Corridor via Lough Ennell and the River Brosna.
- 9.5.210 The Gas Connection Corridor bisects a local watercourse which feeds into Lough Ennell SAC and SPA. In the absence of mitigation, construction works could potentially pollute and introduce sediment into the European sites, thereby potentially impacting the Annex I habitats hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. and alkaline fens. These impacts could result in short to **Medium-Term, Negative, Significant** effects at an International geographic scale.
- 9.5.211 River Boyne and River Blackwater SAC / SPA, River Shannon Callows SAC, Middle Shannon Callows SPA, Lough Derg SAC, North-east Shore SAC, Lough Derg (Shannon) SPA and Lower River Shannon SAC are hydrologically linked to the Gas Connection. However, due to the distance of the hydrological connection, >25km downstream, this is not a viable pathway for potential pollution impacts, therefore direct water quality impacts on habitat features and species within the European site boundaries are unlikely and are not predicted to occur.
- 9.5.212 River Boyne and Blackwater SAC, River Shannon Callows SAC and Lower River Shannon SAC are all hydrologically linked to the Gas Connection Corridor and have otter as a mobile QI species. Otters have extensive home ranges up to 40km (Forestry Commission and Natural England, 2013). River Shannon Callows SAC are hydrologically linked to the Gas Connection Corridor a distance of 70.6km and 132.7km, and at this distance are well-beyond the home range of this species and are unlikely to be part of the SAC population. However, at a hydrological distance of 29km, streams within the Gas Connection Corridor may represent functionally linked habitat for otter associated with River Boyne and Blackwater SAC. In the absence of mitigation, impacts associated with disturbance could result in **Short-Term to Medium-Term, Negative, Significant** effects at an International geographic scale.

- 9.5.213 No bird surveys have been carried out to inform the assessment in respect of the Gas Connection Corridor, however, it is conceivable that various wintering bird species may use habitats within the Gas Connection Corridor for essential activities, including foraging, roosting, loafing, and preening. In particular, agricultural fields are likely suitable for use by whooper swan, an SCI species of Middle Shannon Callows SPA. However, according to guidance produced by Natural England, all wintering birds (except for wintering waders, grazing wildfowl, wigeon and geese) typically forage or roost within 0.5-2km of their core areas (Knight, 2019). Lough Ennell SPA is more than (c.2.5km) this typical foraging range of 2km from the Gas Connection Corridor. Given the lack of survey data, it is considered on a precautionary basis that mobile SCI species of the SPA (i.e., pochard, tufted duck, coot) could make use of habitats within the Gas Connection Corridor and be impacted during construction. Potential construction phase impacts to mobile SCI species of Lough Ennell SPA comprise disturbance, loss of functionally habitat, and indirect dust impact. In the absence of mitigation, impacts associated with disturbance could result in **Short-Term to Medium Term, Negative, Significant** effects at an International geographic scale. All other SPAs designated for wintering birds are well-separated from the Gas Connection Corridor, and it is considered unlikely that any individuals that make use of the Gas Connection Corridor would be part of the designated SCI population of any such SPA.
- 9.5.214 River Boyne and River Blackwater SPA is designated for kingfisher, a territorial species which rarely moves beyond the boundary of its territories which can extend up to 13km in length. Therefore, kingfisher associated with the SPA population are unlikely to occur within the Zol of water-based pollution that may arise from the construction phase, given the hydrological connection is around 29 km downstream. No impacts to kingfisher, and by extension River Boyne and River Blackwater SPA, are likely to occur.
- 9.5.215 Any construction activities have the potential to facilitate the dispersal of INNS through the introduction of seeds and plant fragments transported by construction machinery and clothing/footwear of construction workers. Given the proximity of construction works to watercourses which are upstream of European sites, the risk of INNS introduction cannot be excluded to Lough Ennell SAC and SPA and to a lesser extent the River Boyne and River Blackwater SAC and SPA. In the absence of mitigation, the physical spread of invasive species will be a **Negative, Short-Term, and Significant** event, lasting during the length of the construction period, however, impacts of invasive species themselves on European sites may be **Negative, Medium to Long-Term, Significant** at an International geographic scale.

Sites with statutory designations – national sites

- 9.5.216 There is one site within the Zol of the Gas Connection Corridor, namely Lough Ennell pNHA, located c. 1.8km northwest and 3.1km downstream of the corridor boundary.
- 9.5.217 No national sites are located within the 50m screening distance for dust impacts or the 200m screening distance from roads to be used by construction traffic (IAQM, 2014). No construction-phase impacts of related to air quality are predicted for national sites.
- 9.5.218 A watercourse which feeds into Lough Ennell pNHA is present within the Gas Connection Corridor (3.1km hydrological distance). In the absence of mitigation, construction works could pollute and introduce sediment to the watercourse, thereby potentially impacting the qualifying habitat features (hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. and alkaline fens). Such impacts could have indirect effects to faunal species associated with the pNHA, e.g. foraging birds. Impacts to terrestrial plants and invertebrates within the pNHA are not predicted. Impacts could result in **Short to Medium-Term, Negative, Significant** effects at a National geographic scale.

Habitats

Habitat – loss and damage

- 9.5.219 No baseline habitat surveys have been carried out to inform the Gas Connection Corridor. A review of aerial imagery indicates that the corridor comprises a predominantly agricultural landscape, with fields of improved agricultural grassland with a number of hedgerows, treelines, and watercourses. However, the types and extents of habitats present are unknown.
- 9.5.220 Due to this paucity of baseline data, potential construction phase impacts are therefore based on the above assumptions and limitations but would include habitat loss and damage to retained habitats to facilitate the trenching required during the construction of the Gas Connection Corridor. Habitat loss may be both permanent, e.g. in the case of the above ground installation (AGI) (which will be applied for by GNI in a separate application), or temporary to short-term, e.g. where habitats will be left to regenerate following trenching or for access tracks and site compounds required only during the construction phase.
- 9.5.221 Construction activities can result in damage to habitats within, and adjacent to, the Gas Connection Corridor. Impacts will include the deposition of dust on foliage and impacts to roost systems of retained trees and hedgerows.
- 9.5.222 On a precautionary basis, given the assumptions and limitation surrounding the Gas Connection Corridor and future detailed design of same, impacts from habitat loss and damage may result in **Short-Term to Permanent, Negative, Significant** effects at the Local geographic scale, however significance may also be at County or National, depending on the habitat features present.

Habitats – pollution and water quality

- 9.5.223 Due to the paucity of baseline data, potential construction phase impacts are similarly based on the above assumptions and limitations, but could include pollution and sedimentation to aquatic and/or riparian habitats. These will likely last for the duration of the construction period, and would be temporary to short-term, depending on the extent of the impacts. e.g. in the case of sedimentation from surface water runoff during the trenching required during the construction phase of the Gas Connection Corridor.
- 9.5.224 On a precautionary basis, given the assumptions and limitation surrounding the Gas Connection Corridor and future detailed design of same, impacts to habitat from pollution could have **Temporary to Short-Term, Negative, Significant** effects from the Local geographic scale, however significance may also be at County or National, depending on the habitat features present.

Invasive species

- 9.5.225 No baseline INNS have been carried out to inform the Gas Connection Corridor. The only invasive, non-native plant species returned from the NBDC data search was sycamore, a medium impact (but not scheduled) invasive species.
- 9.5.226 Due to the paucity of baseline data, potential construction phase impacts are similarly based on the above assumptions and limitations, but could include the dispersal of INNS. This could be through the introduction of seeds and plant fragments transported by construction machinery and clothing/footwear of construction workers from offsite. In addition, invasive species may be spread to habitats downstream where there is a direct hydrological connection. Impacts of invasive species on habitats include outcompeting native flora, by forming dense stands. In the absence of mitigation, the physical spread of invasive species could result in a **Negative, Short-Term, and Significant** event, lasting during the length of the construction period, however, impacts of spread of

invasive species themselves may be **Negative, Medium to Long-Term, Significant** at a Local to National geographic scale, depending on the habitat features present.

Bats

- 9.5.227 No baseline bat surveys have been carried out to inform the Gas Connection Corridor. Records of soprano pipistrelle and Daubenton's bat were returned by the records search, however it is possible that eight species (out of the total nine resident in Ireland) are present in the Gas Connection Corridor, given the range of habitats present and species identified during surveys for the Power Plant Area and Electricity Grid Connection. Habitats may provide opportunities for summer roosting (including breeding), commuting, foraging, and hibernation.
- 9.5.228 Potential construction phase impacts are based on the assumptions and limitations associated with the lack of baseline data, but could include mortality, injury, disturbance, and displacement of bats due to loss of roosting sites, and habitat loss and fragmentation.
- 9.5.229 The direct loss of roosting sites, loss or fragmentation of habitats would be a permanent impact, or where habitats may regenerate could be medium to long-term, while disturbance in the form of noise and use artificial lighting used during the construction phase would be temporary to short-term depending on the habitat features present.
- 9.5.230 On a precautionary basis, impacts to bats, their roosts and habitats, would result in **Temporary to Permanent, Negative, Significant** effects, ranging between Local to a National geographic scale, depending on factors such as the bat assemblage present, use of habitats, and roosts present along the Gas Connection Corridor.

Badger

- 9.5.231 No baseline badger surveys have been carried out to inform the Gas Connection Corridor. However, it is likely that badger is present across the area, based on a desk-based review of habitats within the corridor (i.e., farmland) from review of aerial imagery, records returned from the NBDC data search, and their recorded distribution within the nearby Proposed Development. Habitats within the Gas Connection Corridor may provide opportunities for sett creation, breeding commuting, and foraging. There is potential for multiple territories to be present.
- 9.5.232 Potential construction phase impacts could include the risk of mortality, injury, disturbance, and displacement of badger due to loss of or damage to setts, entrapment in excavations or trenching, noise, vibrations, and visual disturbance, and habitat loss and fragmentation. Artificial lighting used during the construction phase may also contribute to disturbance or displacement of badger.
- 9.5.233 On a precautionary basis, the **Negative** effects of these impacts to badger could range from **Short-Term to Permanent**, and range from **Slight to Significant** on a Local to County geographic scale, depending on factors such as the use of habitats, and number of setts and territories present.

Otter

- 9.5.234 Aquatic survey site A3 within the Gas Connection Corridor was identified as a regular otter sprainting. No other signs of otter were identified within the Gas Connection Corridor during aquatic survey (refer to Appendix 9D, EiAR Volume II). It is likely that otter is present across the area, based on a desk-based review of habitats within the corridor identified from aerial imagery (both watercourses and terrestrial habitat) and records returned. Habitats may provide opportunities for breeding/resting sites, commuting and dispersal, and foraging. Nine records of otter were returned from within 2km of the Gas Connection Corridor (Appendix 9H).

9.5.235 Potential construction phase impacts could include the risk of mortality, injury, disturbance, and displacement of otter due to loss of or damage to breeding/resting places, entrapment in excavations or trenching, noise, vibrations, and visual disturbance, and habitat loss and fragmentation. Artificial lighting used during the construction phase may also contribute to disturbance or displacement of otter, whilst pollution and sedimentation can impact their aquatic and riparian habitats.

9.5.236 On a precautionary basis, the **Negative** effects of these impacts to otter could range from **Short-Term** to **Permanent**, and range from **Slight** to **Significant** on a Local to County geographic scale, depending on factors such as the use of habitats, and number of breeding/resting places present.

Other protected mammals

9.5.237 No baseline surveys for any other mammals have been carried out to inform the Gas Connection Corridor. However, it is likely that species such as pine marten, red squirrel, hedgehog, Irish hare, and stoat are present across the area, based on habitat present in aerial imagery, and those recorded within the Power Plant Area and Electricity Grid Connection. In addition, there are records of these species from the NBDC data search of the Gas Connection Corridor. Habitats may provide opportunities for breeding/resting places, commuting, and foraging.

9.5.238 Potential construction phase impacts on other protected mammal species could include the risk of mortality, injury, disturbance, and displacement due to loss of or damage to setts, entrapment in excavations or trenching, noise, vibrations, and visual disturbance, and habitat loss and fragmentation. Artificial lighting used during the construction phase may also contribute to disturbance or displacement of these species.

9.5.239 On a precautionary basis, the **Negative** effects of these impacts to other protected mammals, such as pine marten, red squirrel, hedgehog, Irish hare, and stoat, could range from **Short-Term** to **Permanent**, and range from **Slight** to **Significant** on a Local to County geographic scale, depending on factors such as the use of habitats, and number of breeding/resting places present.

Marsh fritillary

9.5.240 No baseline marsh fritillary surveys have been carried out to inform the Gas Connection Corridor. However, it is possible that this species may be present across the area, should suitable habitat and presence of their larval food plant occur. In addition, there are records of this species from the NBDC data search of the Gas Connection Corridor. Habitats within the Gas Connection Corridor may provide opportunities for adult butterfly dispersal and egg-laying/larval webs.

9.5.241 Potential construction phase impacts to marsh fritillary could include the risk of mortality, injury, disturbance, and displacement of adult butterflies, loss of or damage to larval webs, and habitat loss and fragmentation. Such impacts could range from short-term (displacement) to permanent (habitat loss).

9.5.242 On a precautionary basis, impacts to marsh fritillary could result in **Short-Term** to **Permanent, Negative, Significant** effects between Local to a National geographic scale, depending on factors such as the amount of suitable breeding habitat present, whether breeding is confirmed, and the extent of breeding.

Amphibians

9.5.243 No baseline smooth newt or common frog surveys have been carried out to inform the Gas Connection Corridor. However, it is likely that both species are present across the area, based on habitat present in aerial imagery (both wetland and terrestrial habitat). In addition, there are records of common frog from the NBDC data search of the Gas

Connection Corridor. Habitats within the Gas Connection Corridor may provide opportunities for breeding, commuting and dispersal, and hibernation or other parts of the species' terrestrial phases.

- 9.5.244 Potential construction phase impacts could include the risk of mortality, injury, disturbance, and displacement of amphibians due to loss of or damage to breeding ponds/wetlands, entrapment in excavations or trenching, and habitat loss and fragmentation. Artificial lighting used during the construction phase may also contribute to disturbance or displacement, whilst pollution and sedimentation can impact their aquatic habitats. Such impacts could range from short-term (displacement) for the duration of the construction phase to permanent (habitat loss).
- 9.5.245 On a precautionary basis, impacts to amphibians could result in **Short-Term to Permanent, Negative, Significant** effects between Local to a National geographic scale, depending on factors such as the use of habitats, and presence of breeding places.
- Breeding birds**
- 9.5.246 No baseline breeding bird surveys have been carried out to inform the Gas Connection Corridor. However, based on aerial imagery, the habitats present may provide opportunities for nesting and breeding, commuting, and foraging for many different species of birds.
- 9.5.247 Much of the Gas Connection Corridor passes through agricultural farmland. Important farmland bird species returned within 2km of the corridor in the desk study included the Red-listed yellowhammer, barn owl, and lapwing, and Amber-listed linnet, grasshopper warbler, swallow, tree sparrow, skylark, and spotted flycatcher. The raptors returned from the data search included the Annex I species merlin and peregrine falcon, and the Red-listed kestrel. These species have the potential to forage, and potentially nest within the Gas Connection Corridor.
- 9.5.248 Records of wetland birds included those associated with Derryarkin and Drumman Bogs, however, there are small areas of bog and wetland habitats on the edge of the Gas Connection Corridor that these species may use. Birds in this category include the Red listed curlew, snipe, amber listed coot, quail, little grebe, and the Annex I little egret and gadwell. Some wetland birds may at times use farmland for feeding or roosting, such as black-headed gull (Amber-listed) and whooper swan (Annex I).
- 9.5.249 The Annex I species kingfisher may use some of the watercourses that bisect the Gas Connection Corridor.
- 9.5.250 Potential construction phase impacts to breeding bird species could include risk of mortality, injury, disturbance, and displacement of birds due to loss of or damage to nests, eggs, and young, noise, lighting, vibrations, and visual disturbance, and habitat loss and fragmentation.
- 9.5.251 It is predicted to be unlikely that for many of the breeding birds, likely to be present along the Gas Connection Corridor, including passerines, raptors and breeding waders will be impacted beyond a Local geographic scale of significance. For example, a national estimate of skylark numbers is given at 301,800 (Lewis *et al.*, 2019), which would be an estimated 11,608 per county. Therefore, >116 individuals (or 58 breeding pairs) would be needed to be above the threshold for County level significance, which is highly unlikely given the area of the Gas Connection Corridor which is not likely to contain sufficient habitat to support this number of breeding pairs.
- 9.5.252 On a precautionary basis, impacts could result in **Short-Term to Permanent, Negative, Significant** effects at Local geographic scale for populations of passerines, raptors and

breeding waders, depending on factors such as the use of habitats, and breeding territories present.

Wintering birds

- 9.5.253 No baseline wintering bird surveys have been carried out to inform the Gas Connection Corridor. However, it is possible that a variety of terrestrial and wetland bird species could be present across the area, including seasonal visitors such as the Annex I species whooper swan, and the redwing (red-listed). Habitats may provide opportunities for roosting, commuting, and foraging.
- 9.5.254 Potential construction phase impacts could include risk of mortality, injury, disturbance, and displacement of birds due to noise, lighting, vibrations, and visual disturbance, and habitat loss and fragmentation.
- 9.5.255 For impacts on a County scale to occur, >1% of the County population of whooper swan would need to be impacted. The County population of Westmeath is 982 (Burke *et al.*, 2021) therefore a group of ten whooper swans using the site would be significant at County level. The County population is 1,506 for Offaly, which would mean a group of 16 would be over the 1% level. For impacts on a national scale to occur, >1% of the national population of whooper swan would need to be impacted. The national population is estimated to be 14,467 birds, so a count of 145 would be significant at a national level. Given the numbers of whooper swans using the nearby Derryarkin and Drumman Bogs, it is conceivable that groups of whooper swans of County level significance are using the fields of the Gas Connection Corridor.
- 9.5.256 On a precautionary basis, impacts to wintering birds could result in **Temporary to Permanent, Negative, Significant** effects on a Local geographic scale for a variety of wintering waterbirds and raptors, and to County geographic scale of significance for some found in significant numbers such as potentially the whooper and mute swan, golden plover, lapwing, based on the species known to be present in Drumman and Derryarkin Bogs, and depending on factors such as the use of habitats, and number of individuals present.

Fisheries and aquatics

- 9.5.257 There are several streams present on aerial imagery which the Gas Connection Corridor bisects. Baseline aquatic surveys have been carried out at four sampling sites within the Gas Connection Corridor boundary, comprising aquatic survey sites A1, A2, A3 and E1 (see Figure 9.1). Surveys were also carried out at several aquatic survey sites downstream of the Gas Connection Corridor. It is worth noting, however, that the full extent and distribution of aquatic habitats within the Gas Connection Corridor is unknown.
- 9.5.258 Aquatic survey site A1 is on the Rochfortbridge Stream supported a low abundance of *Lampetra* sp.. No aquatic species of high conservation value were recorded at survey site X2b, located approximately 2.1km downstream of A1.
- 9.5.259 A low abundance of brown trout was recorded at aquatic survey site A3, located on the Kiltonan Stream. Whilst no white-clawed crayfish were recorded, crayfish remains were recorded within an otter spraint at this site.
- 9.5.260 Aquatic survey site E1 is on the upper reaches of the Rochfort Demense Stream and did not support any aquatic species of higher conservation value. However, a medium abundance of brown trout was recorded at survey site E2, located approximately 1.6km downstream of E1.
- 9.5.261 No aquatic species of higher conservation value were recorded at aquatic survey site A2 on the Castlejordan river.

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- 9.5.262 No white-clawed crayfish, rare or protected macrophytes, aquatic bryophytes, or macro-invertebrates were recorded at these sampling sites within the Gas Connection Corridor.
- 9.5.263 Potential construction phase impacts could include release of sediment and other pollutants, and temporary obstruction of fish passages. Such impacts may result in mortality or injury to fish and crayfish, behavioral changes, and deleterious impacts to fish migration, spawning, and fecundity. Such impacts would be short-term for the duration of the construction phase.
- 9.5.264 On a precautionary basis, impacts to fisheries and aquatic species could result in **Short-Term, Negative, Significant** effects between the Local and County geographic scale.
- Summary of Construction Phase Impacts*
- 9.5.265 A summary of the significance of effects from construction phase impacts for the Gas Connection Corridor are presented in Table 9.15.

Table 9. 15: Summary of significant effects from construction phase impacts for the Gas Connection Corridor

POTENTIAL IMPACT	QUALITY OF EFFECTS	SIGNIFICANCE OF EFFECTS	DURATION OF EFFECTS	GEOGRAPHIC SIGNIFICANCE
European sites				
Waterborne pollution impacts	Negative	Significant	Short-term to medium-term	International
Disturbance / displacement of QI/SCI species	Negative	Significant	Short-term to medium-term	International
Spread of invasive species	Negative	Significant	Short-term to Long-term	International
National sites				
Waterborne pollution impacts	Negative	Significant	Short-term to medium-term	National
Habitats				
Habitat loss	Negative	Significant	Permanent	Local
Habitat damage	Negative	Significant	Temporary to short-term	Local
Habitat damage – pollution and sedimentation	Negative	Significant	Temporary to short-term	National to Local
Spread of invasive species	Negative	Significant	Short-term to Long-term	National to Local
Bats				
Loss of roosts.	Negative	Significant	Permanent	National to Local
Mortality risk or injury of bats within roosts.	Negative	Significant	Temporary to short-term	National to Local
Loss of foraging and commuting habitat	Negative	Significant	Medium-term to permanent	National to Local
Habitat fragmentation and disturbance	Negative	Significant	Medium-term to permanent	National to Local

POTENTIAL IMPACT	QUALITY OF EFFECTS	SIGNIFICANCE OF EFFECTS	DURATION OF EFFECTS	GEOGRAPHIC SIGNIFICANCE
Disturbance / displacement of roosting and foraging / commuting bats due to artificial lighting, noise, and vibrations	Negative	Significant	Temporary to short-term	National to Local
Badger				
Loss of setts	Negative	Slight to significant	Permanent	County to Local
Physical damage and/or disturbance to badger setts	Negative	Slight to significant	Short-term	County to Local
Mortality risk or injury of badger in setts	Negative	Slight to significant	Short-term	County to Local
Loss and/or fragmentation of foraging and commuting habitat	Negative	Slight to significant	Short-term to Permanent	County to Local
Mortality risk or injury of badger in construction areas	Negative	Slight to significant	Short-term	County to Local
Disturbance / displacement due to increased human presence, artificial lighting, noise, vibrations and fencing	Negative	Slight to significant	Short-term	County to Local
Otter				
Loss of an otter breeding / resting site	Negative	Slight to significant	Permanent	County to Local
Mortality risk or injury of otter within a breeding / resting site	Negative	Slight to significant	Short-term	County to Local
Disturbance / displacement due to increased human presence, artificial lighting, noise, vibrations and fencing	Negative	Slight to significant	Short-term	County to Local
Mortality risk or injury of otter in construction areas	Negative	Slight to significant	Short-term	County to Local
Loss and/or fragmentation of habitat		Slight to significant	Short-term to Permanent	County to Local
Damage to otter habitat due to water pollution	Negative	Slight to significant	Short-term	County to Local

POTENTIAL IMPACT	QUALITY OF EFFECTS	SIGNIFICANCE OF EFFECTS	DURATION OF EFFECTS	GEOGRAPHIC SIGNIFICANCE
Other protected mammals				
Loss of breeding / resting sites	Negative	Slight to significant	Permanent	County to Local
Habitat loss	Negative	Slight to significant	Short-term to permanent	County to Local
Disturbance / displacement due to increased human presence, artificial lighting, noise, vibrations and fencing	Negative	Slight to significant	Short-term	County to Local
Mortality risk or injury in construction areas	Negative	Slight to significant	Short-term	County to Local
Marsh fritillary				
Habitat loss and fragmentation	Negative	Significant	Short-term to permanent	National to Local
Mortality risk or injury of eggs, larvae and adult butterflies	Negative	Significant	Short-term	National to Local
Amphibians				
Loss or damage to breeding ponds/wetlands	Negative	Significant	Permanent	National to Local
Habitat loss and fragmentation of terrestrial habitat	Negative	Significant	Short-term to Permanent	National to Local
Damage / disruption to breeding waterbodies	Negative	Significant	Short-term	National to Local
Mortality risk of individuals in terrestrial habitat	Negative	Significant	Short-term	National to Local
Mortality risk or injury in construction areas	Negative	Significant	Short-term	National to Local
Disturbance / displacement from waterbodies due to artificial lighting	Negative	Significant	Short-term	National to Local
Breeding birds				
Loss of breeding habitat	Negative	Significant	Permanent	Local
Mortality risk and injury to nesting birds	Negative	Significant	Temporary	Local

POTENTIAL IMPACT	QUALITY OF EFFECTS	SIGNIFICANCE OF EFFECTS	DURATION OF EFFECTS	GEOGRAPHIC SIGNIFICANCE
Disturbance to adults and their eggs, young and nests, and displacement following removal of nests	Negative	Significant	Temporary	Local
Wintering birds				
Mortality risk and injury in construction areas	Negative	Significant	Temporary	County to Local
Disturbance / displacement due to construction noise, visual disturbance, and artificial lighting	Negative	Significant	Temporary	County to Local
Habitat loss and fragmentation	Negative	Significant	Temporary to permanent	County to Local
Fisheries and aquatics				
Pollution / sedimentation of habitat	Negative	Significant	Temporary	County to Local
Temporary obstruction of fish passage	Negative	Significant	Temporary	County to Local

Operational phase

9.5.266 The operational phase impacts of the Gas Connection Corridor are currently unknown. In addition, as there is no baseline ecological information from field surveys for the Gas Connection Corridor, the types or likelihood of operational phase impacts have been assumed on the precautionary principle based on the typical operation of other similar gas pipelines and AGI developments. Furthermore, once operational, the gas pipeline, which comprises the majority of the Gas Connection Corridor, would be entirely underground and would not be visible or result in any permanent habitat loss. It is assumed that the Gas Connection Corridor, once in operation would require infrequent maintenance, pose little to no risk of pollution and not be associated with any noise or light disturbance.

