Appropriate Assessment Screening Report and Natura Impact Statement

Cush Wind Farm Phase II

Cush Wind Limited

Prepared by:

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Basis of Report

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Table of Contents

Basis of Report ..... **ii**
Acronyms and Abbreviations ..... **vii**
1.0 Introduction **1**
1.1 Background 1
1.2 Relevant Legislation and Policy 1
1.3 Report Purpose 2
1.4 Guidance 2
1.5 Sources of Information 2
1.6 Consultation 4
1.7 Assessment Process 6
1.8 Statement of Authority 8
2.0 Proposed Project and Receiving Environment **10**
2.1 Overview of the Proposed Project 10
2.1.1 Wind Turbines 11
2.1.2 Turbine Foundations 12
2.1.3 Crane Hardstands 12
2.1.4 Electrical and Communications Cabling 12
2.1.5 Access Tracks & Site Entrances 13
2.1.6 Proposed Grid Connection 13
2.1.7 Electrical Switch Room Building 14
2.1.8 Underground Electricity Line 14
2.1.9 Earthworks 15
2.1.10 Site Drainage & Rehabilitation 18
2.1.11 Landscaping 20
2.1.12 Micrositing 21
2.1.13 Off-site and Secondary Developments 21
2.2 Existing Environment 24
2.2.1 Desk Study 24
2.2.2 Field Assessments 24
2.2.3 Project Site Overview 28
2.3 Sources for potential impacts from the Project on the receiving environment 29
3.0 AA Screening **34**
3.1 Management of any European Site 34
3.2 Sources of Potential Impacts 34
3.3 Pathways - Ecological Connections 34

3.3.1 General overview of connection rationale 34
3.4 Identification of European Sites - Sensitive Receptors 37
3.5 Assessment of Potential Effects 149
3.5.1 Effects of the Proposed Project Alone 149
3.5.2 In-Combination Effects 150
4.0 AA Screening Conclusion 151
5.0 Natura Impact Statement 152
5.1 Information on European Sites 152
5.1.1 Lough Derg, North-east Shore SAC 152
5.1.2 River Shannon Callows SAC 155
5.1.3 River Little Brosna Callows SPA 156
5.1.4 Middle Shannon Callows SPA 159
5.1.5 Slieve Bloom Mountains SPA 161
5.1.6 Lough Derg (Shannon) SPA 162
5.2 Effects on the Integrity of European Sites 'Alone' 162
5.2.1 Approach to Assessing Collision Risk for SPAs 162
5.2.2 Lough Derg, North-east Shore SAC 163
5.2.3 River Shannon Callows SAC 164
5.2.4 River Little Brosna Callows SPA 165
5.2.5 Middle Shannon Callows SPA 167
5.2.6 Slieve Bloom Mountains SPA 169
5.2.7 Lough Derg (Shannon) SPA 169
5.3 Effects on the Integrity of European Sites 'In Combination' 170
5.3.1 Plans 170
5.3.2 Projects 174
5.4 Implications for the Conservation Objectives 198
5.5 Mitigation Measures 226
5.5.1 Construction Phase 226
5.5.2 Operation phase 235
5.5.2. Decommissioning Phase 236
5.6 Monitoring 236
5.6.1 General Pre-Construction Confirmation Surveys 236
5.6.2 Birds (Post-Construction) 236
5.6.3 Water Quality Monitoring 236
5.7 Conclusions 242

Tables in Text

Table 1-1: Summary of consultation comments and responses 4
Table 2-1 Wind Turbine Coordinates and Existing Ground Levels..... 11
Table 2-2 Spoil Generation & Management 16
Table 2-3 Project Works Material (Aggregates) Volumes 18
Table 2-4 Haul Route Alteration Works 23
Table 2-5: Summary of Ecology Surveys 25
Table 2-6: Identification and characterisation of sources for impacts arising from the Project that have potential for interactions with the receiving environment..... 30
Table 3-1: European Sites Considered for Potential Effects using the Source – Pathway – Receptor model - Wind Farm Site..... 38
Table 3-2: European Sites Considered for Potential Effects using the Source – Pathway – Receptor model - Grid Connection Site..... 96
Table 5-1 Conservation Objectives - Lough Derg, North-east Shore SAC..... 152
Table 5-2: Conservation Objectives for the Qualifying Interests of River Shannon Callows SAC 155
Table 5-3: Conservation Objectives for the Qualifying Interests of River Little Brosna Callows SPA 157
Table 5-4: Conservation Objectives for the Qualifying Interests of Middle Shannon Callows SPA 159
Table 5-5: Conservation Objectives for the Qualifying Interests of Slieve Bloom Mountains SPA 161
Table 5-6: Conservation Objectives for the Qualifying Interests of Lough Derg (Shannon) SPA 162
Table 5-7: Assessment of relevant plans..... 171
Table 5-8: Assessment of Galros Bog Draft Cutaway Bog Decommissioning and Rehabilitation Plan 2026 173
Table 5-9: Projects Considered for In-Combination Effects for River Shannon Callows SAC, Middle Shannon Callows SPA (wetland habitat only) and Lough Derg (Shannon) SPA 175
Table 5-10: Projects Considered for In-Combination Effects for River Little Brosna Callows SPA 176
Table 5-11: Projects Considered for In-Combination Effects for Middle Shannon Callows SPA 177
Table 5-12: Projects Considered for In-Combination Effects for Slieve Bloom Mountains SPA 180
Table 5-13: In-combination effects of collision risk for each of the SPAs identified with connectivity to the Project..... 185
Table 5-14: Implications for the Conservation Objectives..... 199
Table 5-15: Summary of mitigation measures, implementation mechanisms, effectiveness, monitoring and reporting arrangements to avoid or reduce potential adverse effects on the integrity of European sites and their Conservation Objectives..... 238

Appendices

Appendix A Relevant Legislation and Policy

A.1 Relevant Legislation and Policy

A.1.1 Habitats and Birds Directives

A.1.2 European Communities (Birds and Natural Habitats) Regulations 2011

A.1.3 Planning and Development Act 2000 (as amended)

A.1.4 National Planning Framework

Appendix B European Site Data

B.1 Further information on the SAC and SPAs that have undergone assessment

B.2 Further information on the Qualifying Interests of SACs that have undergone assessment

B.3 Further information on the Special Conservation Interests of the SPAs that have undergone assessment

B.4 Reference list of the Site Specific Conservation Objective documents reviewed

Appendix C Distance Matrix Used for the Zone of Influence Pathway Considerations

C.1 Pathway Considerations to inform the Zone of Influence for each of the Qualifying interests and Special Conservation Interests

Appendix D Figures

Appendix E Baseline Bird Survey Reports

Appendix F Collision Risk Model Report

Appendix G Aquatic Survey Report

Appendix H Baseline Bat Survey Report

Appendix I Construction Environmental Management Plan

Appendix J Draft Galros Bog Rehabilitation Plan

Appendix K Peat and Spoil Management Plan

Appendix L Route Access Survey

Acronyms and Abbreviations

AA	Appropriate Assessment
ACP	An Coimisiún Pleanála
ACIEEM	Associate member of CIEEM
BNG	Biodiversity Net Gain
BSc	Bachelor of Science
CIEEM	Chartered Institute of Ecology and Environmental Management
CO	Conservation Objectives
EC	European Commission
EcIA	Ecological Impact Assessment
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
GSI	Geological Survey Ireland
IAQM	Institute of Air Quality Management
LSE	Likely Significant Effect
MRes	Master of Research
NHA	Natural Heritage Areas
NIS	Natura Impact Statement
NPWS	National Parks and Wildlife Service
OD	Ordnance Datum
OPR	Office of Planning Regulator
PEA	Preliminary Ecological Appraisal
SAC	Special Area of Conservation
SCI	Species of Conservation Interest (qualifying features of SPAs)
SNH	Scottish Natural Heritage
SPA	Special Protection Area
S-P-R	Source-Pathway-Receptor
QF	Qualifying Feature (collective term when referring to the features that all Natura 2000 sites are designated for)
QI	Qualifying Interest (qualifying features of SACs)
ZoI	Zone of Influence

1.0 Introduction

1.1 Background

SLR Environmental Consulting (Ireland) Ltd was commissioned by Cush Wind Limited to support the Appropriate Assessment (AA) process and to prepare a Natura Impact Statement (NIS) in respect of Cush Wind Farm Phase II ('the Project'). The Project comprises a 3 no. wind turbine extension to the permitted Cush Wind Farm Phase I[1], together with all associated and ancillary infrastructure and works, including turbine foundations, crane hardstandings, access tracks, internal underground cabling, site drainage and rehabilitation works, peat and spoil management measures, a proposed electrical switch room, and a c.5km underground electricity line required to facilitate connection of the proposed wind farm to the national electricity network. The Project is located in rural County Offaly, approximately 4km north of Birr and c.28km south-west of Tullamore (see **Figure 1**).

Planning permission is being sought from Offaly County Council for the proposed 3 no. turbine extension and associated on-site infrastructure and works within the planning application boundary. The underground electricity line forms part of the Project assessed in this NIS but does not form part of the development for which planning permission is sought under the accompanying planning application.

1.2 Relevant Legislation and Policy

The requirement for AA screening and AA is set out in the Habitats Directive (Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora). This Directive is transposed into Irish law primarily through the European Communities (Birds and Natural Habitats) Regulations 2011–21 (S.I. 477 of 2011, as amended) ("the Birds and Natural Habitats Regulations"), and is applied through the Planning and Development Act 2000 (as amended). Further details are provided in Appendix A.

European sites comprise Special Areas of Conservation (SACs) designated under the Habitats Directive and Special Protection Areas (SPAs) designated under Directive 2009/147/EC on the conservation of wild birds (the Birds Directive). European sites are afforded legal protection in Irish law through the Birds and Natural Habitats Regulations. Candidate SACs (cSACs) and proposed SPAs (pSPAs) are afforded the same level of protection as designated sites pending formal designation and, for the purposes of this report, are collectively referred to as SACs and SPAs.

Article 6(3) of the Habitats Directive requires that any plan or project that is likely to have a significant effect on a European site, while not directly connected with or necessary to the nature conservation management of the site, will be subject to 'Appropriate Assessment' to identify any implications for the European site in view of the site's Conservation Objectives. Specifically, Article 6(3) of the Habitats Directive states:

> *'6(3) Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives. In the light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the*

[1] An Coimisiún Pleanála Reference: ABP-318816-24

integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public'.

The competent authority must carry out a screening for Appropriate Assessment to determine, based on the best scientific knowledge and applying the precautionary principle, if the proposed project, individually or in combination with another plan or project is likely to have a significant effect on a European site. Where it cannot be excluded that such effects may occur, an Appropriate Assessment is required.

The provisions of Article 6(3) do not apply where the proposed plan or project is 'connected with or necessary to the management of the site'. In this case, the proposed project is not directly connected with or necessary to the management of any European site(s).

1.3 Report Purpose

This report presents an AA Screening of whether the Project is likely to have a significant effect on a European site (either alone or in combination with other plans or projects) and is based on best available scientific knowledge. This report has been prepared to inform the competent authority in completing their statutory obligations in relation to Appropriate Assessment, as required by Article 6(3) under Council Directive 92/43/EEC (Habitats Directive).

The information presented will allow the Competent Authority to make their determination regarding likely significant effects on European sites resulting from the proposed Project, in accordance with and fulfilment of the requirements of Article 6 of the Habitats Directive.

1.4 Guidance

The assessment was conducted in accordance with the following guidance:

- European Commission. (2002). Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Luxembourg: Office for Official Publications of the European Communities;
- European Commission. (2021). Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC. Commission Notice (2021) Brussels, 28.9.2021 C (2021) 6913 final;
- Environment Heritage and Local Government. (2009, updated 2010). Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Dublin: National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government;
- European Commission. (2019). Managing Natura 2000 sites. The provisions of Article 6 of the Habitats Directive 92/43/EEC. Brussels, (2019/C 33/01). OJ C 33, 25.1.2019;
- European Commission. (2013). Interpretation Manual of European Union Habitats. Version EUR 28; and
- Office of the Planning Regulator. (2021). OPR Practice Note PN01 Appropriate Assessment Screening for Development Management.

1.5 Sources of Information

Sources of information for the assessment of the Project 'alone' and in combination with other plans and projects consists of the following:

- Environmental Protection Agency (EPA) (on-line map-viewer including the Appropriate Assessment Tool)[2];
- Geological Survey Ireland (GSI) Spatial Resources[3];
- Department of Housing, Planning, and Local Government - EIA Portal[4];
- National Planning Database for information on other projects and plans[5];
- National Parks and Wildlife Service – online European site network information, including site conservation objectives[6];
- National Parks and Wildlife Service – Information on the status of EU protected habitats and species in Ireland (including Article 17 and Article 12 Reports);
- National Biodiversity Data Centre[7];
- SLR. (2023). Bird Survey Report. Breeding 2022. Cush Wind Farm (Appendix E);
- SLR. (2023). Bird Survey Report. Non-Breeding 2022/23. Cush Wind Farm (Appendix E);
- SLR. (2024). Bird Survey Report Breeding Season 2023. Cush Wind Farm (Appendix E);
- SLR. (2024). Bird Survey Report Non-Breeding Season 2023/24. Cush Wind Farm (Appendix E);
- SLR. (2024). Bird Survey Report Breeding Season 2024. Cush Wind Farm (Appendix E);
- SLR. (2024). Bird Migration Survey Report. Cush Wind Farm (Appendix E);
- SLR. (2025). Baseline Ornithology Report – Non-Breeding Bird Surveys 2024/25 (Appendix E); and
- SLR. (2026). Collision Risk Model Report. Cush Wind Farm Phase 2 (Appendix F).
- Triturus (2026). Aquatic baseline report for Cush wind farm, Co. Offaly (2025). Report prepared by Triturus Environmental Ltd. for SLR Consulting Ireland. January 2026. (Appendix G);
- SLR. (2026). Baseline Bat Survey Report. Cush Wind Farm Phase 2 (Appendix H); and
- BnM (2026). Galros Bog. Draft Cutaway Bog Decommissioning and Rehabilitation Plan 2026.

[2] https://gis.epa.ie/EPAMaps, accessed 18 September 2026

[3] https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228, accessed 18 September 2026

[4] https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=d7d5a3d48f104ecbb206e7e5f84b71f1, accessed 18 September 2026

[5] https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=9cf2a09799d74d8e9316a3d3a4d3a8de, accessed 22 July 2026

[6] www.npws.ie, accessed 22 July 2026

[7] www.biodiversityireland.ie, accessed 22 July 2026

1.6 Consultation

A scoping request in relation to the Project was sent to various consultees in January 2026. Responses from biodiversity-related consultees are summarised in Table 1-1 below.

Table 1-1: Summary of consultation comments and responses

Consultee	Comment summary	Response
Development Applications Unit (DAU)	The proposed application site occurs approximately 5 km from the Dovegrove Callows Special Protected Area (SPA), and approximately 8 km from the River Little Brosna Callows SPA. Greenland white-fronted goose and Whooper swans are a qualifying interests of both SPAs. The core foraging range for these species from their winter roosts is between 5 -8 km, and 5 km, respectively. Consequently, there is some potential for the population of Greenland white-fronted goose, associated with both the Dovegrove Callows SPA and the River Little Brosna Callows SPA to forage and transit within the zone of influence of the application site. Similarly, there is some potential for the population of Whooper swan associated with the Dovegrove Callows SPA to forage and transit within the zone of influence of the application site. The Department recommends that a data request should be submitted to the National Parks and Wildlife Service of this Department for any historical data for the winter population of Greenland White-fronted goose to facilitate characterisation of their presence in the wider area and to help determine more accurately whether the application site occurs within the core foraging area of any known roost sites. Similarly, both Greenland White-fronted Goose and Whooper Swan should be target species for the distribution and abundance	A suite of bird surveys, including flight activity surveys, nocturnal migration surveys and winter swan and goose feeding distribution surveys (extending at least 600 m from the Project site) were undertaken, as detailed in Table 2-5 below. Greenland white-fronted goose was not recorded during any of these surveys. Whooper swan were recorded and collision, disturbance and displacement, and barrier effects have been assessed in the context of the SPA populations in this NIS. A data request was made to NPWS for information including records of Greenland white-fronted goose (received 03/09/2026).

Consultee	Comment summary	Response
	surveys with the zone of influence of the application site following best practice (see NatureScot 2025)1. As disturbance, and displacement, effects may occur up to 600 m from relevant construction or operation stage activities, it is recommended that an area of a minimum of 600 m around the application site boundary is surveyed for these species to determine their presence or absence, and should they be present, their distribution and abundance. A particular focus should be on habitats that are suitable foraging habitat for this species within this area, such as grasslands and wetlands. If surveys determine the presence of Greenland White-fronted Goose and Whooper swan within the zone of influence of the application, the significance of any potential collision mortality effects, disturbance and displacement effects, or barrier effects, should be contextualised in terms of the populations associated with the Dovegrove Callows SPA and the River Little Brosna Callows SPA accordingly, before then being contextualised in terms of the national population.	
National Parks and Wildlife Service (NPWS)	The site lies approx. 3.84 km from Dovegrove Callows SPA and 6.39 km from River Little Brosna Callows SPA, whose qualifying interests include Greenland white-fronted goose *Anser albifron flavostris* and whooper swan *Cygnus cygnus*. Given typical core foraging ranges (5–8 km for Greenland white-fronted geese; ~5 km for whooper swan), there is potential for both species to forage or transit within the site's zone of influence.	A suite of bird surveys, including flight activity surveys, nocturnal migration surveys and winter swan and goose feeding distribution surveys (extending at least 600 m from the Project site) were undertaken, as detailed in Table 2-5 below. Greenland white-fronted goose was not recorded during any of these surveys. A data request was made to NPWS for information including records of Greenland

Consultee	Comment summary	Response
	The Department recommends submitting a data request to NPWS for historical records of Greenland white-fronted goose to clarify whether the site falls within any known core foraging area. Both Greenland white-fronted goose and whooper Swan should be target species for distribution and abundance surveys, following NatureScot (2025) guidance. Because disturbance/displacement effects may extend up to 600 m from construction/operational activities, surveys should cover at least a 600 m buffer around the site, focusing on suitable foraging habitats (grasslands, wetlands). If these species are recorded, the EIAR should assess potential collision, disturbance/displacement, and barrier effects in the context of SPA populations first, and subsequently national populations.	white-fronted goose (received 03/09/2026).
Waterways Ireland	Waterways Ireland is the navigation body responsible for the management of the inland waterways including the Lower Bann, Erne System, Shannon-Erne Waterway, Shannon Navigation, Royal Canal, Grand Canal and the Barrow Navigation. We do not have jurisdiction over this area.	None required

1.7 Assessment Process

The process of determining the likelihood of significant effects from a proposed project on European sites is an iterative process centred around a Source-Pathway-Receptor model. For an effect to be established, all three elements of this mechanism must be in place. The absence of one of the elements of the mechanism is sufficient to conclude that a potential effect cannot occur.

- Source(s) – e.g., pollutant run-off, noise, removal of vegetation, etc.;
- Pathway(s) – functional link, or ecological pathway e.g., groundwater connecting to nearby qualifying wetland habitats; and,

- Receptor(s) – the qualifying habitats and species of European sites and ecological resources supporting those habitats/species.

In the context of this report, a source is any identifiable element of the proposed project that is known to interact with the receiving environment. A receptor is the Qualifying Interests (QI)[8] for an SAC or Special Conservation Interests (SCI)[9] for an SPA, or an ecological feature that is known to be utilised by the QI/SCI. The term qualifying feature is used to collectively refer to QIs and SCIs within this report. A pathway is any connection or link between the source and the receptor

The assessment commences with a description of the proposed project, along with a description of the receiving environment and the associated sources for impacts to the receiving environment. All elements of the proposed project are presented including the proposed project location and existing baseline environment. The type of impacts that are likely due to the proposed project (Source) are identified having regard to the spatial and temporal scale of the proposed project, resource requirements and likely emissions. These sources are then used to define the zone of influence (ZoI) of the proposed project as detailed in Section 3.3.

The European Commission Notice (2021) on the 'Assessment of plans and projects in relation to Natura 2000 sites – Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC, states that in identifying European sites (Natura 2000 sites), which may be affected by the project, the following should be identified:

- Any European sites geographically overlapping with any of the actions or aspects of the plan or project in any of its phases, or adjacent to them;
- Any European sites within the likely ZoI of the plan or project. European sites located in the surroundings of the plan or project (or at some distance) that could still be indirectly affected by aspects of the project, including as regards the use of natural resources (e.g., water) and various types of waste, discharge or emissions of substances or energy; and
- European sites whose connectivity or ecological continuity can be affected by the plan or project.

The ZoI of a proposed project is the geographical area over which it could affect the receiving environment in a way that could have potential effects on the QIs of a European site. The OPR (2021) practice note[10] states that the ZoI must be established on a case-by-case basis using the Source-Pathway-Receptor (S-P-R) framework and not by arbitrary distances (such as 15 km). Section 3.3 sets out the detailed rationale for the identification of relevant European sites within the ZoI based on the sources of impacts arising from the proposed project. Subsequently, an assessment is undertaken with respect to potential connectivity (Pathways) to European sites and their qualifying interests/special conservation interests are identified.