Sites with statutory designations – European sites

9.5.267 There are nine European sites within the Zol of the Gas Connection Corridor, all of which are hydrologically connected via watercourses within the corridor. The closest of these is Lough Ennell SAC and SPA, located 1.8km northwest and 3.1km downstream of the Site. The Gas Connection Corridor bisects a local watercourse which feeds into Lough Ennell SAC and SPA. During the operational phase of the Gas Connection Corridor there will be negligible risk of pollution events, and an infrequent requirement for maintenance. As such no impacts are predicted during the operational phase of the Gas Connection Corridor to European sites.

Sites with statutory designations – national sites

9.5.268 There is one site with a national nature conservation designation within the Zol of the Gas Connection Corridor, namely Lough Ennell pNHA, located c. 1.8km northwest and 3.1km downstream of the corridor boundary.

9.5.269 The Gas Connection Corridor run through a local watercourse which feeds into Lough Ennell pNHA. During the operational phase of the Gas Connection Corridor there will be negligible risk of pollution events, and an infrequent requirement for maintenance. As such no impacts are predicted during the operational phase of the Gas Connection Corridor to national sites.

Habitats

9.5.270 No baseline habitat surveys have been carried out to inform the Gas Connection Corridor. A review of aerial imagery indicates that the corridor comprises a predominantly agricultural landscape, with fields of improved agricultural grassland with a number of hedgerows, treelines, and watercourses, however, the types and extents of habitats present are unknown.

9.5.271 During the operational phase of the Gas Connection Corridor there will be negligible risk of pollution events, infrequent maintenance required, and no lighting proposed. No impacts to groundwater or surface water are envisaged, unless during these infrequent or emergency maintenance of elements of the infrastructure (refer to Chapter 12: Water Environment). As such no impacts are predicted to habitats during the operational phase of the Gas Connection Corridor.

Bats

9.5.272 No baseline bat surveys have been carried out to inform the Gas Connection Corridor. Records of soprano pipistrelle and Daubenton's bat were returned by the records search, however it is possible that eight species (out of the total nine resident in Ireland) are present in the Gas Connection Corridor, given the range of habitats present and species identified along the Power Plant Area and Electricity Grid Connection.

9.5.273 No impacts are predicted in relation to bat roosting, foraging or commuting habitats along the Gas Connection Corridor, given the nature of the development once operational (i.e., underground gas pipeline).

Badger

9.5.274 No baseline badger surveys have been carried out to inform the Gas Connection Corridor. However, it is likely that badger is present across the area, based on a desktop review of habitat (i.e., farmland) from review of aerial imagery and their recorded distribution within the nearby Proposed Development. Habitats within the Gas Connection Corridor may provide opportunities for setts, breeding commuting, and foraging. There is potential for multiple territories to be present.

9.5.275 No impacts are predicted given the assumption of infrequent maintenance, and no operational noise or lighting disturbance along the Gas Connection Corridor.

Otter

9.5.276 No baseline otter surveys have been carried out to inform the Gas Connection Corridor. However, it is likely that otter is present across the area, based on a desktop review of habitat identified from aerial imagery (both watercourses and terrestrial habitat). Habitats may provide opportunities for breeding/resting sites, commuting and dispersal, and foraging.

9.5.277 No impacts are predicted given the assumption of negligible pollution, infrequent maintenance, and no operational noise or lighting disturbance along the Gas Connection Corridor.

Other protected mammals

9.5.278 No baseline surveys for any other mammals have been carried out to inform the Gas Connection Corridor. However, it is likely that species such as pine marten, red squirrel, hedgehog, Irish hare, and stoat are present across the area, based on habitat present in aerial imagery, and those recorded within the Power Plant Area and Electricity Grid Connection. In addition, there are records of these species from the NBDC data search of the Gas Connection Corridor. Habitats may provide opportunities for breeding/resting places, commuting, and foraging.

9.5.279 No impacts are predicted given the assumption of infrequent maintenance, and no operational noise or lighting disturbance along the Gas Connection Corridor.

Marsh fritillary

9.5.280 No baseline marsh fritillary surveys have been carried out to inform the Gas Connection Corridor. However, it is possible that this species may be present across the area, should suitable habitat and presence of their larval food plant occur. In addition, there are records of this species from the NBDC data search of the Gas Connection Corridor. Habitats within the Gas Connection Corridor may provide opportunities for adult butterfly dispersal and egg-laying/larval webs.

9.5.281 No impacts are predicted given the assumption of infrequent maintenance, and no operational noise or lighting disturbance along the Gas Connection Corridor.

Amphibians

9.5.282 No baseline smooth newt or common frog surveys have been carried out to inform the Gas Connection Corridor. However, it is likely that both species are present across the area, based on habitat present in aerial imagery (both wetland and terrestrial habitat). In addition, there are records of common frog from the NBDC data search of the Gas Connection Corridor. Habitats within the Gas Connection Corridor may provide

opportunities for breeding, commuting and dispersal, and hibernation or other parts of the species' terrestrial phases.

- 9.5.283 No impacts are predicted given the assumption of negligible risk of pollution, infrequent maintenance, and no operational noise or lighting disturbance along the Gas Connection Corridor.

Breeding birds

- 9.5.284 No baseline breeding bird surveys have been carried out to inform the Gas Connection Corridor. However, it is likely that a variety of bird species are present across the area, based on habitat present in aerial imagery. Habitats may provide opportunities for nesting and breeding, commuting, and foraging.

- 9.5.285 No impacts are predicted given the assumption of negligible risk of pollution, infrequent maintenance, and no operational noise or lighting disturbance along the Gas Connection Corridor.

Wintering birds

- 9.5.286 A variety of terrestrial and wetland birds could be present across the area, including seasonal visitors such as the Annex I species whooper swan, and the Red-listed redwing. Habitats may provide opportunities for roosting, commuting, and foraging.

- 9.5.287 No impacts are anticipated given the assumption of little to no risk of pollution, infrequent maintenance, and no operational noise or lighting disturbance along the Gas Connection Corridor.

Fisheries and aquatics

- 9.5.288 Potential operational phase impacts are based on the assumptions and limitations surrounding the Gas Connection Corridor. No impacts are predicted given the assumption of negligible pollution, infrequent maintenance, and no operational noise or lighting disturbance along the Gas Connection Corridor.

Summary of Operational Phase Impacts

- 9.5.289 In summary there are no significant effects anticipated from the operational phase impacts for the Gas Connection Corridor.

Decommissioning phase

- 9.5.290 The gas connection will be managed by the TAO and transmission service operators TSO (GNI) as part of the national gas networks. At the end of its design life, it is expected that the gas connection pipeline may have residual life remaining and the operational life may be extended if appropriate and/or the asset refurbished and retained as part of the national transmission network. It is therefore not envisaged that the Gas Connection Corridor will be decommissioned.

9.6 Mitigation and enhancement measures

9.6.1 In this section, the mitigation measures that are relevant to biodiversity and will be employed by the contractor and / or Site operators during construction and operation, as secured by the Construction Environment Management Plan (CEMP) (refer to EIAR Volume II, Appendix 5A) and the Habitat Management Plan (refer to Appendix 9K) are outlined. Key themes underpinning the mitigation measures are:

- Pre-construction surveys for protected species, where required/necessary, to determine if any breeding or resting sites have become established in the period between baseline survey and construction works commencing will be carried out, and for the presence of any non-native invasive species. Any surveys which require licensing (e.g. inspection of bat roosts) will be supported by a specific mitigation plan. All pre-construction surveys will be completed immediately prior to vegetation clearance (i.e. weeks/days leading up to clearance to ensure recency/robustness of information);
- Safeguarding of retained habitats;
- Safeguarding of protected or notable species known or likely to occur within the Proposed Development Site;
- Commission/appointment of an appropriately experienced ecologist to undertake an Ecological Clerk of Works (eCoW) role, which will be to oversee and advise both contractors and site operators during times of major works within particularly sensitive ecological windows (e.g., breeding bird season) during both the construction phase, and as part of monitoring during the operational phases.
- Approach to the Identification of Ecological Constraints

Mitigation Hierarchy

9.6.2 The Proposed Development has regard for and has engaged the following mitigation hierarchy (CIEEM, 2022), where there is potential for impacts on relevant ecological receptors:

1. Avoidance: seek options that avoid harm to ecological features (e.g., locating to an alternative site);
2. Mitigation: negative effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed (e.g., through a condition or planning obligation);
3. Compensation: where there are significant residual negative ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures e.g., by providing suitable habitats elsewhere on the client-owned parts of the wider site (e.g. inclusion of replanting lands to compensate for forestry felling requirements for the Proposed Development); and
4. Enhancement: seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation, or compensation.

9.6.3 This hierarchy requires the highest level to be applied where possible. Only where this cannot reasonably be adopted should lower levels be considered. The rationale for the proposed mitigation and/or compensation has been clearly outlined within the Section, including sufficient detail to show that these measures are feasible and how they will be implemented.

Universal Project Mitigation

9.6.4 There are several universal mitigation measures that have been developed as part of this EIA, and which are not specifically or necessarily related to biodiversity, but that provide measures or controls that will benefit or safeguard a variety of ecological features/receptors. These comprise the Construction Environment Management Plan (CEMP) (presented in EIAR Chapter 5, Appendix 5B), the Habitat Management Plan (presented in Appendix 9K) and Peat and Spoil Management Plan (presented in EIAR Chapter 5, Appendix 5B).

9.6.5 To avoid repetition, the mitigation measures detailed in the CEMP are summarised in the following subsections and referred to in relation to each element of the Proposed Development as required.

Construction Environment Management Plan

9.6.6 A CEMP has been prepared for the Proposed Development (refer to Appendix 5A). The CEMP implemented during the construction phase of the Proposed Development. The CEMP identifies the perceived risks to the sensitive environmental receptors, potential pollution pathways, and the protection measures to be employed which will negate the risks arising from the impacts of construction-related works and activities.

9.6.7 The appointed contractor will protect the Site, the works, and the general environment including the watercourses and waterbodies, against pollution and sedimentation during the construction phase of the Proposed Development. The Contractor will comply with all relevant legislation in relation to the control of hazardous substances and pollutants during the works.

9.6.8 The appointed contractor will, at all times, work within and comply with all relevant environmental regulations and pollution prevention guidelines. The use of oils, chemicals and other potential pollutants onsite requires significant care and attention. All construction works will be carried out by employing accepted good work practices during construction, and environmental management measures such as the following:

- All materials will be stored at the construction compound and transported to the works zone immediately prior to construction;
- Weather conditions will be taken into consideration when planning construction activities to minimise risk of runoff from the Site;
- Provision of 50m exclusion zones and barriers (silt fences) between any excavated material and any surface water features to prevent sediment washing into the receiving water environment;
- If dewatering is required e.g., in wet areas, water will be treated prior to discharge.
- The contractor shall ensure that silt fences are regularly inspected and maintained during the construction phase;
- If very wet, ground must be accessed during the construction process bog mats / aluminum panel tracks will be used to enable access to these areas by machinery. However, works will be scheduled to minimize access requirements during winter months;
- The contractor shall ensure that all personnel working on site are trained in pollution incident control response. A regular review of weather forecasts of heavy rainfall is required, and the Contractor is required to prepare a contingency plan for before and after such events;

- The contractor will carry out visual examinations of local watercourses during the construction phase to ensure that sediment is not above baseline conditions. In the unlikely event of water quality concerns, the Environmental Manager and ECoW will be consulted;
- Excavations will be left open for minimal periods to avoid acting as a conduit for surface water flows;
- Only emergency breakdown maintenance will be carried out onsite. Emergency procedures and spillage kits will be available and construction staff will be familiar with emergency procedures;
- Appropriate containment facilities will be provided to ensure that any spills from vehicles are contained and removed offsite. Adequate stocks of absorbent materials, such as sand or commercially available spill kits shall be available;
- Concrete or potential concrete contaminated water run-off will not be allowed to enter any watercourses. Any pouring of concrete (delivered to site ready mixed) will only be carried out in dry weather. Washout of concrete trucks shall not be permitted onsite;
- Entry by plant equipment, machinery, vehicles and construction personnel into watercourses or wet drainage ditches shall not be permitted. All routes used for construction traffic shall be protected against migration of soil or wastewater into watercourses; and,
- Cabins, containers, workshops, plant, materials storage, and storage tanks shall not be located near any surface water channels and will be located beyond the 50m hydrological buffer at all times;

9.6.9 The following general control and mitigation measures will be followed as a minimum to ensure no significant adverse direct and indirect effects on ecological features arise from the Proposed Development:

- The appointed contractor will be required to implement appropriate communications including reporting of environmental practice on-site, toolbox talks, daily briefings, an environmental noticeboard (with ecological information, spill/emergency response and refuelling area/procedure) and signage (including ecological exclusion areas);
- All site personnel involved in the construction of the Proposed Development will be made aware of the ecological features present and the mitigation measures and working procedures which must be adopted. This will be achieved as part of the site induction process through the delivery of a Toolbox Talk. In addition, briefings will be provided to all site personnel in advance of those works which are considered to present an increased risk of impacting upon ecological features.;
- The contractor's CEMP will include a Pollution Prevention Plan (PPP) (or similar document) which will set out procedures and diagrams for:
 - Dewatering of excavations to sustainable drainage system (SuDS) treatment area.
 - Temporary soil storage.
 - Fuel storage / refuelling.
 - Concrete wash-out area.
 - Preventing existing drainage features becoming pathways for construction run-off.

- Reducing soil exposure and reinstating as rapidly as possible.
- Temporary construction SuDS such as ditches with check dams, clean water ditches, settlement ponds, silt fencing and straw bales.
- Contingency measures.
- The contractor will not be permitted to use materials that could cause heavy metal, sulphide, or strong acid pollution of run-off, and must use aggregates free of excessive fines clays;
- Prior to the commencement of construction, a suitably qualified and experienced ECoW will be appointed and will provide input into the contractor's site-specific Method Statements and construction programme as and when required, as well as overseeing the implementation of the CEMP (and any mitigation measures identified therein).

9.6.10 The CEMP, which will continue to be a 'live' (i.e. working) document after obtaining planning consent, prescribes that best practice guidance on pollution prevention will be followed at all times during the construction of the Proposed Development. These best practice measures include:

- Controls and contingency measures to manage run-off from construction areas and fine sediment;
- All oils, fuels, lubricants, or other chemicals will be stored in appropriate bunded containers in suitable storage areas, with spill kits provided at the storage location and relevant places across the Proposed Development. There will be no storage of any oils, fuels, lubricants or other chemicals within 30m of watercourses;
- All refuelling and servicing of vehicles and plant will be carried out in designated bunded areas with impermeable bases, which will be situated at least 30m from watercourses;
- The use of concrete will only occur outside the set-back zone of 30m from watercourses and will be carefully controlled to avoid the release of dust and contaminated run-off. No on-site batching should occur. Washout from concrete chutes will be only carried out in designated impermeable areas;
- Temporary storage of excavated materials will be located at least 30m from watercourses; and,
- Soil exposure during the construction works will be minimized and exposed soil will be reinstated as rapidly as possible.

Power Plant Area – Detailed Mitigation

Construction phase

Sites with statutory designations – European sites

9.6.11 Watercourses, ditches surrounding the Power Plant Area are hydrologically connected to the River Boyne and River Blackwater SAC and SPA. Measures for pollution prevention and safeguarding of local watercourses detailed within the CEMP, and outlined above, will ensure safeguarding of watercourses and waterbodies from impacts of pollution and sedimentation. No further specific mitigation in relation to pollution is proposed.

9.6.12 Measures to prevent the spread of invasives species during construction are outlined in the CEMP (detailed in EIA Chapter 5 Proposed Project, Appendix 5A). No further specific mitigation in relation to invasive species is proposed.

Sites with statutory designations – national sites

- 9.6.13 There are no valid source-pathway-receptor pathways for construction phase impacts identified between any nationally designated sites and the Power Plant Area. Therefore, as there will be no impacts on nationally designated sites, no mitigation required.

Habitats – habitat replacement

- 9.6.14 Within the Power Plant Area, there will be unavoidable loss of habitats to facilitate the construction phase, including losses to amenity grassland (improved), dry meadows and grassy verges, scrub and immature woodland, and bog woodland.
- 9.6.15 Habitat loss will be kept to a minimum where possible, by only removing habitat required to facilitate the construction footprint, including working, storage areas and laydown areas etc. Where habitats are disturbed, removed, or damaged for temporary construction compounds and within the Peat Deposition Area, these will be reinstated naturally through succession and left unmanaged following construction.

In addition, landscape mitigation is proposed for the Power Plant Area. To the south of the proposed thermal power plant, a combination of woodland mix and grass mix will be introduced, with the aim to facilitate better integration with the existing scrub adjacent to the site and to enhance the screening of the lower section of the Power Plant Area over time when the woodland mix matures. This mix will comprise pedunculate oak, Scots pine, holly, rowan, downy birch and goat willow. To the west of the site, clusters of mixed deciduous trees, including pedunculate oak, common beech, wild cherry, Scots pine and downy birch are proposed to enhance the visual aesthetics of the site. Full details are presented in the Landscape Mitigation Strategy (EIAR Chapter 10 Landscape and Visual, Appendix 10B).

- 9.6.16 An area of approximately 17.08 ha will be planted with trees, over five areas. The largest within an area of bare cutover bog to the west of the line-cable interface compound within Ballybeg Bog, and two areas of vegetated cutover bog to the east of the 220kV overhead line, and then in two strips along the boundary with the old railway track through Derryarkin (See Appendix 9K). This is to replace for the loss of trees, in particular bog woodland, as a result of the construction of the Proposed Development, including the Power Plant Area and Electricity Grid Connection. Replanting will aim to create an area of bog woodland, dominated by downy birch, but include to a lesser extent include holly *Ilex aquifolium*, rowan, Scots pine, oaks *Quercus* spp. and willows, which aligns with the Ballybeg Cutaway Bog Decommissioning and Rehabilitation Plan and Derryarkin Cutaway Bog Decommissioning and Rehabilitation Plan (see Appendix 9J). Full details are presented in the Habitat Management Plan (see Appendix 9K).

Habitats – pollution and water quality

- 9.6.17 Watercourses, ditches, and waterbodies are present within and surrounding the Power Plant area. Measures for pollution prevention and safeguarding during construction are detailed within the CEMP and will include a Pollution Prevention Plan (PPP) (or similar document), and, will ensure they are safeguarded from impacts of pollution and sedimentation, including the use of SuDs during construction will mitigate the risk of surface run-off to watercourses.
- 9.6.18 The planned foul wastewater discharge, consisting of sewage and domestic type wastewater, is to be treated in a proprietary secondary treatment system, for discharge to the Yellow River. It is anticipated that treatment of foul water will be settlement, biological treatment, settlement and then discharge. Refer EIAR Volume I, Chapter 5: Proposed Development, for more detail.
- 9.6.19 The planned rain/ surface water discharge, consisting of stormwater runoff from the site surfaces, is to be treated in a stormwater system incorporating oil interceptors to enable

the legislative limits to be achieved, prior to controlled discharge to the Mongagh River at approximately 700m north of the Power Plant Area.

9.6.20 No further specific mitigation is proposed.

Invasive species

9.6.21 Measures to prevent the spread of invasive species during construction are outlined in the CEMP (detailed in EIAR Chapter 5 Proposed Project, Appendix 5A). As a minimum:

- The Contractor will prepare an Invasive Species Action Plan to be implemented during construction, and all personnel will be made aware of the requirements.
- Plant and machinery will be inspected upon arrival and departure from site and cleaned / washed as necessary to prevent the spread of invasive aquatic / riparian species such as Japanese knotweed *Fallopia japonica* and Himalayan Balsam *Impatiens glandulifera*. A sign off sheet will be maintained by the contractor to confirm the implementation of measures.
- Site hygiene signage will be erected in relation to the management of non-native invasive material.

Bats

9.6.22 Eight bat roosts of four different bat species (soprano pipistrelle, common pipistrelle, Natterer's bat and brown long-eared bat), were confirmed within six buildings and one structure within or directly south of the Power Plant Area. Roosts present within B4, B4a, B5 and S1 will require derogation licences prior to exclusion of bats from these roosts to proceed with demolition works required.

9.6.23 All works to demolish buildings with known bat roosts must be carried out under the supervision of a suitably experienced and licensed ecologist or the project ECoW.

9.6.24 The loss of these bat roosts will be compensated with the provision of alternative roosting sites. To mitigate for the loss of these known bat roosts, Building B2 (which will be retained) located approximately 85m to the south of the Power Plant Area and outside the Proposed Development boundary, will be further enhanced. This building is already known to contain a maternity colony of Natterer's bats, but through the safeguarding of this structure and provision of suitable enhancement measures as presented below, it is envisaged that this structure can support additional roosting bat populations.

9.6.25 Various bespoke artificial bat roosts will be included within and on the exterior of this building to provide roosting opportunities for both soprano and common pipistrelle, as well as for brown long-eared bats.

9.6.26 In addition, it is also proposed to erect ten artificial bat roost boxes, to be mounted on poles across the wider Proposed Development Site (e.g five Sku pole mounted roost maternity double bat box or similar), either within the Site or within BNM's ownership/control in appropriate locations to compensate for the loss of the roosts (see Figure 9.10). The provision of bat boxes across the Proposed Development Site will also provide additional roosting opportunities throughout the wider site.

9.6.27 These must be erected prior to commencement of construction and therefore the demolition of existing roost sites in the Power Plant Area.

9.6.28 Buildings B1 and B3 are considered to be used as either night roosts or feeding perches, in particular by brown long-eared bats. These are located outside of the Proposed Development boundary and will be retained.

9.6.29 Bats are particularly sensitive to lighting, and whilst B1, B2 and B3 are outside the Proposed Development footprint, the following mitigation (following BCT/ILP:

GN08/2023) regarding lighting must be adhered to in relation to these retained roosts and the surrounding habitat on this southern boundary with the Proposed Development during the construction:

- Lighting will be minimised in terms of number of lights and the power of the lights (lux level) along this southern boundary of the Proposed Development, with light reaching these buildings not greater than 1 lux to avoid roost disturbance; similarly using powerful lighting on wildlife corridors can, for some species, effectively sever connectivity;
- Directional lighting, facing and located away from these roosts and surrounding vegetation along this southern boundary is proposed; and,
- Lighting will be turned off when not in use except to meet the minimum requirements for Health and Safety and Security

Badger

- 9.6.30 No badger setts were identified within the Derrygreenagh works, however, badger activity and two outlier setts were found outside the southern boundary of the site. As mobile species, it is possible that badger may establish new setts prior to construction. Therefore, preconstruction badger surveys will be carried out within the Zol of the Power Plant Area within no sooner than one month prior to works commencing, to determine if any setts have become newly established since baseline surveys. The ECoW will provide advice in the event that additional setts are identified, including potential requirements under licence on a temporary or permanent basis.
- 9.6.31 If piling is required within 150m of BA01 or BA02, south of the Proposed Development, then these setts will require temporary closure, until works are complete. Otherwise, these setts will be retained.
- 9.6.32 The use of artificial lighting during construction has likelihood to deter badger from retained setts and habitats. Lighting design will ensure no light spill in excess of one lux on semi-natural habitats, and particularly in proximity to badger setts.
- 9.6.33 To alleviate a range of general likely significant effects to badger during the construction phase of the Power Plant Area, the following mitigation will be adhered to:
- A Badger Management Plan will be devised and implemented by the appointed contractor (with input from the ECoW). The Badger Management Plan will include the mitigation presented within this Section. This Plan will ensure all sett locations, immediately prior to the commencement of the construction phase are known to the relevant personnel (with cognisance to the preferred confidentiality) and drawings of sett locations and protection zones will be prepared.
 - All works will be largely restricted to daylight hours, where working schedules permit, to reduce as far as possible disturbance to badger.
 - The use of artificial lighting during the construction period will be limited and lighting will be kept to essential locations only, with the position and direction of lighting being designed to minimise light spill and intrusion and disturbance to semi-natural habitats and their conservation value. Use of full cut-off lanterns are proposed to minimise light spillage onto adjacent areas.
 - Drainage and attenuation ducts will restrict badger entry, and any excavation/trench which is liable to entrap wildlife will be covered, fenced off at the end of the day or have a means of escape for any animal which may fall in (e.g., mammal ladder or ramps).

- Water sources which may be used by badger will be safeguarded by the pollution prevention measures outlined in the CEMP and is outlined above.

Otter

- 9.6.34 Construction phase impacts to otter associated with the Power Plant Area comprise pollution of watercourses and waterbodies, disturbance and displacement caused by increased human presence, noise, artificial lighting, and vibrations; injury or entrapment due to any unsecured open trenching / excavation pits; and exposure to oils and other toxic materials. The implementation of the CEMP will ensure these habitats are safeguarded from pollution and therefore will safeguard otter from negative effects of pollution. Construction safeguards outlined in Paragraph 9.6.32 in respect of badger will also alleviate risk of mortality or injury to otter, should they be present within the site during the construction. No additional or specific mitigation for otter is required.

Other protected mammals

- 9.6.35 Mitigation during the construction phase for safeguarding badger (Paragraph 9.6.32) is also relevant to pine marten, Irish hare, stoat, and red squirrel and will safeguard these species from negative impacts during the construction phase should they be present. No specific mitigation is proposed for red squirrel or pine marten, as the habitats to be impacted within the Power Plant Area are not considered suitable to support dreys or dens.
- 9.6.36 Potential impacts to hedgehog and stoat will be mitigated by avoidance. Prior to construction works commencing that have the potential to disturb these species (i.e., within woodland and scrub), the footprint of the works area will be subject to a robust walkover by the ECoW to ensure that there are no hedgehogs or stoats are present and at risk from machinery.
- 9.6.37 Hedgehog hibernate over winter typically under log piles or tree roots, or within dense vegetation and scrub. Should construction works be undertaken during winter months, such vegetation or potential hibernacula at risk of disturbance or removal will be inspected by the ECoW for the presence of hibernating hedgehog prior to any removal.

Marsh fritillary

- 9.6.38 Habitats within the Power Plant Area are suitable for marsh fritillary, although no larval webs were identified in this area. Removal of this habitat will only take place following checks for larvae of marsh fritillary between August and September when larval webs on devil's-bit scabious are conspicuous and before larvae begin to hibernate.
- 9.6.39 Should marsh fritillary larval webs be recorded within the Power Plant Area, these will be translocated if avoidance is not feasible during construction. This will be advised and carried out by the ECoW, and a licence will be required. The method will normally include the following provisions:
- The proposed donor and recipient areas will be surveyed by a suitably experienced ecologist / ECoW to identify suitable areas with devil's-bit scabious and habitat structure.
 - The ECoW will monitor the translocation operations and deliver toolbox talks to relevant site personnel.
 - Translocation will take place in autumn or winter (October-December), when plants are dormant and outside of the bird breeding season. It is best to avoid such work when soil conditions are very wet, to avoid damage and disruption to the habitat.
 - Low ground-pressure tracked vehicles such as bog masters must be used to avoid compacting and smearing peat or soil during translocation.

- A specialist machine operator will be appointed for the translocation operations (removal, translocation, and placement of turves), who will be suitably experienced with the required machinery and equipment.
- The recipient area (the area where the translocated turves are to be re-established) should be similar to the donor site in terms of soil conditions and hydrology. The recipient area will be prepared before the turves are removed from the donor site, so that the turves can be translocated and put in place as quickly as possible, minimise drying out or other disruption.
- A flat-bottomed digger bucket will be used for removal of the turves from the donor site. The turves should be 20-25 cm in thickness, and as large in area as can be accommodated by the digger bucket. Turves will be neatly and vertically cut along their edges as much as possible, to ensure turves are as large as possible with clean edges for best reinstatement.
- Operations will be planned so that turves are moved from the donor area to the recipient area in a single movement, so that temporary storage is not needed.
- Translocated turves will be placed in the prepared recipient area at the same depth as they were previously situated, so that their upper surface is flush with the surrounding ground surface.
- A monitoring plan will be put in place to assess the degree of success of the translocation.

9.6.40 Any areas of marsh frillary habitat lost will be replaced, ideally within the Proposed Development site boundary.

Amphibians

9.6.41 Mitigation for smooth newt and common frog will focus on safeguarding their breeding habitat from damage and / or disturbance, avoiding impacts to breeding smooth newt and common frog, and minimising disturbance impacts to terrestrial smooth newt and common frog during construction.

9.6.42 Robust mitigation is required to protect smooth newt and common frogs from impacts arising from construction works within the Power Plant Area. The ponds to be retained supporting smooth newt populations (i.e. Pond 2), and potentially common frog populations must remain intact and unimpacted by potential pollution. This will require a full suite of pollution prevention measures during the construction phase, as outlined in the CEMP.

9.6.43 Pond 3 will be removed to facilitate the construction of the Power Plant Area. To reduce the risk of injury or mortality of amphibians during the construction phase, it will be necessary to ensure that individuals are absent from the construction footprint of the Power Plant Area and retained within a safe 'refuge area' prior to construction commencing. This will be achieved using capture and exclusion methods. Standard techniques for these methods are described for great crested newt *Triturus cristatus* in the *Great Crested Newt Mitigation Guidelines* (English Nature, 2001) and *Great Crested Newts: Survey and Mitigation for Development Project* (Natural England, 2015). Published literature on smooth newt mitigation is not currently available.

9.6.44 The precise method by which the capture and exclusion will be achieved has not been devised (and is not necessary) as part of this assessment and will instead be detailed in a Species Protection Plan which will be required as part of the licensing process with NPWS. The method will normally include the following provisions:

- The recipient pond(s) will be surveyed by a suitably experienced ecologist / ECoW during the breeding season (March to June inclusive) to determine suitability and presence of resident breeding newts or frogs.
- Amphibian fencing will be installed around the recipient waterbodies within a 'refuge area' in late January/early February prior to the translocation exercise commencing (weather dependent, it is best to avoid such works when soil conditions are very wet, to avoid damage and disruption to the habitat). The refuge area will encompass areas of habitat required by smooth newts at all times of year, including waterbodies for breeding and terrestrial areas.
- Prior to installation of amphibian fencing, and where necessary, vegetation will be removed from along a 1m corridor following the route of the amphibian fence. This will be done mechanically (e.g. strimming or clearance of scrub) and following checks for presence by the ECoW.
- The amphibian fencing will be designed to ensure that amphibians can remain in the refuge area and that they can continue to move between terrestrial and aquatic habitats. It will however serve to prevent amphibians from re-entering the construction areas of the Power Plant Area.
- If present, amphibians will be translocated (through netting and torching) from Pond 3 to the recipient pond(s) within the refuge area. Translocation will take place during the amphibian breeding season (March to June inclusive). Operations will be planned so that newts and/or frogs are moved from the donor pond to the recipient pond in a single movement. Following translocation, the pond to be removed will be lost drained carefully, ensuring no amphibians remain in the pond.
- On completion of construction works, the amphibian fencing will be removed, and amphibians will be free to move around.
- Low ground-pressure tracked vehicles such as bog masters must be used to avoid compacting and smearing peat or soil during translocation.

9.6.45 Removal of the grassland and scrub within the Power Plant Area and within 200m of ponds may potentially injure or kill terrestrial smooth newts and common frogs and therefore should only be removed following checks of these habitats for presence by the ECoW. These areas will be cleared in stages – firstly by cutting back vegetation to around 5-10cm to facilitate easier and more effective searches for these species, and following searches this vegetation can be removed entirely.

9.6.46 Peat Deposition Areas will be checked by the ECoW for the presence of smooth newt and common frog before any deposition commences.

Breeding birds

9.6.47 Any removal of vegetation will be restricted to the non-breeding bird season (i.e., carried out from September to February inclusive), unless carried out under the supervision of a suitably experienced ecologist / ECoW who will survey the vegetation for breeding birds immediately prior to removal. For the avoidance of doubt, it should be noted that birds may nest in grass and low scrub, in addition to trees. Birds can also nest in buildings, which must be checked for nests if the buildings are to be demolished in the breeding season. If nests are found, work must stop immediately until birds fledge and cease to return to the nest and the ECoW will advise the contractor of any exclusion zones around potential or confirmed nests.

9.6.48 The loss of vegetation may displace breeding birds, and this loss of habitat may require them to move to the wider area where there is ample foraging and nesting habitat.

Likewise, the loss of some buildings on site will remove nesting opportunities on site. Although new buildings will be constructed, it is possible they will not provide the same opportunities for breeding birds. Therefore, nest cups suitable for house martin and swallow must be provided on new buildings in similar locations to existing nests. These must be installed under the direction a suitably experienced ecologist / ECoW.

Wintering birds

- 9.6.49 No other specific mitigation for wintering birds is proposed or recommended as wintering birds do not rely on the Power Plant Area for foraging or roosting. The Power Plant Area is not of any significance or importance to wintering birds.

Fisheries and aquatics

- 9.6.50 Mitigation for fish and other aquatic species will focus on the protection given to the water environment as outlined in the CEMP and above, during the construction phase of the Power Plant Area.

Operational phase

Sites with statutory designations – European sites

- 9.6.51 The operation of the Power Plant Area will not give rise to significant adverse effects on any European site, including as a result of air quality, water quality impacts, or disturbance/displacement of QI/SCI species. Therefore, as there will be no impacts on European sites, no mitigation is required.

Sites with statutory designations – national sites

- 9.6.52 The operation of the Power Plant Area will not give rise to significant adverse effects on any national site, including as a result of air quality, water quality impacts, or disturbance / displacement due to noise, lighting or increased presence of personnel. Therefore, there will be no impacts on national sites and there is no mitigation required.

Habitats

- 9.6.53 Accidental spillages may potentially result in a direct or indirect impact to surface water run-off (including accidental distillate fuel spillages from the proposed tanks and pipelines). The CEMP will include a Pollution Prevention Plan (PPP) (or similar document), and the use of SuDs during operation will mitigate the risk of surface run-off to watercourses.

Bats

- 9.6.54 The use of artificial lighting during operation has likelihood to deter bats from using the site to commute or forage, and to cause disturbance to the bat roosts adjacent to the site (B1, 2, B3). The following mitigation regarding lighting (following BCT/ILP: GN08/2023) must be adhered to in relation to these retained roosts and the surrounding habitat on this southern boundary with the Proposed Development during the operation:

- Lighting will be minimised in terms of number of lights and the power of the lights (lux level) along this southern boundary of the Proposed Development, with light reaching these buildings not greater than 1 lux to avoid roost disturbance; similarly single powerful lighting on wildlife corridors can, for some species, effectively sever connectivity;
- Directional lighting, facing and located away from these roosts and surrounding vegetation along this southern boundary is proposed; and,
- Lighting will be turned off when not in use except to meet the minimum requirements for Health and Safety and Security.

9.6.55 Lighting design will ensure no light spill in excess of one lux on semi-natural habitats, and particularly in proximity to known bat roosts and foraging corridors surrounding the Power Plant Area.

Badger

9.6.56 The use of artificial lighting during operation has likelihood to deter badger from retained setts and habitats. Lighting design will ensure no light spill in excess of one lux on semi-natural habitats, and particularly in proximity to badger setts.

Otter

9.6.57 The use of artificial lighting during operation has likelihood to deter otter from retained habitats. Lighting design will ensure no light spill in excess of one lux on semi-natural habitats, and particularly in proximity to waterbodies and ditches surrounding the Power Plant Area.

9.6.58 The CEMP will include a Pollution Prevention Plan (PPP) (or similar document), and the use of SuDs during operation will ensure waterbodies are safeguarded from pollution (including accidental distillate fuel spillages from the proposed tanks and pipelines) and therefore will safeguard otter from negative effects of pollution.

Other protected mammals

9.6.59 The use of artificial lighting during operation has likelihood to deter other protected mammals from retained habitats surrounding the Power Plant Area. Lighting design will ensure no light spill in excess of one lux on semi-natural habitats.

Marsh fritillary

9.6.60 No significant impacts to marsh fritillary are predicted for the operational phase, and no mitigation for marsh fritillary is required.

Amphibians

9.6.61 The use of artificial lighting during operation has likelihood to deter amphibians from retained habitats. Lighting design will ensure no light spill in excess of one lux on semi-natural habitats, and particularly in proximity to waterbodies and ditches surrounding the Power Plant Area.

9.6.62 The CEMP will include a Pollution Prevention Plan (PPP) (or similar document), and the use of SuDs during operation will mitigate the risk of surface run-off to watercourses, will safeguard amphibians from negative effects of pollution.

Breeding birds

9.6.63 No significant impacts to breeding birds are predicted for the operational phase. No mitigation for breeding birds is required.

9.6.64 Wintering birds

9.6.65 The use of artificial lighting during operation has potential to deter nocturnal feeding species such as golden plover, if in the vicinity of the site. Lighting design will ensure no light spill in excess of one lux on semi-natural habitats.

Fisheries and aquatics

9.6.66 The implementation of the CEMP will ensure waterbodies are safeguarded from pollution (including accidental distillate fuel spillages from the proposed tanks and pipelines) and therefore will safeguard fish and other aquatic species from negative effects of pollution.

Decommissioning phase

- 9.6.67 Given that the decommissioning phase will have similar impacts as the construction phase, the same mitigation measures will likely be required and implemented. Best practice mitigation measures at the time of future decommissioning may change and this will be detailed in a future decommissioning plan.

Electricity Grid Connection – specific mitigation*Construction phase***Sites with statutory designations – European sites**

- 9.6.68 Watercourses, ditches surrounding the Electricity Grid Connection are hydrologically connected to the River Boyne and River Blackwater SAC and SPA. Measures for pollution prevention and safeguarding of local watercourses detailed within the CEMP, and outlined above, will ensure safeguarding of watercourses and waterbodies from impacts of pollution and sedimentation. No further specific mitigation in relation to pollution is proposed.
- 9.6.69 Measures to prevent the spread of invasives species during construction are outlined in the CEMP (detailed in EiAR Chapter 5 Proposed Project, Appendix 5A). No further specific mitigation in relation to invasive species is proposed.

Sites with statutory designations – national sites

- 9.6.70 The use of oils, chemicals, sediment and other potential pollutants on-site requires significant care and attention. All standard guidance will be followed, as outlined in the CEMP, summarised above and detailed in Appendix 5A, EiAR Volume II. No specific mitigation is required.

Habitats – replacement

- 9.6.71 Within the lands associated with the Electricity Grid Connection, there will be unavoidable loss of habitats to facilitate the Proposed Development, including losses to cutover bog (both bare peat and partly vegetated), mixed woodland, bog woodland and scrub.
- 9.6.72 Habitat loss will be kept to a minimum where possible, by only removing habitat required to facilitate the construction footprint, including working, storage areas and laydown areas etc. Where habitats are disturbed, removed, or damaged for working and laydown areas, these will be reinstated naturally through succession and left unmanaged following construction.
- 9.6.73 In addition, landscape mitigation is proposed around both the 220 kV and 440 kV substation compounds. For the 220 kV substation compound a mix of deciduous tree will be planted to the east along the R400 to screen the lower parts of the development from the road and enhance visual aesthetics. This will comprise pedunculate oak, common beech, wild cherry, Scot's pine and downy birch. A grassland mix will be planted on areas that are currently hard standing, and will comprise species such as cock's foot, common knapweed, purple moor grass, devil's bit scabious, bent grasses false oat-grass, plantains, thistles, common hogweed and yarrow. Around the 440 kV substation compound a band of deciduous trees, comprising pedunculate oak, Scot's pine, field maple, common alder, hawthorn and hazel, will be planted along the southern and eastern side of the compound to provide screening for views north of the Grand Canal. A grassland mix will be planted along the eastern entrance, as well as the northern, western and southern boundary of the substation compound. This will comprise cock's foot, orchids, common knapweed, devil's bit scabious, bent grasses, false oat-grass, plantains, thistles, common hogweed and yarrow. Full details are presented in the Landscape Mitigation Strategy (EiAR Chapter 10 Landscape and Visual, Appendix 10B).

9.6.74 An area of approximately 17.08 ha will be planted with trees, over five areas. The largest within an area of bare cutover bog to the west of the line-cable interface compound within Ballybeg Bog, and two areas of vegetated cutover bog to the east of the 220kV overhead line, and then in two strips along the boundary with the old railway track through Derryarkin (See Appendix 9K). This is to replace for the loss of trees, in particular bog woodland, as a result of the construction of the Proposed Development, including the Power Plant Area and Electricity Grid Connection. Replanting will aim to create an area of bog woodland, dominated by downy birch, but include to a lesser extent include holly *Ilex aquifolium*, rowan, Scots pine, oaks *Quercus* spp. and willows, which aligns with the Ballybeg Cutaway Bog Decommissioning and Rehabilitation Plan (see Appendix 9J). Full details are presented in the Habitat Management Plan (see Appendix 9K).

Habitats – pollution and water quality

9.6.75 Watercourses, ditches, and waterbodies are present within and in the area surrounding lands associated with the Electricity Grid Connection. Measures for pollution prevention and safeguarding such features detailed within the CEMP, and outlined above will ensure they are safeguarded from impacts of pollution and sedimentation, including the use of SuDs during construction will mitigate the risk of surface run-off to watercourses. No further specific mitigation is proposed. No further specific mitigation is proposed.

9.6.76 Similarly, Annex I habitat Active raised bogs (7110) adjacent the southern section of the Electricity Grid Connection will be protected from runoff through measures outlined in the CEMP.

Invasive species

9.6.77 Measures to prevent the spread of invasives species during construction are outlined in the CEMP (detailed in EiAR Chapter 5 Proposed Project, Appendix 5A). As a minimum:

- The Contractor will prepare an Invasive Species Action Plan to be implemented during construction, and all personnel will be made aware of the requirements.
- Plant and machinery will be inspected upon arrival and departure from site and cleaned / washed as necessary to prevent the spread of invasive aquatic / riparian species such as Japanese knotweed *Fallopia japonica* and Himalayan Balsam *Impatiens glandulifera*. A sign off sheet will be maintained by the contractor to confirm the implementation of measures.
- Site hygiene signage will be erected in relation to the management of non-native invasive material.

Bats

9.6.78 Construction works in the vicinity of building B6 immediately adjacent to the Electricity Grid Connection, and construction work adjacent to the treelines and hedgerows in the south of the Electricity Grid Connection have potential to disturb and displace roosting and foraging/commuting bats.

9.6.79 Works must be restricted to the daylight hours, and lighting used during construction will not illuminate any natural habitats used by roosting, foraging or commuting bats.

9.6.80 Bats are particularly sensitive to lighting, and whilst B6 is outside the Proposed Development footprint, the following mitigation regarding lighting (following BCT/ILP: *GN08/2023*) must be adhered to in relation to this retained roost and the surrounding habitat during the construction:

- Lighting will be minimised in terms of number of lights and the power of the lights (lux level), with light reaching these buildings not greater than 1 lux to avoid roost disturbance; similarly using powerful lighting on wildlife corridors can, for some species, effectively sever connectivity;
- Directional lighting, facing and located away from this roosts and surrounding vegetation; and,
- Lighting will be turned off when not in use except to meet the minimum requirements for Health and Safety and Security.

Badger

- 9.6.81 Subsidiary sett BA03 is only 6m north of the temporary construction compound for the 400kV substation, and within the permanent soil deposition area, it will require permanent closure for the works to proceed. Outlier sett BA04 is 46m west of the 400kV substation, and therefore within the 50m distance stated by the NRA guidance within which no works should take place during the breeding season (December to June). If works are required within the breeding season, this sett should be temporarily closed, but the sett can remain open if works are to take place in the non-breeding season as the sett is more than 30m away from the works. If there is piling within 150m of outlier sett BA02, this sett will require temporary closure. Sett closure will require a licence and be overseen by a suitably qualified ecologist / ECoW.
- 9.6.82 As badgers are a mobile species which are active within the vicinity of lands associated with the Electricity Grid Connection, it is possible that badger may establish new setts prior to construction. Therefore, pre-construction badger surveys will be carried out within the Zol of the Electricity Grid Connection no sooner than one month of the works commencing, to determine if any setts have become newly established since baseline surveys. the ECoW will provide advice in the event that additional setts are identified, including potential requirements under licence on a temporary or permanent basis.
- 9.6.83 The use of artificial lighting during construction has likelihood to deter badger from retained setts and habitats. Lighting design will ensure no light spill in excess of one lux on semi-natural habitats, and particularly in proximity to badger setts.
- 9.6.84 To alleviate a range of general likely significant effects to badger during the construction phase of the Electricity Grid Connection, the following mitigation will be adhered to:
- A Badger Management Plan will be devised and implemented by the appointed contractor (with input from the ECoW). The Badger Management Plan will include the mitigation presented within this Section. This Plan will ensure all sett locations, immediately prior to the commencement of the construction phase are known to the relevant personnel (with cognisance to the preferred confidentiality) and drawings of sett locations and protection zones will be prepared.
 - All works will be largely restricted to daylight hours, where working schedules permit, to reduce as far as possible disturbance to badger.
 - The use of artificial lighting during the construction period will be limited and lighting will be kept to essential locations only, with the position and direction of lighting being designed to minimise light spill and intrusion and disturbance to semi-natural habitats and their conservation value. Use of full cut-off lanterns are proposed to minimise light spillage onto adjacent areas.
 - Drainage and attenuation ducts will restrict badger entry, and any excavation/trench which is liable to entrap wildlife will be covered, fenced off at the end of the day or

have a means of escape for any animal which may fall in (e.g., mammal ladder or ramps).

- Water sources which may be used by badger will be safeguarded by the pollution prevention measures outlined in the CEMP and is outlined in above.

Otter

9.6.85 Construction phase impacts to otter associated with the Electricity Grid Connection comprise pollution of watercourses and waterbodies, disturbance and displacement caused by increased human presence, noise, artificial lighting, and vibrations; injury or entrapment due to any unsecured open trenching / excavation pits; and exposure to oils and other toxic materials. The implementation of the CEMP will ensure these habitats are safeguarded from pollution and therefore will safeguard otter from negative effects of pollution. Construction safeguards outlined in Paragraph 9.6.32 in respect of badger will also alleviate risk of mortality or injury to otter, should they be present within the site during the construction. No additional or specific mitigation for otter is required.

Other protected mammals

9.6.86 Mitigation during the construction phase for safeguarding badger (Paragraph 9.6.32) is also relevant to pine marten, Irish hare, stoat, and red squirrel and will safeguard these species from negative impacts during the construction phase should they be present. No specific mitigation is proposed for red squirrel or pine marten, as the habitats to be impacted within the Electricity Grid Connection are not considered suitable to support dreys or dens.

9.6.87 Potential impacts to hedgehog and stoat will be mitigated by avoidance. Prior to construction works commencing that have the potential to disturb these species (i.e., within woodland and scrub), the footprint of the works area will be subject to a robust walkover by the ECoW to ensure that there are no hedgehogs or stoats are present and at risk from machinery.

9.6.88 Hedgehog hibernate over winter typically under log piles or tree roots, or within dense vegetation and scrub. Should construction works be undertaken during winter months, such vegetation or potential hibernacula at risk of disturbance or removal will be inspected by the ECoW for the presence of hibernating hedgehog prior to any removal.