The potential for in-combination effects with other plans and projects is examined in Section 3.5, having regard to the identified impacts of the proposed project along the ecological pathways identified to European sites.

[8] SACs are areas designated under the Habitats Directive to conserve habitats listed in Annex I of the Directive and plant and animal species listed in Annex II. Collectively these are referred to as the 'Qualifying Interests' or 'QIs' of the SAC.

[9] SPAs are sites classified under the Birds Directive to protect rare or vulnerable bird species listed in Annex I to the Directive as well as regularly occurring migratory species and wetlands. Wetland habitats that support internationally important populations of migratory birds may be coastal or inland. Collectively, these species and habitats are referred to as the 'Special Conservation Interests' of the SPA.

[10] Office of the Planning Regulator. (2021). OPR Practice Note PN01. Appropriate Assessment Screening for Development Management.

In Section 3.5 the likelihood of significant effects of the European sites within the ZoI is examined having regard to the sensitivity of the European site with pathways for impacts associated with the project on its own and in combination with other plans and projects.

Having regard to the European Commission Communication on the Precautionary Principle (European Commission, 2021) the:

> "absence of scientific *evidence on the significant negative effect of an action cannot be used as justification for approval of this action. When applied to Article 6(3) procedure, the precautionary principle implies that the absence of a negative effect on Natura 2000 sites has to be demonstrated before a plan or project can be authorised. In other words, if there is a lack of certainty as to whether there will be any negative effects, then the plan or project cannot be approved."*

Where significant effects are determined to be likely, or where there is uncertainty regarding the likelihood of significant effects, the project will be required under law to be subjected to Appropriate Assessment.

This report is based on best scientific knowledge and has utilised ecological expertise. In addition, a detailed online review of published scientific literature was conducted. This included a detailed review of the National Parks and Wildlife Service website including mapping and available reports for relevant sites and in particular sensitive qualifying interests/special conservation interests described and their conservation objectives.

1.8 Statement of Authority

This report was written by SLR Senior Ecologist Kathryn Robson and technically reviewed by SLR Technical Director Dr Andrew Torsney. Sinéad Clifford carried out the approval of this report.

Kathryn Robson - Kathryn (MSc) is a Senior Ecologist with over seven years professional experience in the environmental consultancy sector. Her core expertise is in the provision of quality ecology consulting for renewable energy projects, primarily onshore wind farm developments. She has the ability to deliver a range of technical reports including EIAR biodiversity chapters, Appropriate Assessments and Natura Impact Statements. She is currently responsible for project management, ecological survey design, conducting and directing ecology surveys and reporting for a number of projects in Ireland. Her ecology survey strengths are in bat survey and bird survey. Kathryn has experience conducting surveys at all stages of development from supporting planning applications to operational monitoring to ensure compliance with planning consent. Kathryn consistently delivers reliable ecological guidance in the delivery of a range of projects.

Dr Andrew Torsney MCIEEM - Dr Andrew Torsney is the Regional Lead for Ecology in Ireland and a seasoned environmental consultant with over 14 years of experience, having spearheaded a diverse range of projects spanning local to national scales. His expertise includes the successful management of high-impact national initiatives, such as the National Grid Implementation Plan for EirGrid and Fáilte Ireland's National Tourism Monitoring Programme. Andrew's proficiency extends beyond project management, showcasing his ability to deliver complex technical reports and provide strategic environmental guidance that aligns with both regulatory frameworks and stakeholder expectations. Andrew is a recognised bat specialist with extensive experience in bat ecology, survey design, impact assessment and mitigation. He authored the bat identification guide for the National Biodiversity Data Centre and has undertaken research developing habitat suitability models for six bat species within the Yorkshire Dales National Park. His research also includes investigations into swarming behaviour and migratory bat movements in Poland, alongside population genetic cluster analyses in Devon. Andrew holds a national bat derogation licence and has acted as Technical Associate and technical lead on numerous complex bat projects, including the offshore bat assessment for the Dublin Array Offshore Wind Farm. His expertise spans roost

assessment, activity survey design, collision risk assessment, habitat connectivity, mitigation strategy development and the application of emerging evidence to inform planning and appropriate assessment.

Sinéad Clifford MCIEEM - Sinéad has worked in the environmental sector since 2015 and joined SLR Consulting in 2021. She holds a BSc in Wildlife Biology from Institute of Technology Tralee, and a Certificate (Distinction) in Ecological Consultancy from Ecology Training UK (formerly Acorn Ecology). Sinéad has strong field skills, and regularly carries out bat, ornithological, botanical and mammalian surveys. In addition, she has extensive experience managing bat surveys for large scale projects, including wind energy developments. She is also an experienced GIS user, having produced multiple maps and species distribution models. She is proficient in using ArcGIS, QGIS, and Arc Field Maps software. Sinéad has prepared a wide variety of ecological reports, including biodiversity chapters for Environmental Impact Assessment Reports (EIAR), Ecological Impact Assessments (EcIA), Appropriate Assessment (AA) screening reports, Natura Impact Statements (NIS), and bat reports.

2.0 Proposed Project and Receiving Environment

2.1 Overview of the Proposed Project

The Project is located in rural County Offaly, approximately 4km north of the town of Birr and c.28km south-west of Tullamore (see Figure 1). The proposed wind farm site is located in the townlands of Galros East, Whigsborough, Ballycollin, and Eglish. The proposed underground electricity line extends through the townlands of Eglish, Ballynaguilsha, Shanacloon, Cloncarban, Clonbeale Beg Glebe and Mullanafawnia.

The project assessed within this AA Screening Report and NIS comprises a 3 no. wind turbine extension to the permitted Cush Wind Farm Phase I, together with all associated and ancillary infrastructure and works. This includes the proposed wind farm infrastructure, a c.5km underground electricity line required to facilitate connection of the proposed wind farm to the national electricity network, and relevant off-site or secondary works associated with the construction and operation of the Project.

For clarity, the Project assessed for the purposes of Appropriate Assessment is broader than the development for which planning permission is sought under the accompanying planning application. Planning permission is being sought from Offaly County Council for the proposed 3 no. turbine extension and associated on-site infrastructure and works within the planning application boundary. The underground electricity line forms part of the Project assessed in this AA Screening Report and NIS but does not form part of the development for which planning permission is sought under the accompanying planning application. A 10-year planning permission is sought in respect of the development comprised in the planning application.

The Project assessed in this report includes:

- 3 no. wind turbines within the following turbine dimension range:
    - overall turbine tip height of 199.1m to 200m;
    - rotor diameter of 158m to 175m; and
    - hub height of 111.6m to 120.9m;
- all associated turbine foundations and crane hardstanding areas;
- all associated internal underground electrical and communications cabling;
- construction of approximately 1.7km of wind farm access tracks;
- use of 1 no. permitted construction-phase site entrance from the N62 national road and 1 no. permitted operational-phase site entrance from the L300321 local road;
- storage, as required, of excavated material within dedicated spoil deposition areas;
- 1 no. proposed electrical switch room building and associated compound, including a new site entrance onto the L300321 local road;
- a c.5km underground electricity line extending from the proposed electrical switch room to facilitate connection of the proposed wind farm to the national electricity network; and
- all associated and ancillary site development, excavation, construction, landscaping and reinstatement works, including site drainage infrastructure, rehabilitation works and environmental mitigation measures.

The project assessed for the purposes of Appropriate Assessment also includes relevant off-site or secondary works required to facilitate its construction, including upgrade works to public roads along the turbine component haul route.

For the purposes of the Appropriate Assessment references to the 'Wind Farm Site' comprise the proposed turbines and associated on-site infrastructure, including the proposed electrical switch room building and compound, while references to the 'Grid Connection Site' comprise the c.5km underground electricity line route extending from the proposed switch room. These terms are used solely to distinguish the principal spatial components of the Project for assessment purposes and do not alter the overall definition of the Project set out above.

The proposed wind turbine design and layout has been informed by a number of factors including environmental constraints, maximising energy yield and maintaining sufficient inter-turbine separation distances to minimise wake effects and maintain correct operational performance. The coordinates of the proposed wind turbines are set out in Table 2-1 below.

Table 2-1 Wind Turbine Coordinates and Existing Ground Levels

Turbine ID	Easting*	Northing*	Overall Tip Height (m) Parameter Range	Approximate Ground Level (mAOD)
T9	608636	710729	199.1 - 200	50.5
T10	608275	711034	199.1 - 200	48.2
T11	608944	711100	199.1 - 200	50.2

**Coordinates provided In Irish Transverse Mercator (ITM)*

***Note: Micrositing and any immaterial deviations to the proposed turbines within an overall development envelope (overall height or red line boundary) are fully assessed and incorporated into report.*

2.1.1 Wind Turbines

The project comprises 3 no. wind turbines (numbered T9, T10 and T11) together with associated foundations, crane hardstanding areas and electrical infrastructure. The Irish Transverse Mercator (ITM) coordinates and existing ground levels of each proposed wind turbine are set out in **Table -1** above.

The turbines will consist of a three-bladed rotor connected via a hub to a nacelle containing the electrical generation equipment. The blades will be constructed of glass-reinforced plastic. The nacelle will be supported on a steel tower of tubular construction. The colour of the proposed turbines and blades will be white, off-white or light grey, as determined by the Planning Authority.

The turbines will rotate in the same direction and will typically have a cut-in wind speed of 3 metres-per-second (m/s) and a cut-out speed of 25 m/s.

Each turbine will include its own transformer located inside the tower. Transformers will either be oil-filled and appropriately bunded or will be of a solid cast resin type which eliminates the requirement for bunding. The transformers will increase the electrical voltage and on-site electrical cables will connect the turbines to the proposed electrical switch room building.

The proposed wind turbines will have the dimensional ranges set out in below:

- Turbine Tip Height – Maximum height 200 metres, Minimum height 199.1 metres
- Hub Height – Maximum height 120.9 metres, Minimum height 111.6 metres
- Rotor Diameter: - Maximum diameter 175 metres, Minimum diameter 158 metres

The final turbine model will be selected within the proposed dimensional range and will have a rated electrical output of approximately 6.1 MW to 7.2 MW per turbine, giving the project a total installed generating capacity of approximately 18.3MW to 21.6MW.

The development footprint of the proposed project within the AA Screening and NIS, will be based on the maximum potential footprint for all of the infrastructural elements. This precautionary approach is taken as the assessment of the maximum development footprint and will therefore, in the absence of mitigation, give rise to the greatest potential for significant effects. Should the development footprint be less than the maximum, this in itself will further mitigate the assessed effects.

Turbine design parameters have a bearing on the assessment of shadow flicker, noise, visual impact, traffic and transport and ecology (specifically bats and birds - as addressed elsewhere in this AA Screening and NIS).

2.1.2 Turbine Foundations

Each turbine tower will be secured by means of a steel foundation ring to a reinforced concrete foundation. Initial geotechnical investigations carried out at each of the turbine locations demonstrate that the subsoil conditions are generally suitable for the construction of standard turbine gravity foundations.

In accordance with the approach set out in Section 5.3 of the Wind Energy Development Guidelines for Planning Authorities (2006), the final foundation design, including its detailed dimensions and reinforcement requirements, will be established through post-consent detailed design and further geotechnical investigation prior to construction.

While initial geotechnical investigations indicate that gravity raft foundations are likely to be suitable at the proposed turbine locations, the final foundation type will be confirmed following further site-specific geotechnical investigation, with a piled foundation only used at a turbine location where required by the ground conditions.

Any associated micro-siting of the turbine locations will be undertaken within the parameters assessed in this EIAR and the scope of the planning permission.

2.1.3 Crane Hardstands

Crane hardstand areas will be established adjacent to each turbine to facilitate crane operations for turbine installation. The hardstand areas will typically measure approximately 100m by 45m and will consist of levelled and compacted (unsealed) hardcore placed on top of a geotextile membrane. The hardstands will generally be of a ‘floated’ construction type, thus avoiding significant excavations; however, localised excavations may be required to avoid excessive placement of granular fill.

The crane hardstands will be retained *in situ* during the operation phase of the project to accommodate crane activities in the event of a major turbine component replacement e.g. replacement of a turbine blade or generator.

Temporary set-down areas, also comprising levelled and compacted (unsealed) hardcore on a geotextile membrane, will be located immediately adjacent to each hardstand during the construction phase to accommodate the temporary storage of turbine components following their delivery to the project site, and crane components during crane assembly.

2.1.4 Electrical and Communications Cabling

On-site electrical and communications cables will connect the proposed turbines to the proposed electrical switch room building. All on-site electrical and communications cables will be placed underground and will be of a solid polymeric construction with either aluminium or

copper conductors. The cables will follow the alignment of the on-site access tracks, insofar as practicable, and will be installed within new trenches.

2.1.5 Access Tracks & Site Entrances

Access to the wind farm site will be provided via three site entrances, including two entrances permitted as part of Cush Wind Farm Phase I. These comprise a construction phase entrance from the N62 national road (eastern side) which will be used to transport construction materials and turbine components (including abnormal-sized loads) to the site, and an operation phase entrance from the L300321 local road.

A third entrance from the L300321 local road will provide access to the proposed electrical switch room building.

Following the construction phase, the entrance from the N62 will be closed off and retained for occasional use in the event of a major turbine component replacement during the operation phase of the project (e.g. replacement of a turbine blade or generator).

A total of c. 1.7km of new on-site access tracks will be required for construction purposes and for site access during the operation phase. The access tracks will connect with the access tracks permitted as part of Cush Wind Farm Phase I.

As is the case with the permitted access tracks, the proposed access tracks will be predominantly of a 'floating' construction type to minimise the need for excavation. This typically comprises the placement of a layer of geotextile or geogrid on the existing ground surface, followed by aggregate. Where shallow peat is present (<1 m), conventional 'excavate and replace' or 'cut and fill' ('founded') access track construction methods will be used. Where required by ground conditions, a geotextile layer may also be installed within founded access tracks.

The access tracks will be similar to normal agricultural tracks with a typical running width of approximately 5m, with additional widening at bends to accommodate turbine delivery vehicles. Access tracks will be unsealed and constructed of crushed stone material to allow for permeability.

The access tracks will be constructed with horizontal and vertical alignments suitable to accommodate abnormal-sized loads and to provide adequate drainage. Passing bays and turning heads will be provided along the access tracks to accommodate vehicle turning and passing traffic, as required. Drainage and cable trenches will also be provided alongside the access tracks.

2.1.6 Proposed Grid Connection

The proposed grid connection will comprise an underground electricity line ('UGL') of approximately 5km in length, extending from the proposed electrical switch room building ('switch room') to the point where it connects to the electricity network at the proposed Mullanafawnia 110kV substation[11]. The proposed switch room will be located on the southern side of the project (wind farm) site, immediately south of the proposed wind turbines.

The proposed UGL route will run from the proposed switch room to the point of connection to the electricity network, through the townlands of Eglish, Ballynaguilsha, Shanacloon, Cloncarban, Clonbeale Beg Glebe, and Mullanafawnia, Co. Offaly.

The proposed switch room will be located in the townland of Eglish will require a proposed new site entrance/access onto the L300321 local road.

[11] The proposed Mullanafawnia 110kV substation is being promoted separately by a third-party developer and does not form part of the project assessed in this NIS.

2.1.7 Electrical Switch Room Building

The switch room will be constructed within the project site. The purpose of this switch room is to act as a 'node' to where the underground electrical (and communications) cabling circuits from each wind turbine will converge. The switch room building will contain electrical apparatus and will transfer electricity from each individual circuit to a single circuit for its onward transmission to the Mullanafawnia 110kV electricity substation.

The switch room will measure 13.12m x 7.33m (gross floor area of 96.2m^2) and will have an overall height of c. 6m to ridge height. The switch room building will be constructed of blockwork and finished in sand and cement render, blue/black slate roof covering and galvanised steel doors and will contain a control room, switchgear room, storeroom and welfare facilities for staff during the operation phase of development.

The switch room building will also include a dedicated mains water connection to provide for toilet facilities and hand washing. A water connection will be sought to connect the switch room to the local water scheme (Eglish, Rath & Drumcullen Ltd Group Water Scheme[12]), the closest point of which is located along the L300321 local road to the east of the switch room. Wastewater from the switch room will be stored in a sealed tank and will be periodically disposed of off-site, as required, by a local licensed waste collector. Water supply and wastewater management proposals of this nature are common practice for wind farm developments.

The switch room will comprise an electrical switch room building in a compound area measuring c. 25.11m x 17.08m equating to a compound footprint area of c. 429m^2. The compound area will be surrounded by a palisade fence, with associated gates, of c. 2.6m in height for safety and security reasons.

The switch room is located in a relatively flat area of agricultural pasture and does not traverse any drains or watercourses. There will be a requirement to undertake minor modifications to ground levels in order to achieve the required levels for the switch room building. As part of the design process, it is estimated that c. 60m^3 of material will be excavated to facilitate the construction of the switch room.

The switch room compound will be surfaced with free-draining crushed stone aggregates such that rainwater can percolate to ground. Rock and capping material will be sourced from local (appropriately licenced) quarries.

2.1.8 Underground Electricity Line

In order to connect the proposed project to the proposed110kV Mullanafawnia substation, it is proposed to install c. 5km of 33kV underground electricity line ('UGL'). The UGL will be installed within ducting in an excavated trench of c. 1.2m deep and c. 1.0m wide and pulled through the ducting in sections of c. 1,200m in length or depending on the length of cable required. Cable (electricity line) lengths will be connected at designated 'jointing plinths' to be installed along the route. Jointing plinths will comprise a concrete slab of c. 2m^2 which will be installed within the trench to provide a firm foundation for the joining of the electricity line. Traditional joint bay chambers will not be required.

The proposed UGL is located within the townlands of Eglish, Ballynaguilsha, Shanacloon, Cloncarban, Clonbeale Beg Glebe, and Mullanafawnia and is located within private lands. The underground electricity line (c. 5km in length) crosses public roads at the N52 national road and at the L7006 local road at Clonbeale Beg Glebe, where it will be placed under the carriageway. The remainder of the underground electricity line will be situated in private lands

[12] The scheme's groundwater source at Springfield, Rath is identified as 'Rath Group Water Scheme' in the GSI/Offaly County Council report, Rath Group Water Scheme Groundwater Source Protection Zones (July 2009).

(off road). The proposed UGL will be installed under the public road using Horizontal Directional Drilling (HDD).

The proposed UGL also crosses a watercourse (Rapemills River) at 2 no. locations. As is the case with road crossings, the UGL will be installed in under the watercourse using HDD.

Within private lands, the trench will be backfilled, finished with topsoil and reseeded or allowed to naturally revegetate. Where the electricity line passes through a hedgerow, c. 4-5m of hedgerow and/or trees will be removed to facilitate construction activities; however, all such hedgerow/trees will be replaced/replanted on a like-for-like basis.

All trenching works will be undertaken to ensure that only short sections of trench are open at any one time. Excavated materials will be stored separately (subsoil, topsoil, and aggregates) for use during the reinstatement of the trench/joint plinth/communication chambers or disposed of at an appropriate licensed facility as necessary. The sequence of works is typically as follows:-

- Identify existing underground services prior to excavation;
- Excavate the trench to the required dimensions;
- Place a blinding layer (sand) at the base of the trench;
- Place and joint the high-density polyethylene (HDPE) power ducts using ties at 3m intervals;
- Lay in and compact a layer of sand around and above ducts and place yellow warning tape above;
- Install HDPE communications cable ducts;
- Lay in and compact an additional layer of gravel/excavated material;
- Final backfill layer to include yellow warning tape; and,
- Appropriate reinstatement, as discussed above.

Prior to the commencement of construction, a detailed Method Statement will be prepared by the contractor, to be appointed by the Developer, outlining the precise methodology to be followed during the trenching phase. This Method Statement will be reviewed by the Environmental Manager (EM; to be appointed by the selected contractor) to ensure that the environmental protective measures to be implemented are suitable and to the required standard, including all mitigation measures included in this report and all relevant conditions of planning consent.

As part of the design process, it is estimated that c. 5,946m^3 of material will be excavated to accommodate the underground electricity line infrastructure. It is estimated that this excavated material will be re-used while c. 2,075m^3 of backfill material (sand) will be imported from a local quarry (or quarries).

2.1.9 Earthworks

2.1.9.1 Excavation

Earthworks will largely arise from the excavation of topsoil, subsoil, peat (including peaty topsoils) and rock (if/where present) at the locations of proposed infrastructure.

During construction, excavated topsoil, peat, subsoil and rock (if found) material will be side cast separately for re-use in the reinstatement and landscaping of the site or, in the case of rock, in the construction of access tracks and turbine hardstands. It is estimated that c. 68,525m3 of material will be excavated to facilitate the construction of the project as a whole.

Preliminary site investigations indicate that the ground profile across the proposed wind farm site is predominantly characterised by peat and peaty soils overlying marl and lacustrine clay deposits, with underlying glacial deposits. Ground conditions along the underground electricity line route are more variable, with areas of limestone-derived till and sand and gravel deposits occurring in addition to localised peat and soils. There was very little in the way of rock or rock outcrops identified during these preliminary investigations and, as such, it is not anticipated that significant volumes of rock will be available from on-site construction excavations.

A preliminary Peat & Spoil Management Plan has been prepared in respect of the project and incorporates measures regarding the appropriate management of material, including peat, which will arise from the construction of the project.