Marsh fritillary

9.6.89 Habitats within the lands associated with the Electricity Grid Connection are suitable for marsh fritillary, with larval webs identified in this area. Removal of this habitat must only be completed following checks for larvae of marsh fritillary between August and September when larval webs on devil's-bit scabious are conspicuous and before larvae begin to hibernate.

9.6.90 Where marsh fritillary habitat within the lands associated with the Electricity Grid Connection are to be impacted, these will be translocated if it is not feasible to avoid these during construction. The method will include the following provisions:

- The proposed donor and recipient areas will be surveyed by a suitably experienced ecologist / ECoW to identify suitable areas with devil's-bit scabious and habitat structure.
- the ECoW will monitor the translocation operations and deliver toolbox talks to relevant site personnel.
- Translocation will take place in autumn or winter (October-December), when plants are dormant and outside of the bird breeding season. It is best to avoid such work when soil conditions are very wet, to avoid damage and disruption to the habitat.

- Low ground-pressure tracked vehicles such as bog masters must be used to avoid compacting and smearing peat or soil during translocation.
- A specialist machine operator will be appointed for the translocation operations (removal, translocation, and placement of turves), who will be suitably experienced with the required machinery and equipment.
- The recipient area (the area where the translocated turves are to be re-established) should be similar to the donor site in terms of soil conditions and hydrology. The recipient area will be prepared before the turves are removed from the donor site, so that the turves can be translocated and put in place as quickly as possible minimise drying out or other disruption.
- A flat-bottomed digger bucket will be used for removal of the turves from the donor site. The turves should be 20-25 cm in thickness, and as large in area as can be accommodated by the digger bucket. Turves will be neatly and vertically cut along their edges as much as possible, to ensure turves are as large as possible with clean edges for best reinstatement.
- Operations will be planned so that turves are moved from the donor area to the recipient area in a single movement, so that temporary storage is not needed.
- Translocated turves will be placed in the prepared recipient area at the same depth as they were previously situated, so that their upper surface is flush with the surrounding ground surface.
- A monitoring plan will be put in place to assess the degree of success of the translocation.

9.6.91 Any areas of marsh fritillary habitat lost will be replaced, ideally within the Proposed Development site boundary.

Amphibians

9.6.92 Mitigation for smooth newt and common frog will focus on safeguarding their breeding habitat from damage and / or disturbance, avoiding impacts to breeding smooth newt and common frog, and minimising disturbance impacts to terrestrial smooth newt and common frog during construction.

9.6.93 Pond 1, which was confirmed to support smooth newt, is located within the 220kV substation compound and at the southern boundary of the proposed substation infrastructure of the Electricity Grid Connection. In addition, further suitable terrestrial and aquatic habitat is present within the Electricity Grid Connection. Robust mitigation is therefore required to protect smooth newt and common frogs from impacts arising from construction works.

9.6.94 To ensure terrestrial and aquatic amphibian habitats are protected, there will be a full suite of pollution prevention measures as outlined in the CEMP. In addition, a capture and exclusion exercise will be carried out, whereby amphibians within Pond 1 will be translocated to a safe 'refuge' area prior to construction commencing. To reduce the risk of injury or mortality of amphibians during the construction phase, it will be necessary to ensure that individuals are absent from the construction footprint of the Electricity Grid Connection and retained within a safe 'refuge area' prior to construction commencing. This will be achieved using capture and exclusion methods. Standard techniques for these methods are described for great crested newt *Triturus cristatus* in the *Great Crested Newt Mitigation Guidelines* (English Nature, 2001) and *Great Crested Newts: Survey and Mitigation for Development Project* (Natural England, 2015). Published literature on smooth newt mitigation is not currently available.

9.6.95 The precise method by which the capture and exclusion will be achieved has not been devised (and is not necessary) as part of this assessment and will instead be detailed in a Species Protection Plan which will be required as part of the licensing process with NPWS. The method will normally include the following provisions:

- The recipient pond(s) will be surveyed by a suitably experienced ecologist / ECoW during the breeding season (March to June inclusive) to determine suitability and presence of resident breeding newts or frogs.
- Amphibian fencing will be installed around the recipient waterbodies within a 'refuge area' in late January/early February prior to the translocation exercise commencing (weather dependent, it is best to avoid such works when soil conditions are very wet, to avoid damage and disruption to the habitat). The refuge area will encompass areas of habitat required by smooth newts at all times of year, including waterbodies for breeding and terrestrial areas.
- Prior to installation of amphibian fencing, and where necessary, vegetation will be removed from along a 1m corridor following the route of the amphibian fence. This will be done mechanically (e.g. strimming or clearance of scrub) and following checks for presence by the ECoW.
- The amphibian fencing will be designed to ensure that amphibians can remain in the refuge area and that they can continue to move between terrestrial and aquatic habitats. It will however serve to prevent amphibians from re-entering the construction areas of the Power Plant Area.
- If present, amphibians will be translocated (through netting and torching) from Pond 3 to the recipient pond(s) within the refuge area. Translocation will take place during the amphibian breeding season (March to June inclusive). Operations will be planned so that newts and/or frogs are moved from the donor pond to the recipient pond in a single movement. Following translocation, the pond to be removed will be lost drained carefully, ensuring no amphibians remain in the pond.
- On completion of construction works, the amphibian fencing will be removed, and amphibians will be free to move around.
- Low ground-pressure tracked vehicles such as bog masters must be used to avoid compacting and smearing peat or soil during translocation.

9.6.96 Removal of the grassland and scrub within the Power Plant Area and within 200m of ponds may potentially injure or kill terrestrial smooth newts and common frogs and therefore should only be removed following checks of these habitats for presence by the ECoW. These areas will be cleared in stages – firstly by cutting back vegetation to around 5-10cm to facilitate easier and more effective searches for these species, and following searches this vegetation can be removed entirely.

9.6.97 Peat Deposition Areas will be checked by the ECoW for the presence of smooth newt and common frog before any deposition commences.

Breeding birds

9.6.98 Any removal of vegetation will be restricted to the non-breeding bird season (i.e., carried out from September to February inclusive), unless carried out under the supervision of a suitably experienced ecologist / ECoW who will survey the vegetation for breeding birds immediately prior to removal. For the avoidance of doubt, it should be noted that birds may nest in grass and low scrub, in addition to trees. Birds can also nest in buildings, which must be checked for nests if the buildings are to be demolished in the breeding season. If nests are found, work must stop immediately until birds fledge and cease to

return to the nest and the ECoW will advise the contractor of any exclusion zones around potential or confirmed nests.

- 9.6.99 The loss of vegetation may displace breeding birds, and this loss of habitat may require them to move to the wider area where there is ample foraging and nesting habitat.

Wintering birds

- 9.6.100 No specific mitigation is proposed for wintering birds as potential displacement of birds during construction is likely to be short-term.

Fisheries and aquatics

- 9.6.101 Mitigation for fish and other aquatic species will focus on the protection given to the water environment as outlined in the CEMP and above, during the construction phase of the Electricity Grid Connection.

Operational phase

Sites with statutory designations – European sites

- 9.6.102 The operation of the Electricity Grid Connection will not give rise to significant adverse effects on any European site, including as a result of collision risk, disturbance, air quality, water quality impacts, or disturbance/displacement of QI/SCI species. Therefore, as there will be no impacts on European sites, no mitigation is required.

Sites with statutory designations – national sites

- 9.6.103 Impacts to groundwater or surface water are not envisaged, unless via routine or emergency maintenance of elements of the power transmission infrastructure, which could indirectly impact Grand Canal pNHA. The CEMP will include a Pollution Prevention Plan (PPP) (or similar document), and the use of SuDs during operation will mitigate the risk of surface run-off to watercourses.

Habitats

- 9.6.104 Impacts to groundwater or surface water are not envisaged, unless via routine or emergency maintenance of elements of the power transmission infrastructure, which could indirectly impact to the watercourses and ditches which traverse the Electricity Grid Connection. The CEMP will include a Pollution Prevention Plan (PPP) (or similar document), and the use of SuDs during operation will mitigate the risk of surface run-off to watercourses.

Bats

- 9.6.105 The use of artificial lighting during operation has likelihood to deter bats from using the site to commute, forage or roost. Lighting design will ensure no light spill excess from the 220kV and 400kV substations associated with the Electricity Grid Connection, on to the bat roost (B6) and on semi-natural habitats remaining in or adjacent to site.

- 9.6.106 The following mitigation regarding lighting (following BCT/ILP: *GN08/2023*) must be adhered to in relation to this retained roost and the semi-natural habitat (i.e. treelines, woodland) associated with the Electricity Grid Connection during operation:

- Lighting will be minimised in terms of number of lights and the power of the lights (lux level), with light reaching building B6 not greater than 1 lux to avoid roost disturbance; similarly using powerful lighting on wildlife corridors can, for some species, effectively sever connectivity;
- Directional lighting, facing and located away from these roosts and semi-natural habitats is proposed; and,

- Lighting will be turned off when not in use except to meet the minimum requirements for Health and Safety and Security.

9.6.107 A lighting design for the operation of the 220kV and 400kV substations associated with the Electricity Grid Connection must be produced prior to the commencement of construction to illustrate how this will be achieved.

Badger

9.6.108 The use of artificial lighting during operation at the 220kv and 400kV substations associated with the Electricity Grid Connection has the potential to deter badger from retained habitats. Lighting design will ensure no light spill in excess of one lux on semi-natural habitats, and particularly in proximity to retained badger setts.

Otter

9.6.109 The use of artificial lighting during operation at the 220kv and 400kV substations associated with the Electricity Grid Connection has the potential to deter otter from foraging and commuting along retained habitats. Lighting design will ensure no light spill in excess of one lux on semi-natural habitats, and particularly along watercourses, namely the Yellow River and Coolcor Stream.

Other protected mammals

9.6.110 The use of artificial lighting during operation at the 220kv and 400kV substations associated with the Electricity Grid Connection has the potential to deter pine marten, Irish hare, stoat, or red squirrel which may be present in retained or adjacent habitats. Lighting design will ensure no light spill in excess of one lux on semi-natural habitats, and particularly along watercourses, namely the Yellow River and Coolcor Stream.

Marsh fritillary

9.6.111 No significant impacts to marsh fritillary are predicted for the operational phase, and no mitigation for marsh fritillary is required.

Amphibians

9.6.112 The use of artificial lighting during operation has likelihood to deter amphibians from retained habitats. Lighting design around the 220kV and 400kV substations associated with the Electricity Grid Connection will ensure no light spill in excess of one lux on semi-natural habitats, and particularly in proximity to waterbodies and ditches. The CEMP will include a Pollution Prevention Plan (PPP) (or similar document), and the use of SuDs during operation will ensure waterbodies are safeguarded from pollution.

Breeding birds

9.6.113 Mitigation will be delivered to minimise the risk of collision and electrocution of breeding birds with the Overhead Line in the Electricity Grid Connection, or displacement from suitable habitat by the proximity to the electricity transmission lines. Birds with high wing loading (i.e. ratio of body height to wing area) and broad wings are significantly more vulnerable to collision, such as, herons, swans and raptors or many waterfowl (coots, rails, grebes, and shorebirds), or those that fly in large flocks (e.g. lapwings). Transmission lines will be fitted with devices such as flight diverters, hanging tags and marker spheres, to make them more visible to flying birds (see guidance documents, EirGrid, 2020).

Wintering birds

9.6.114 Overhead lines are a potential risk to commuting and migrating birds in winter, including whooper swans associated with the Derryarkin Bog, and the aforementioned breeding bird species also present in winter, through collision, electrocution, as well as and displacement from suitable habitat in proximity to the electricity transmission lines.

Transmission lines will be fitted with devices such as flight diverters, hanging tags, and marker spheres, to make them more visible to flying birds.

Fisheries and aquatics

- 9.6.115 Careful design and management of site drainage for the Electricity Grid Connection is based on the principal of SUDS during operation will mitigate the risk of polluted surface run-off to watercourses. All operation lighting will be directed away from watercourses to prevent light spillage.

Decommissioning phase

- 9.6.116 Given that the decommissioning phase will have similar impacts as the construction phase, the same mitigation measures will be required and implemented.

Gas Connection Corridor

- 9.6.117 The Gas Connection Corridor is not being applied for in the planning application for the Proposed Development (as it will be applied for by GNI under separate consenting processes). The Gas Connection Corridor is the preferred route, as indicated by GNI, at the time of writing but may be subject to change as part of the detailed design process to be carried out by GNI at a later date. Similarly, mitigation for the construction, operation, or decommissioning phases of the Gas Connection Corridor will be determined by GNI as part of these future consenting processes and detailed design.

9.7 Residual effects

Power Plant Area

Construction, operation, and decommissioning phases

- 9.7.1 With the implementation of mitigation measures presented in Section 9.5, residual effects for the Power Plant Area will largely be considered to be **Imperceptible** or **Not Significant** with the exception of the following ecological constraints outlined below.

Bats

- 9.7.2 Following the implementation of the mitigation outlined in Section 9.5 residual effects are still expected to remain as a result of activities during construction, including the loss of bat roosts in five buildings, and disturbance during operation to retained and new bats roosts. The residual effect of the Proposed Development on bats will remain, **Permanent, Negative, And Slight**, at the Local geographic scale.

Amphibians

- 9.7.3 With the implementation of mitigation for smooth newt and common frog focusing on safeguarding their breeding and terrestrial habitats from damage and / or disturbance during construction, the impacts from habitat loss and fragmentation, disturbance, injury or mortality as a result of construction activities for the Power Plant Area will be significantly reduced. However, a residual effect will remain, which will be **Short-Term, Negative, and Slight** effects to populations of these species at the Local geographic scale.

Electricity Grid Connection

Construction, operation, and decommissioning phases

- 9.7.4 With the implementation of mitigation measures presented in Section 9.5, residual impacts for the Electricity Grid Connection will largely be considered to be **Imperceptible** or **Not Significant** with the exception of the following ecological constraints outlined below.

Badger

- 9.7.5 Despite the implementation of mitigation to protect badgers and their setts during construction, the loss of setts, and disturbance/disruption to badger setts and their commuting and foraging habitat via increased human presence and artificial lighting during operation will continue to have a **Permanent, Negative, Slight** effect on badger populations at the Local geographic scale.

Amphibians

- 9.7.6 With the implementation of mitigation for smooth newt and common frog focusing on safeguarding their breeding and terrestrial habitats from damage and / or disturbance during construction, the impacts from habitat loss and fragmentation, disturbance, injury or mortality as a result of construction activities for the Electricity Grid Connection will be significantly reduced. However, a residual effect will remain, which will be **Short-Term, Negative and Slight** effects to populations of these species at the Local geographic scale.

Breeding and wintering birds

- 9.7.7 Once operational, the overhead lines and pylons within the Electricity Grid Connection will be fitted devices such as flight diverters, hanging tags and marker spheres, to make them more visible to flying birds. However, this might not fully mitigate the risk of collision and electrocution for populations of breeding birds, comprising mute and whooper swans, tufted duck, great crested grebe, teal, coot lapwing, kestrel, peregrine, little egret,

common sandpiper, sparrowhawk and buzzard have been recorded using both Derryarkin and Ballybeg Bogs. As well as wintering populations of whooper swans, mute swans, golden plover, lapwing, little egret, and birds of prey including buzzard, hen harrier, kestrel, sparrowhawk and peregrine falcon. Barrientos et al., (2011) suggested that adequate marking of power lines may reduce collision mortality by up to 78% compared to unmarked sites. As such, the residual effect will remain as a **Permanent, Negative, Slight** effect at the Local geographic scale for common sandpiper, sparrowhawk and buzzard, while populations of protected and listed species present during the breeding season comprising mute and whooper swans, tufted duck, great crested grebe, teal, coot lapwing, kestrel, peregrine and little egret, as well as wintering populations of whooper swans, mute swans, golden plover, lapwing, little egret, and birds of prey including buzzard, hen harrier, kestrel, sparrowhawk and peregrine falcon the residual effect will remain as a **Permanent, Negative, Slight** effect at the County (geographic scale, as collisions and subsequent injury or mortality remain possible.

- 9.7.8 The presence of the overhead lines and pylons along the Electricity Grid Connection may still cause both breeding and wintering birds to be displaced from suitable habitat and could act as a partial barrier to movement. As such the residual effect that will be **Permanent, Negative, and Slight** at the Local geographic scale for breeding populations of common sandpiper, sparrowhawk and buzzard, while for breeding populations of protected and listed species comprising mute and whooper swans, tufted duck, great crested grebe, teal, coot lapwing, kestrel, as well as peregrine and little egret, as well as wintering populations of whooper and mute swan, golden plover, lapwing, little egret, peregrine and snipe the residual effect will remain as a **Permanent, Negative, Slight** effect at the County geographic scale.

Gas Connection Corridor

Construction, operation and decommissioning phases

- 9.7.9 The Gas Connection Corridor is not being applied for in the planning application for the Proposed Development (as it will be applied for by GNI under separate consenting processes). The Gas Connection Corridor is the preferred route, as indicated by GNI, at the time of writing but may be subject to change as part of the detailed design process to be carried out by GNI at a later date. Similarly, mitigation measures for the Gas Connection Corridor will be determined by GNI as part of these future consenting processes and detailed design.

9.8 Cumulative effects

Cumulative Assessment – interaction of effects between the various elements of the Proposed Development and Overall Project

- 9.8.1 The potential cumulative impacts from interactions between various elements of the Proposed Development and Overall Project, as described in Chapter 5, have been considered in terms of impacts on Biodiversity. Due to the proximity, scale, and timelines associated with each element, there is potential for cumulative effects with the Proposed Development and Overall Project.
- 9.8.2 This impact assessment has considered all elements of the Proposed Development and Overall Project, including elements which are not subject to this planning permission, during the construction, operation and decommissioning phases. A cumulative impact assessment has therefore been carried out throughout this chapter to examine the impacts that the various elements of the Overall Project will have on biodiversity.

Power Plant Area

- 9.8.3 The Electricity Grid Connection is part of this application while a separate consent application for the Gas Connection Corridor will be made by Gas Networks Ireland (GNI) under Section 39A of the Gas Act. These elements of the Overall Project are integral to the operation of the Power Plant Area. Therefore, there is potential for overlapping construction phases of each element of the Overall Project (i.e., Grid Connection, Gas Connection Corridor and Power Plant Area) creating cumulative ecological impacts.
- 9.8.4 With the implementation of the aforementioned mitigation, residual effects for the Power Plant Area during construction, operation and decommissioning will largely be considered to be imperceptible or not significant, with the exception of local populations of bats and amphibians during construction (and decommissioning), and on bats during operation. The residual effects on both bats and amphibians will remain, **Permanent, Negative and Slight**, at the Local geographic scale.
- 9.8.5 This has the potential to act cumulatively with the residual effect on amphibians during construction (or decommissioning) of the Electricity Grid Connection, and potentially the Gas Connection Corridor should construction occur at the same time. No other effects are expected cumulatively during construction. However, the potential for cumulative effects for bats during the construction of the Gas Connection Corridor cannot be assessed in the absence of detailed design, further survey and mitigation.
- 9.8.6 No cumulative effects during the operation of the Power Plant Area are anticipated from the operation of the Electricity Grid Connection or the Gas Connection Corridor given the nature of these elements.

Electricity Grid Connection

- 9.8.7 The Electricity Grid Connection is part of this application with the Power Plant Area application, while a separate consent application for the Gas Connection Corridor will be made by GNI under Section 39A of the Gas Act. These are all part of the Overall Project and are all integral for the overall operation. Therefore, there is potential for overlapping construction phases of each element of the Overall Project (i.e., Grid Connection, Gas Connection Corridor and Power Plant Area) creating cumulative ecological impacts.
- 9.8.8 With the implementation of the aforementioned mitigation, residual effects for the Electricity Grid Connection during construction, operation and decommissioning will largely be considered to be imperceptible or not significant, with the exception of local populations of amphibians during construction (and decommissioning), as well as on populations of breeding and wintering birds that use the habitats in the vicinity of the Electricity Grid Connection during operation. The residual effects on amphibians within

the Electricity Grid Connection will remain, **Permanent, Negative, and Slight**, at the Local geographic scale, while the residual effects on birds from collision risk, electrocution and or disturbance effects of the overhead lines and pylons present as part of the operation is considered to be **Permanent, Negative, Slight** at the Local for breeding populations of common sandpiper, sparrowhawk and buzzard or at the County geographic scale for protected and listed species present during the breeding season comprising mute and whooper swans, tufted duck, great crested grebe, teal, coot lapwing, kestrel, peregrine and little egret, as well as wintering populations of whooper swans, mute swans, golden plover, lapwing, little egret, and birds of prey including buzzard, hen harrier, kestrel, sparrowhawk, peregrine falcon, and snipe (in the case of disturbance only).

- 9.8.9 During construction the impacts to amphibians could act cumulatively with those at the Power Plant Area, and potentially the Gas Connection Corridor should construction occur at the same time. No other impacts are considered to lead to cumulative effects from construction activities at the Power Plant Area or Gas Connection Corridor, provided that all mitigation is implemented.
- 9.8.10 The residual effect on both breeding and wintering birds as a result of the overhead lines and pylons will not act cumulatively with the other elements of the Proposed Development or Overall Project.

Gas Connection Corridor

- 9.8.11 The Gas Connection Corridor will be subject to separate consenting applications which will be made by GNI. However, the Gas Connection Corridor has been considered part of the Overall Project as it is integral to the operation of the Proposed Development. Therefore, there is potential for overlapping construction phases of each element of the Overall Project (i.e., Electricity Grid Connection, Gas Connection Corridor and Power Plant Area) creating cumulative ecological impacts.
- 9.8.12 Overlapping construction phases of the Gas Connection Corridor with the Power Plant Area and Electricity Grid Connection has the potential to result in cumulative effects on amphibian populations given the assessed residual effects during construction for both these elements.
- 9.8.13 Cumulative effects on local bat populations cannot be assessed in the absence of detailed design, further survey and mitigation for the Gas Connection Corridor, and there is the potential, should any residual effects on bats result from the Gas Connection Corridor that these could act cumulatively with those at the Power Plant Area.
- 9.8.14 No other cumulative effects are anticipated from the operation of the Gas Connection Corridor, given the nature of this element.

Cumulative in-combination effects -other nearby projects.

- 9.8.15 A search of committed developments (i.e., those that have received full or outline planning permission) in the locality of the Proposed Development was undertaken using publicly available data from the MyPlan.ie 'National Planning Application' database, An Bord Pleanála (ABP) database, and the Offaly and Westmeath County Council's Planning Portals.
- 9.8.16 A desk-based planning history search for the last five years and within 5km of the Proposed Development was undertaken using these resources to current and future land use. Planning applications older than five years have not been assessed as they have been deemed to either have expired or have been constructed (due to the general five-year life of planning consents).

9.8.17 A full list of planning applications obtained from the search is presented in Appendix 19A (refer to EIAR Volume II) Applications in relation to smaller planning applications predominantly for extensions or alterations to existing dwellings are not considered to be relevant to the cumulative assessment within this EIAR, given their small scale. Therefore, only projects of sufficient size and scale that may potentially act in-combination with the Proposed Development and Overall Project and are therefore listed in Table 9.16 and assessed herein.

Table 9. 16: Planning applications with the potential for cumulative effects within 5km of the Proposed Development within the last five years

PLANNING REF.	SUMMARY DETAILS	ADDRESS / APPLICANT	STATUS
WCC ABP-309112-21	Development for the storage and seasoning of biomass logs.	Bord na Mona Energy Ltd, Toar, Rarthgarrett, Tyrellspass	Granted 11/05/2021 Permitted
WCC 2260051	Phased extraction of sand and gravel (wet working). An EIAR and NIS has been submitted.	Kilsaran Concrete Unlimited Company - Farthingstown Townland, Mongagh Bridge, Rochfortbridge	Awaiting decision Submitted
WCC ABP-312783	220kV Gas Insulated Switchgear (GIS) Electrical substation and two 220kV underground transmission cables.	Lumcloon Energy Ltd - Kiltotan and Collinstown and Oldtown, Rochfortbridge	Granted 09/09/2022 Permitted
OCC 22490	Construction of a materials recovery facility for the processing of up to 90,000 tonnes per annum of waste.	Oxygen Environmental Unlimited Company - Derryarkin, Rhode, Co. Offaly	Awaiting decision Submitted
OCC 23277	To import soil and stone not exceeding 25,000 tons over a period of 2 years for the purpose of raising existing ground levels.	Knockdrin and Derrygreenagh Townslands, Rhode, Co. Offaly - Tony McCabe	Awaiting decision Submitted
OCC 18324	The filling of lands with inert waste for the purpose of land reclamation and all associated ancillary facilities.	Kilmurray Pre-Cast Concrete Ltd - Derryarkin, Rhode	Granted - 24/10/2019 Operational
OCC 1849	Development consisting of the extraction of sand and gravel from a greenfield area. An EIAR and NIS has been submitted.	Kilmurray Pre-Cast Concrete Ltd - Derryarkin, Rhode	Granted 29/03/2018 Permitted
OCC 1925	Extension to the southwest and south-east of the existing sand and gravel pit upgrading	Derryarkin Sand and Gravel DAC, Derrygreenagh Knockdrin Garr and Carrick townlands, Rhode.	Granted 21/03/2019 In Construction
OCC 21247	A 23-year permission for a 44.0-hectare extension to an existing authorized sand and gravel pit. An EIAR has been submitted.	Kilmurray Pre-Cast Concrete Ltd - Derryarkin, Rhode	Granted 18/02/2022 Permitted
OCC 20237	Development of a combined heat and power generating biomass gasification plant.	Newleaf Energy Ltd, Coolcor, Rhode	Granted 06/05/2021 Permitted
OCC 20238	An energy storage facility designed to provide system support services to the electricity grid on a 2.7-hectare site.	Rhode Energy Storage Ltd - Coolcor, Rhode	Granted 20/05/2021 Permitted

PLANNING REF.	SUMMARY DETAILS	ADDRESS / APPLICANT	STATUS
OCC 19161	Development of an energy storage facility designed to provide 20mw.	Schwungrad Energie Ltd - Coolcor, Rhode, Co. Offaly	Granted 04/06/2019 Permitted
OCC 22664	Construction of a 110kv substation, Clonin, Rhode, Co. Offaly.	Eirgrid PLC - DerryroN 110kV Substation, Clonin, Rhode	Granted 23/02/2023 Permitted
OCC ABP-309491	a 110kV substation, associated 110kV underground grid connection, cabling and associated works.	OBM solar Ltd Srah, Coolcor and Clonin, Rhode	Granted 13/10/2021 Permitted
OCC ABP-304925	Solar PVv energy development within a site area of approximately 15ha.	Highfield Solar Ltd - Clonin, Rhode	Granted 11/03/2021 Permitted
OCC ABP-315436	Application for Leave to Apply for Substitute Consent for peat extraction and all associated bog development works.	Bord na mona - Derryhinch, Drumman, Derryarkin and Ballybeg Bogs located in Counties Meath, Westmeath and Offaly.	Awaiting decision Submitted
OCC 20494	A 10 year permission for the construction of a solar PV development.	OBM Solar Ltd. Srah Greenhilld and Wood, Rhode	Granted 26/04/2021 Permitted
OCC 21488	A 10 year permission for the construction of an extension to the permitted solar PV and battery storage development permitted.	OBM Solar Ltd. Srah Greenhilld and Wood, Rhode	Granted 10/12/21 Permitted
WCC 21515	The development comprising 275MWe reserve gas-fired generator. An EIAR has been submitted.	Lumcloon Energy Ltd, Kiltotan and Collinstown and Oldtown, Rochfortbridge, Co Westmeath	Granted 11/05/2022 Permitted
WCC 21532	The Energy Storage System (ESS) development. Permission is sought for 10 years. An EIAR has been prepared.	Lumcloon Energy Ltd, Kiltotan and Collinstown and Oldtown, Rochfortbridge, Co Westmeath.	Granted 11/05/2022 Permitted
ABP- OCC PA19.PA00 32	A 15-year planning permission, for development of the Yellow River Wind Farm (96MW).	Green Wind Energy Ltd Rhode, Co. Offaly	Granted with conditions - 03/06/2014 In Construction
-ABP - OCC TBC	Emerging project to deliver a range of low to zero carbon energy generation and storage assets across a land bank of over 5ha.	Rhode Derrygreenagh Bog Group	Potential Project
ABP / WCC TBC	Emerging project consisting of a gas connection corridor for Castlelost.	Castlelost	Potential Project

9.8.18 Most of these projects are sufficiently distant and of a certain nature and scale that there are no pathways for these to act in-combination with the Proposed Development. Of the developments which are relatively close to the Proposed Development, i.e. within c. 1km of the Site, there is no likelihood of in-combination effects with the ecological receptors addressed in this Chapter following mitigation measures outlined in respective projects.

9.8.19 With respect to the receptors for which there are residual effects identified from the Proposed Development, amphibians are likely to remain in suitable terrestrial habitat within 200-250m of breeding ponds, and therefore none of the projects identified will cumulatively impact amphibians or their habitat.

9.8.20 None of the projects identified will have impacts on breeding or wintering birds which may combine with the Proposed Development, due to the nature of these projects and their distance from the Proposed Development.

Summary of cumulative impacts

9.8.21 The scale and location of each of these plans and projects have been considered cumulatively with each other and the construction and operation of the Proposed Development. Any impacts arising would not cause significant effects to any ecological receptors over those already identified and considered in each assessment.

Table 9. 17: Summary of Cumulative Effects from the Power Plant Area with the Overall Project and Other Nearby Projects and Developments.

ECOLOGICAL FEATURE	HIGHEST VALUATION	IMPACTS	CONSTRUCTION PHASE	OPERATION PHASE	MITIGATION PROPOSED	RESIDUAL IMPACT SIGNIFICANCE	CUMULATIVE RESIDUAL IMPACT SIGNIFICANCE
			SIGNIFICANCE	SIGNIFICANCE			
Designated sites							
European sites (SAC, SPA)	International	Pollution	Significant	n/a	Yes	Not significant	Not significant
		Spread invasive species	Significant	n/a	Yes	Not significant	Not significant
National sites (NHA, pNHA)	National	None	n/a	n/a	None	n/a	n/a
Habitats							
	Local (Higher)	Habitat loss and damage	Significant	n/a	Yes	Not significant	Not significant
		Waterborne pollution	Significant	Moderate	Yes	Not significant	Not significant
		Spread of invasive species	Significant	n/a	Yes	Not significant	Not significant
		Airborne pollution		Not significant	No	Not significant	Not significant
Protected and Notable Species							
Bats	County	Loss of roosts Mortality or injury	Significant		Yes	Not significant	Slight (Local) (at construction and operation)
		Roost disturbance (light/noise)	Significant	Moderate	Yes	Slight (Local) (at construction and operation)	
		Loss of habitat / fragmentation	Slight		No	Not significant	Not significant
		Habitat disturbance (light/noise)	Slight	Moderate	Yes	Slight (Local) (at construction and operation)	Slight (Local) (at construction and operation)
Badger	Local	Loss of setts Mortality or injury	Significant	n/a	Yes	Not significant	Not significant
		Disturbance / displacement (human presence/light/noise)	Significant	Slight	Yes	Not significant	Not significant

ECOLOGICAL FEATURE	HIGHEST VALUATION	IMPACTS	CONSTRUCTION PHASE	OPERATION PHASE	MITIGATION PROPOSED	RESIDUAL IMPACT SIGNIFICANCE	CUMULATIVE RESIDUAL IMPACT SIGNIFICANCE
			SIGNIFICANCE	SIGNIFICANCE			
Otter	County	Mortality or injury	Moderate	n/a	Yes	Not significant	Not significant
		Disturbance / displacement (human presence/light/noise)	Moderate	Slight	Yes	Not significant	Not significant
		Pollution	Moderate	Moderate	Yes	Not significant	Not significant
Other protected mammals	Local	Mortality or injury Loss breeding / resting places Habitat damage and loss	Significant	n/a	Yes	Not significant	Not significant
		Disturbance / displacement (human presence/light/noise)	Significant	Slight	Yes	Not significant	Not significant
Marsh fritillary	County	Habitat loss Habitat damage Mortality or injury Disturbance / displacement	Significant	n/a	Yes	Not significant	Not significant
		Airborne pollution	n/a	Imperceptible	No	Imperceptible	Imperceptible
Amphibians	County	Habitat loss / damage / fragmentation	Significant	n/a	Yes	Slight, Local (at construction)	Slight, Local (at construction)
		Mortality or injury	Moderate	n/a	Yes	Slight, Local (at construction)	Slight, Local (at construction)
		Disturbance / displacement (human presence/light/noise)	Slight	Slight	Yes	Not significant	Not significant
		Waterborne pollution	Significant	Slight	Yes	Not significant	Not significant
		Airborne pollution	n/a	Imperceptible	No	Imperceptible	Imperceptible
Breeding birds	County	Mortality or injury Loss breeding habitat	Significant	n/a	Yes	Not significant	Not significant

ECOLOGICAL FEATURE	HIGHEST VALUATION	IMPACTS	CONSTRUCTION PHASE	OPERATION PHASE	MITIGATION PROPOSED	RESIDUAL IMPACT SIGNIFICANCE	CUMULATIVE RESIDUAL IMPACT SIGNIFICANCE
			SIGNIFICANCE	SIGNIFICANCE			
		Disturbance / displacement (human presence/light/noise)	Moderate	Not significant	Yes	Not significant	Not significant
Wintering birds	County	Disturbance / displacement (human presence/light/noise)	Slight	Not significant	Yes	Not significant	Not significant
Fisheries and aquatics	County	Mortality or injury Disturbance / displacement Pollution / sedimentation of habitat Temporary obstruction of fish passage	Significant	Moderate	Yes	Not significant	Not significant

**Depending on specific effects and the sensitivity of individual watercourses as per the Fisheries Assessment (Appendix 9D)*

Table 9. 18: Summary of Cumulative Effects from the Electricity Grid Connection with the Overall Project and Other Nearby Projects and Developments.

ECOLOGICAL FEATURE	HIGHEST VALUATION	IMPACTS	CONSTRUCTION PHASE	OPERATION PHASE	MITIGATION PROPOSED	RESIDUAL IMPACT SIGNIFICANCE	CUMULATIVE RESIDUAL IMPACT SIGNIFICANCE
			SIGNIFICANCE	SIGNIFICANCE			
Designated sites							
European sites (SAC, SPA)	International	Pollution	Significant	n/a	Yes	Not significant	Not significant
		Spread invasive species	Significant	n/a	Yes	Not significant	Not significant
National sites (NHA, pNHA)	National	None	n/a	n/a	None	n/a	n/a
Habitats							
	Local (Higher)	Habitat loss and damage	Significant	n/a	Yes	Not significant	Not significant
		Waterborne pollution	Significant	Moderate	Yes	Not significant	Not significant
		Spread of invasive species	Significant	n/a	Yes	Not significant	Not significant
		Airborne pollution		Not significant	No	Not significant	Not significant

ECOLOGICAL FEATURE	HIGHEST VALUATION	IMPACTS	CONSTRUCTION PHASE	OPERATION PHASE	MITIGATION PROPOSED	RESIDUAL IMPACT SIGNIFICANCE	CUMULATIVE RESIDUAL IMPACT SIGNIFICANCE
			SIGNIFICANCE	SIGNIFICANCE			
Protected and Notable Species							
Bats	County	Loss of roosts Mortality or injury	Significant		Yes	Not significant	Not significant
		Roost disturbance (light/noise)	Significant	Moderate	Yes	Not significant	Not significant
		Loss of habitat / fragmentation	Slight		No	Not significant	Not significant
		Habitat disturbance (light/noise)	Slight	Moderate	Yes	Not significant	Not significant
Badger	Local	Loss of setts Mortality or injury Loss of habitat / fragmentation	Significant	n/a	Yes	Slight (Local) (at construction)	Slight (Local) (at construction)
		Disturbance / displacement (human presence/light/noise)	Significant	Slight	Yes	Slight (Local) (at operation)	Slight (Local) (at operation)
Otter	County	Mortality or injury	Significant	n/a	Yes	Not significant	Not significant
		Disturbance / displacement (human presence/light/noise)	Significant	Slight	Yes	Not significant	Not significant
		Pollution	Significant	Slight	Yes	Not significant	Not significant
Other protected mammals	Local	Mortality or injury Loss breeding / resting places Habitat damage and loss	Significant	n/a	Yes	Not significant	Not significant
		Disturbance / displacement (human presence/light/noise)	Significant	Slight	Yes	Not significant	Not significant
Marsh fritillary	County	Habitat loss Habitat damage Mortality or injury	Significant	n/a	Yes	Not significant	Not significant

ECOLOGICAL FEATURE	HIGHEST VALUATION	IMPACTS	CONSTRUCTION PHASE	OPERATION PHASE	MITIGATION PROPOSED	RESIDUAL IMPACT SIGNIFICANCE	CUMULATIVE RESIDUAL IMPACT SIGNIFICANCE
			SIGNIFICANCE	SIGNIFICANCE			
		Disturbance / displacement					
		Airborne pollution	n/a	Imperceptible	No	Imperceptible	Imperceptible
Amphibians	County	Habitat loss / damage / fragmentation	Significant	n/a	Yes	Slight, Local (at construction)	Slight, Local (at construction)
		Mortality or injury	Moderate	n/a	Yes	Slight, Local (at construction)	Slight, Local (at construction)
		Disturbance / displacement (human presence/light/noise)	Slight	Slight	Yes	Not significant	Not significant
		Waterborne pollution	Significant	Slight	Yes	Not significant	Not significant
		Airborne pollution	n/a	Imperceptible	No	Not significant	Not significant
Breeding birds	County	Mortality or injury Loss breeding habitat	Moderate	n/a	Yes	Not significant	Not significant
		Disturbance / displacement (human presence/light/noise)	Moderate	Imperceptible	Yes	Not significant	Not significant
		Mortality and injury through collision with overhead lines or pylons	n/a	Significant	Yes	Slight, Local to County (at operation)	Slight, Local to County (at operation)
		Displacement / habitat fragmentation due to presence of overhead lines or pylons	n/a	Slight	Yes	Slight, Local to County (at operation)	Slight, Local to County (at operation)
Wintering birds	County	Disturbance / displacement (human presence/light/noise)	Slight	n/a	Yes	Not significant	Not significant
		Mortality and injury through collision with overhead lines or pylons	n/a	Significant	Yes	Slight, Local to County (at operation)	Slight, Local to County (at operation)

ECOLOGICAL FEATURE	HIGHEST VALUATION	IMPACTS	CONSTRUCTION PHASE	OPERATION PHASE	MITIGATION PROPOSED	RESIDUAL IMPACT SIGNIFICANCE	CUMULATIVE RESIDUAL IMPACT SIGNIFICANCE
			SIGNIFICANCE	SIGNIFICANCE			
		Displacement / habitat fragmentation due to presence of overhead lines or pylons	n/a	Slight	Yes	Slight, Local to County (at operation)	Slight, Local to County (at operation)
Fisheries and aquatics	National	Mortality or injury Disturbance / displacement Pollution / sedimentation of habitat Temporary obstruction of fish passage	Significant	Significant	Yes	Not significant	Not significant

**Depending on specific effects and the sensitivity of individual watercourses as per the Fisheries Assessment (Appendix 9D)*

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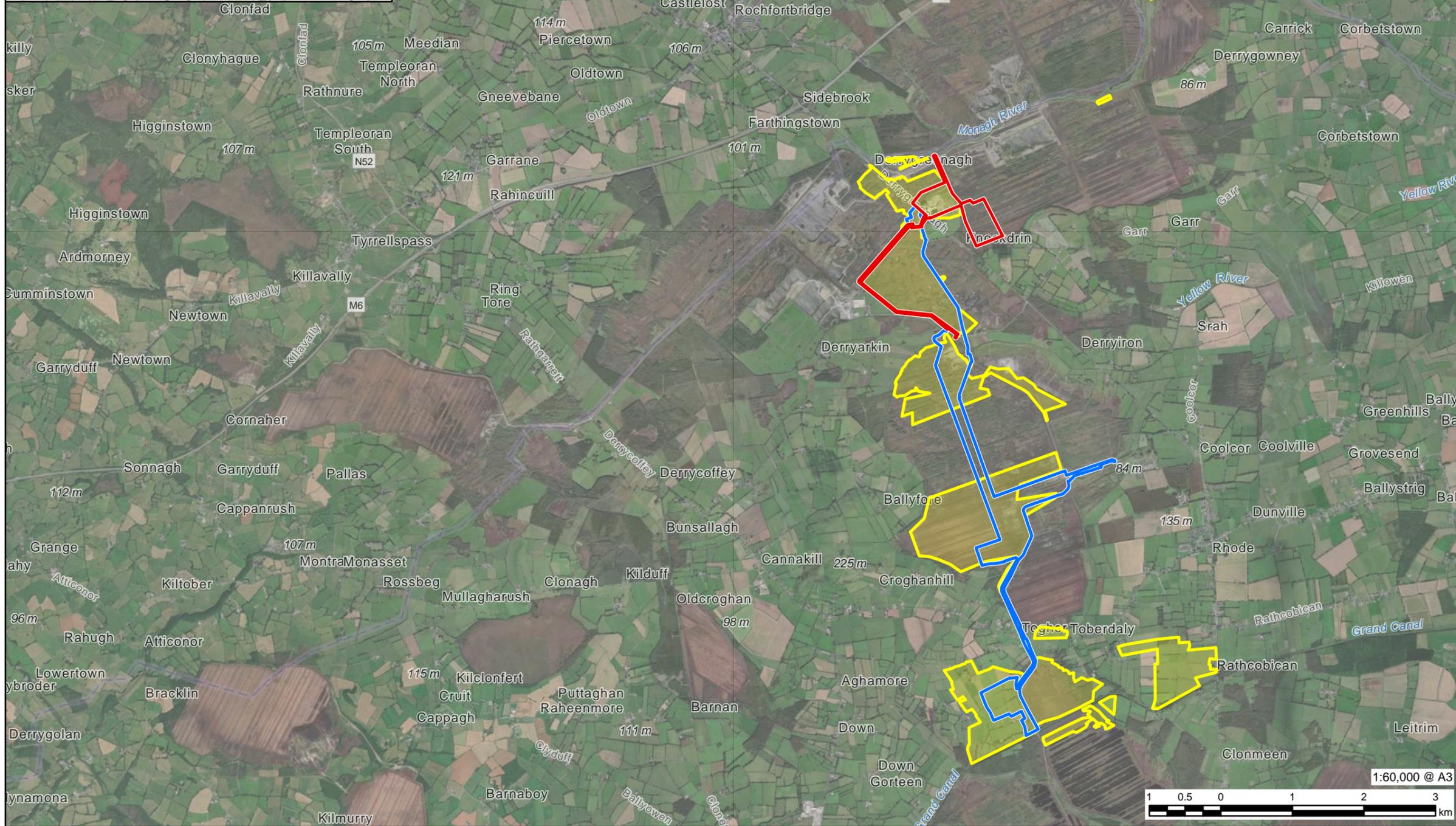
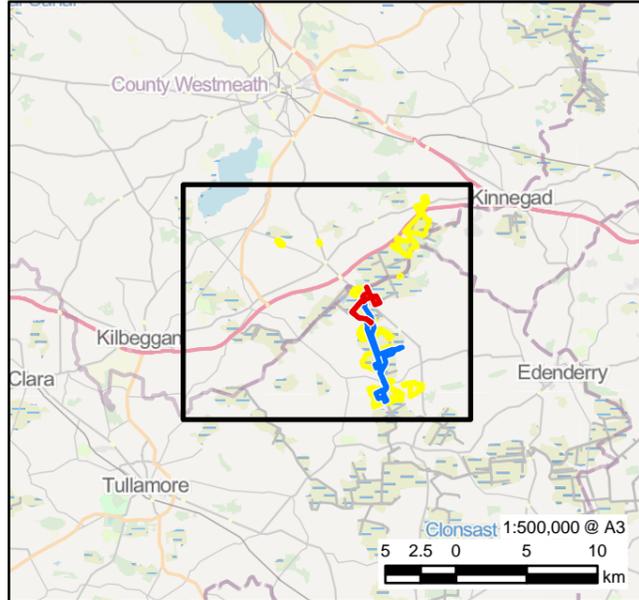
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LEGEND

- ▭ Power Plant Area Boundary
- ▭ Electricity Grid Connection Boundary
- ▭ Woodrow APEM Survey Area

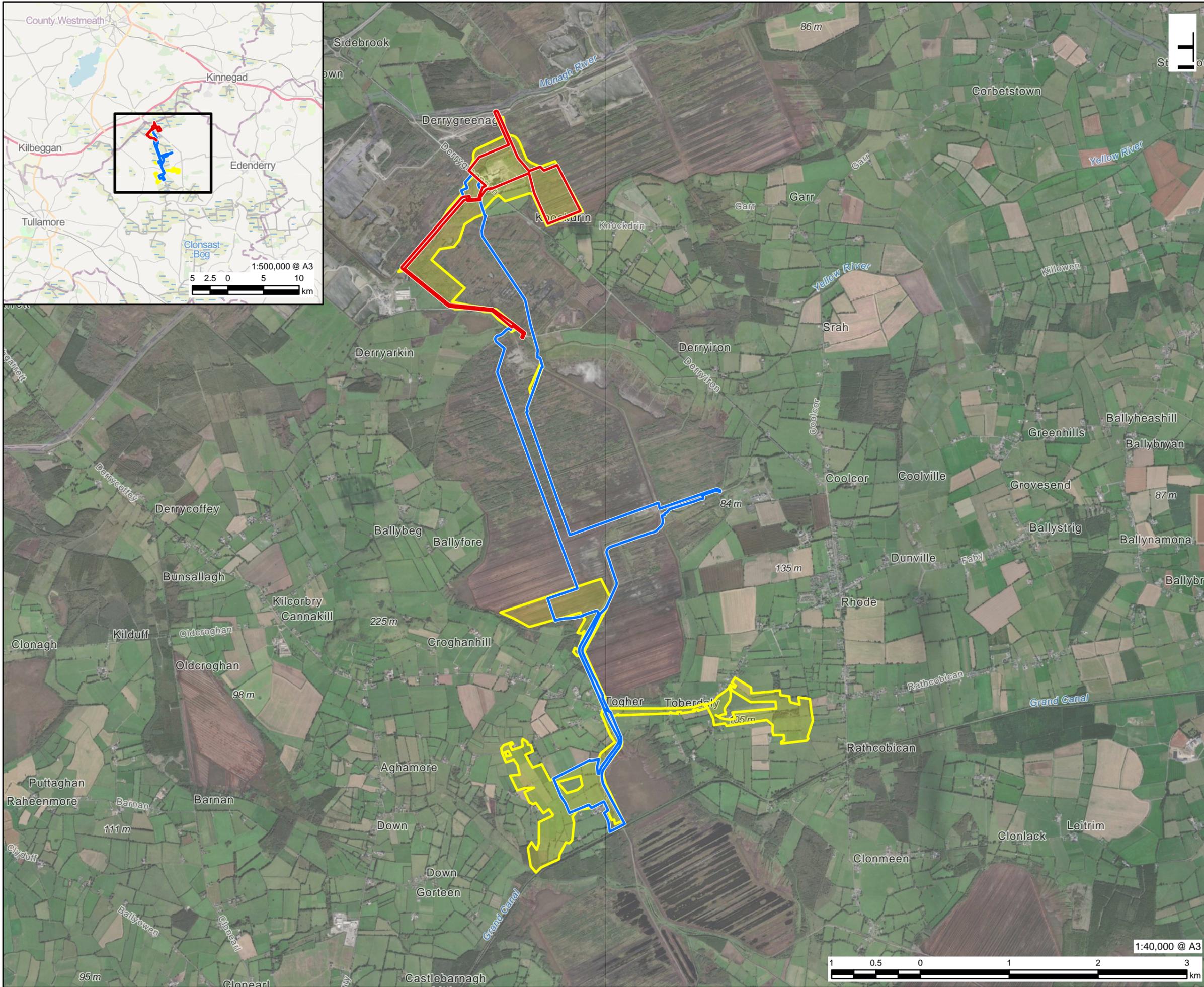
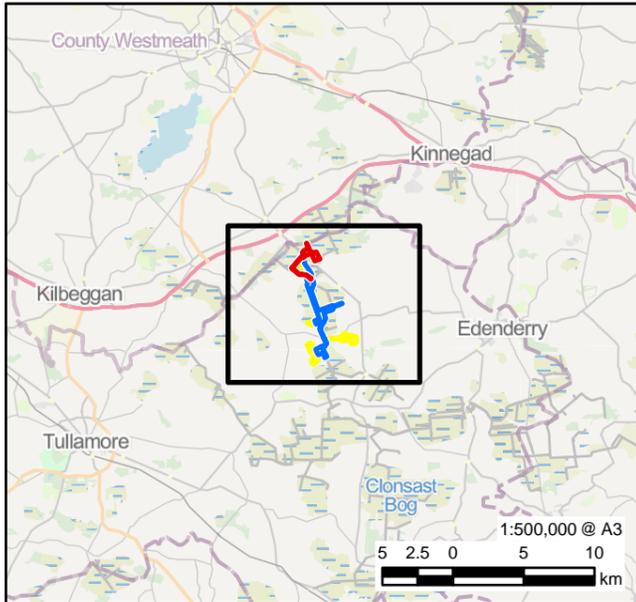
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ISSUE PURPOSE
FOR ISSUE
PROJECT NUMBER
60699676
FIGURE TITLE
Survey Area - Woodrow APEM