Prior to the commencement of development at the site, an updated, detailed Peat & Spoil Management Plan will be prepared following the post-consent detailed design process and will address the re-use, reinstatement, storage and restoration of all material excavated during the construction phase, including detailed methods regarding the establishment and management of the spoil deposition areas for the project.

With regard to the proposed grid connection the site of the switch room is gently sloping from west to east, as a result, extensive earthworks will not be required. As set out above, in order to provide a level compound area and to ensure appropriate levels are available for the construction of the electrical switch room building, it is proposed to implement a cut and fill approach whereby topsoil and subsoil will be excavated at higher elevations and imported material (aggregates) will be deposited at areas of lower elevation to create a level platform. This process will avoid excessively deep or expansive excavations and will, similarly, avoid the requirement to import significant volumes of stone aggregates to make up levels.

Additionally, this process will ensure that the geological integrity of the site is maintained. Following the cut and fill process, the switch room compound will be finished with compacted stone aggregates.

Due to the generally shallow nature of excavations, substantial volumes of spoil are not predicted to be generated. It is proposed that excavated material (topsoil, subsoil and rock [where present]) will, insofar as possible, be utilised in the post-construction reinstatement of the project.

Table 2-2, below, provides a breakdown of the spoil volumes predicted to be generated, and proposals regarding the reuse or disposal of this material, across the project site.

Table 2-2 Spoil Generation & Management

Project Element	Volume of Material to be Excavated (m^3)	Volume of Material to be utilised for reinstatement/landscaping (m^3)	Volume of Material to be disposed of in deposition areas (m^3)	Volume to be Disposed Off-Site (m^3)
Proposed Wind Farm (Incl. foundations, access tracks, hardstands, drainage, and internal cables)	62,509	15,364	47,145	-

Project Element	Volume of Material to be Excavated (m^3)	Volume of Material to be utilised for reinstatement/landscaping (m^3)	Volume of Material to be disposed of in deposition areas (m^3)	Volume to be Disposed Off-Site (m^3)
Switch Room (incl. Compound area, and site entrance)	60	60	-	-
Underground Electricity Line	5,946	5,946	-	-
Haul Route Upgrade Works	10	-	-	10

2.1.9.2 Spoil Deposition

In the first instance, surplus excavated material will, as described in the preceding sections, be utilised in the reinstatement and landscaping of the project where practicable. While it is estimated that the above reinstatement and landscaping processes will account for substantial volumes of excavated material; it is proposed to develop a number of dedicated spoil deposition areas, where excess material (predominately peat and peaty subsoils) which cannot be utilised for reinstatement or is unsuitable for landscaping purposes, will be stored permanently.

The project site includes a designated spoil deposition area, located immediately southeast of T11, as well as a series of smaller deposition areas located around the bases of proposed turbines and along the attendant access track.

The location of the deposition areas have been selected due to the absence of notable environmental constraints, separation distance to watercourses and generally flat or gently sloping gradient. Excavated material will be transported to the selected areas where it will be placed in layers and compacted as necessary to ensure long term stability and to mitigate settlement. Appropriate drainage management measures will be implemented to encourage vegetative regeneration of the material while ensuring that the deposited peat/spoil does not become waterlogged. The drainage measures will also be designed to prevent any pollution of surface water features in the environs of the project site.

Following the completion of construction, the deposition areas will be reinstated to reflect the adjoining ground profile and integrate with the surrounding landscape. Where appropriate, topsoil stripped during initial site preparation will be placed to the surface to support natural revegetation and increased proliferation of local habitats and species. Drainage features will be incorporated where required to manage surface water and prevent erosion.

Works at the spoil deposition areas will be monitored, on a weekly basis during the construction phase and monthly for a 6-month period thereafter, by an appropriately qualified geotechnical engineer.

In the event that material is generated which is unsuitable for storage within the deposition areas (e.g. asphalt cuttings from public road upgrades) or excess material arises which cannot be accommodated on-site, this shall be removed from site and disposed of at a licensed waste disposal facility.

2.1.9.3 Aggregates Sources

As described above, preliminary site investigations have identified that there is little to no rock present within the project site which can be utilised in the construction of access tracks and crane hardstands. Accordingly, aggregates, including access track and crane hardstand topping material and concrete, will be imported from local suppliers.

Only fully licensed quarries which have been subject to EIA and have appropriate planning permission for the volumes of material to be extracted will be used. These aggregates are slated for extraction in the normal course of the relevant quarry's business and therefore will have no additional likely significant environmental impacts above and beyond those normally entailed in the operation of the quarry.

As part of the Traffic Management Plan, suppliers will be instructed to utilise the extensive national and regional road networks to access the site and to avoid local roads insofar as possible.

On the basis of the design process undertaken to date, the estimated volumes of construction materials/aggregates (rock/stone and concrete) required in the construction of the project are included at Table 2-3 below.

Table 2-3 Project Works Material (Aggregates) Volumes

Infrastructure ID	Rock/Stone sourced from On-Site Excavations (m^3)	Rock/Stone sourced from Local Supplier (m^3)	Concrete sourced from Local Supplier (m^3)	Sand sourced from Local Supplier (m^3)	Tarmacadam/ Tar & Chips sourced from Local Supplier (m^3)
Proposed Wind Farm (Incl. foundations, access tracks, hardstands, drainage, and internal cables)	-	53,414	3,390	1,462	-
Switch Room (incl. compound and site entrance)	-	197	48	9	-
Underground Electricity Line	-	-	-	2,075	-
Haul Route Upgrade Works	-	1,600	-	-	10

2.1.10 Site Drainage & Rehabilitation

2.1.10.1 Construction Drainage Management and Disposal

Construction works will be carried out in accordance with the 'Land & Soil' and 'Water' assessments and mitigation measures included in this reporting in order to prevent any likely significant effects on nearby watercourses by debris, silt and hydrocarbons.

Sources of likely significant effects on the hydrological environment during construction include increased volumes of surface water runoff; the generation of silt laden surface water runoff from excavations and the storage of stockpiled materials; contamination due to the

leakage of oils/fuel from site vehicles; spillage during refuelling operations; and leakage from chemical, waste and fuel storage areas.

Specific mitigation measures are presented in the CEMP (Appendix I). The precise implementation and siting of these measures will be determined, subject to planning permission being granted, following the further post-consent detailed design process and will be included within a detailed CEMP to be agreed with the Planning Authority prior to the commencement of construction.

All surface water runoff from stockpiles (including the spoil deposition areas), excavations, or from dewatering operations will be passed through an appropriate attenuation train, including silt fences (also known as silt curtains) and silt traps (also known as silt/settlement/sediment/stilling ponds)[13]. Other surface water protection measures which may be implemented, as appropriate, include straw bales, silt bags and siltbusters.

Surface water control measures will be implemented as construction progresses through the site; however, prior to the commencement of earthworks, temporary silt/sediment control infrastructure (e.g. straw bales) will be placed in agricultural/peatland drains around the site until the full range of construction phase measures are installed.

The inclusion of these surface water runoff measures within the project design will avoid any discharge of silt or sediment laden waters directly to any surface water feature or to ground prior to being fully treated. The precise design, sizing and siting of drainage infrastructure (including the size of stilling ponds, lagoon-type settlement ponds and discharge rates) will be confirmed as part of the post-consent detailed design process; however, it can be confirmed that the design will be reflective of predicted precipitation levels with an appropriate allowance for climate change.

Along the route of the underground electricity line, temporary surface water control measures will be installed within agricultural drains and streams as construction progresses along the route. Such features may include silt fences, silt traps or straw bales which will ensure that silt/sediment or suspended material is not discharged to downstream waters.

As described above, at the intersection of the route of the underground electricity line and natural watercourses (2 no.), it is proposed that the underground electricity line will be installed via HDD. All HDD works will be undertaken in strict accordance with best practice methodologies with surface water measures being installed; including the installation of double silt fencing, avoidance of any refuelling activities within 50m of the streams, bunding of the drilling fluid, pumping and recycling plants, spill kits being available in the event of an accidental spillage or leakage, and the provision of adequately sized skips for the temporary storage of drilling arisings and drilling flush. All such arisings and flush will be disposed of at a licensed waste management facility.

A Planning-Stage Surface Water Management Plan (SWMP) has been prepared in respect of the project (enclosed within the CEMP Appendix I). This SWMP will be further developed prior to the commencement of development, following the post-consent detailed design process, and will incorporate the precise implementation and siting of surface water management infrastructure.

Following the completion of construction, temporary surface water treatment infrastructure will, where appropriate, be decommissioned and removed from site. Due to the permeable nature of the access tracks, hardstands and switch room footing, the vast majority of surface water will percolate to ground. Stormwater drainage infrastructure will be installed around the switch room to capture any runoff from roofed or paved areas and will be passed through an oil interceptor before being discharged to an agricultural drain. Discharge rates will be designed

13 Please note that the titles of surface water protection infrastructure are used interchangeably within this report and accompanying documentation.

to mimic greenfield runoff rates thus avoiding any long term alteration to the hydrological regime of the project site.

2.1.10.2 Rehabilitation Works

The proposed wind farm site is located on lands which form part of Galros Bog. Galros Bog forms part of the Bord na Móna (BNM) group of bogs and was historically subject to industrial peat production, including the supply of peat to the nearby Derrinlough Briquette Factory. Industrial peat harvesting has now ceased across Galros Bog, and the lands now form part of a wider cutaway/cutover peatland landscape undergoing transition following the cessation of peat extraction.

BNM has prepared a *draft Galros Bog Rehabilitation Plan* (2026) in respect of the wider Galros Bog complex in accordance with its obligations under the relevant Integrated Pollution Control (IPC) licensing regime. The draft Rehabilitation Plan is a BNM document and does not form part of the proposed project. It is, however, an important contextual document in understanding the future management, rehabilitation and environmental stabilisation of the wider Galros Bog lands.

For clarity, the proposed project does not seek to regularise, authorise or retrospectively assess any historic peat extraction activity at Galros Bog. Historic peat extraction forms part of the existing baseline environment assessed in this report. The proposed project comprises a new renewable energy development on lands historically subject to industrial peat production.

Cush Wind Limited has engaged with BNM during the preparation of the draft Rehabilitation Plan in order to ensure that the proposed project has been considered in the context of the wider rehabilitation objectives for Galros Bog. The project has been designed so that its construction, drainage, peat/spoil management and reinstatement measures are compatible with, and do not prejudice, the wider rehabilitation and environmental stabilisation objectives for Galros Bog.

The design of the proposed wind farm, including the Site Drainage Plan (SDP), which makes up an integral part of the Surface Water Management Plan (SWMP) has been developed in consideration of the Galros Bog Rehabilitation Plan. The draft Galros Bog Rehabilitation Plan is included at Appendix J hereto. Furthermore, peat and spoil management measures, including the use of peat/spoil deposition areas, as set out in the Peat and Spoil Management Plan (**Appendix I**), have been designed to have had regard to the measures identified within the Rehabilitation Plan. The project includes the provision of peat/spoil deposition areas, including 1 no. designated spoil deposition area, and the use of areas surrounding access tracks and turbine hardstand areas.

2.1.11 Landscaping

Some hedgerow and tree removal will be required throughout the project site to enable the construction of the project. The extent of hedgerow and tree removal has, by design, been minimised and no vegetation will be unnecessarily removed.

The Ecological Clerk of Works (ECoW), to be appointed to monitor works during the construction phase, will select appropriate locations for the replacement of hedgerows and trees and will monitor the bolstering of hedgerows. The siting of this replacement vegetation will be carefully selected to maintain or enhance the ecological connectivity of the site while ensuring that adverse effects do not arise as a consequence. All new treelines or hedgerows will be planted using native species and in a similar composition to treelines or hedgerows lost. The replacement of these trees and hedgerows will be conducted in accordance with the wider reinstatement and landscaping proposals for the project.

2.1.12 Micrositing

The immaterial micrositing of elements of the project, following post-consent detailed site investigations and geotechnical analysis, also forms part of the project assessed in this reporting.

A micrositing allowance of 20m in any direction is proposed for wind turbines in accordance with Section 5.3 of the *Wind Energy Development Guidelines for Planning Authorities 2006*[14]. It is anticipated that the agreed micrositing distance will form a condition accompanying a grant of planning permission. It is also proposed that hardstands, access tracks, and underground cables may be immaterially micro-sited subject to compliance with the mitigation measures included in this reporting.

These immaterial micrositing deviations have been incorporated, and fully assessed, throughout this reporting, and will have no likely significant impacts on the substantive conclusions of this reporting.

2.1.13 Off-site and Secondary Developments

2.1.13.1 Turbine Component/Delivery Haul Route

The turbine component haul route assumes that turbine components will enter via the Port of Galway. From there, the turbine components will be transported by specialised HGVs along the N6, M6, N52 and N62 before accessing the project site via the construction phase site entrance. In order to facilitate the delivery of turbine components, accommodation works will be required at various locations along the route.

The haul route is the same as that assessed as part of the permitted Cush Wind Farm Phase I development. The turbine components will be delivered to the site as part of a coordinated construction programme for Cush Wind Farm Phases I and II. However, as the current project potentially incorporates slightly larger turbine dimensions than those previously permitted for Cush Wind Farm Phase, an updated Route Access Survey was undertaken and provided. While the established haul route remains suitable, the revised assessment identifies some minor variations to the temporary accommodation works.

A total of 23 no. locations have been identified where accommodation works to the public road network will be required. The works principally comprise temporary road widening at identified roundabouts and junctions; the temporary removal and reinstatement of street furniture and fencing; and cutting back trees and hedgerows. The temporary accommodation works will be reinstated following the delivery of the turbine components. At the R339/Connolly Avenue junction in Galway City, a c. 6 m section of existing wall will be permanently removed and replaced with fencing.

A summary description of the principal accommodation works identified in the Route Access Survey is provided in **Table 2-4.** The full schedule of accommodation works at all 23 no. locations is provided in the Route Access Survey. Traffic management measures for turbine component deliveries will be agreed in advance with the relevant local authorities. These deliveries will comprise abnormal-sized loads but will not constitute abnormal-weight loads. The timing and management of deliveries will be agreed with the relevant local authorities and An Garda Síochána, as necessary, and all applicable notifications, licences and permits will be obtained in advance.

[14] Wind turbine positioning is also referred to at Section 7.5 of the *Draft Revised Wind Energy Development Guidelines 2019*.

Port of Galway to M6/N52 Junction

From the Port of Galway to the junction of the M6 and N52, the turbine component haul route follows regional, national and motorway routes. It will be necessary to temporarily remove street furniture; including road signs, bollards and street lighting; and to undertake temporary works to existing roundabouts to accommodate oversized vehicle loads, including the temporary removal of vegetation and emplacement of hardcore. As set out above there is 1 no. location along this route which will require permanent works and the removal of a small section of wall and fence, in order to facilitate the safe/unrestricted passage of turbine components. Further details of the required temporary works are included in the Route Access Survey (see Appendix L).

M6/N52 Junction to N52/N62 Junction

From the junction of the M6 and N52, the haul route follows the N52 to its junction with the N62.

Along this section of the route, which passes around the town of Tullamore and through the small town of Kilcormac, temporary hardcore will be laid on roundabout central islands and road signs, street furniture and street lighting temporarily removed at a number of locations; however, the extent of works will be minimal and will be reinstated immediately following the delivery of turbine components.

This will involve the removal of up to 3 no small trees which make up part of the existing public realm works in Kilcormac. It is proposed to temporarily remove these trees and replant them immediately upon completion of components being delivered to the site, where possible. If this is not possible, the trees will be replaced on a like for like basis, including reinstatement with similar tree species and size. The street furniture which will be removed in Kilcormac will also be reinstated upon delivery of turbine components.

N52/N62 Junction to Wind Farm

Due to the existing alignment of the junction of the N52 and N62, turbine components; including blades; are assessed to be incapable of navigating the existing junction alignment. Accordingly, it is proposed to undertake a reverse manoeuvre. The reverse manoeuvre involves reversing the abnormal load from the N62 onto private lands[15], controlled by the Developer, before making a forward movement along the N62 towards the construction phase site entrances. Within the private lands, an area will be hardcored to accommodate HGVs associated with the delivery of turbine components. The works necessary to undertake this manoeuvre will result in the temporary removal of road signs and street lighting and the removal and replacement of a small section of tree lined hedgerow and fence on the eastern side of the junction. In line with the other proposed temporary works along the haul route, the extent of works will be minimal and will be reinstated immediately following the delivery of turbine components.

It is important to note that the temporary reverse manoeuvre location, along the eastern side of the N52/N62 junction, will only be utilised by turbine component delivery vehicles travelling towards the project site. Once the delivery of components has been completed, the extendable blade/tower-section trailer will be retracted to a shorter overall length. Therefore, delivery vehicles leaving the site will not be required to utilise the temporary reverse point and will be able to negotiate the existing junction without the need for a reverse manoeuvre.

[15] The physical (temporary) works proposed in order to accommodate this reverse manoeuvre were permitted as part of the Cush Wind Farm Phase I planning consent (ACP Reference: ABP-318816-24)

Summary

All temporary works will be fully reinstated to the satisfaction of the relevant local authority. A summary of key locations, where more notable works are required, are provided at **Table 2-4** below.

Table 2-4 Haul Route Alteration Works

Location ID (per Route Access Survey)	Description of Haul Route Works
Location 7.2.5: R339/Connolly Avenue Junction	Permanent removal of wall and replacement with fence on third party lands. Temporary removal of traffic signals, street lighting and electric pole.
Location 7.2.6: Connolly Avenue/R336 Junction	Temporary hardcore on offside of junction and temporary removal of street lighting.
Location 7.2.7: R336/N6 Junction	Temporary removal of railings, tree, traffic signals and street lighting.
Location 7.2.8: N6 Coolagh Roundabout	Temporary removal of road signs and street lighting.
Location 7.3.1: M6/N52 Roundabout	Temporary hardcore at roundabout and exit slip and temporary modifications to street furniture. Temporary removal of road signs and street lighting.
Location 7.3.2: N52/M6 Roundabout	Temporary hardcore and removal of road signs on central island of roundabout.
Location 7.4.1: N52/R420 Ardan Roundabout	Temporary hardcore of roundabout central island.
Location 7.4.2: N52/L2025 Roundabout	Temporary hardcore on splitter and central island of roundabout and temporary removal of road signs.
Location 7.4.3: N52/R420 Roundabout	Temporary hardcore and road sign removal on central island of roundabout.
Location 7.4.4: N52/R443 Roundabout	Temporary hardcore and road sign removal on central island/splitter at roundabout.
Location 7.4.5: N52/Tullamore Distillery Roundabout	Temporary hardcore and road sign removal on central island of roundabout.
Location 7.4.6: N52/R421 Roundabout (East)	Temporary hardcore and road sign removal on central island of roundabout.
Location 7.4.7: N52/R421 Roundabout (West)	Temporary hardcore and on central island of roundabout and temporary removal of road sign.
Location 7.4.8: N52/L6009 Roundabout	Temporary hardcore and road sign removal on central island of roundabout.

Location ID (per Route Access Survey)	Description of Haul Route Works
Location 7.5.1: Right hand bend in Kilcormac	Temporary removal and replacement of small streetscape trees.
Location 7.5.3: N52/N62 Junction	Provision of temporary hardcore to east of junction to accommodate reverse manoeuvre onto N62. Temporary removal of fence, road signs and street lighting. Temporary removal and replacement of hedge and trees on eastern side of junction.

During the delivery of turbine components to site, all associated (abnormal sized loads) HGVs will be accompanied by escort vehicles. An Garda Síochána will also be informed prior to turbine component transportation as it will be necessary to temporarily close junctions as the components pass through.

As all works are temporary, with the exception of the wall removal and associated replacement fencing in Galway, excavated material will be fully re-used in the reinstatement of each works location. Any waste tarmacadam/concrete will be transported to a licenced facility.

All works will be carried out in accordance with relevant best practice manuals, guidelines and specifications.

2.1.13.2 Turbine Component Haul Route - Aggregates Sources & Quantities

The estimated volumes of construction materials and aggregates required to facilitate the turbine component haul route accommodation works are included in **Table 2.3**.

2.2 Existing Environment

2.2.1 Desk Study

A desk study was carried out to collate available information on the existing natural environment at the Project location using the sources of information outlined in Section 1.5. This section is based on an ecological desk study comprising an online search for:

(i) Statutory designated sites (SACs, SPAs, Ramsar sites, National Parks and NHAs) within the receiving environment;

(ii) Annex I habitats within 2 km;

(iii) Watercourses, as well as groundwater and surface water bodies, with potential hydrological connectivity;

(iv) Annex I bird species, as well as Annex II and IV (non-bird) species, from the 10 km square of the Project site; and

(v) Records of invasive non-native species from the same 10 km square(s).

2.2.2 Field Assessments

Ecological surveys were carried out to yield sufficient data to support this assessment. A brief description of the surveys undertaken, and survey dates are presented in **Table 2-5** below.