FIGURE NUMBER
Figure 9.1a

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LEGEND

	Power Plant Area Boundary
	Electricity Grid Connection Boundary
	AECOM Survey Area

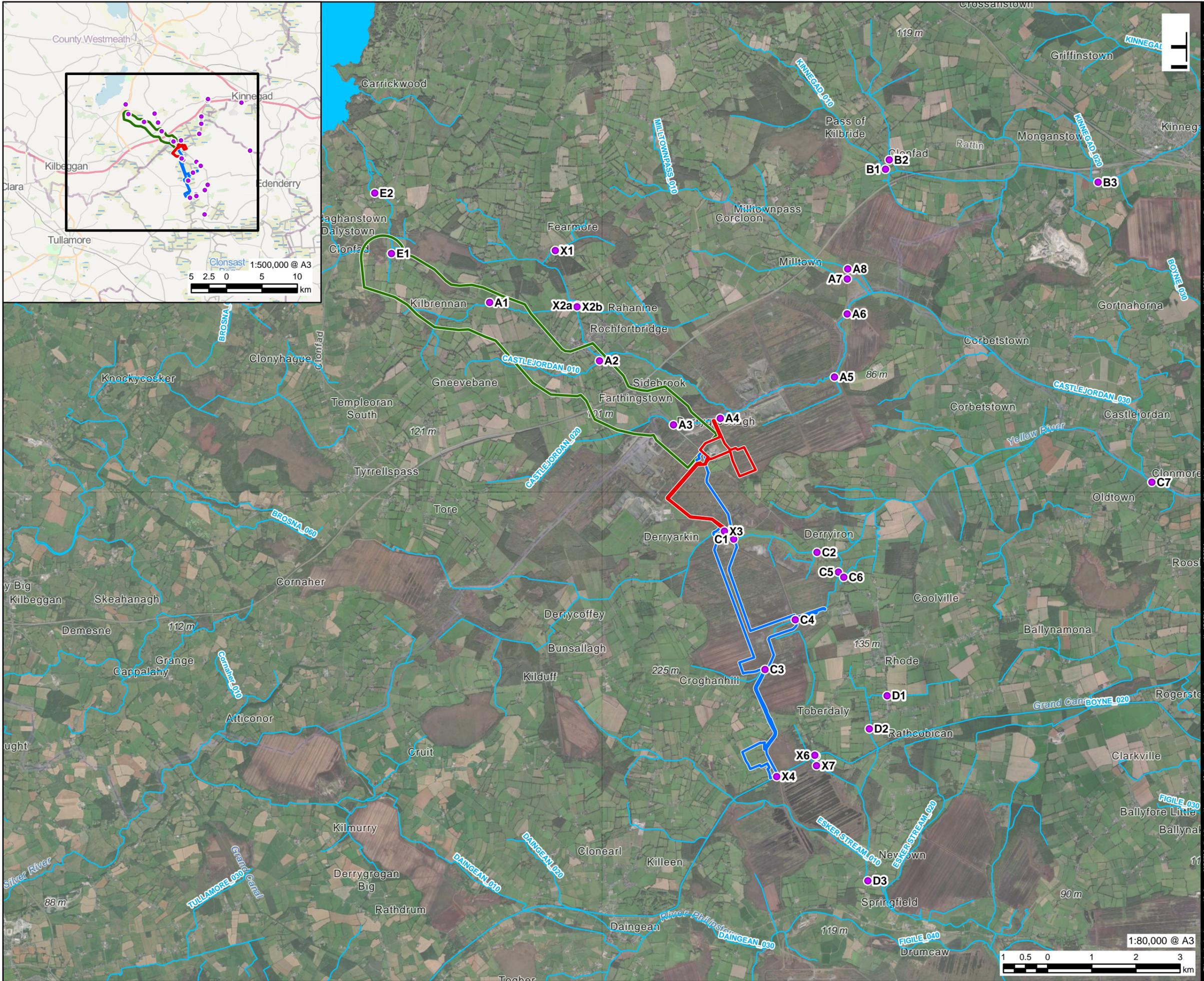
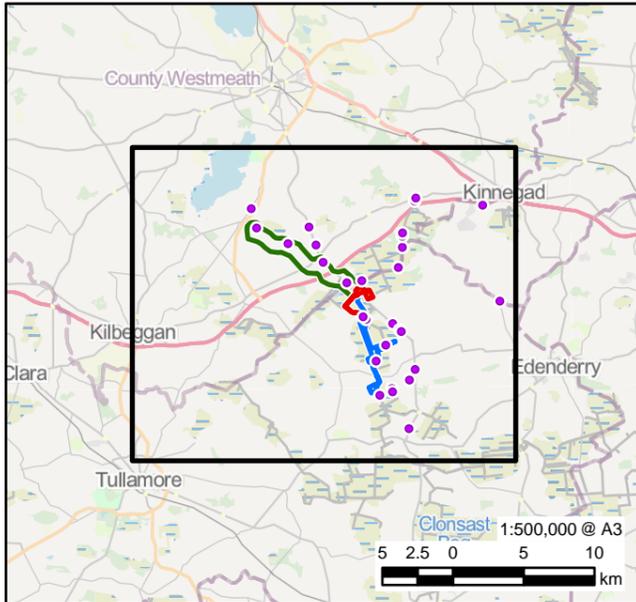
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ISSUE PURPOSE
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PROJECT NUMBER
60699676
FIGURE TITLE
Survey Area - AECOM

FIGURE NUMBER
Figure 9.1b

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Derrygreenagh Power Station

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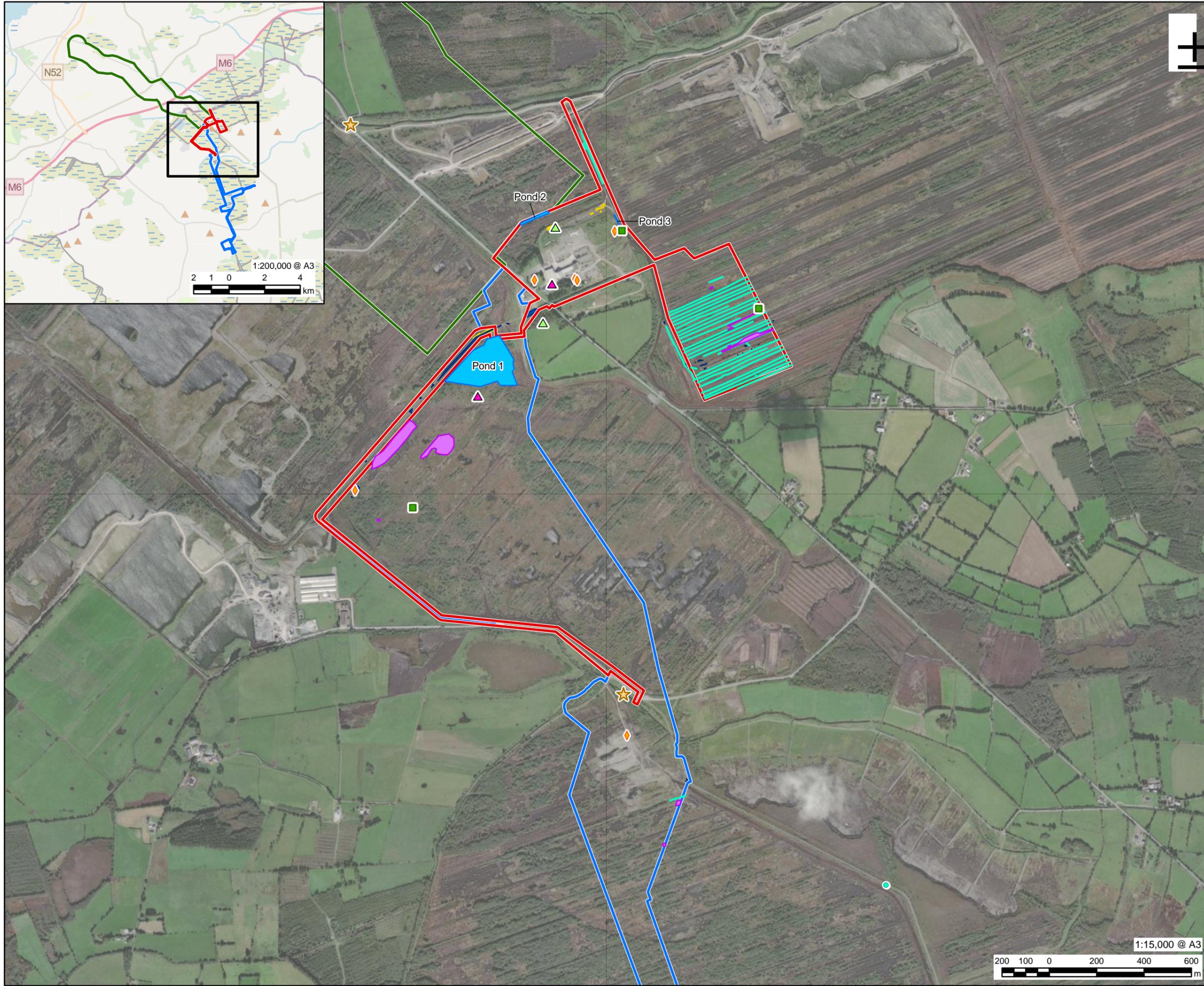
- LEGEND**
- ▬ Power Plant Area Boundary
 - ▬ Electricity Grid Connection Boundary
 - ▬ Gas Connection Corridor Boundary
 - Triturus Survey Sites
 - ▬ Watercourse
 - ▬ Waterbody

NOTES

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ISSUE PURPOSE
FOR ISSUE
PROJECT NUMBER
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FIGURE TITLE
Triturus Survey Sites
FIGURE NUMBER
Figure 9.1c

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- ▭ Power Plant Area Boundary
- ▭ Electricity Grid Connection Boundary
- ▭ Gas Connection Corridor Boundary
- Incidental sightings of protected/notable Species*
- Common Frog Record
- ◆ Irish Hare Record
- Otter Record*
- ★ Spraint
- Pine Marten Record*
- ▲ Droppings
- ▲ Live
- Amphibians*
- ▭ eDNA Survey – Positive for Smooth Newt
- ▭ Suitable Amphibian Habitat – Pond/Wetland
- ▭ Suitable Amphibian Habitat – Ditch
- Habitats*
- ▭ Devils Bit Scabious
- ▭ Potential Marsh Fritillary Habitat
- Marsh Fritillary Larval Webs

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FIGURE TITLE

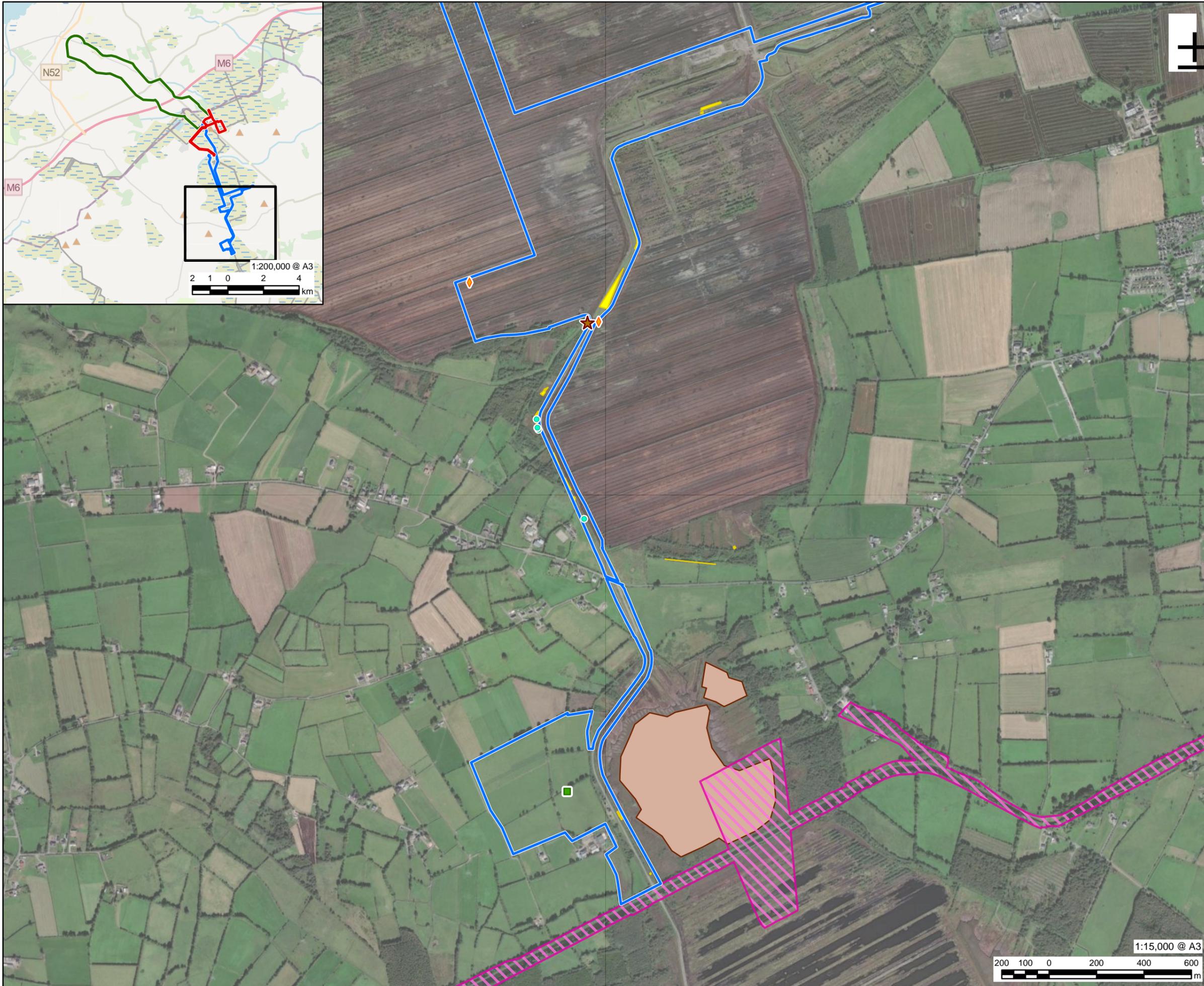
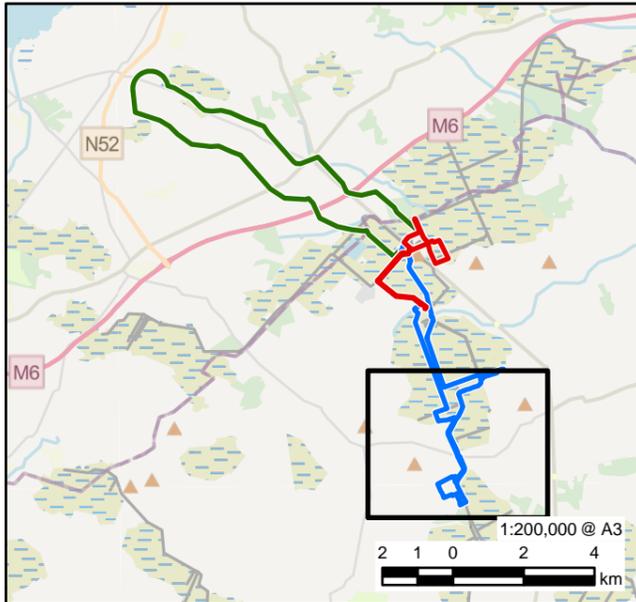
Ecological Constraints (Page 1 of 2)

FIGURE NUMBER

Figure 9.2a

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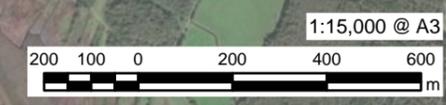
- LEGEND**
- Electricity Grid Connection Boundary
 - Incidental sightings of protected/notable Species*
 - Common Frog Record
 - Irish Hare Record
 - Otter Record*
 - Holt
 - Habitats*
 - Potential Marsh Fritillary Habitat
 - Annex I Habitat – Active Raised Bogs (7110)
 - Marsh Fritillary Larval Webs
 - Designated Sites*
 - Grand Canal - Proposed Natural Heritage Area (pNHA)

NOTES

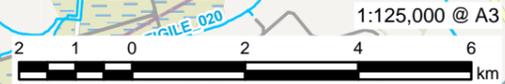
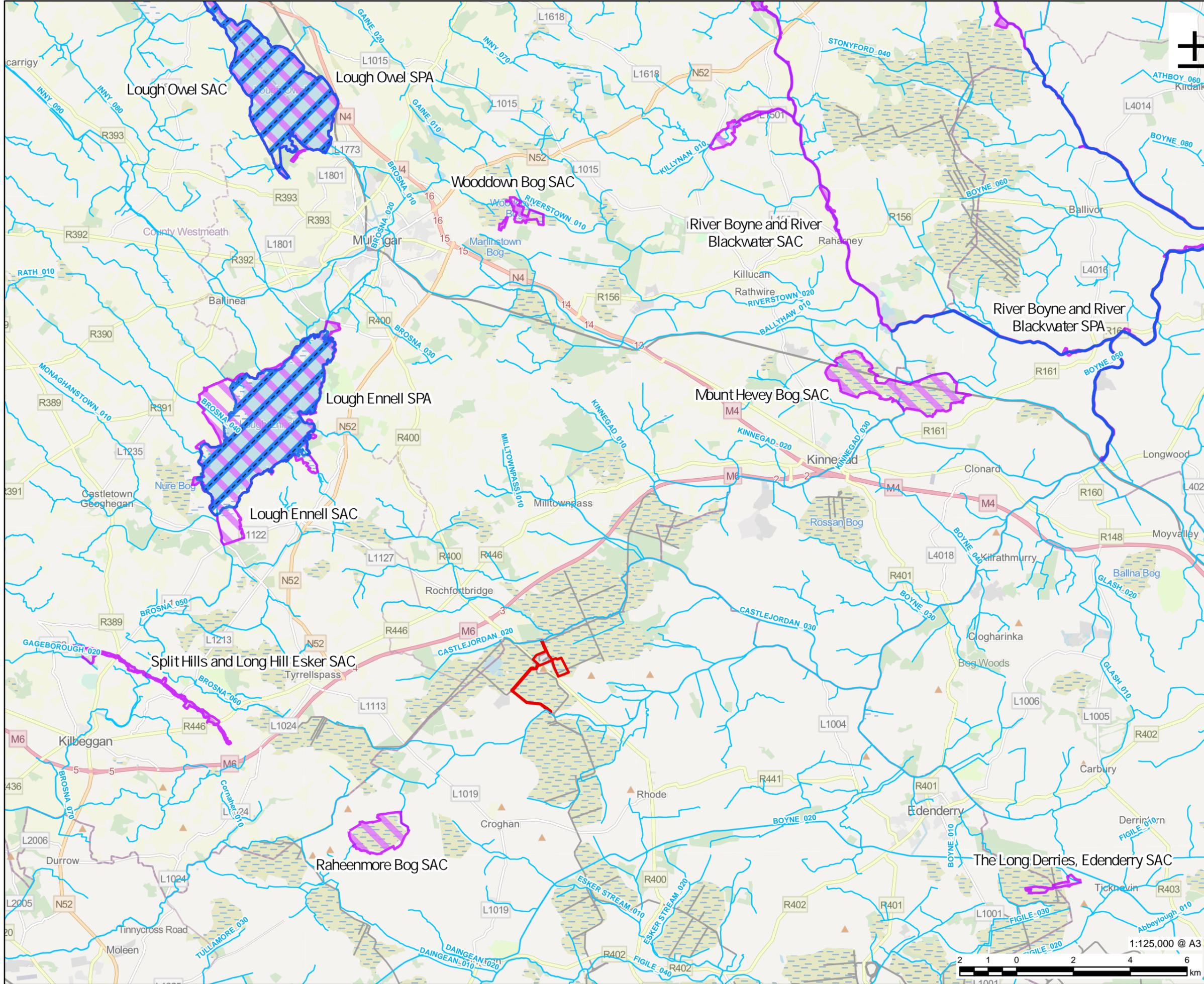
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FIGURE TITLE
Ecological Constraints (Page 2 of 2)

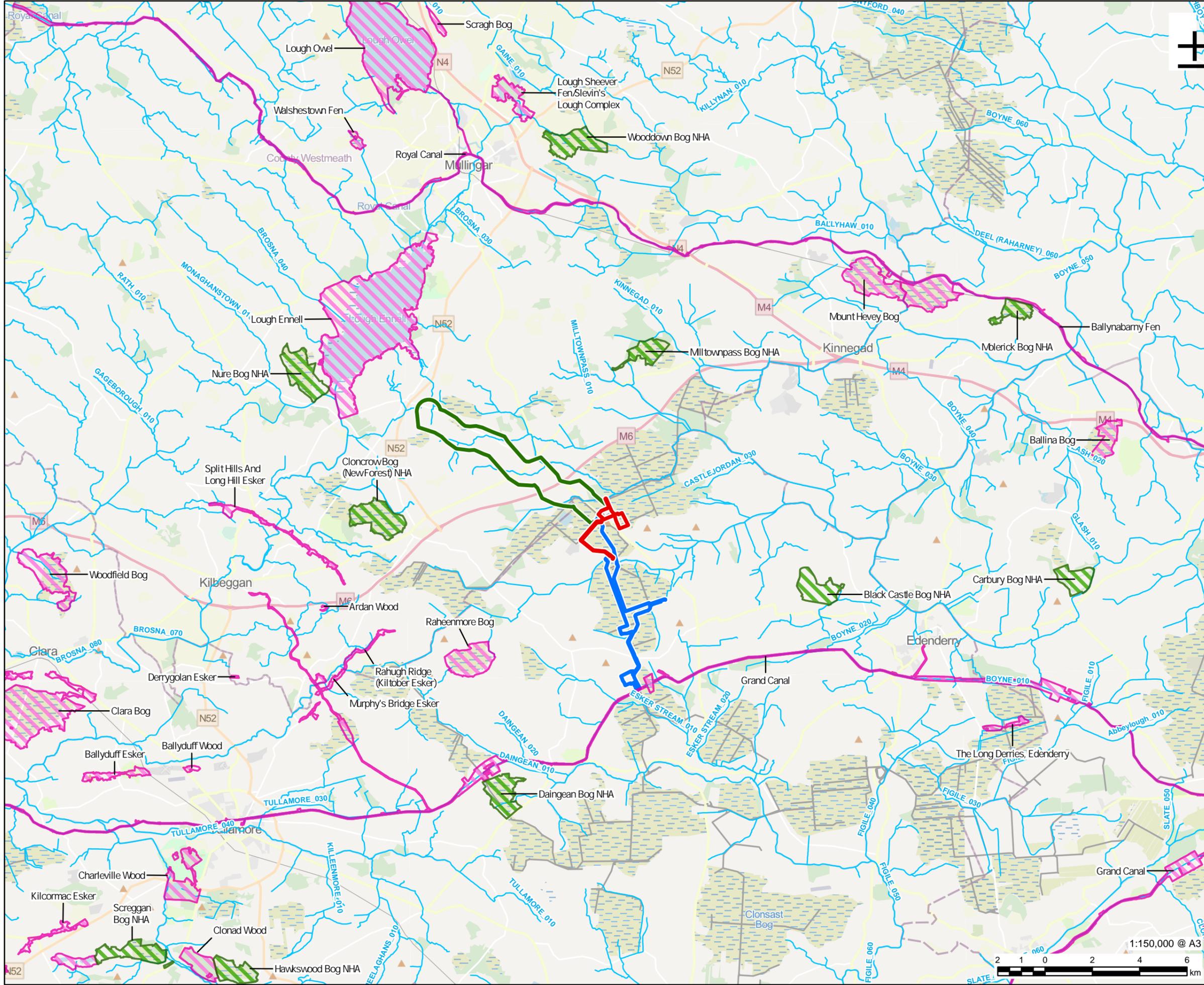
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Figure 9.2b