Table 2-5: Summary of Ecology Surveys

Survey	Brief Description	Timing
Site Walkover	An initial walkover of the site was undertaken to identify any major constraints.	30th June – 1st July 2026 (proposed UGL location) 06th March 2026
Habitats	Survey to determine habitats present within the main wind farm site, grid-connection route, and substation.	30th June – 1st July 2026 (proposed UGL location) 06th March 2026
Invasive Species	Recording non-native invasive species observed during habitat surveys, and on an ad-hoc basis during other surveys. The location and area covered by invasive plant species (i.e. area or length(m^2)/(m)) of plant species was also noted.	30th June – 1st July 2026 (proposed UGL location) 06th March 2026
Aquatic Surveys	Undertaken on a catchment-wide scale, the baseline surveys focused on aquatic habitats in relation to fisheries potential (including both salmonid and lamprey habitat), white-clawed crayfish (*Austropotamobious pallipes*), freshwater pearl mussel (*Margaritifera margaritifera*) (eDNA only), macro-invertebrates (biological water quality), macrophytes and aquatic bryophytes, aquatic invasive species, and species of conservation value which may use the watercourses in the vicinity of the project. Full details of the survey methodology are included in section 2 of the aquatic survey report in **Appendix G.**	14th, 15th and 16th August 2025
Invertebrate, Amphibian and Reptile Suitability Assessment	Invertebrate species observed were noted throughout the entirety of ecological surveys on an ad-hoc basis. Suitability for and evidence of amphibians and reptiles also noted during surveys.	31st June – 1st July 2026 (proposed UGL location) 06th March 2026
Marsh Fritillary	Habitat assessment to determine potential and suitability for marsh fritillary.	10th – 11th July 2025 (habitat condition assessment) 25th – 26th August 2025 (larval web survey)
Bird Surveys Full details of survey dates are contained within **Appendix E**.	Vantage point (VP) surveys covering each turbine location plus a 500m radius around the same. One VP x 36 hours/VP/season (minimum) over two years.	Breeding season 22: May – August 2022 (36 hours)
		Non-breeding season 22/23: October 2022 – March 2023 (36 hours)
		Breeding season 23: April – August 2023 (36 hours)

Survey	Brief Description	Timing
		Non-breeding season 23/24: October 2023 – March 2024 (36 hours)
	Nocturnal migration surveys within the wind farm site plus a 500m buffer zone	Spring 24: April 2024 (18 hours)
		Autumn 24: November 2024 (2 hours)
		Spring 25: March 2025 (2 hours)
	Breeding wader (lowland) surveys within the wind farm site plus a 500m buffer zone (all seasons) and the UGL and amenity trail as originally proposed (breeding 24 season only); these two elements are no longer part of the application in their surveyed form (the amenity trail has been removed and the grid connection site has been realigned).	Breeding season 22: May – June 2022 (3 visits)
		Breeding season 23: April – June 2023 (3 visits)
		Breeding season 24: April – June 2024 (3 visits)
	Breeding woodcock surveys within the wind farm site, the UGL and amenity trail as originally proposed (these two elements are no longer part of the application in their surveyed form (the amenity trail has been removed and the underground electricity line has been realigned)), plus a 500m buffer zone.	Breeding season 24: May – June 2024 (3 visits)
	Common kingfisher habitat suitability assessment within watercourses within the wind farm site plus a 500m buffer zone.	Breeding seasons 23: April 2023 (1 visit)
	Breeding raptor surveys within the wind farm site plus a 2km buffer zone (all seasons) and the amenity trail and UGL as originally proposed (breeding 24 season only); these two elements are no longer part of the application in their surveyed form (the amenity trail has been removed and the underground electricity line has been realigned).	Breeding season 22: May – July 2022 (4 visits)
		Breeding season 23: April – July 2023 (4 visits)
		Breeding season 24: April – July 2024 (4 visits)
	Barn owl nesting / roost appraisal within the wind farm site plus a 500m buffer zone.	Breeding seasons 23: April 2023 (1 visit)
	Winter swan and goose feeding distribution surveys within the wind farm site plus at least a 600m buffer zone (all non-breeding seasons) and the UGL and amenitry trail as originally proposed (non-breeding 23/24 – 24/25 seasons only); these two elements are no longer part of the application in their surveyed form (the amenity trail has been removed and	Non-breeding season 22/23: October 2022 – March 2023 (12 visits)
		Non-breeding season 23/24: October 2023 – March 2024 (12 visits)
		Non-breeding season 24/25: October 2024 – March 2025 (12 visits)

Survey	Brief Description	Timing
	the underground electricity line has been realigned).	
	Nocturnal wader surveys at suitable habitat within the wind farm site plus a 500m buffer (all seasons) and in a the amenity trail and UGL as originally proposed (non-breeding 24/25 season only); these two elements are no longer part of the application in their surveyed form (the amenity trail has been removed and the underground electricity line has been realigned).	Non-breeding season 22/23: January and March 2023 (2 visits)
		Non-breeding season 24/25: October 2024 - March 2025 (6 visits)
Terrestrial Mammals (excluding bats)	Survey carried out within 50m of site infrastructure. Surveys for otter also extended 150m upstream/downstream of water crossings (i.e. 300m total).	31st – 1st July 2026 (proposed UGL location) 06th March 2026
Bats	Preliminary ecological appraisal of project site to determine presence of potential commuting, foraging, and roosting habitat.	April 04th 2026
	Preliminary roost assessment targeting (trees and structures):	April 04th 2026
	Ground-level Static Detectors:	**Spring:** 06th May 2025 – 15th May 2025 **Summer:** 04th June 2025 – 16th June 2025 **Autumn:** 16th September 2025 – 26th September 2025
	Survey of Trees along underground electricity line	April 04th 2026, 31st – 1st July 2026 (proposed UGL location)

2.2.2.1 Survey Area

'Study area' hereafter refers to the entirety of the areas studied from both desk and field for the Project.

'Survey area' hereafter refers to the areas surveyed specifically for field surveys.

Habitats, Flora, Terrestrial Mammals (Excluding Bats) & Other Protected Fauna

The survey area for habitats, flora, terrestrial mammals (excluding bats) and other protected fauna included lands within the site boundary (including all areas within 50m of the proposed grid connection, and nodes of the haul route.

Where access allowed, all areas within 150m of any proposed infrastructure of the project were surveyed for signs of mammals. Areas within the site boundary were assessed for habitat suitability for amphibians and reptiles.

Marsh fritillary surveys were carried out within the project site were assessed for habitat suitability for the species.

Bats

The study areas used for bat impact assessment were as recommended by relevant good practice survey guidance (NatureScot, 2021). These are described in more detail within the baseline bat report **(Appendix H**).

Birds

The study areas used for the ornithological impact assessment differ according to receptor as recommended by relevant good practice survey guidance (NatureScot, 2025c). These are described in more detail within the baseline survey reports (**Appendix E**).

Note that for the 2024 breeding bird and 2024/25 non-breeding bird surveys, a underground electricity line and amenity trail was surveyed that is no longer under consideration as part of the current project; however, it is currently included in the baseline bird reports.

For the assessment of effects on bird species, a variety of buffer distances have been applied to each turbine location and around all other infrastructure, where appropriate. These buffers are in accordance with current guidance and evidence-based research.

Fisheries & Aquatic Ecology

The survey areas used for the fisheries and aquatic ecology impact assessment followed a catchment-level approach. All freshwater watercourses which could be affected directly or indirectly by the project were considered with a total of 14 no. riverine sites targeted for detailed aquatic assessment. These sites were both within the project site boundary and along the proposed grid connection. The surveys are described in more detail within the baseline survey report (**Appendix G**).

2.2.3 Project Site Overview

2.2.3.1 Wind Farm Site

Within the Project site the dominant habitat is cutover bog (PB4). This was previously subject to industrial peat extraction which is evident by the drainage and lack of vegetation throughout this habitat. Ground elevations range from between 55 m and 45 m ordnance datum (OD) across the Project site. The most elevated section is located to the north of the Project site. A first order watercourse, West Galros (EPA code 25W44), flows briefly within the Project site. In addition, another first order watercourse, Eglish 25 (EPA code 25E18) flows south adjacent to the Project site. Both of these watercourses are tributaries of Rapemills_010 (European code: IE_SH_25R010300), second order watercourse. The Project site lies within Banagher ground waterbody (European code: IE_SH_G_040), Birr ground waterbody (European code: IE_SH_G_041) and Birr gravels waterbody (IE_SH_G_244).

2.2.3.2 Grid Connection Site

Habitats along the route of the proposed underground electricity line and within the immediate vicinity of the wind farm site include cutover bog PB4, improved agricultural grassland GA1, fields occasionally bounded by hedgerows WL1, and treelines WL2, and parcels of scrub.

2.2.3.3 Annex I Habitats

While a 0.34 km^2 parcel of 7230 alkaline fens is recorded approximately 1.76 km northeast of the Project site boundary, and the Project site overlaps with a 100 km^2 polygon record for 6430 Hydrophilous tall-herb swamp, no Annex I habitats were recorded present within the Project site or survey area.

2.2.3.4 Eurpoean Designated Species

With regards to bats, the only species of bat in Ireland that is listed under Annex II of the Habitats Directives is the lesser horseshoe bat (*Rhinolophus hipposideros*). This bat species was not recorded during any of the bat surveys. The Project site is not within the range of this species.

The following Annex I bird species were recorded during the suite of bird surveys conducted between 2022 and 2025: European golden plover (*Pluvialis apricaria*), great white egret (*Ardea alba*), hen harrier (*Circus cyaneus*), little egret (*Egretta garzetta*), merlin (*Falco columbarius*), peregrine falcon (*Falco peregrinus*), sandwich tern (*Thalasseus sandvicensis*) and whooper swan (*Cygnus cygnus*).

2.3 Sources for potential impacts from the Project on the receiving environment

This section identifies the sources of potential impact generated by the Project, irrespective of whether they have the potential to affect a European site. The purpose of this stage is solely to identify the activities and processes associated with the Project that could give rise to ecological effects within the receiving environment.

The identification of impact sources (set out in Table 2-6) follows the European Commission (2021) guidance and the OPR (2021) Practice Note and considers the principal mechanisms by which the Project could affect the environment at source, including:

- Habitat destruction, fragmentation or deterioration;
- Surface water run-off carrying suspended solids or contaminants to receiving waters;
- Changes to groundwater quality, yield or flow paths;
- Project-related activities (e.g. noise, vibration, lighting, human presence and structures) causing disturbance or displacement of species;
- Project-related activities leading to injury or mortality of species, or reductions in population size or density;
- Air pollution, including dust and other airborne emissions; and
- The introduction or spread of invasive alien species during construction or operation.

The identification of an impact source at this stage does not imply that a likely significant effect on a European site will occur. The relevance of each source is subsequently considered through the Source–Pathway–Receptor assessment Source-Pathway-Receptor assessment (Section 1.6 & Section 3.3 where it is determined whether a credible pathway exists between the Project and any European site. Only those sources for which a source–pathway–receptor linkage exists are carried forward to the assessment of likely significant effects.

Table 2-6: Identification and characterisation[16] of sources for impacts arising from the Project that have potential for interactions with the receiving environment[17]

Impact Source Type	Project Phase	Potential Impact Source Description
Habitat destruction/ fragmentation/ deterioration.	Construction Phase	The construction of the Project infrastructure may result in habitat destruction, fragmentation and deterioration.
	Operation Phase	There are no sources for effects related to habitat fragmentation, destruction or deterioration during the operation phase.
	Decommissioning Phase	Accidental damage to, or deterioration of, habitats may occur as tracks and infrastructure are removed.
Surface water run-off carrying suspended silt and contaminants into local watercourses.	Construction Phase	Construction related activities may generate surface water run-off the contains suspended silt and/or contaminants. This run-off may flow into local watercourses. Accidental spills or leaks of lubricants, or fuels from vehicles associated with the maintenance of the turbines may enter a nearby watercourse.
	Operation Phase	Accidental spills or leaks of lubricants, or fuels from vehicles associated with the maintenance of the turbines may enter a nearby watercourse.
	Decommissioning Phase	Release of suspended solid and other pollution during the removal of infrastructure. These pollutants could enter a nearby watercourse.

[16] As per the CIEEM (2023) Guidelines on ecological assessments the sources for impacts are considered with reference to the following criteria (where relevant); positive or negative, extent, magnitude, duration, timing, frequency, and reversibility. However, it is recognised that some of these criteria are more easily assessed later on in the assessment process when the sensitive receptors are known.

[17] Assessment of Plans and Projects significantly affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC', (European Commission, 2021), the likely impacts of the project are set out relative to the following project features: size (e.g. in relation to direct land-take); overall affected area including the area affected by indirect impacts (e.g. noise, turbidity, vibrations); physical changes in the environment (e.g. modification of riverbeds or morphology of other water bodies, changes in the density of forest cover); changes in the intensity of an existing pressure (e.g. increase in noise, pollution or traffic); resource requirements (e.g. water abstraction, mineral extraction); emissions (e.g. nitrogen deposition) and waste (and whether they are disposed of on land, water or in the air); transportation requirements (e.g. access roads); duration of construction, operation, decommissioning, etc.; temporal aspects (timing of the different stages of a plan or project)

Impact Source Type	Project Phase	Potential Impact Source Description
		Accidental spills or leaks of lubricants, or fuels from vehicles associated with the maintenance of the turbines may enter a nearby watercourse.
Changes to groundwater quality, yield and/or flow paths.	Construction Phase	Construction related activities, such as earthworks, has the potential to cause changes to groundwater quality, yield and/or flow paths. Temporary and highly localised groundwater drawdown may occur during construction of turbine foundations.
	Operation Phase	There are no sources for effects related to changes to groundwater during the operation phase.
	Decommissioning Phase	Decommissioning related activities, such as earthworks, has the potential to cause changes to groundwater quality, yield and/or flow paths.
Project-related activities (e.g. noise, vibration, lighting, human presence and structures) causing disturbance or displacement of species.	Construction Phase	Construction related activities have the potential to cause disturbance and/or displacement of species from the Project site through increased noise levels, vibration and increased human presence.
	Operation Phase	The operation of the three wind turbines and associated human activities for maintenance purposes both have the potential to cause disturbance and/or displacement of species, particularly birds, from the Project site.
	Decommissioning Phase	The removal of the turbines and associated infrastructure has the potential to cause disturbance and/or displacement of species from the Project site.
Project-related activities leading to injury or mortality of species, or reductions in population size or density.	Construction Phase	Through the destruction, fragmentation and deterioration of habitat the construction phase could lead to a reduction in plant population size and/or density. Furthermore, construction phase activity could, in the absence of mitigation, result in the injury or death of animals, leading to a reduction in population size or density.
	Operation Phase	The operation of the three turbines poses a collision risk to birds and bats. Collision of a bird or bird with turbine rotors is almost certain to result in the death of the bird or bat. This potential impact is identified as negative and would continue for the lifetime of the Project. The magnitude

Impact Source Type	Project Phase	Potential Impact Source Description
		of the impact is dependent on the level of bird and bat activity within the Project site and so may be small, moderate or large.
	Decommissioning Phase	The decommissioning phase could, in the absence of mitigation, result in the injury or death of animals, leading to a reduction in population size or density.
Air pollution due to dust and other airborne emissions.	Construction Phase	Construction related activities may generate dust and other airborne emissions. The Institute of Air Quality Management (IAQM) guidance[18] suggests that air pollution and dust potentially generated from road schemes are only likely to be important for sensitive European sites within 200 m and 500 m, respectively. The dust and airborne emissions generated as a result of the construction of the Project is considered to be similar to that generated during road schemes.
	Operation Phase	There are no anticipated sources for impacts due to air pollution during the operation phase.
	Decommissioning Phase	Decommissioning related activities may generate dust and other airborne emissions. The Institute of Air Quality Management (IAQM) guidance[18] suggests that air pollution and dust potentially generated from road schemes are only likely to be important for sensitive European sites within 200 m and 500 m, respectively. The dust and airborne emissions generated as a result of the decommissioning of the Project is considered to be similar to that generated during road schemes.
The introduction or spread of invasive / alien species during construction or operation.	Construction Phase	No invasive/alien species were recorded within the Project site. Therefore, there are no anticipated sources for impacts due to the introduction or spread of invasive/alien species during the construction phase.
	Operation Phase	There are no anticipated sources for impacts due to the introduction or spread of invasive/alien species during the operation phase.

[18] Holman *et al.* (2014). IAQM Guidance on the assessment of dust from demolition and construction, Institute of Air Quality Management, London. www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf.

Impact Source Type	Project Phase	Potential Impact Source Description
	Decommissioning Phase	No invasive/alien species were recorded within the Project site. Therefore, there are no anticipated sources for impacts due to the introduction or spread of invasive/alien species during the decommissioning phase.

3.0 AA Screening

This section of the report examines if the proposed project is likely to have a significant effect upon European Sites, either alone or in combination with other plans or projects.

3.1 Management of any European Site

The authors of this report confirm that this Project is not intended as part of the management of any European site.

3.2 Sources of Potential Impacts

Based on the project description in Section 2.0 and a review of the planning documents the following sources for impacts have been identified.

Habitat destruction, fragmentation and deterioration may occur during the construction phase, and to a lesser extent, also during the decommissioning phase.

Firstly, suspended solids and other pollutants generated during the construction and decommissioning phase could enter local watercourses via surface water run-off. These pollutants could then travel downstream and potentially reach European sites, resulting in adverse effects to the QIs through changes in water quality and the natural circulation and supply of sediments. In addition, accidental spills or leaks of lubricants, or fuels from vehicles associated with the maintenance of the turbines may enter a nearby watercourse.

Secondly, construction and decommissioning related activities, such as earthworks, have the potential to cause changes to groundwater quality, yield and/or flow paths. Temporary and highly localised groundwater drawdown may occur during construction of turbine foundations.

Thirdly, construction and decommissioning related activities have the potential to cause disturbance and/or displacement of species from the Project site through increased noise levels, vibration and increased human presence. Additionally, the operation of the three wind turbines and associated human activities for maintenance purposes both have the potential to cause disturbance and/or displacement of species, particularly birds, from the Project site.

Fourthly, the construction phase could lead to a reduction in plant population size and/or density through negative impacts to habitats. Furthermore, construction and decommissioning phase activities could, in the absence of mitigation, result in the injury or death of animals. The operation of the turbines poses a collision risk to birds and bats. Collision of a bird or bird with turbine rotors is almost certain to result in the death of the bird or bat. This potential impact is identified as negative and would continue for the lifetime of the Project.

Finally, the Institute of Air Quality Management (IAQM) guidance[18] suggests that air pollution and dust potentially generated from road schemes are only likely to be important for sensitive European sites within 200 m and 500 m, respectively. The dust and airborne emissions generated as a result of the construction and decommissioning of the Project is considered to be similar to that generated during road schemes.

3.3 Pathways - Ecological Connections

3.3.1 General overview of connection rationale

Many QFs are mobile species whose home ranges, distributions, movements, and dispersal abilities vary across space and time. As a result, a population of a mobile QF associated with a European Site may also utilise habitat within, or adjacent to, a project site.

Where such use occurs, even intermittently, there is a functional ecological connection between the Project and the relevant European Site. These connections can involve a range

of taxa, including birds, mammals, migratory fish, and other mobile species that form the QFs of European Sites.

Other examples of potential ecological connections include habitat connections either directly or as 'stepping stones'. Also, the area surrounding a project area (subject lands) may support a population of the same species as within a connected European Site which occasionally exchanges individuals. Furthermore, the subject lands may support populations of species which are prey/food or hosts to the QFs of a European Site.

3.3.1.1 Ecological Connections – Zone of Influence (ZoI)

Ecological connectivity has been assessed following NPWS guidelines (NPWS, 2010) and the Office of the Planning Regulator's Practice Note PN01 (OPR, 2021). Both documents emphasise that the use of fixed or universal study areas (e.g. a standard 15 km radius) is not appropriate at AA screening stage. Instead, connectivity must be evaluated on a case-by-case basis, reflecting the ecological scale, dispersal characteristics, and functional requirements of each QF, in order to determine whether a realistic source-receptor pathway exists between a project and European Sites.

The assessment considers only inherent ecological pathways and baseline environmental conditions and does not rely on project-specific avoidance or mitigation measures when determining the potential for connectivity. This ensures that the screening exercise addresses whether a pathway for significant effects could exist, rather than whether such effects might be prevented.

Each QF operates at a distinct ecological scale and is influenced by different mechanisms of connectivity. For instance:

- Terrestrial habitats are influenced by factors such as seed dispersal distances, community composition dynamics, edge effects, and broader land-use changes;
- Mobile species are shaped by home-range size, population structure, dispersal ability, and the permeability of the intervening landscape; and
- Highly localised or microhabitat-specialist species (e.g. *Vertigo* snails) are dependent on habitat conditions operating at very small spatial scales (often metres) and therefore have limited potential for functional connectivity with distant European Sites.

To reflect this variability, a QF-specific distance and connectivity matrix has been developed (Table 3-1 and Table 3-2). This matrix summarises the relevant ecological and functional attributes of each QF assessed in this report, including typical home-range or dispersal distances, habitat requirements, sensitivity to disturbance, and any hydrological or landscape-scale influences relevant to connectivity. Spatial parameters applied in the screening assessment are therefore ecologically justified, evidence-based, and proportionate to the sensitivities of each QF.

For most non-avian QFs, an initial 2 km buffer has been adopted, as this is sufficient to capture local ecological processes such as short-range species movements, seed dispersal, edge effects, and small-scale habitat interactions. Where evidence indicates that a QF operates at a broader spatial scale, larger distances have been applied, informed by empirical evidence. Full justification and supporting references for each QF are provided in Appendix C.

Screening for bird SCIs asks a single question: is there a pathway by which the Project could have a likely significant effect on the population for which the SPA is designated? For birds, three types of pathway are considered. A species is screened in if any one of them cannot be excluded on adequate evidence; it is screened out only if all three are excluded.

1 **Habitat connectivity.** Whether the Project area is, or is likely to be, used by birds from the SPA population for the ecological function relevant to the SPA (foraging, roosting or nesting). This is assessed from the species' movement ecology and the season or

seasons for which the SPA is designated. For central-place foragers, which commute from a fixed nest or roost, core foraging ranges are used, following NatureScot (2016); where no published range exists, the 20 km grey goose value is applied as a precautionary proxy, and as a floor rather than a ceiling, so that a larger published range for a comparable species is used in preference where available. For species that do not forage from a central place, a distribution-led assessment is used instead, based on distribution data, survey records, movement ecology and habitat continuity. Brief or incidental presence with no evident ecological function, such as a single bird grounded momentarily during otherwise continuous passage, does not by itself establish habitat connectivity; connectivity requires evidence of functional use, such as repeated, patterned or sustained foraging, roosting or nesting activity.

2 **Risk connectivity.** Where the Project introduces an operational risk to birds in flight, such collision with turbines, whether birds from the SPA population pass through the zone of influence. This is independent of habitat use and of distance to the SPA: a recorded flight through the Project area is direct evidence of exposure and is sufficient in itself to establish the pathway. The judgement here is one of attribution, that is, whether the birds recorded can reasonably be linked to the SPA population, having regard to the location of the nearest SPA nesting, roosting or wintering areas, the behaviour observed, and published dispersal and ranging distances.

3 **Cross-seasonal connectivity.** Whether birds from the SPA's qualifying-season population are subject to habitat use (Test 1) or risk exposure (Test 2) at the site outside the qualifying season, such that an effect occurring at that time could still affect the SPA population. This test extends Tests 1 and 2 across the full period the population may be present, rather than treating the qualifying season as the only relevant window. Population membership alone is not sufficient: a bird that merely transits the site, with no stopover, foraging, roosting or risk exposure while present, does not establish connectivity under this test, even where it plausibly belongs to the SPA population.

Where the evidence for any pathway is insufficient to reach a conclusion, that pathway is treated as inconclusive rather than excluded, and the species is screened in on a precautionary basis, consistent with Article 6(3). Connectivity conclusions assume survey effort adequate to the species and season; any limitations are identified in Appendix C.

3.3.1.2 Airborne Connections

Airborne emissions were considered using the approaches outlined in IAQM guidance (IAQM, 2019) (IAQM, 2014), which suggests that air pollution and dust from road schemes are only likely to be important for sensitive European Sites within 200 m and 500 m, respectively.

3.3.1.3 Hydrological and Hydrogeological Connections

A first order watercourse, West Galros (EPA code 25W44), flows briefly through the south-western corner of the Project site. In addition, another first order watercourse, Eglish 25 (EPA code 25E18) flows south of the Project site. These watercourses are tributaries of the Rapemills_010 (European code: IE_SH_25R010300), second order watercourse. The Rapemills river is a tributary of the Shannon [Lower]_020 (European code: IE_SH_25S012060), and then Shannon [Lower]_030 (European code: IE_SH_25S012350) which flows in Lough Derg.

The Project site lies within the Lower Shannon water framework directive catchment (catchment ID 25B) and the Shannon (Lower) (subcatchment ID 25B_1) and Brosna (subcatchment ID 25A_1) subcatchments.

The Project lies within Banagher ground waterbody (European code: IE_SH_G_040), Birr ground waterbody (European code: IE_SH_G_041) and Birr gravels waterbody (IE_SH_G_244).

Hydrological connectivity was also searched for using GIS to identify any European Sites downstream of the project connected via watercourses.

Groundwater interactions considered all European Sites within the same groundwater body from the EPA map viewer data. Although all European Sites within the groundwater body were initially considered, the likelihood of a viable groundwater pathway decreases with distance. Irish aquifer characterisation studies show that for moderate-transmissivity fractured bedrock systems, groundwater flow paths from recharge to discharge zones (including those associated with groundwater-dependent terrestrial ecosystems or groundwater habitats) are typically within a range of 1–5 km (Williams et al., 201[19], Gill et al. 2022[20]). While longer flow paths may occur in karst or conduit-dominated (Schuler et al., 2020[21]), in the absence of specific hydrogeological evidence, a conservative screening radius of 5 km is considered appropriate for identifying potential groundwater pathways. This 5 km radius was therefore applied when screening for potential effects arising from groundwater interactions, with reference to the potential impact sources outlined in Table 2-5.

3.4 Identification of European Sites - Sensitive Receptors

European Sites identified to have sources for impacts and pathways for effects from sections 3.2 and 3.3 above are listed in Table 3-1. Within the table each of the sensitive receptors present (if any) are discussed relative to the identified impacts and pathways. The locations of these sites, along with hydrological and hydrogeological details, are shown in Figures 2-15**.**

[19] Hunter Williams, N.H. & Lee, M. (2013). “Characterisation of the groundwater environment — Irish aquifers.” In *Groundwater & Sustainable Development*, Geological Survey Ireland. (Note: this is a conference/workshop style document, see “Characterisation of the groundwater environment for resource assessment, development, management and protection” by Taly Hunter Williams & Monica Lee)

[20] Kilroy, G., Dunne, F., Ryan, J., O’Connor, Á., Daly, D., Craig, M., Coxon, C., Johnston, P. & Moe, H. (2008). *A Framework for the Assessment of Groundwater-Dependent Terrestrial Ecosystems under the Water Framework Directive*. STRIVE/Environmental Research Centre Report No. 12, Environmental Protection Agency, Johnstown Castle, Co. Wexford.

[21] Schuler, P., Stoeckl, L., Schnegg, P.-A., Bunce, C. & Gill, L. (2020). *“A combined-method approach to trace submarine groundwater discharge from a coastal karst aquifer in Ireland.”* Hydrogeology Journal, 28(2), 561-577. doi:10.1007/s10040-019-02082-0

Table 3-1: European Sites Considered for Potential Effects using the Source – Pathway – Receptor model[22] - Wind Farm Site

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
IE0004137	Dovegrove Callows SPA	3.84	• Greenland white-fronted goose (*Anser albifrons flavirostris*) [A395] (w)	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The SPA is located approximately 3.84 km beyond the boundary of the Project site. Therefore, there is no pathway for habitat destruction, fragmentation or deterioration. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There is no downstream hydrological connectivity, therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The Project site is within the same groundwater body as Dovegrove Callows SPA (Banagher groundwater body (European code:	N

[22] The known threats and pressures for each site along with the Article 17 and Article 12 data for each QI and SCI are provided in Appendix B which were used in the assessment process.

[23] (w): wintering, (r): reproducing, (p) permanent

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				IE_SH_G_040). However, the SCI birds are not reliant upon groundwater dependant terrestrial ecosystems (GWDTEs) within the SPA and rather seasonally flooded callow habitats. Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> Greenland white-fronted goose were not recorded during the suite of bird surveys conducted between 2022 and 2025. Therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> Greenland white-fronted goose were not recorded during the suite of bird surveys conducted between 2022 and 2025. Therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Dovegrove Callows SPA is located over 3.8 km	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				from the Project site. Therefore, there is no pathway for effects.	
IE0000919	Ridge Road, SW of Rapemills SAC	4.67	• Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) important orchid sites [6210]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The habitat for which the SAC is designated is not present within the Project site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interest is a terrestrial habitat but there is no hydrological connectivity. This, along with the distance from the Project site means there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The qualifying interest is a terrestrial habitat that is not groundwater dependant. Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u>	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				The qualifying interest is a terrestrial habitat and therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> The qualifying interest is a terrestrial habitat and therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Ridge Road, SW of Rapemills SAC is located over 4 km from the Project site. Therefore, there is no pathway for effects.	
IE0000566	All Saints Bog and Esker SAC	5.53	• Degraded raised bogs still capable of natural regeneration [7120] • Active raised bogs [7110] • Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) important orchid sites [6210]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The habitats for which this SAC is designated are not present within the Project site. Therefore,	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
			• Bog woodland [91D0] • Depressions on peat substrates of the Rhynchosporion [7150]	there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The SAC is designated for raised bog habitat which is ombrotrophic and receives its water supply principally from precipitation. The raised bog water table is perched and is functionally separated from the regional groundwater regime by the acrotelm/catotelm structure and marginal lagg zone. Consequently, no viable impact pathway exists whereby the proposed development could affect the supporting habitat of the qualifying interest species. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC. <u>Project-related activities causing disturbance/displacement of species</u> The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u>	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. All Saints Bog and Esker SAC is located over 5 km from the Project site. Therefore, there is no pathway for effects.	
IE0004103	All Saints Bog SPA	5.68	• Greenland white-fronted goose (*Anser albifrons flavirostris*) [A395] (w)	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The SPA is located approximately 5.68 km beyond the boundary of the Project site. Therefore, there is no pathway for habitat destruction, fragmentation or deterioration effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u>	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				There is no downstream hydrological connectivity to this SPA. <u>Changes to groundwater quality, yield and/or flow paths</u> The Project site is within the same groundwater body as All Saints Bog SPA (Banagher groundwater body (European code: IE_SH_G_040). However, geese have not been recorded within this SPA since 1993/94 and the conservation objectives document for this SPA suggests the geese have shifted to foraging on grassland sites rather than peatland sites, with neither being groundwater-dependent. Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> Greenland white-fronted goose were not recorded during the suite of bird surveys conducted between 2022 and 2025. Therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> Greenland white-fronted goose were not recorded during the suite of bird surveys conducted between 2022 and 2025. Therefore, there is no pathway for effects.	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				<u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. The SPA is located approximately 5.68 km beyond the boundary of the Project site, there is no pathway for effects.	
IE0004086	River Little Brosna Callows SPA	6.39	• Black-headed gull (*Chroicocephalus ridibundus*) [A179] (w) • Whooper Swan (*Cygnus cygnus*) [A038](w) • Lapwing (*Vanellus vanellus*) [A142] (w) • Shoveler (*Anas clypeata*) [A056] (w) • Greenland white-fronted goose (*Anser albifrons flavirostris*) [A395] (w) • Wigeon (*Anas penelope*) [A050] (w)	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The wetland for which this SPA is designated is located approximately 6.39 km beyond the boundary of the Project site. Therefore, there is no pathway for habitat destruction, fragmentation or deterioration effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u>	Y

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
			• Pintail (*Anas acuta*) [A054] (w) • Golden plover (*Pluvialis apricaria*) [A140] (w) • Teal (*Anas crecca*) [A052] (w) • Black-tailed godwit (*Limosa limosa*) [A156] (w) • Wetland and Waterbirds [A999]	A study of the watercourses revealed that there is no hydrological connectivity between the Project site and River Little Brosna Callows SPA. However, due to the close proximity of Middle Shannon Callows SPA to this SPA, there is the possibility that SCI species from River Little Brosna Callows SPA utilize the wetland habitat within Middle Shannon Callows for ex-situ foraging. Therefore, as Middle Shannon Callows SPA is hydrologically connected to the Project site there is the potential for suspended solids, nutrients and other pollutants generated during the construction and decommissioning of the Project to negatively affect the wetland habitat of Middle Shannon Callows SPA which are potentially utilised by SCI species from River Little Brosna Callows SPA. <u>Changes to groundwater quality, yield and/or flow paths</u> On a precautionary basis the wetland habitat for which this SPA is designated is considered to be groundwater dependant. River Little Brosna Callows SPA is within the same groundwater body as the Project site (Banagher groundwater body; European code: IE_SH_G_040). The groundwater vulnerability within the Project site is classed as moderate. There are no identified karst features with a 2 km zone of the	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Project site. In addition, the SPA is over 6 km from the Project site. Therefore, there is no realistic hydrogeological connection for potential effects to the SPA. <u>Project-related activities causing disturbance/displacement of species</u> Evidence of probable breeding lapwing were recorded during the 2024 breeding season surveys, approximately 500 m from the development footprint. Lapwing were also observed probably breeding in this area during the breeding season of 2022 and 2023. A buffer of at least 108 m is required to avoid disturbance to nesting lapwing[24]. The probable nest was recorded approximately 500 m from the development footprint, well beyond the advised buffer distance. Furthermore, the SPA is designated for wintering lapwing and therefore disturbance (if it occurs) of breeding lapwing will not impact the SPA population. Three whooper swans were recorded on a single occasion within the Project site, approximately 465 m from proposed infrastructure. As low numbers of birds were recorded very infrequently it is unlikely that the Project site is consistently or is of great importance for this species.	

[24] Hötker, H., K-M. Thomsen & H. Jeromin. (2006). Impacts on biodiversity of exploitation of renewable energy sources: the example of birds and bats - facts, gaps in knowledge, demands for further research, and ornithological guidelines for the development of renewable energy exploitation. MichaelOtto-Institut im NABU, Bergenhusen.

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				However, the core foraging distance for whooper swan is 5 km[25]. The SPA is located approximately 6.39 km from the Project, a distance great than the core foraging distance of this species. Therefore, there is no pathway for disturbance/displacement effects on whooper swan. None of the other SCI were recorded breeding using any of the habitats during the winter season within the Project site. In conclusion, there is no pathway for disturbance/displacement effects on any of the SCI species of River Little Brosna SPA. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> Black-headed gull (during the breeding season only), whooper swan, lapwing, golden plover and teal were recorded during flight activity surveys. The Irish breeding black-headed gulls are largely resident and may form part of the wider wintering population present in Ireland[26]. Black-headed gull are known to travel comparable or greater distances between breeding/roosting sites and	

[25] SNH. (2016). Assessing Connectivity with Special Protection Areas (SPAs). Guidance. Version 3.

[26] Wernham, C.V., Toms, M.P., Marchant, J.H., Clark, J.A., Siriwardena, G.M. & Baillie, S.R. (eds). (2002). The Migration Atlas: movements of the birds of Britain and Ireland (2002). T. & A.D. Poyser, London.

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				foraging or wintering areas. Given this, and in the absence of any study establishing a defensible connectivity distance for this species and population type, a credible pathway exists whereby individuals from this breeding population could contribute to the SPA's wintering qualifying interest. As previously mentioned, the core foraging distance for whooper swan is 5 km[27] [28]. As the distance of the SPA from the Project site is 6.39 km, this is greater than the core foraging distance for whooper swan, and therefore, there is no pathway for effects. The core foraging range for golden plover and lapwing in the winter is 12 km[29]. The Project Site, located approximately 6.3 km from the SPA, is within the core foraging range for these two species. Therefore, there is a pathway for effects. Teal were recorded within the CRZ during the breeding season only, whereas the SPA is designated for its wintering population. Breeding-season presence and a wintering qualifying interest are not automatically the same population: in Ireland, wintering teal numbers are	

[27] SNH. (2016). Assessing Connectivity with Special Protection Areas (SPAs). Guidance. Version 3.

[28] McCarthy, A. (2022). *Seasonal ecology and the conservation of hen harriers (Circus cyaneus) in Ireland*. PhD thesis. University College Cork.

[29] Gillings, S & Fuller, R.J. (1999). Winter ecology of Golden Plovers and Lapwings: a review and consideration of extensive survey methods.

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				substantially augmented by migrants arriving from Iceland, Britain and continental Europe[26], so the individuals recorded during the breeding season are not necessarily connected to the SPA's wintering qualifying population. Breeding teal are also characteristically sedentary during the brood-rearing period: a long-running Finnish boreal-lake dataset[30] [31] demonstrates strong fidelity of breeding teal to a small number of preferred wetlands within a watershed, rather than ranging across the wider landscape. At a separation distance of 6.39 km, this is well beyond the spatial scale over which breeding teal are known to operate. Therefore, no credible mobile species pathway exists. The operation of the turbines poses a collision risk to these species. Collision of a bird with turbine rotors is almost certain to result in the death of the bird. None of the other SCI species were recorded during the suite of bird surveys and therefore there is no pathway for effects. In conclusion, there is a pathway for effects for black-headed gull, lapwing and golden plover.	

[30] Holopainen et al., (2015). Duck habitat use and reproduction in boreal wetlands: importance of habitat quality and population density.

[31] Elmberg, J., Nummi, P., Pöysä, H., Gunnarsson, G., Sjöberg, K. (2005). Early breeding Teal Anas crecca use the best lakes and have the highest reproductive success. Vol. 42 Annales Zoologici Fennici

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. River Little Brosna Callows SPA is located over 6 km from the Project site. Therefore, there is no pathway for effects.	
IE0000216	River Shannon Callows SAC	7.80	• Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] • Alkaline fens [7230] • Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510] • Limestone pavements [8240] • Otter (*Lutra lutra*) [1355], • Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. Habitat destruction/ fragmentation/ deterioration The habitats for which this SAC is designated are not present within the Project site. Therefore, there is no pathway for effects. Surface water run-off carrying suspended silt and contaminants into local watercourses There is hydrological connectivity between the Project site and River Shannon Callows SAC. A first order watercourse, West Galros (EPA	Y

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				code 25W44), flows briefly within the Project site. In addition, another first order watercourse, Eglish 25 (EPA code 25E18) flows south adjacent to the Project site. These watercourses are tributaries of the Rapemills_010 (European code: IE_SH_25R010300), second order watercourse which flows into River Shannon Callows SAC. There is potential to negatively affect Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) through reduced water quality as a result of polluted surface water run-off flowing into local watercourses that are hydrologically connected to River Shannon Callows SAC. There is also the potential to indirectly effect otter via reduced water quality through the same pathway as described above. <u>Changes to groundwater quality, yield and/or flow paths</u> Alkaline fen is GWDTE. The Project site is within the same groundwater body as All Saints Bog and Esker SAC (Banagher groundwater body (European code: IE_SH_G_040). The groundwater vulnerability within the Project site is classed as moderate. There are no identified karst features with a 2 km zone of the Project site. In addition, the SAC is over 7 km from the Project site. Therefore, there is no realistic	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				hydrogeological connection for potential effects to the SAC. <u>Project-related activities causing disturbance/displacement of species</u> Otter signs (mostly spraints) were identified at a total of four sites on the Rapemills River (Please see Appendix G for more details) during aquatic surveys in 2025. A study of the watercourses revealed that there is hydrological connectivity between the Project site and River Shannon Callows SAC. The SAC is ca. 13km in-stream distance from the Project site. Otter have a range In Ireland of ca. 7 km (females) and ca. 13km (males 13 km) with some known to have expanded their range from 10 km to 20 km[32], and the SAC is located approximately 7 km from the Project site. Hence, these otter signs may be from otters associated with the SAC. Therefore, there is a pathway for disturbance/displacement of otter. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u>	

[32] Reid, N., Hayden, B., Lundy, M.G., Pietravalle, S., McDonald, R.A. & Montgomery, W.I. (2013). National Otter Survey of Ireland 2010/12. Irish Wildlife Manuals No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Otter signs (mostly spraints) were identified at a total of four sites on the Rapemills River (Please see Appendix G for more details) during aquatic surveys in 2025. A study of the watercourses revealed that there is hydrological connectivity between the Project site and River Shannon Callows SAC. Considering the known range of otter in Ireland, otters from the SAC could utilize watercourses within/in the vicinity of the Project site and thus be injured/killed by Project related activities, in the absence of mitigation. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. River Shannon Callows SAC is located over 7 km from the Project site. Therefore, there is no pathway for effects.	
IE0004096	Middle Shannon Callows SPA	7.80	• Whooper swan (*Cygnus cygnus*) [A038] (w) • Lapwing (*Vanellus vanellus*) [A142] (w)	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction	Y

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
			• Golden plover (*Pluvialis apricaria*) [A140] (w) • Wigeon (*Anas penelope*) [A050] (w) • Corncrake (*Crex crex*) [A122][33] • Black-headed gull (*Chroicocephalus ridibundus*) [A179] (w) • Black-tailed Godwit (*Limosa limosa*) [A156] (w) • Wetland and Waterbirds [A999]	in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The wetland for which this SPA is designated is located approximately 7.8 km beyond the boundary of the Project site. Therefore, there is no pathway for habitat destruction, fragmentation or deterioration effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> A study of the watercourses revealed that there is hydrologically connectivity between the Project site and Middle Shannon Callows SPA. A first order watercourse, West Galros (EPA code 25W44), flows briefly within the Project site. In addition, another first order watercourse, Eglish 25 (EPA code 25E18) flows south adjacent to the Project site. These watercourses are tributaries of the Rapemills_010 (European code: IE_SH_25R010300), second order watercourse. The Rapemills river flows into the SPA. Therefore, there is potential to negatively affect the wetland habitat through a reduction in water quality as a result of polluted surface water run-	

[33] The status of corncrake as a Species of Conservation Interest for the Middle Shannon Callows SPA is currently under review. The outcome of this review will determine whether a site-specific conservation objective is set for this species

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				off flowing into local watercourses that are hydrologically connected to the SPA. <u>Changes to groundwater quality, yield and/or flow paths</u> On a precautionary basis the wetland habitat for which this SPA is designated is considered to be groundwater dependant. Middle Shanonn Callows SPA partially lies within the same groundwater body as the Project site (Banagher groundwater body; European code: IE_SH_G_040). The groundwater vulnerability within the Project site is classed as moderate. There are no identified karst features with a 2 km zone of the Project site. In addition, the SPA is over 7.8 km from the Project site. Therefore, there is no realistic hydrogeological connection for potential effects to the SPA. <u>Project-related activities causing disturbance/displacement of species</u> Evidence of probable breeding lapwing were recorded during the 2024 breeding season surveys, approximately 500 m from development footprint. Lapwing were also observed probably breeding in this area during the breeding season of 2022 and 2023. A buffer of at least 108 m is required to avoid disturbance to nesting	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				lapwing[34]. The probable nest was recorded approximately 500 m from the development footprint, well beyond the advised buffer distance. Furthermore, the SPA is designated for wintering lapwing and therefore disturbance (if it occurs) of breeding lapwing will not impact the SPA population. Three whooper swans were recorded on a single occasion within the Project site, approximately 465 m from proposed project infrastructure. As low numbers of birds were recorded very infrequently it is unlikely that the Project site is consistently or is of great importance for this species. Furthermore, the core foraging distance of whooper swan is approximately 5 km[28]. The SPA is located approximately 7.80 km from the Project site, a distance greater than the core foraging distance for this species. Therefore, there is no pathway for disturbance/displacement effects on whooper swan. None of the other SCIs were recorded breeding or using any of the habitats during the winter season within, or in the vicinity, of the Project. Therefore, there is no pathway for effects on these species. In conclusion, there is a pathway for	

[34] Hötker, H., K-M. Thomsen & H. Jeromin. (2006). Impacts on biodiversity of exploitation of renewable energy sources: the example of birds and bats - facts, gaps in knowledge, demands for further research, and ornithological guidelines for the development of renewable energy exploitation. MichaelOtto-Institut im NABU, Bergenhusen.