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LEGEND

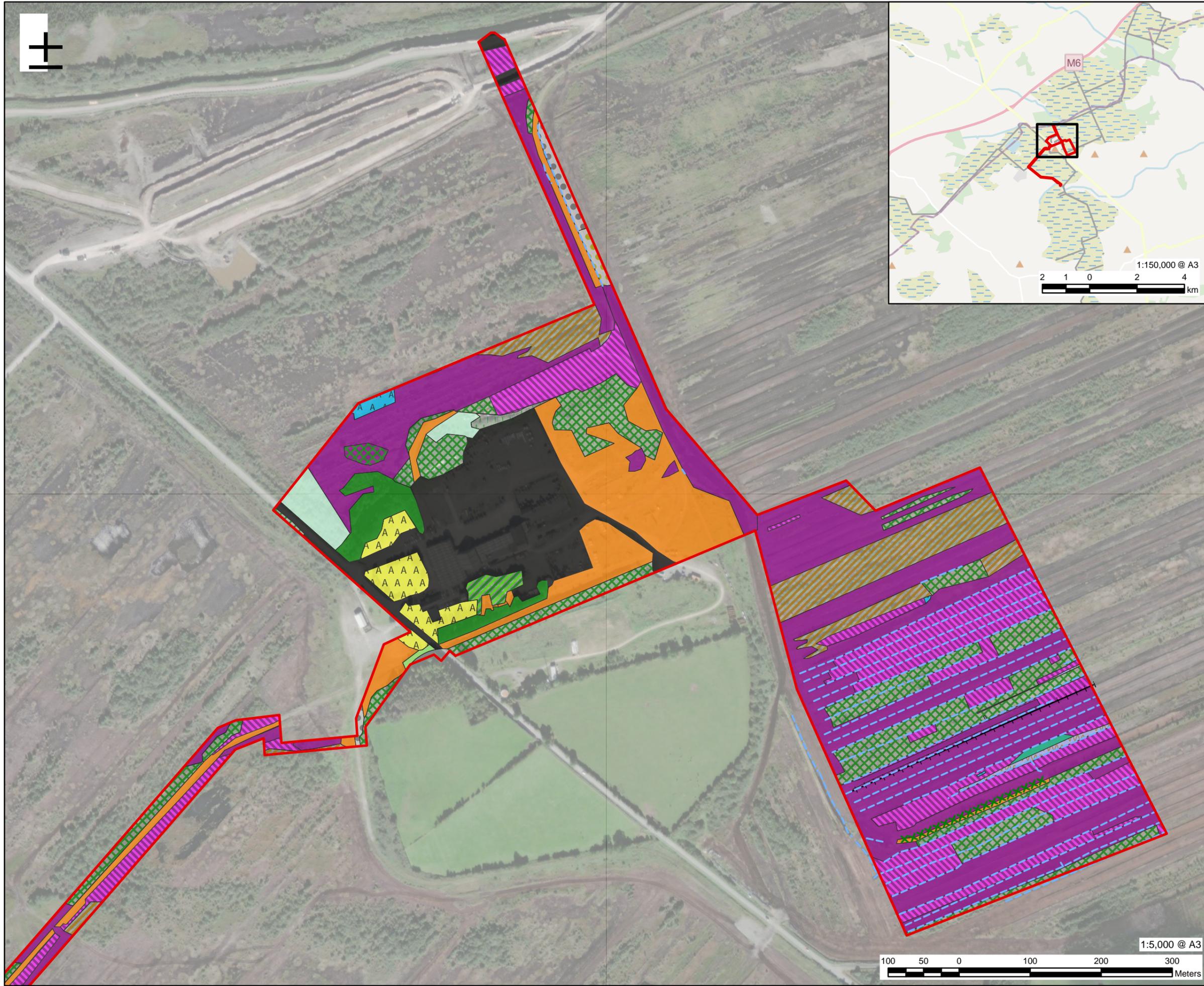
- Power Plant Area Boundary
- Electricity Grid Connection Boundary
- Gas Connection Corridor Boundary
- Designated Sites**
- Natural Heritage Area (NHA)
- Proposed Natural Heritage Area (pNHA)

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FIGURE TITLE
NHA and pNHA Sites in Proximity to the Proposed Development and Overall Project
FIGURE NUMBER
Figure 9.4

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LEGEND

- Power Plant Area Boundary
- Fossit Habitat Classification*
- BL3 - Buildings and artificial surfaces
- ED2 - Spoil and bare ground
- ED3 - Recolonising bare ground
- FL2 - Acid oligotrophic lakes
- FS1 - Reed and large sedge swamps
- GA2 - Amenity grassland (improved)
- GM1 - Freshwater Marsh
- GS2 - Dry meadows and grassy verges
- PB4a - Cutover Bog (Bare)
- PB4b - Cutover Bog (Colonised by Vegetation)
- W - Woodland Habitat
- WD2 - Mixed broadleaved/conifer woodland
- WD4 - Conifer plantation
- WL2 - Treelines
- WN7 - Bog woodland
- WS1 - Scrub
- WS2 - Immature woodland
- BL2 - Earth banks
- FW4 - Drainage ditches
- XX WS1 - Scrub

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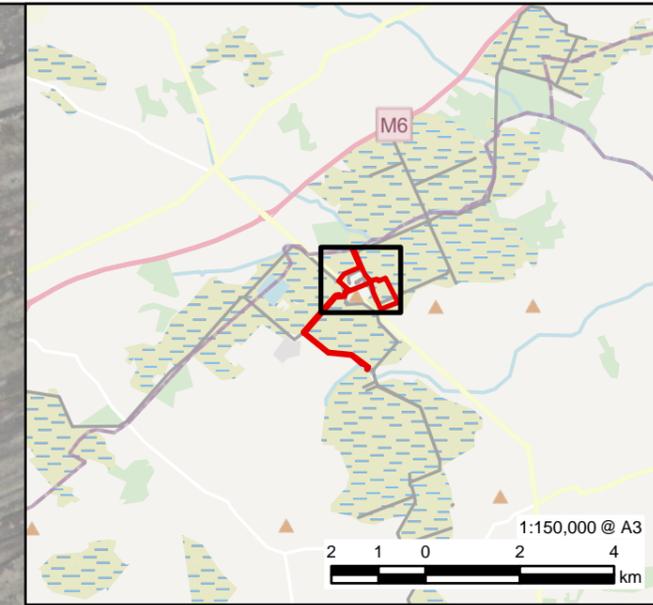
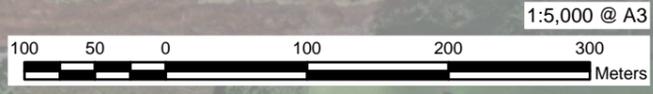
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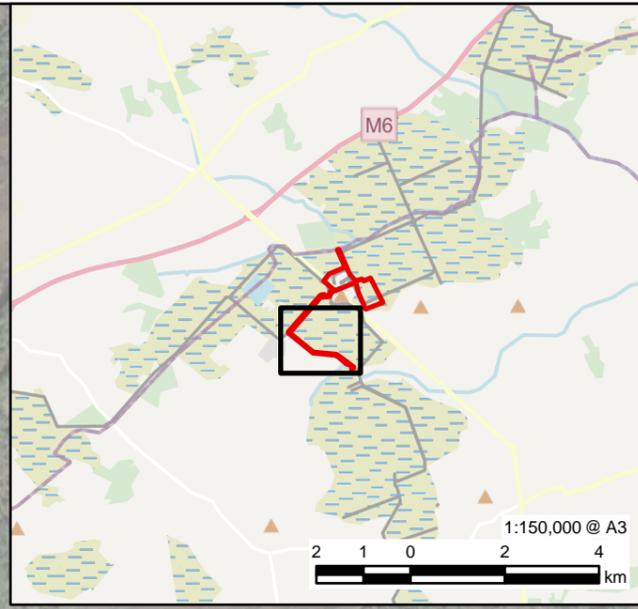
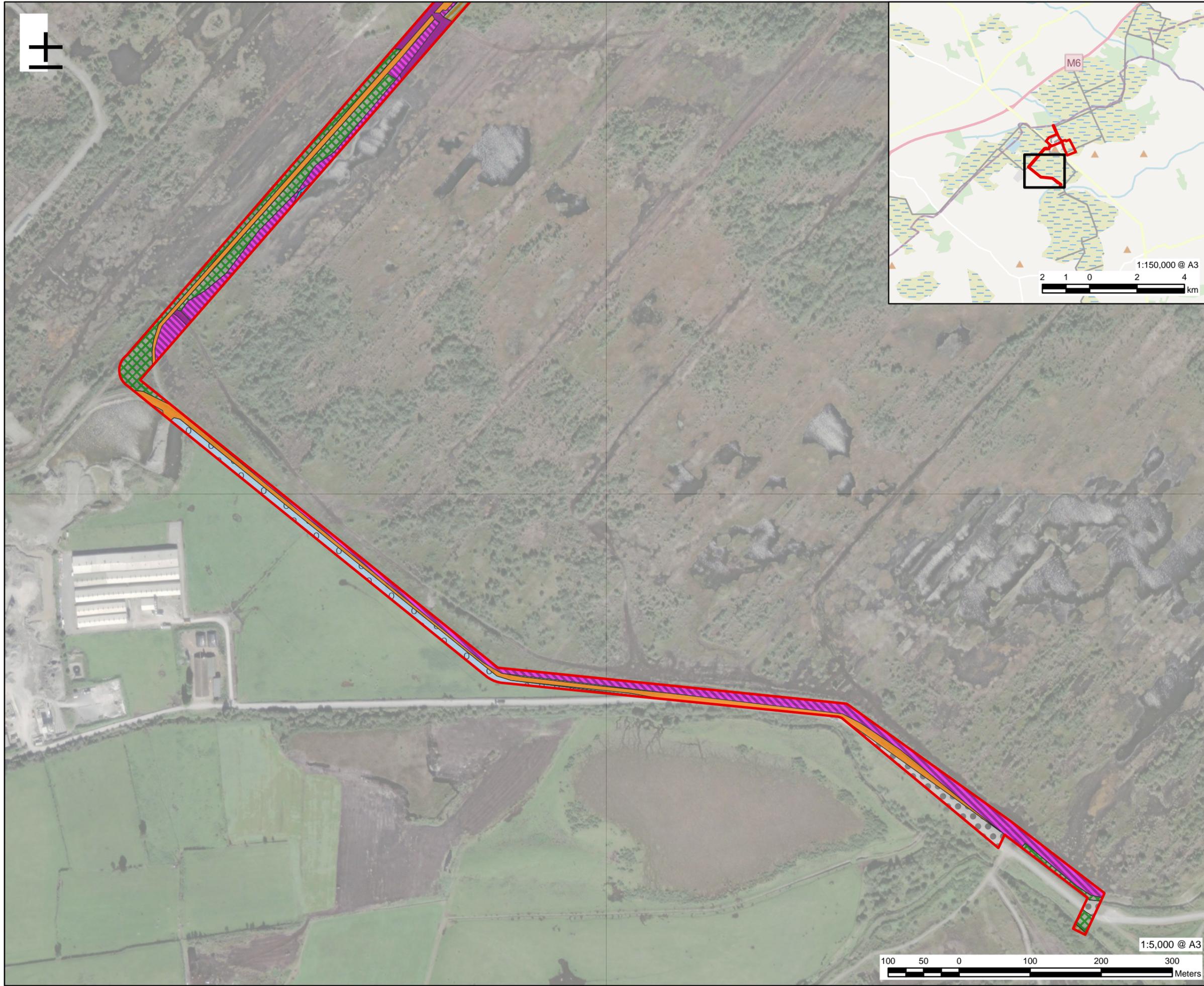
Fossit Habitats within the Power Plant Area (Page 1 of 2)

FIGURE NUMBER

Figure 9.5a



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- LEGEND**
- Power Plant Area Boundary
 - Fossit Habitat Classification*
 - ED2 - Spoil and bare ground
 - FL2 - Acid oligotrophic lakes
 - FL8 - Other artificial lakes and ponds
 - GS2 - Dry meadows and grassy verges
 - PB4a - Cutover Bog (Bare)
 - PB4b - Cutover Bog (Colonised by Vegetation)
 - WN7 - Bog woodland
 - WS1 - Scrub
 - FW4 - Drainage ditches

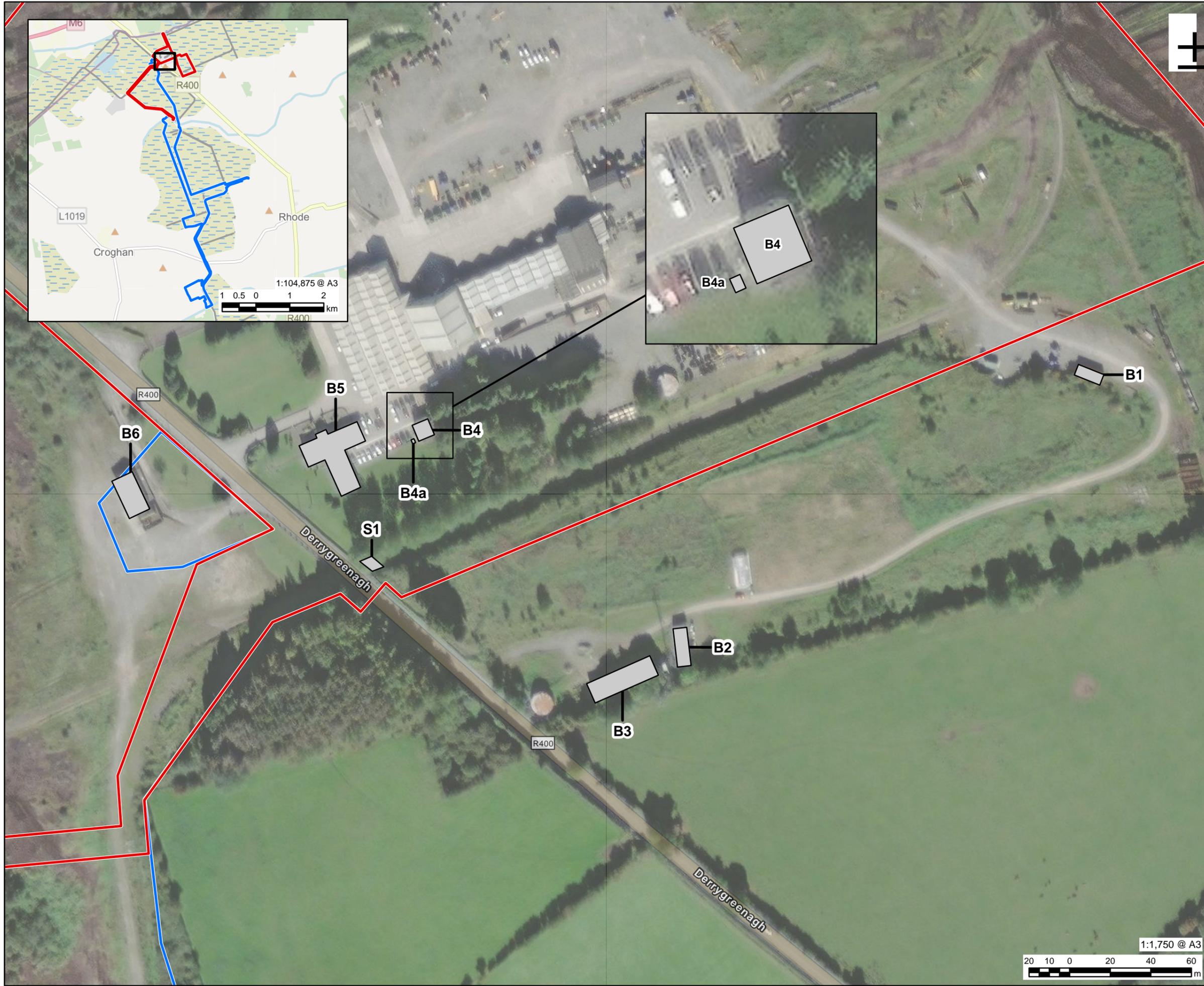
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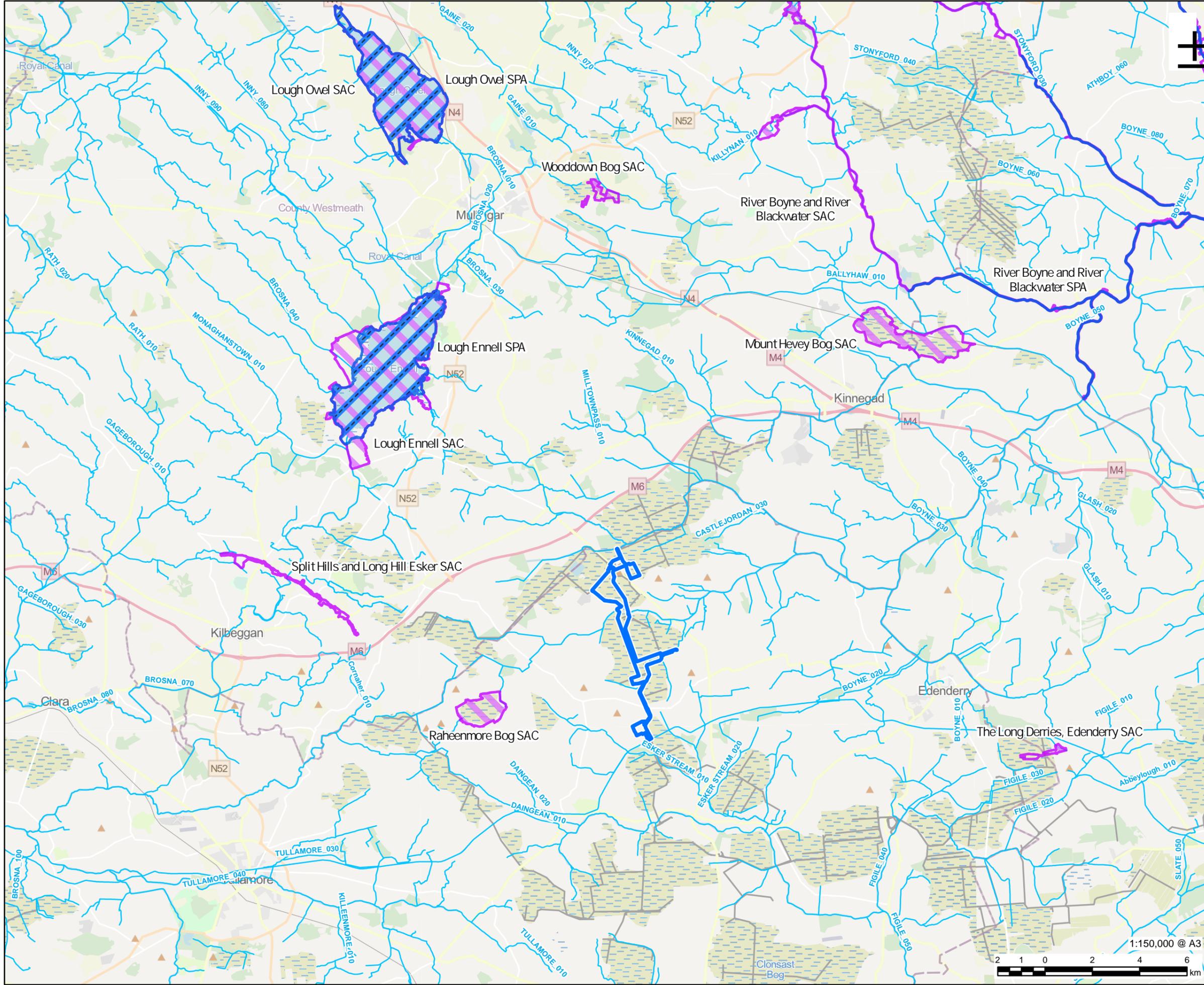
ISSUE PURPOSE
FOR ISSUE
PROJECT NUMBER
60699676
FIGURE TITLE
Fossit Habitats within the Power Plant Area (Page 2 of 2)

FIGURE NUMBER
Figure 9.5b

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PROJECT
Derrygreenagh Power Station

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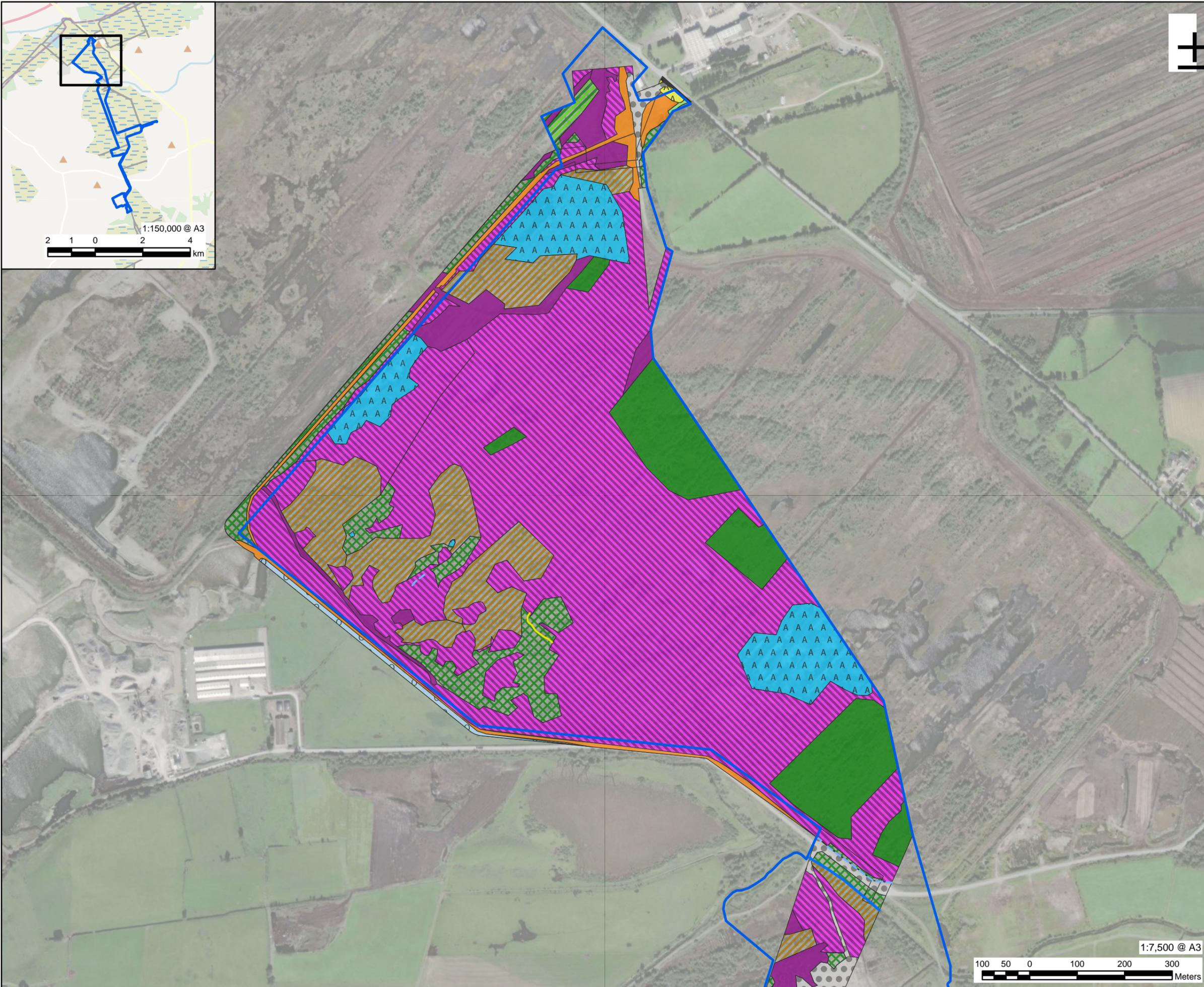
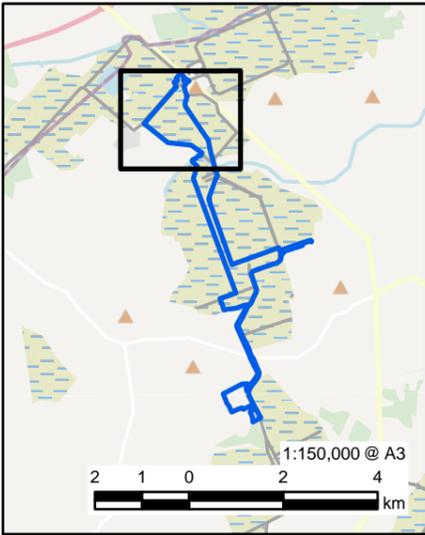
- LEGEND**
- Electricity Grid Connection Boundary
 - Water and Drainage**
 - Watercourse
 - Waterbody
 - Designated Sites**
 - Special Protection Area (SPA)
 - Special Area of Conservation (SAC)