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				disturbance/displacement effects on lapwing. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> Of these SCI species, whooper swan, lapwing, golden plover and black-headed gull were recorded during flight activity surveys. Therefore, the operation of the turbines potentially poses a collision risk to these species. Collision of a bird with turbine rotors is almost certain to result in the death of the bird. However, whooper swan is not considered to have realistic connectivity with the Project site based on core foraging ranges[28]. The core foraging distance for whooper swan is 5 km[35] [36]. As the distance of the SPA from the Project site is 7.8 km, this is greater than the core foraging distance for whooper swan, and therefore, there is no pathway for effects. The core foraging range for golden plover and lapwing in the winter is 12 km[37]. The Project Site, located approximately 7.8 km from the SPA, is within the core foraging range for these two	

[35] SNH. (2016). Assessing Connectivity with Special Protection Areas (SPAs). Guidance. Version 3.

[36] McCarthy, A. (2022). *Seasonal ecology and the conservation of hen harriers (Circus cyaneus) in Ireland*. PhD thesis. University College Cork.

[37] Gillings, S & Fuller, R.J. (1999). Winter ecology of Golden Plovers and Lapwings: a review and consideration of extensive survey methods.

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				species. Therefore, there is a pathway for effects. The Irish breeding black-headed gulls are largely resident and may form part of the wider wintering population present in Ireland[38]. Black-headed gull are known to travel comparable or greater distances between breeding/roosting sites and foraging or wintering areas. Given this, and in the absence of any study establishing a defensible connectivity distance for this species and population type, a credible pathway exists whereby individuals from this breeding population could contribute to the SPA's wintering qualifying interest. In conclusion, there is a pathway for effects on lapwing, golden plover and black-headed gull. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. The SPA is located approximately 7.8 km from the	

[38] Wernham, C.V., Toms, M.P., Marchant, J.H., Clark, J.A., Siriwardena, G.M. & Baillie, S.R. (eds). (2002). The Migration Atlas: movements of the birds of Britain and Ireland (2002). T. & A.D. Poyser, London.

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Project site. Therefore, there is no pathway for effects.	
IE0002236	Island Fen SAC	9.06	• *Juniperus communis* formations on heaths or calcareous grasslands [5130] • Alkaline fens [7230]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The habitats for which this SAC is designated are not present within the Project site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interests are terrestrial habitats with no hydrological connectivity. Therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> Alkaline fens, a qualifying interest of Island Fen SAC, is a GWDTE. However, this SAC lies within a different groundwater body to the Project site. The SAC lies within Shinrone groundwater body (IE_SH_G_205), while the Project site lies within Banagher groundwater body (European code: IE_SH_G_040). Therefore, there is no pathway for effects.	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Project-related activities causing disturbance/displacement of species The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. Project-related activities leading to injury or mortality of species, or reductions in population size or density. The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Island Fen SAC is located over 9 km from the Project site. Therefore, there is no pathway for effects.	
IE00002147	Lisduff Fen SAC	9.22	• Petrifying springs with tufa formation (*Cratoneurion*) [7220] • Geyer's whorl snail (*Vertigo geyeri*) [1013] • Alkaline fens [7230]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution.	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Habitat destruction/ fragmentation/ deterioration The habitats for which this SAC is designated are not present within the Project site. Therefore, there is no pathway for effects. Surface water run-off carrying suspended silt and contaminants into local watercourses The qualifying interests are terrestrial habitats and species. Therefore, there is no pathway for effects. Changes to groundwater quality, yield and/or flow paths All of the qualifying interests of Lisduff Fen SAC are GWDTEs, namely; petrifying springs with tufa formation (*Cratoneurion*), and alkaline fens. However, this SAC lies within a different groundwater body to the Project site. The SAC lies within Shinrone groundwater body (IE_SH_G_205), while the Project site lies within Banagher groundwater body (European code: IE_SH_G_040). Therefore, there is no pathway for effects. Project-related activities causing disturbance/displacement of species The qualifying interests are terrestrial habitats or species of limited mobility (Geyer's whorl snail) and therefore, there is no pathway for effects.	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Project-related activities leading to injury or mortality of species, or reductions in population size or density. The qualifying interests are terrestrial habitats or species of limited mobility (Geyer's whorl snail). The distance and lack of suitable ecological corridor between the Project site and the SAC mean there is no suitable pathway for Geyer's whorl snail. Therefore, there is no pathway for effects. Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Lisduff Fen SAC is located over 9 km from the Project site. Therefore, there is no pathway for effects.	
IE0000641	Ballyduff/Clonfinane Bog SAC	9.42	• Degraded raised bogs still capable of natural regeneration [7120] • Bog woodland [91D0] • Active raised bogs [7110]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution.	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
			• Depressions on peat substrates of the Rhynchosporion [7150]	Habitat destruction/ fragmentation/ deterioration The habitats for which this SAC is designated are not present within the Project site. Therefore, there is no pathway for effects. Surface water run-off carrying suspended silt and contaminants into local watercourses The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. Changes to groundwater quality, yield and/or flow paths The following three qualifying interests of Ballyduff/Clonfinane Bog SAC are GWDTEs; degraded raised bogs still capable of natural regeneration, bog woodland and active raised bogs. The Project site is within the same groundwater body as the SAC (Banagher groundwater body; European code: IE_SH_G_040). The groundwater vulnerability within the Project site is classed as moderate. There are no identified karst features with a 2 km zone of the Project site. In addition, the SAC is over 9 km from the Project site. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC. Project-related activities causing disturbance/displacement of species The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects.	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Project-related activities leading to injury or mortality of species, or reductions in population size or density. The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. Air pollution due to dust and other airborne emissions IAQM guidance18 suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Ballyduff/Clonfinane Bog SAC is located over 9 km from the Project site. Therefore, there is no pathway for effects.	
IE0000585	Sharavogue Bog SAC	10.74	• Active raised bogs [7110] • Depressions on peat substrates of the Rhynchosporion [7150] • Degraded raised bogs still capable of natural regeneration [7120]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction /fragmentation/deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. Habitat destruction/ fragmentation/ deterioration The habitats for which this SAC is designated are not present within the Project site. Therefore, there is no pathway for effects. Surface water run-off carrying suspended silt	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				and contaminants into local watercourses The qualifying interests are terrestrial habitats with a lack of hydrological connectivity and therefore, there is no pathway for effects. Changes to groundwater quality, yield and/or flow paths None of the QI are GWDTEs. Therefore, there is no pathway for effects. Project-related activities causing disturbance/ displacement of species The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. Project-related activities leading to injury or mortality of species, or reductions in population size or density. The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Sharavogue Bog SAC is located over 10.74 km	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				from the Project site. Therefore, there is no pathway for effects.	
IE0004160	Slieve Bloom Mountains SPA	11.89	• Hen harrier (*Circus cyaneus*) [A082] (r)	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The SPA is located approximately 11.89 km beyond the boundary of the Project site. Therefore, there is no pathway for habitat destruction, fragmentation or deterioration effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There is no downstream hydrological connectivity between the Project site and the SPA. Therefore, there is no pathway for effects. Furthermore, hen harrier is not reliant on surface water habitats. <u>Changes to groundwater quality, yield and/or flow paths</u> The SPA is located in a different groundwater body to the Project site. The Project site is located in Banagher groundwater body (European code: IE_SH_G_040). The SPA lies within multiple groundwater bodies, the closest	Y

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				of which is Clonaslee West (European code: IE_SH_G_066). However, hen harrier (the only QF for the SPA) is not reliant on groundwater dependant terrestrial habitats. Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> Hen harrier were not recorded breeding, nor roosting during the winter months within the Project site or surrounding 500 m. Therefore, there is no pathway for disturbance/displacement effects on hen harrier. <u>Project related activities leading to injury or mortality of species, or reductions in population size or density.</u> A total of 7 hen harrier flight lines on individual birds (5 during non-breeding season 2022/23 and 2 during non-breeding season 2023/24) were recorded during flight activity surveys. Hen harrier range widely in the winter[39] and therefore there could be connectivity to the SPA population. Therefore, the operation of the turbines poses a collision risk to hen harrier. Collision of a bird with turbine rotors is almost certain to result in the death of the bird.	

[39] Probst, R., and Probst, R. (2025). Winter Ecology of the Hen Harrier, Circus cyaneus: Bridging Behavioral Insights and Conservation Requirements. Vol. 15. Animals

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				In conclusion, there is a pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Slieve Bloom Mountains SPA is located over 11.8 km from the Project site. Therefore, there is no pathway for effects.	
IE0002353	Redwood Bog SAC	11.97	• Degraded raised bogs still capable of natural regeneration [7120] • Active raised bogs [7110] • Depressions on peat substrates of the Rhynchosporion [7150]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The habitats for which this SAC is designated are not present within the Project site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interests are terrestrial habitats and there is a lack of hydrological connectivity to	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				the SPA. Therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The habitats for which this SAC are designated are not GWDTE. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC. <u>Project-related activities causing disturbance/displacement of species</u> The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Redwood Bog SAC is located over 11 km from	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				the Project site. Therefore, there is no pathway for effects.	
IE0000581	Moyclare Bog SAC	12.24	• Active raised bogs [7110] • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the Rhynchosporion [7150]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The habitats for which this SAC is designated are not present within the Project site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interests are terrestrial habitats and there is a lack of hydrological connectivity. Therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The habitats for which this SAC are designated are not GWDTE. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC. <u>Project-related activities causing disturbance/displacement of species</u>	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Moyclare Bog SAC is located over 12 km from the Project site. Therefore, there is no pathway for effects.	
IE0002207	Arragh More (Derrybreen) Bog SAC	13.24	• Degraded raised bogs still capable of natural regeneration [7120]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u>	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				The habitat for which this SAC is designated is not present within the Project site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interest is a terrestrial habitat and therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The habitats for which this SAC are designated are not GWDTE. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC. <u>Project-related activities causing disturbance/displacement of species</u> The qualifying interest is a terrestrial habitat and therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> The qualifying interest is a terrestrial habitat and therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. The SAC is located over 13 km from the Project site. Therefore, there is no pathway for effects.	
IE0000412	Slieve Bloom Mountains SAC	13.81	• Northern Atlantic wet heaths with *Erica tetralix* [4010] • Blanket bogs (if active) [7130], • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The habitats for which this SAC is designated are not present within the Project site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interests are terrestrial habitats with no hydrological connectivity and therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The SAC is designated for blanket bog habitat which is ombrotrophic and receives its water supply principally from precipitation. Therefore, there is no pathway for effects.	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Project-related activities causing disturbance/displacement of species The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. Project-related activities leading to injury or mortality of species, or reductions in population size or density. The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Slieve Bloom Mountain SAC is located over 13 km from the Project site. Therefore, there is no pathway for effects.	
IE0000647	Kilcarren-Firville Bog SAC	13.95	• Degraded raised bogs still capable of natural regeneration [7120] • Active raised bogs [7110]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution.	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
			• Depressions on peat substrates of the Rhynchosporion [7150]	Habitat destruction/ fragmentation/ deterioration The habitats for which this SAC is designated are not present within the Project site. Therefore, there is no pathway for effects. Surface water run-off carrying suspended silt and contaminants into local watercourses The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. Changes to groundwater quality, yield and/or flow paths The habitats for which this SAC are designated are not GWDTE. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC. Project-related activities causing disturbance/displacement of species The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. Project-related activities leading to injury or mortality of species, or reductions in population size or density. The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. Air pollution due to dust and other airborne emissions	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Kilcarren-Firville Bog SAC is located over 13 km from the Project site. Therefore, there is no pathway for effects.	
IE0000575	Ferbane Bog SAC	14.08	• Degraded raised bogs still capable of natural regeneration [7120] • Active raised bogs [7110] • Depressions on peat substrates of the Rhynchosporion [7150]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The habitats for which this SAC is designated are not present within the Project site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interests are terrestrial habitats without a hydrological connection, and therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u>	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				The habitats for which this SAC are designated are not GWDTE. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC. <u>Project-related activities causing disturbance/displacement of species</u> The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Ferbane Bog SAC is located over 14 km from the Project site. Therefore, there is no pathway for effects.	
IE0000859	Clonaslee Eskers and Derry Bog SAC	15.11	• Geyer`s whorl snail (*Vertigo geyeri*) [1013] • Alkaline fens [7230]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. Habitat destruction/ fragmentation/ deterioration The habitat for which this SAC is designated is not present within the Project site. Therefore, there is no pathway for effects. Surface water run-off carrying suspended silt and contaminants into local watercourses The qualifying interests are terrestrial habitats and species with a lack of surface watercourse connectivity. Therefore, there is no pathway for effects. Changes to groundwater quality, yield and/or flow paths Alkaline fen is a GWDTE. However, this SAC lies within a different groundwater body to the Project site. The SAC lies within Geashill and Clonaslee West groundwater bodes (IE_SH_G_103 and IE_SH_G_066, respectively), while the Project site lies within Banagher groundwater body (European code: IE_SH_G_040). Therefore, there is no pathway for effects. Project-related activities causing disturbance/displacement of species	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				The qualifying interests are terrestrial habitats or species of limited mobility (Geyer's whorl snail) and therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> The qualifying interests are terrestrial habitats or species of limited mobility (Geyer's whorl snail) and therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. The SAC is located over 15 km from the Project site. Therefore, there is no pathway for effects.	
IE0001683	Liskeenan Fen SAC	16.25	• Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u>	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				The habitat for which this SAC is designated is not present within the Project site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interest is a terrestrial habitat and therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The qualifying interest, Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae,* of this SAC is a GWDTE. However, Liskeenan Fen SAC lies within a different groundwater body to the Project site. The SAC lies within Borrisokane groundwater body (European code: IE_SH_G_042), while the Project site lies within Banagher groundwater body (European code: IE_SH_G_040). Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> The qualifying interest is a terrestrial habitat with no surface watercourse connectivity and therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u>	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				The qualifying interest is a terrestrial habitat and therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Liskeenan Fen SAC is located over 16 km from the Project site. Therefore, there is no pathway for effects.	
IE0004097	River Suck Callows SPA	17.8	• Greenland white-fronted goose (*Anser albifrons flavirostris*) [A395] (w) • Whooper swan (*Cygnus cygnus*) [A038] (w) • Golden plover (*Pluvialis apricaria*) [A140] (w) • Lapwing (*Vanellus vanellus*) [A142] (w) • Wigeon (*Anas penelope*) [A050] (w) • Wetland and Waterbirds [A999]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The wetland for which this SPA is designated is located approximately 17 km beyond the boundary of the Project site. Therefore, there is no pathway for habitat destruction, fragmentation or deterioration effects.	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Surface water run-off carrying suspended silt and contaminants into local watercourses A study of the watercourses revealed that there is no hydrological connectivity between the Project site and River Suck Callows SPA. Therefore, there is no pathway for effects. Changes to groundwater quality, yield and/or flow paths On a precautionary basis the wetland habitat for which this SPA is designated is considered to be groundwater dependant. However, River Suck Callows SPA lies within a different groundwater body from the Project site. The SPA lies within Aughrim, Athlone West and South Suck groundwater bodies (European codes: IE_SH_G_019, IE_SH_G_014 and IE_SH_G_225, respectively. The Project site lies with Banagher groundwater body (European code: IE_SH_G_040). Therefore, there is no pathway for effects. Project-related activities causing disturbance/displacement of species Evidence of probable breeding lapwing were recorded during the 2024 breeding season surveys, approximately 500 m from the development footprint. Lapwing were also observed probably breeding in this area during the breeding season of 2022 and 2023.	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				However, the core foraging distance of lapwing during the winter season is 12 km[29]. The core foraging range during the summer is smaller than the core foraging range during the winter. The SPA is situated approximately 17.8 km from Project site, a distance greater than the core foraging distance of this species, and therefore, there are no pathways for disturbance/displacement effects on lapwing. Three whooper swans were recorded on a single occasion within the Project site, approximately 465 m from the proposed infrastructure (T10). As low numbers of birds were recorded very infrequently it is unlikely that the Project site is consistently or is of great importance for this species. However, the core foraging distance of whooper swan during the winter is approximately 5 km[40]. As previously mentioned, the SPA is located approximately 17.8 km from the Project site, a distance greater than the core foraging distance of whooper swan, and therefore, there are no pathways for disturbance/displacement effects on this species. None of the other SCIs were recorded breeding or using any of the habitats during the winter season within the Project site, or immediate	

[40] McCarthy, A. (2022). Seasonal ecology and the conservation of Hen Harriers (*Circus cyaneus*) in Ireland. PhD thesis. University College Cork.