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FIGURE TITLE
Designated Sites in Proximity to the Electricity Grid Connection

FIGURE NUMBER
Figure 9.7

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- Electricity Grid Connection Boundary
- Fossit Habitat Classification**
- BL3 - Buildings and artificial surfaces
- ED2 - Spoil and bare ground
- FL2 - Acid oligotrophic lakes
- FL8 - Other artificial lakes and ponds
- GA2 - Amenity grassland (improved)
- GS2 - Dry meadows and grassy verges
- PB4a - Cutover Bog (Bare)
- PB4b - Cutover Bog (Colonised by Vegetation)
- W - Woodland Habitat
- WD2 - Mixed broadleaved/conifer woodland
- WD4 - Conifer plantation
- WN7 - Bog woodland
- WS1 - Scrub
- FW2 - Depositing/lowland rivers
- FW4 - Drainage ditches
- Other

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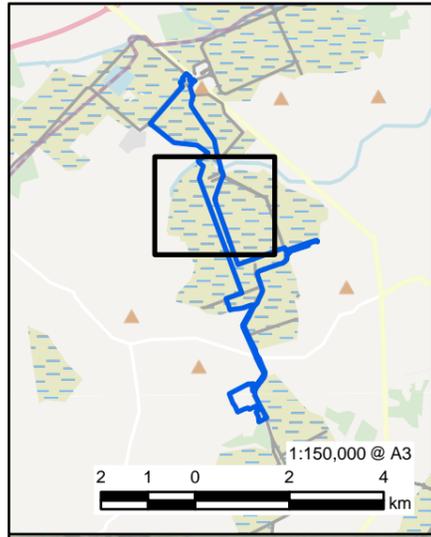
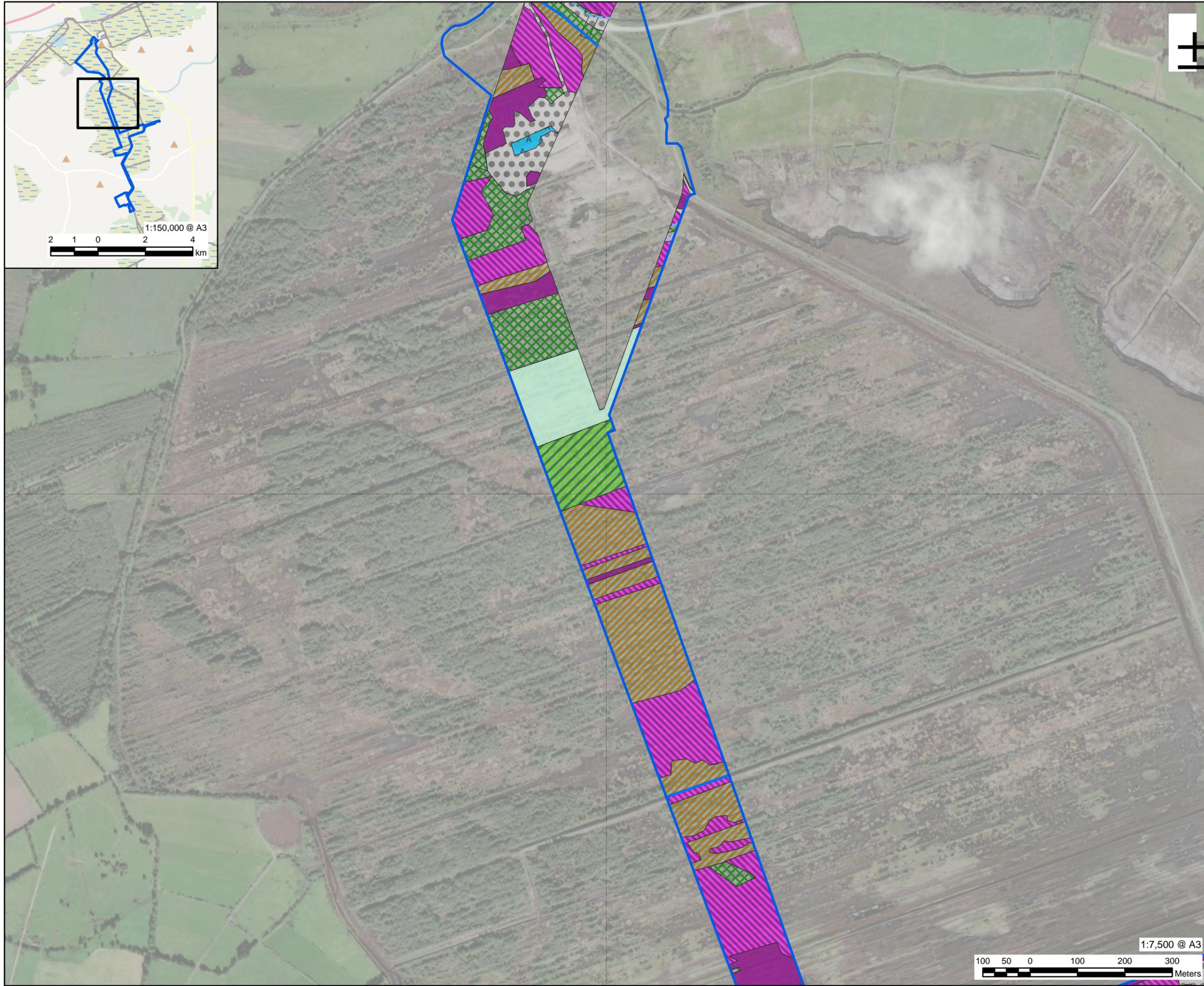
FIGURE TITLE

Fossit habitats within the Electricity Grid
Connection
(Page 1 of 4)

FIGURE NUMBER

Figure 9.8a

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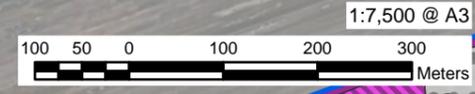


LEGEND

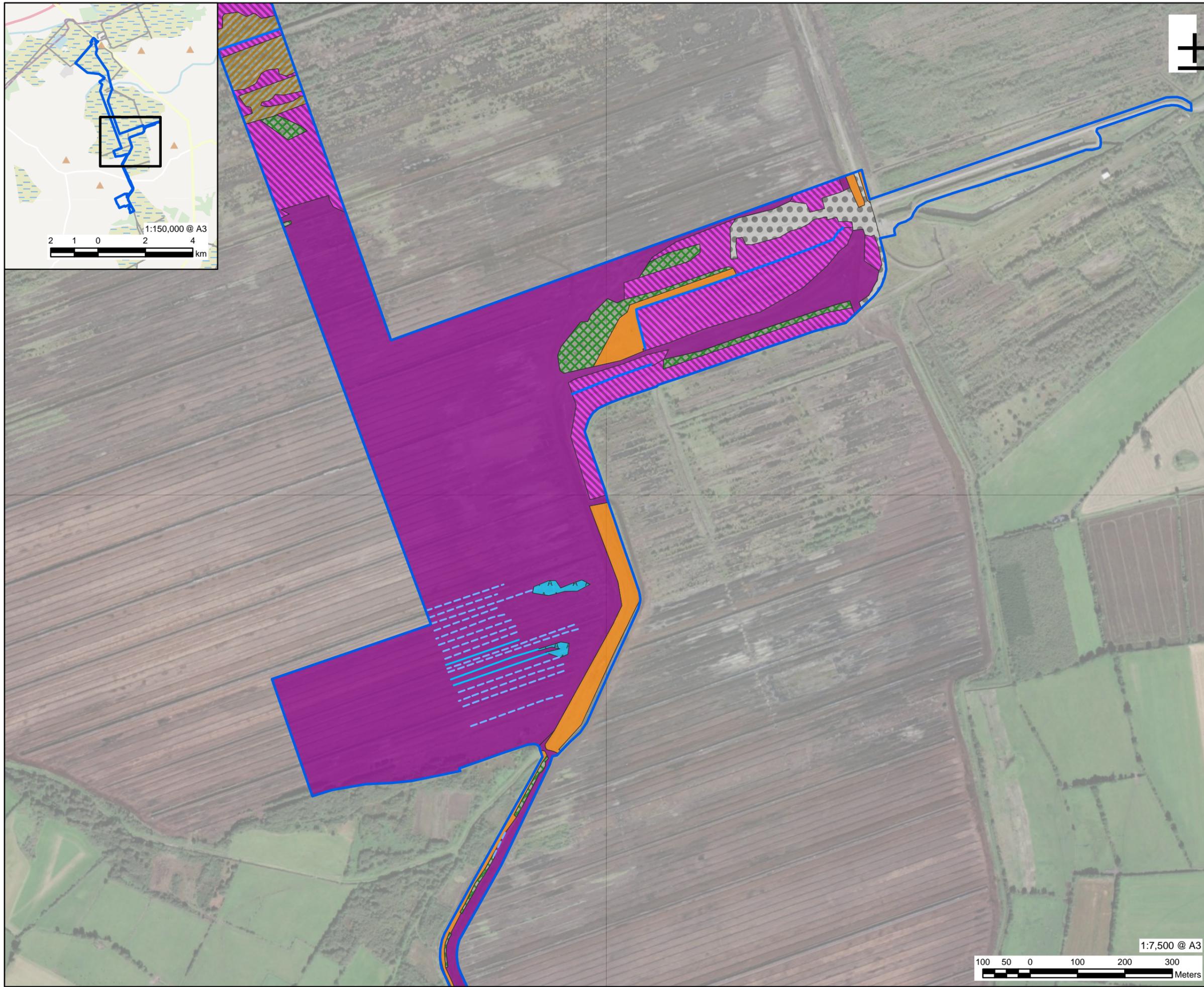
- Electricity Grid Connection Boundary
- Fossit Habitat Classification**
- ED2 - Spoil and bare ground
- FL2 - Acid oligotrophic lakes
- FS1 - Reed and large sedge swamps
- PB4a - Cutover Bog (Bare)
- PB4b - Cutover Bog (Colonised by Vegetation)
- W - Woodland Habitat
- WD2 - Mixed broadleaved/conifer woodland
- WN7 - Bog woodland
- WS1 - Scrub
- WS2 - Immature woodland
- FW2 - Depositing/lowland rivers
- FW4 - Drainage ditches

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60699676
FIGURE TITLE
Fossit habitats within the Electricity Grid
Connection
(Page 2 of 4)
FIGURE NUMBER
Figure 9.8b



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LEGEND

- Electricity Grid Connection Boundary
- Fossit Habitat Classification**
- ED2 - Spoil and bare ground
- FL2 - Acid oligotrophic lakes
- GS2 - Dry meadows and grassy verges
- PB4a - Cutover Bog (Bare)
- PB4b - Cutover Bog (Colonised by Vegetation)
- WN7 - Bog woodland
- WS1 - Scrub
- FW - Watercourses
- FW2 - Depositing/lowland rivers
- FW4 - Drainage ditches

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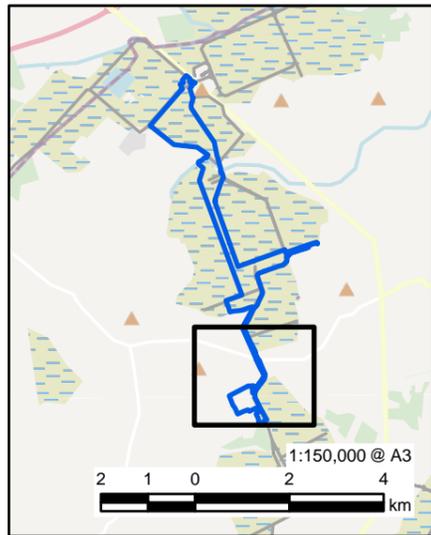
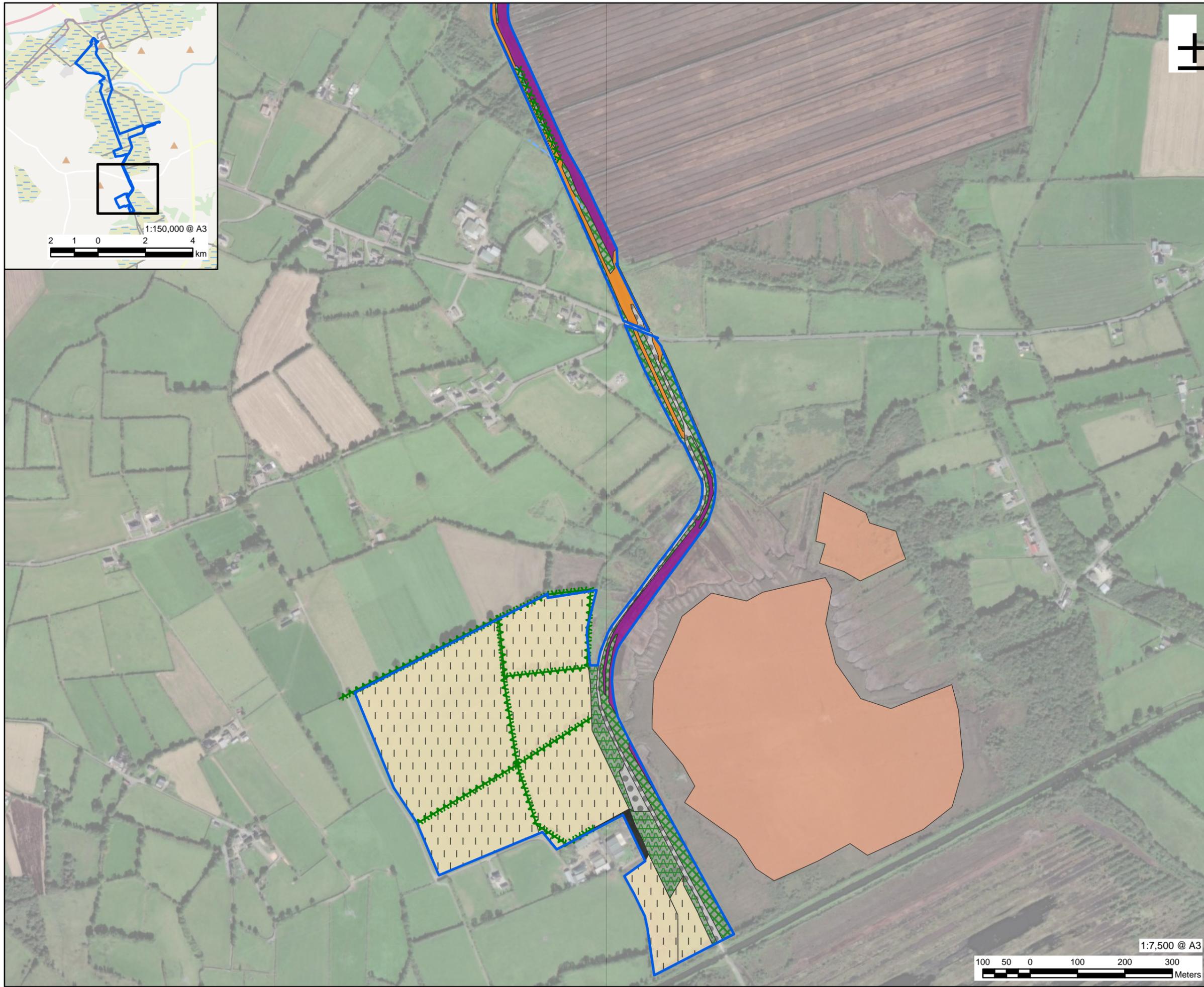
FIGURE TITLE

Fossit habitats within the Electricity Grid
Connection
(Page 3 of 4)

FIGURE NUMBER

Figure 9.8c





- Electricity Grid Connection Boundary
- Fossit Habitat Classification**
- BL3 - Buildings and artificial surfaces
- ED2 - Spoil and bare ground
- GA1 - Improved agricultural grassland
- GS2 - Dry meadows and grassy verges
- PB1 (7120) - Active Raised Bog
- PB4a - Cutover Bog (Bare)
- WL1 - Hedgerows
- WS1 - Scrub
- FW4 - Drainage ditches
- WL1 - Hedgerows
- WS1 - Scrub

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ISSUE PURPOSE

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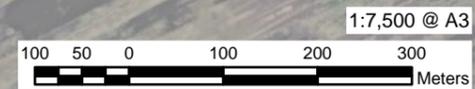
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FIGURE TITLE

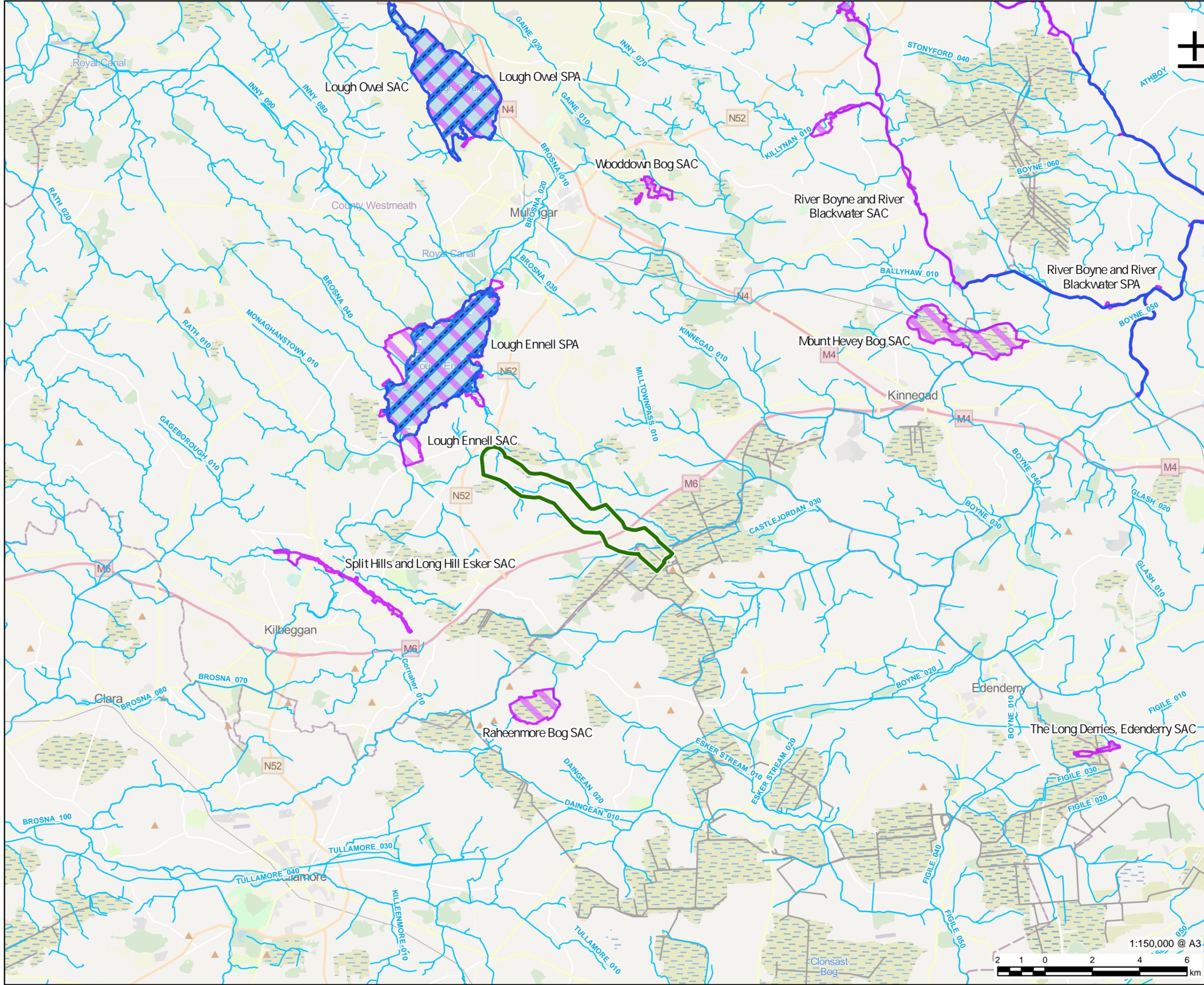
Fossit habitats within the Electricity Grid
Connection
(Page 4 of 4)

FIGURE NUMBER

Figure 9.8d



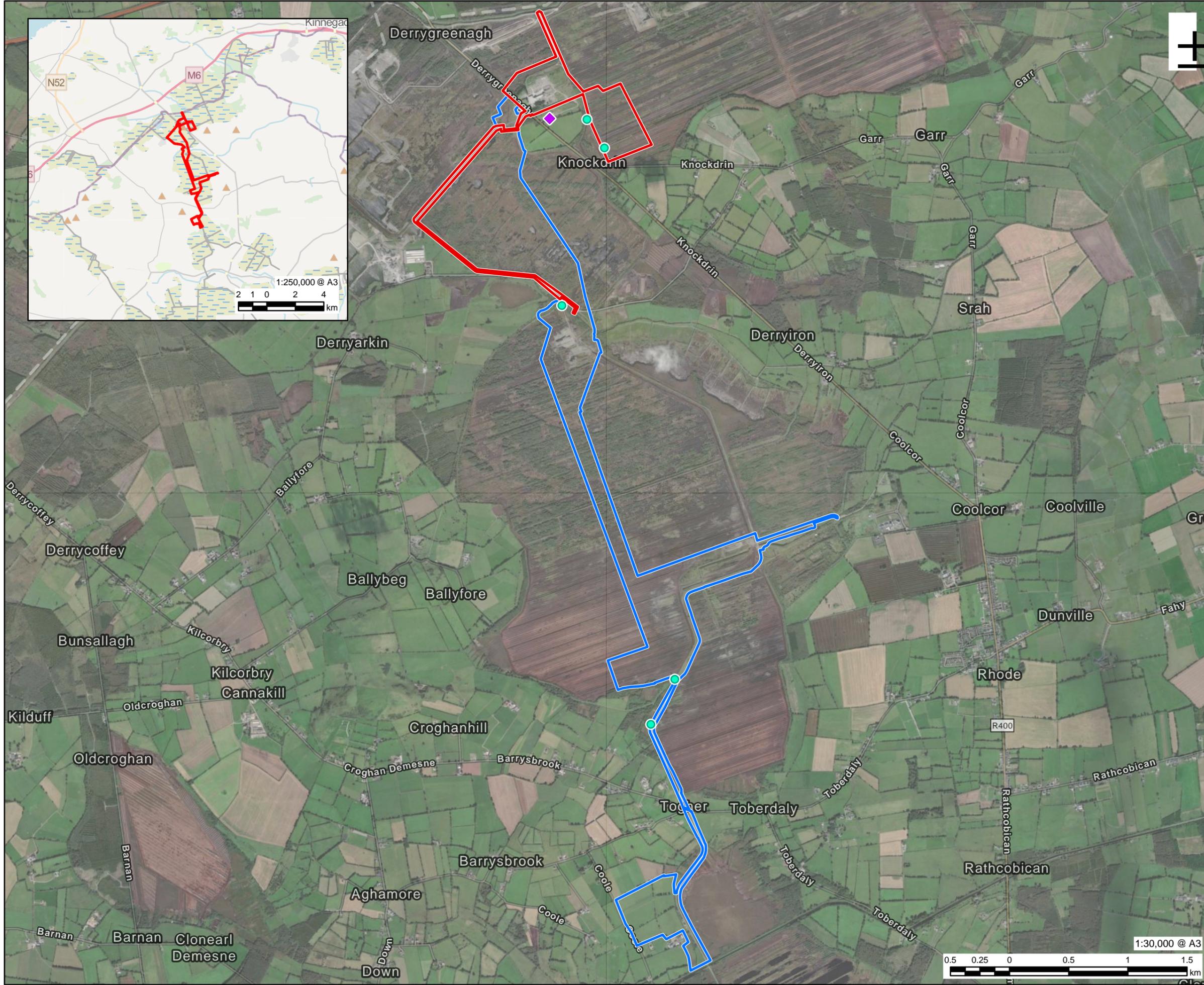
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- Gas Connection Corridor Boundary
- Water and Drainage**
- Watercourse
- Waterbody
- Designated Sites**
- Special Protection Area (SPA)
- Special Area of Conservation (SAC)

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- LEGEND**
- ▭ Power Plant Area Boundary
 - ▭ Electricity Grid Connection Boundary
 - Bat box pole
 - ◆ Building enhancements

NOTES
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FIGURE TITLE
Bat Mitigation Measures

FIGURE NUMBER
Figure 9.10

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