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				vicinity. Therefore, there is no pathway for effects on these bird species. In conclusion, there is no pathway for disturbance/displacement effects on lapwing and whooper swan. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> Whooper swan, golden plover and lapwing were recorded during flight activity surveys. Therefore, the operation of the turbines poses a collision risk to these species. Collision of a bird with turbine rotors is almost certain to result in the death of the bird. However, the core foraging distance for wintering whooper swan is approximately 5 km[25]. Also, the core foraging distance for both wintering golden plover and wintering lapwing is 12 km[29]. Core foraging distances during the breeding season is less than during the winter season. Therefore, based on the core foraging distances of these species, there is no pathway for effects on any of the QI bird species for this SPA, including whooper swan, golden plover and lapwing. In conclusion, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u>	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. River Suck Callows SPA is located over 17 km from the Project site. Therefore, there is no pathway for effects.	
IE0000576	Fin Lough (Offaly) SAC	18.17	• Alkaline fens [7230] • Geyer`s whorl snail (*Vertigo geyeri*) [1013]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The habitat for which this SAC is designated is not present within the Project site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interests are terrestrial habitats and species. Therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u>	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Alkaline fen is a GWDTE. However, the SAC lies within a different groundwater body to the Project site. The SAC lies within GWDTE-Fin Lough Fen groundwater body (IE_SH_G_060), while the Project site lies within Banagher groundwater body (European code: IE_SH_G_040). Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> The qualifying interests are terrestrial habitats or species of limited mobility (Geyer's whorl snail) and therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> The qualifying interests are terrestrial habitats or species of limited mobility (Geyer's whorl snail) and therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. The	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				SAC is located over 18 km from the Project site. Therefore, there is no pathway for effects.	
IE0000580	Mongan Bog SAC	19.52	• Active raised bogs [7110] • Depressions on peat substrates of the Rhynchosporion [7150] • Degraded raised bogs still capable of natural regeneration [7120]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The habitats for which this SAC is designated is not present within the Project site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> A study of the local watercourses revealed that there is no hydrological connectivity between the SAC and the Project site. There is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The habitats for which this SAC are designated are not GWDTE. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC.	N
IE0004017	Mongan Bog SPA	19.54	• Greenland white-fronted goose (*Anser albifrons flavirostris*) [A395] (w)	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The SPA is located approximately 19.5 km beyond the boundary of the Project site. Therefore, there is no pathway for habitat destruction, fragmentation or deterioration effects <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There is no downstream hydrological connectivity between the Project site and the SPA. Therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The SPA lies within a different groundwater body as the Project site. The SPA lies within the following two groundwater bodies; Inny groundwater body (European code: IE_SH_G_110) and GWDTE-Fin Lough Fen (SAC 000571) ground water body (European code: IE_SH_G_060). The Project site lies within Banagher groundwater body (European code: IE_SH_G_040). Therefore, there is no pathway for effects.	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Project-related activities causing disturbance/displacement of species Greenland white-fronted goose were not recorded during the suite of bird surveys conducted between 2022 and 2025. Therefore, there is no pathway for effects. Project-related activities leading to injury or mortality of species, or reductions in population size or density. Greenland white-fronted goose were not recorded during the suite of bird surveys conducted between 2022 and 2025. Therefore, there is no pathway for effects. Air pollution due to dust and other airborne emissions The qualifying interest is a bird species and therefore, there is no pathway for effects.	
IE0002241	Lough Derg, North-east Shore SAC	19.65	• Alluvial forests with *Alnus glutinosa and Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] • Limestone pavements [8240] • Alkaline fens [7230] • *Taxus baccata* woods of the British Isles [91J0], Juniperus	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. Habitat destruction/ fragmentation/ deterioration The habitats for which this SAC is designated are not present within the Project site. Therefore, there is no pathway for effects.	Y

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
			communis formations on heaths or calcareous grasslands [5130] • Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210]	<u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There is hydrological connectivity between the Project site and Lough Derg, North-east Shore SAC. A first order watercourse, West Galros (EPA code 25W44), flows briefly within the Project site. In addition, another first order watercourse, Eglish 25 (EPA code 25E18) flows south adjacent to the Project site. These watercourses are tributaries of the Rapemills_010 (European code: IE_SH_25R010300), second order watercourse. The Rapemills river is a tributary of the Shannon [Lower]_020 (European code: IE_SH_25S012060) and then Shannon [Lower]_030 (European code: IE_SH_25S012350) which flows in Lough Derg, in which the SAC is located. <u>Changes to groundwater quality, yield and/or flow paths</u> Alkaline fen is a QI for this SAC and is a groundwater-dependant habitat. The SAC lies within the same groundwater body as the Project (Banagher). Therefore, there is a potential pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> There is a hydrological connectivity between the Project site and the SAC. The habitat Alluvial	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] is dependant on watercourses. Therefore, there is a potential pathway for impacts Project-related activities leading to injury or mortality of species, or reductions in population size or density. The QI are habitats only. Therefore, there is no pathway for effects. Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. The SAC is located over 19 km from the Project site. Therefore, there is no pathway for effects.	
IE0004058	Lough Derg (Shannon) SPA	19.93	• Cormorant (*Phalacrocorax carbo*) [A017] (b) (r) Goldeneye (*Bucephala clangula*) [A067] (w) • Common tern (*Sterna hirundo*) [A193] (b)	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution.	Y

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
			• Tufted Duck (*Aythya fuligula*) [A061] (w) • Wetland and Waterbirds [A999]	Habitat destruction/ fragmentation/ deterioration The wetland for which this SPA is designated is located approximately 19.93 km beyond the boundary of the Project site. However, considering the remote hydrological connectivity, there is a pathway for habitat destruction, fragmentation or deterioration effects. Surface water run-off carrying suspended silt and contaminants into local watercourses A study of the watercourses revealed that there is hydrological connectivity between the Project site and Lough Derg (Shannon) SPA. A first order watercourse, West Galros (EPA code 25W44), flows briefly within the Project site. In addition, another first order watercourse, Eglish 25 (EPA code 25E18) flows south adjacent to the Project site. These watercourses are tributaries of the Rapemills_010 (European code: IE_SH_25R010300), second order watercourse. The Rapemills river is a tributary of the Shannon [Lower]_020 (European code: IE_SH_25S012060) and then Shannon [Lower]_030 (European code: IE_SH_25S012350) which flows in Lough Derg in which the SPA is located. Therefore, there is a potential pathway for effects. Changes to groundwater quality, yield and/or flow paths	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				On a precautionary basis the wetland habitat for which this SPA is designated is considered to be groundwater dependant. Lough Derg (Shannon) SPA partially lies within the same groundwater body as the Project site (Banagher groundwater body; European code: IE_SH_G_040). The groundwater vulnerability within the Project site is classed as moderate. There are no identified karst features with a 2 km zone of the Project site. In addition, the SAC is over 17 km from the Project site. Therefore, there is no realistic hydrogeological connection for potential effects to the SPA. <u>Project-related activities causing disturbance/displacement of species</u> None of these SCI bird species have been recorded breeding, nor using any of the habitats during the winter season within the Project site or 500 m of the Project site boundary. Therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> Of these SCI species only cormorant was recorded during flight activity surveys. Therefore, the operation of the turbines poses a collision risk to this species. Collision of a bird with turbine rotors is almost certain to result in the death of the bird. However, cormorant has a core	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interests and Special Conservation Interests)[23]	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				foraging distance of between 10 – 15 km[41] [42], and the SPA is located approximately 19.9 km from the Project site. Therefore, the distance from the Project site is greater than the core foraging distance of cormorant and hence there is no pathway for effects. In conclusion, there is no pathway for effects on cormorant. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. The SPA is located over 19 km from the grid connection site. Therefore, there is no pathway for effects.	

[41] Klimaszyk, P. and Rzymski, P. (2016). The complexity of ecological impacts induced by great cormorants. Hydrobiologia. Volume 771, pages 13–30.

[42] van Eerden, M. R., S. van Rijn, S. Volponi, J.-Y. Paquet and D. Carss. (2012). Cormorant and the European Environment: Exploring Cormorant Ecology on a Continental Scale. COST Action 635, Final Report I: 126.

Table 3-2: European Sites Considered for Potential Effects using the Source – Pathway – Receptor model[43] - Grid Connection Site

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
IE0004137	Dovegrove Callows SPA	4.44	• Greenland white-fronted goose (*Anser albifrons flavirostris*) [A395] (w)	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The SPA is located approximately 4.4 km beyond the boundary of the Project site. Therefore, there is no pathway for habitat destruction, fragmentation or deterioration effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There is no hydrological connectivity between the Project site and the SPA. Therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The QF for this SPA is a species. Therefore, there is no pathway for effects. Further, the installation of the grid connection site will not interfere with groundwater.	N

[43] The known threats and pressures for each site along with the Article 17 and Article 12 data for each QI and SCI are provided in Appendix B which were used in the assessment process.

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Project-related activities causing disturbance/displacement of species Greenland white-fronted goose was not recorded during the suite of bird surveys conducted between 2022 and 2025. Furthermore, the grid route does not appear to cross any habitats likely to contains important numbers of geese. Therefore, there is no pathway for effects. Project-related activities leading to injury or mortality of species, or reductions in population size or density. Greenland white-fronted goose was not recorded during the suite of bird surveys conducted between 2022 and 2025. Therefore, there is no pathway for effects. Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered The SPA is located approximately 4.4 km beyond the boundary of the Project site. Therefore, there is no pathway for habitat destruction, fragmentation or deterioration effects	
IE0000919	Ridge Road, SW of Rapemills SAC	5.38	• Semi-natural dry grasslands and scrubland facies on calcareous substrates	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
			(*Festuco-Brometalia*) important orchid sites [6210]	off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The habitat for which the SAC is designated is not present within the grid connection site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interest is a terrestrial habitat and therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The qualifying interest is a terrestrial habitat that is not groundwater dependant. Additionally the underground electricity line installation will not interfere with groundwater. Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> The qualifying interest is a terrestrial habitat and therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u>	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				The qualifying interest is a terrestrial habitat and therefore, there is no pathway for effects. Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Ridge Road, SW of Rapemills SAC is located over 5 km from the grid connection site. Therefore, there is no pathway for effects.	
IE0004103	All Saints Bog SPA	6.55	• Greenland white-fronted goose (*Anser albifrons flavirostris*) [A395] (w)	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. Habitat destruction/ fragmentation/ deterioration The SPA is located approximately 6.55 km beyond the boundary of the Project site. Therefore, there is no pathway for habitat destruction, fragmentation or deterioration Effects. Surface water run-off carrying suspended silt and contaminants into local watercourses	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				There is a downstream hydrological connectivity between the grid connection site and the SPA via the Rapemills River. However, according to the conservation objectives for the SPA "Greenland Whitefronted Goose has not been recorded using the SPA since 1993/94 when 75 individuals were recorded (NPWS internal files), which coincides with a general shift by this species from foraging on peatland sites to grassland sites (Burke et al., 2014; NPWS internal files)". Therefore, there is no pathway for impacts <u>Changes to groundwater quality, yield and/or flow paths</u> The Project site is within a different groundwater body to the SPA. The SPA lies within Banagher groundwater body (European code: IE_SH_G_040). The grid connection site lies within Birr gravels groundwater body (IE_SH_G_244), Birr groundwater body (European code: IE_SH_G_041) and Shinrone groundwater body. However, the UGL installation will not interfere with groundwater. Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> Greenland white-fronted goose was not recorded during the suite of bird surveys conducted between 2022 and 2025. Furthermore, the grid route does not appear to cross any habitats likely	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				to contains important numbers of geese. Therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> Greenland white-fronted goose was not recorded during the suite of bird surveys conducted between 2022 and 2025. Therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. The SPA is located approximately 6.55 km beyond the boundary of the Project site. Therefore, there is no pathway for effects.	
IE0002236	Island Fen SAC	7.11	• *Juniperus communis* formations on heaths or calcareous grasslands [5130] • Alkaline fens [7230]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u>	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				The habitats for which this SAC is designated are not present within the grid connection site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interests are terrestrial habitats with no surface watercourse connectivity and therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> Alkaline fens, a qualifying interest of Island Fen SAC, is a GWDTE. This SAC lies within the same groundwater body as the grid connection site; the Shinrone groundwater body (IE_SH_G_205). However, the groundwater vulnerability within the grid connection site is classed as moderate. However, the grid connection site will not interfere with groundwater, and there are no identified karst features with a 2 km zone. In addition, the SAC is over 7 km from the grid connection site. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC. <u>Project-related activities causing disturbance/displacement of species</u> The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects.	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Project-related activities leading to injury or mortality of species, or reductions in population size or density. The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Island Fen SAC is located over 7 km from the grid connection site. Therefore, there is no pathway for effects.	
IE0004086	River Little Brosna Callows SPA	7.16	• Black-headed gull (*Chroicocephalus ridibundus*) [A179] (w) • Whooper Swan (*Cygnus cygnus*) [A038] (w) • Lapwing (*Vanellus vanellus*) [A142] (w) • Shoveler (*Anas clypeata*) [A056] (w)	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. Habitat destruction/ fragmentation/ deterioration The wetland for which this SPA is designated is located approximately 7 km from the grid connection site. Therefore, there is no pathway for habitat destruction, fragmentation or	Y

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
			• Greenland white-fronted goose (*Anser albifrons flavirostris*) [A395] (w) • Wigeon (*Anas penelope*) [A050] (w) • Pintail (*Anas acuta*) [A054] (w) • Golden plover (*Pluvialis apricaria*) [A140] (w) • Teal (*Anas crecca*) [A052] (w) • Black-tailed godwit (*Limosa limosa*) [A156] (w) • Wetland and Waterbirds [A999]	deterioration effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> A study of the watercourses revealed that there is no hydrological connectivity between the grid connection site and River Little Brosna Callows SPA. However, due to the close proximity of Middle Shannon Callows SPA to this SPA, there is the possibility that SCI species from River Little Brosna Callows SPA utilize the wetland habitat within Middle Shannon Callows for ex-situ foraging. Therefore, as Middle Shannon Callows SPA is hydrologically connected to the Project site there is the potential for suspended solids, nutrients and other pollutants generated during the construction and decommissioning of the Project to negatively affect the wetland habitat of Middle Shannon Callows SPA which are potentially utilised by SCI species from River Little Brosna Callows SPA. <u>Changes to groundwater quality, yield and/or flow paths</u> On a precautionary basis the wetland habitat for which this SPA is designated is considered to be groundwater dependant. River Little Brosna Callows SPA is a different groundwater body as the grid connection site. The SPA lies within Banagher groundwater body (European code: IE_SH_G_040). The grid connection site lies	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				within Birr gravels groundwater body (IE_SH_G_244), Birr groundwater body (European code: IE_SH_G_041) and Shinrone groundwater body. Additionally, the UGL will not interfere with groundwater. Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> None of these bird species were recorded, during the suite of bird surveys, using any of the habitats within the Project site during the winter season or breeding. A desk study searching for these SCI species within 2 km of the grid route[44] returned only black-headed gull and lapwing. However, the grid route does not appear to cross any important habitats for lapwing or black-headed gull, or any of the SCI species for this SPA. Therefore, there is no pathway for disturbance/displacement effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> The grid connection site does not pose a risk of injury or mortality to any of these bird species as it is underground. There is no pathway for effects.	

[44] NBDC 2 km hectads: N01V, N11A, N11F, N002, N10Z, N10E, N10J

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. River Little Brosna Callows SPA is located over 7 km from the grid connection site. Therefore, there is no pathway for effects.	
IE0002147	Lisduff Fen SAC	8.82	• Petrifying springs with tufa formation (*Cratoneurion*) [7220] • Alkaline fens [7230] • Geyer's whorl snail (*Vertigo geyeri*) [1013]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. Habitat destruction/ fragmentation/ deterioration The habitats for which this SAC is designated are not present within the grid connection site. Therefore, there is no pathway for effects. Surface water run-off carrying suspended silt and contaminants into local watercourses There is a lack of surface watercourse connectivity . Therefore, there is no pathway for effects.	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Changes to groundwater quality, yield and/or flow paths Petrifying springs with tufa formation (*Cratoneurion*), and alkaline fens are GWDTE. While the SAC lies within the same groundwater body as the grid connection site: the Shinrone groundwater body (IE_SH_G_205), the UGL will not interfere with groundwater. Additionally, the groundwater vulnerability within the grid connection site is classed as moderate. There are no identified karst features with a 2 km zone. In addition, the SAC is over 8 km from the grid connection site. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC. Project-related activities causing disturbance/displacement of species The qualifying interests are terrestrial habitats or species of limited mobility (Geyer's whorl snail) and therefore, there is no pathway for effects. Project-related activities leading to injury or mortality of species, or reductions in population size or density. The qualifying interests are terrestrial habitats or species of limited mobility (Geyer's whorl snail) and therefore, there is no pathway for effects. Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Lisduff Fen SAC is located over 8 km from the grid connection site. Therefore, there is no pathway for effects.	
IE0000216	River Shannon Callows SAC	9.06	• Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] • Alkaline fens [7230] • Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*) [6510] • Limestone pavements [8240] • Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) [6410] • Otter (*Lutra lutra*) [1355]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The habitats for which this SAC is designated are not present within the grid connection site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The is a potential hydrological connectivity between the grid connection site and River Shannon Callows SAC. The Rapemills_010 (European code: IE_SH_25R010300), second order watercourse flows alongside the grid connection site. The watercourse flows into River Shannon Callows SAC. There is potential to negatively effect Alluvial forests with *Alnus*	Y

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				glutinosa and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) through reduced water quality as a result of polluted surface water run-off flowing into local watercourses that are hydrologically connected to River Shannon Callows SAC. There is also the potential to indirectly effect otter via reduced water quality through the same pathway as described above. <u>Changes to groundwater quality, yield and/or flow paths</u> Alkaline fen is a GWDTE. However, the grid connection site lies within a different groundwater body to the SAC. SAC lies is within Banagher groundwater body (European code: IE_SH_G_040), while the grid connection site lies within the following three groundwtater bodies Birr gravels, Birr and Shinrone (European codes: IE_SH_G_244, IE_SH_G_041 and IE_SH_G_205, respectively. Additionally the UGL will not interfere with groundwater. Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> Otter signs (mostly spraints) were identified at a total of four sites on the Rapemills River (Please see Appendix G for more details) during aquatic surveys in 2025.	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				A study of the watercourses revealed that there is hydrological connectivity between the grid connection site and River Shannon Callows SAC via Rapemills river. Otter have a range In Ireland of ca. 7 km (females) and ca. 13km (males 13 km) with some known to have expanded their range from 10 km to 20 km. Therefore, there is potential for the QI population to the be present in the Rapemills river. Therefore, there is a pathway for disturbance/displacement of otter. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> Otter signs (mostly spraints) were identified at a total of four sites on the Rapemills River (Please see Appendix G for more details) during aquatic surveys in 2025. A study of the watercourses revealed that there is hydrological connectivity between the grid connection site and River Shannon Callows SAC. No otter holts/couches were recorded along the UGL. However, otters from the SAC could utilize watercourses within/in the vicinity of the grid connection site and thus be injured/killed by Project related activities, in the absence of mitigation. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. River Shannon Callows SAC is located over 7 km from the grid connection site. Therefore, there is no pathway for effects.	
IE0004096	Middle Shannon Callows SPA	9.37 km	• Whooper swan (*Cygnus cygnus*) [A038] (w) • Lapwing (*Vanellus vanellus*) [A142] (w) • Golden plover (*Pluvialis apricaria*) [A140] (w) • Wigeon (*Anas penelope*) [A050] (w) • Corncrake (*Crex crex*) [A122][45] • Black-headed gull (*Chroicocephalus ridibundus*) [A179] (w) • Black-tailed Godwit (*Limosa limosa*) [A156] (w)	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The wetland for which this SPA is designated is located approximately 9.37 km beyond the boundary of the grid connection site. Therefore, there is no pathway for habitat destruction, fragmentation or deterioration effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> A study of the watercourses revealed that there is hydrologically connectivity between the grid connection site and Middle Shannon Callows	Y

[45] The status of corncrake as a Species of Conservation Interest for the Middle Shannon Callows SPA is currently under review. The outcome of this review will determine whether a site-specific conservation objective is set for this species

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
			• Wetland and Waterbirds [A999]	SPA. Therefore, there is potential to negatively affect the wetland habitat through a reduction in water quality as a result of polluted surface water run-off flowing into local watercourses that are hydrologically connected to the SPA. <u>Changes to groundwater quality, yield and/or flow paths</u> On a precautionary basis the wetland habitat for which this SPA is designated is considered to be groundwater dependant. However, the SPA and the grid connection site lie within different groundwater bodies, and the UGL will not interfere with groundwater. The SPA lies within Banagher groundwater body (European code: IE_SH_G_040), while the grid connection site lies within the following three groundwater bodies: Birr gravels, Birr and Shinrone (European codes: IE_SH_G_244, IE_SH_G_041 and IE_SH_G_205, respectively). Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> None of these bird species were recorded, during the suite of bird surveys, using any of the habitats within the Project site during the winter season or breeding season. A desk study searching for these SCI species within 2 km of	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				the grid route[46] returned only black-headed gull and lapwing. However, the grid route does not appear to cross any important ex situ habitats for lapwing or black-headed gull, or any of the SCI species for this SPA. Therefore, there is no pathway for disturbance/displacement effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> The grid connection site does not pose a risk of injury or mortality to any SCI species for this SPA as it will be underground. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the grid connection site as the levels of air pollution and dust are unlikely to exceed those for a road scheme. The SPA is located approximately 9.37 km from the grid connection site. Therefore, there is no pathway for effects.	

[46] NBDC 2 km hectads: N01V, N11A, N11F, N002, N10Z, N10E, N10J

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
IE0000641	Ballyduff/Clonfinane Bog SAC	9.98	• Degraded raised bogs still capable of natural regeneration [7120] • Bog woodland [91D0] • Active raised bogs [7110] • Depressions on peat substrates of the Rhynchosporion [7150]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The habitats for which this SAC is designated are not present within the grid connection site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The SAC is designated for raised bog habitat which is ombrotrophic and receives its water supply principally from precipitation. The raised bog water table is perched and is functionally separated from the regional groundwater regime by the acrotelm/catotelm structure and marginal lagg zone. Consequently, no viable impact pathway exists whereby the proposed development could affect the supporting habitat of the qualifying interest species. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC.	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Project-related activities causing disturbance/displacement of species The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. Project-related activities leading to injury or mortality of species, or reductions in population size or density. The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Ballyduff/Clonfinane Bog SAC is located over 9 km from the grid connection site. Therefore, there is no pathway for effects.	
IE0000412	Slieve Bloom Mountains SAC	10.18	• Northern Atlantic wet heaths with *Erica tetralix* [4010] • Blanket bogs (if active) [7130], • Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. Habitat destruction/ fragmentation/ deterioration	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
			(*Alno-Padion, Alnion incanae, Salicion albae*) [91E0]	The habitats for which this SAC is designated are not present within the grid connection site. Therefore, there is no pathway for effects <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interests are terrestrial habitats lacking surface watercourse connectivity, and therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The SAC is designated for blanket bog habitat which is ombrotrophic and receives its water supply principally from precipitation. Consequently, no viable impact pathway exists whereby the proposed development could affect the supporting habitat of the qualifying interest species. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC. Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u>	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Slieve Bloom Mountain SAC is located over 10 km from the grid connection site. Therefore, there is no pathway for effects.	
IE0000585	Sharavogue Bog SAC	10.91	• Active raised bogs [7110] • Depressions on peat substrates of the Rhynchosporion [7150] • Degraded raised bogs still capable of natural regeneration [7120]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction /fragmentation/deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The habitats for which this SAC is designated are not present within the grid connection site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects.	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Changes to groundwater quality, yield and/or flow paths The SAC is designated for raised bog habitat which is ombrotrophic and receives its water supply principally from precipitation. The raised bog water table is perched and is functionally separated from the regional groundwater regime by the acrotelm/catotelm structure and marginal lagg zone. Consequently, no viable impact pathway exists whereby the proposed development could affect the supporting habitat of the qualifying interest species. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC.. Project-related activities causing disturbance/ displacement of species The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. Project-related activities leading to injury or mortality of species, or reductions in population size or density. The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Sharavogue Bog SAC is located over 10 km from the grid connection site. Therefore, there is no pathway for effects.	
IE0000859	Clonaslee Eskers and Derry Bog SAC	12.16	• Alkaline fens [7230], • Geyer`s whorl snail (Vertigo geyeri) [1013]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The habitat for which this SAC is designated is not present within the grid connection site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There is a lack of surface watercourse connectivity. Therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> Alkaline fen are GWDTE. However, this SAC lies within a different groundwater body to the grid connection site. The SAC lies within Geashill and Clonaslee West groundwater bodes (IE_SH_G_103 and IE_SH_G_066, respectively).	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				The grid connection site lies within the following three groundwater bodies Birr gravels, Birr and Shinrone (European codes: IE_SH_G_244, IE_SH_G_041 and IE_SH_G_205, respectively. Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> The qualifying interests are terrestrial habitats or species of limited mobility (Geyer's whorl snail) and therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> The qualifying interests are terrestrial habitats or species of limited mobility (Geyer's whorl snail) and therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. The SAC is located over 12 km from the grid connection site. Therefore, there is no pathway for effects.	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
IE0004160	Slieve Bloom Mountains SPA	8.5	• Hen harrier (*Circus cyaneus*) [A082] (r)	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The SPA is located approximately 8.5 km beyond the boundary of the grid connection site. Therefore, there is no pathway for habitat destruction, fragmentation or deterioration effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There is no downstream hydrological connectivity between the grid connection site and the SPA. Furthermore, hen harrier is not reliant on surface water habitats. Therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The SPA is located in a different groundwater body to the Project site. The grid connection site lies within the following three groundwater bodies Birr gravels, Birr and Shinrone (European codes: IE_SH_G_244, IE_SH_G_041 and IE_SH_G_205, respectively. The SPA lies within multiple groundwater bodies, however, the closest of these to the Project site is Clonaslee	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				West (European code: IE_SH_G_066). Further, the SPA is not designated for GWDTE. Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> Hen harrier was not recorded roosting, breeding, nor regularly hunting across within the wind farm site. A desk study searching within 2 km of the grid route[47] did not return hen harrier. Furthermore, the grid route does not appear to cross any important habitats for hen harrier. Therefore, there is no pathway for disturbance/displacement effects. <u>Project related activities leading to injury or mortality of species, or reductions in population size or density.</u> The grid connection site does not pose a risk of injury or mortality to hen harrier as it will be underground. Therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road	

[47] NBDC 2 km hectads: N01V, N11A, N11F, N002, N10Z, N10E, N10J

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Slieve Bloom Mountains SPA is located over 8.5 km from the Project site. Therefore, there is no pathway for effects..	
IE0002353	Redwood Bog SAC	12.83	• Degraded raised bogs still capable of natural regeneration [7120] • Active raised bogs [7110] • Depressions on peat substrates of the Rhynchosporion [7150]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The habitats for which this SAC is designated are not present within the grid connection site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interests are terrestrial habitats lacking surface watercourse connectivity, and therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The SAC is designated for raised bog habitat which is ombrotrophic and receives its water supply principally from precipitation. The raised bog water table is perched and is functionally separated from the regional groundwater regime	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				by the acrotelm/catotelm structure and marginal lagg zone. Consequently, no viable impact pathway exists whereby the proposed development could affect the supporting habitat of the qualifying interest species. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC. <u>Project-related activities causing disturbance/displacement of species</u> The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Redwood Bog SAC is located over 12 km from the grid connection site. Therefore, there is no pathway for effects.	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
IE0000581	Moyclare Bog SAC	13.40	• Active raised bogs [7110] • Degraded raised bogs still capable of natural regeneration [7120] • Depressions on peat substrates of the Rhynchosporion [7150]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The habitats for which this SAC is designated are not present within the grid connection site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interests are terrestrial habitats lacking surface watercourse connectivity and therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The SAC is designated for raised bog habitat which is ombrotrophic and receives its water supply principally from precipitation. The raised bog water table is perched and is functionally separated from the regional groundwater regime by the acrotelm/catotelm structure and marginal lagg zone. Consequently, no viable impact pathway exists whereby the proposed development could affect the supporting habitat of the qualifying interest species. Therefore,	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				there is no realistic hydrogeological connection for potential effects to the SAC. <u>Project-related activities causing disturbance/displacement of species</u> The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Moyclare Bog SAC is located over 13 km from the grid connection site. Therefore, there is no pathway for effects.	
IE0002207	Arragh More (Derrybreen) Bog SAC	13.86	• Degraded raised bogs still capable of natural regeneration [7120]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The habitat for which this SAC is designated is not present within the grid connection site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interest is a terrestrial habitat lacking surface watercourse connectivity and therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The SAC is designated for raised bog habitat which is ombrotrophic and receives its water supply principally from precipitation. The raised bog water table is perched and is functionally separated from the regional groundwater regime by the acrotelm/catotelm structure and marginal lagg zone. Consequently, no viable impact pathway exists whereby the proposed development could affect the supporting habitat of the qualifying interest species. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC.. <u>Project-related activities causing disturbance/displacement of species</u>	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				The qualifying interest is a terrestrial habitat and therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> The qualifying interest is a terrestrial habitat and therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> The qualifying interest is a terrestrial habitat and therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. The SAC is located over 13 km from the grid connection site. Therefore, there is no pathway for effects.	
IE0000647	Kilcarren-Firville Bog SAC	14.58	• Degraded raised bogs still capable of natural regeneration [7120] • Active raised bogs [7110]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
			• Depressions on peat substrates of the Rhynchosporion [7150]	species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The habitats for which this SAC is designated are not present within the grid connection site. Therefore, there is no pathway for effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> The qualifying interest is a terrestrial habitat and therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The SAC is designated for raised bog habitat which is ombrotrophic and receives its water supply principally from precipitation. The raised bog water table is perched and is functionally separated from the regional groundwater regime by the acrotelm/catotelm structure and marginal lagg zone. Consequently, no viable impact pathway exists whereby the proposed development could affect the supporting habitat of the qualifying interest species. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC. <u>Project-related activities causing disturbance/displacement of species</u> The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects.	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Project-related activities leading to injury or mortality of species, or reductions in population size or density. The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Kilcarren-Firville Bog SAC is located over 14 km from the grid connection site. Therefore, there is no pathway for effects.	
IE0000575	Ferbane Bog SAC	15.16	• Degraded raised bogs still capable of natural regeneration [7120] • Active raised bogs [7110] • Depressions on peat substrates of the Rhynchosporion [7150]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. Habitat destruction/ fragmentation/ deterioration The habitats for which this SAC is designated are not present within the grid connection site. Therefore, there is no pathway for effects.	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Surface water run-off carrying suspended silt and contaminants into local watercourses The qualifying interest is a terrestrial habitat lacking surface watercourse connectivity and therefore, there is no pathway for effects. Changes to groundwater quality, yield and/or flow paths The SAC is designated for raised bog habitat which is ombrotrophic and receives its water supply principally from precipitation. The raised bog water table is perched and is functionally separated from the regional groundwater regime by the acrotelm/catotelm structure and marginal lagg zone. Consequently, no viable impact pathway exists whereby the proposed development could affect the supporting habitat of the qualifying interest species. Therefore, there is no realistic hydrogeological connection for potential effects to the SAC. Project-related activities causing disturbance/displacement of species The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects. Project-related activities leading to injury or mortality of species, or reductions in population size or density. The qualifying interests are terrestrial habitats and therefore, there is no pathway for effects.	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Ferbane Bog SAC is located over 15 km from the grid connection site. Therefore, there is no pathway for effects.	
IE0001683	Liskeenan Fen SAC	16.77	• Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* [7210]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. Habitat destruction/ fragmentation/ deterioration The habitat for which this SAC is designated is not present within the grid connection site. Therefore, there is no pathway for effects. Surface water run-off carrying suspended silt and contaminants into local watercourses The qualifying interest is a terrestrial habitat lacking surface watercourse connectivity and therefore, there is no pathway for effects.	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Changes to groundwater quality, yield and/or flow paths The qualifying interest, Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae,* of this SAC is a GWDTE. However, Liskeenan Fen SAC lies within a different groundwater body to the grid connection site. The SAC lies within Borrisokane groundwater body (European code: IE_SH_G_042), while the grid connection site lies within the following three groundwater bodies; Birr gravels, Birr and Shinrone (European codes: IE_SH_G_244, IE_SH_G_041 and IE_SH_G_205, respectively. Therefore, there is no pathway for effects. Project-related activities causing disturbance/displacement of species The qualifying interest is a terrestrial habitat and therefore, there is no pathway for effects. Project-related activities leading to injury or mortality of species, or reductions in population size or density. The qualifying interest is a terrestrial habitat and therefore, there is no pathway for effects. Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m,	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Liskeenan Fen SAC is located over 16 km from the grid connection site. Therefore, there is no pathway for effects.	
IE0004097	River Suck Callows SPA	19.05	• Greenland white-fronted goose (*Anser albifrons flavirostris*) [A395] (w) • Whooper swan (*Cygnus cygnus*) [A038] (w) • Golden plover (*Pluvialis apricaria*) [A140] (w) • Lapwing (*Vanellus vanellus*) [A142] (w) • Wigeon (*Anas penelope*) [A050] (w) • Wetland and Waterbirds [A999]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The wetland for which this SPA is designated is located approximately 19 km beyond the boundary of the grid connection site. Therefore, there is no pathway for habitat destruction, fragmentation or deterioration effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> A study of the watercourses revealed that there is no hydrological connectivity between the grid connection site and River Suck Callows SPA. Therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u>	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				On a precautionary basis the wetland habitat for which this SPA is designated is considered to be groundwater dependant. However, River Suck Callows SPA lies within a different groundwater body from the grid connection site. The SPA lies within Aughrim, Athlone West and South Suck groundwater bodies (European codes: IE_SH_G_019, IE_SH_G_014 and IE_SH_G_225, respectively. The grid connection site lies within the following three groundwater bodies; Birr gravels, Birr and Shinrone (European codes: IE_SH_G_244, IE_SH_G_041 and IE_SH_G_205, respectively. Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> During the suite of bird surveys within the wind farm site none of these bird species were recorded using any of the habitats within the wind farm site during the winter season or breeding. A desk study searching for these SCI species within 2 km of the grid route[48] returned only lapwing. However, the grid route does not appear to cross any important habitats for lapwing, or any of the SCI species for this SPA. Therefore, there is no pathway for disturbance/displacement effects.	

[48] NBDC 2 km hectads: N01V, N11A, N11F, N002, N10Z, N10E, N10J

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Project-related activities leading to injury or mortality of species, or reductions in population size or density The grid connection site does not pose a risk of injury or mortality to any of these QI bird species as it is underground. Therefore, there is no pathway for effects. Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. River Suck Callows SPA is located over 19 km from the grid connection site. Therefore, there is no pathway for effects.	
IE0002162	River Barrow and River Nore SAC	19.33	• Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation [3260] • Alluvial forests *with Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] • Hydrophilous tall herb fringe communities of plains and of	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. Habitat destruction/ fragmentation/ deterioration The habitats for which this SAC is designated are not present within the grid connection site. Therefore, there is no pathway for effects.	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
			the montane to alpine levels [6430] • Petrifying springs with tufa formation (*Cratoneurion*) [7220] • Estuaries [1130] • Salicornia and other annuals colonising mud and sand [1310] • European dry heaths [4030] • Reefs [1170] • Mediterranean salt meadows (*Juncetalia maritimi*) [1410] • Mudflats and sandflats not covered by seawater at low tide [1140] • Old sessile oak woods with Ilex and Blechnum in the British Isles [91A0] • Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) [1330] • Killarney fern (*Trichomanes speciosum*) [1421] • Nore Pearl Mussel (*Margaritifera durrovensis*) [1990] • Freshwater pearl mussel (*Margaritifera margaritifera*) [1029]	<u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> A study of the watercourses revealed that there is no hydrological connectivity between the grid connection site and River Barrow and River Nore SAC. Therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> Petrifying springs with tufa formation (Cratoneurion) [7220] is groundwater dependant. However, the SAC lies within different groundwater bodies to the grid connection site. The grid connection site lies within the following three groundwater bodies; Birr gravels, Birr and Shinrone (European codes: IE_SH_G_244, IE_SH_G_041 and IE_SH_G_205, respectively. While the closest groundwater body to the grid connection site within which part of the SAC lies is Clonaslee goundwater body (European code: IE_SE_G_039). Additionally, the grid connection site will not interfere with groundwater. Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> There is no hydrological connection between the grid connection site and the SAC, therefore, there is no pathway for disturbance/displacement impacts on Nore pearl mussel, freshwater pearl mussel, white-clawed crayfish, Atlantic salmon,	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
			• White-clawed crayfish (*Austropotamobius pallipes*) [1092] • Desmoulin`s whorl snail (*Vertigo moulinsiana*) [1016] • Atlantic salmon (*Salmo salar*) [1106] • Brook lamprey (*Lampetra planeri*) [1096] • Sea lamprey (*Petromyzon marinus*) [1095] • Twaite shad (*Alosa fallax*) [1103] • River lamprey (*Lampetra fluviatilis*) [1099] • Otter (*Lutra lutra*) [1355]	brook lamprey, sea lamprey, twaite shad, river lamprey and otter. Desmoulin's whorl snail is a species of limited mobility and as the SAC is over 19 km from the grid connection site there is considered to be no pathway for disturbance/displacement effects on this species. Therefore, there is no pathway for disturbance/displacement on any of the QI species for River Barrow and River Nore SPA. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> There is no hydrological connection between the grid connection site and the SAC, therefore, there is no pathway for injury or mortality impacts on Nore pearl mussel, freshwater pearl mussel, white-clawed crayfish, Atlantic salmon, brook lamprey, sea lamprey, twaite shad, river lamprey and otter. Desmoulin's whorl snail is a species of limited mobility and as the SAC is over 19 km from the grid connection site there is considered to be no pathway for injury or mortality effects on this species. Therefore, there is no pathway for injury or mortality effects on any of the QI species for River Barrow and River Nore SPA.	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. River Barrow and River Nore SAC is located over 19 km from the grid connection site. Therefore, there is no pathway for effects.	
IE0000576	Fin Lough (Offaly) SAC	19.42	• Alkaline fens [7230] • Geyer`s whorl snail (*Vertigo geyeri*) [1013]	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. Habitat destruction/ fragmentation/ deterioration The habitat for which this SAC is designated is not present within the grid connection site. Therefore, there is no pathway for effects. Surface water run-off carrying suspended silt and contaminants into local watercourses A study of the watercourses revealed that there is no hydrological connectivity between the grid connection site and Fin Lough (Offaly) SAC. Therefore, there is no pathway for effects.	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Changes to groundwater quality, yield and/or flow paths While Alkaline fen is GWDTE, the SAC lies within a different groundwater body to the grid connection site. The SAC lies within GWDTE-Fin Lough Fen groundwater body (IE_SH_G_060), while the grid connection site lies within the following three groundwater bodies: Birr gravels, Birr and Shinrone (European codes: IE_SH_G_244, IE_SH_G_041 and IE_SH_G_205, respectively). Therefore, there is no pathway for effects. Project-related activities causing disturbance/displacement of species The qualifying interests are terrestrial habitats or species of limited mobility (Geyer's whorl snail) and therefore, there is no pathway for effects. Project-related activities leading to injury or mortality of species, or reductions in population size or density. The qualifying interests are terrestrial habitats or species of limited mobility (Geyer's whorl snail) and therefore, there is no pathway for effects. Air pollution due to dust and other airborne emissions IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Fin Lough (Offaly) SAC is located over 19 km from the grid connection site. Therefore, there is no pathway for effects.	
IE0002241	Lough Derg, North-east Shore SAC	19.65km	• Taxus baccata woods of the British Isles [91J0] • Alkaline fens [7230] • Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) [91E0] • Limestone pavements [8240] • Juniperus communis formations on heaths or calcareous grasslands [5130] • Calcareous fens with Cladium mariscus and species of the Caricion davallianae [7210]	There is a hydrological connection to the SAC via Rapemills river which runs paralell to the grid connection site and drains to the river Shannon, and into Lough Derg. Alkaline fen is a QI for this SAC and is a groundwater-dependant habitat. The SAC lies within the same groundwater body as the Project (Banagher). However the underground electricity line will not interfere with groundwater. There is an ecological and hydrological connection to the SAC.	Y
IE0004058	Lough Derg (Shannon) SPA	20.59	• Cormorant (*Phalacrocorax carbo*) [A017] (b) (r) • Goldeneye (*Bucephala clangula*) [A067] (w) • Common tern (*Sterna hirundo*) [A193] (b)	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The wetland for which this SPA is designated is	Y

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
			• Tufted Duck (*Aythya fuligula*) [A061] (w) • Wetland and Waterbirds [A999]	located approximately 20 km beyond the boundary of the grid connection site. Therefore, there is no pathway for habitat destruction, fragmentation or deterioration effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> A study of the watercourses revealed that there is hydrological connectivity between the grid connection site and Lough Derg (Shannon) SPA. The Rapemills_010 (European code: IE_SH_25R010300), second order watercourse flows alongside the grid connection site. The Rapemills river is a tributary of the Shannon [Lower]_020 (European code: IE_SH_25S012060) and then Shannon [Lower]_030 (European code: IE_SH_25S012350) which flows in Lough Derg in which the SPA is located. Therefore, there is a pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> On a precautionary basis the wetland habitat for which this SPA is designated is considered to be groundwater dependant. However, the SPA and the grid connection site lie within different groundwater bodies. Lough Derg (Shannon) SPA lies within Banagher groundwater body (European code: IE_SH_G_040), Nenagh groundwater body (European code: IE_SH_G_178), Tynagh groundwater body (European code: IE_SH_G_236) and Lough	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Graney groundwater body (European code: IE_SH_G_157). The grid connection site lies within the following three groundwater bodies: Birr gravels, Birr and Shinrone (European codes: IE_SH_G_244, IE_SH_G_041 and IE_SH_G_205, respectively). Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> None of these SCI bird species have been recorded breeding or wintering within the grid connection site or within 500 m. Therefore, there is no pathway for effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> The grid connection site does not pose a risk of injury or mortality to any of these QI bird species. Therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Lough Derg (Shannon) SPA is located over 20	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				km from the grid connection site. Therefore, there is no pathway for effects.	
IE0004017	Mongan Bog SPA	20.78	• Greenland white-fronted goose (*Anser albifrons flavirostris*) [A395] (w)	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The SPA is located approximately 20.78 km beyond the boundary of the UGL. Therefore, there is no pathway for habitat destruction, fragmentation or deterioration effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There is no downstream hydrological connectivity between the Project site and the SPA. Therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The SPA is not designated for any GWDTE. Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u> The core foraging range of Greenland white-fronted goose is 8 km[25]. The grid connection site is located approximately 20.7 km from the SPA.	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				Therefore, the grid connection site lies beyond the core foraging range for this species. Therefore, there is no pathway for effects. Furthermore, the grid route does not appear to cross any habitats likely to contains important numbers of geese. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> The grid connection site does not pose a risk of injury or mortality to Greenland white-fronted goose as it is underground. Furthermore, the core foraging range of Greenland white-fronted goose is 8 km[25]. The grid connection site is located approximately 20.7 km from the SPA. Therefore, the grid connection site lies beyond the core foraging range for this species. In conclusion, therefore, there is no pathway for effects. <u>Air pollution due to dust and other airborne emissions</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are unlikely to exceed those for a road scheme. Mongan Bog SPA is located over 20 km from	

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				the grid connection site. Therefore, there is no pathway for effects.	
IE0004233	River Nore SPA	23.36	• Kingfisher (*Alcedo atthis*) [A229] (r)	As identified in Table 2-6 the main sources for impacts relate to habitat destruction/ fragmentation/ deterioration, surface water run-off, changes to groundwater, disturbance/displacement of species, reduction in species population/density and air pollution. <u>Habitat destruction/ fragmentation/ deterioration</u> The SPA is located approximately 23.3 km beyond the boundary of the grid connection site. Therefore, there is no pathway for habitat destruction, fragmentation or deterioration effects. <u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There is no hydrological connectivity between the grid connection site and the SPA. Therefore, there is no pathway for effects. <u>Changes to groundwater quality, yield and/or flow paths</u> The SPA is not designated for GWDTE. Therefore, there is no pathway for effects. <u>Project-related activities causing disturbance/displacement of species</u>	N

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				A desk study searching for kingfisher within 2 km of the grid route[49] did not return this species. Furthermore, the core home range of kingfisher is an estimated 2.5 km[50]. The SPA is located approximately 23.3 km from the grid connection site and hence beyond the home range of kingfisher. Therefore, there is no pathway for disturbance/displacement effects. <u>Project related activities leading to injury or mortality of species, or reductions in population size or density.</u> Kingfisher was not recorded within the grid connection site or surrounding 500 m. Therefore, there is no pathway for injury or mortality effects on this species. Furthermore, the grid connection site is underground and therefore does not pose a risk of injury or mortality to kingfisher. <u>Air pollution due to dust and other airborne emission</u> IAQM guidance[18] suggests that air pollution and dust from are likely to be important for sensitive European sites within 200 m and 500 m, respectively. While this guidance relates to road schemes, it is considered appropriate for the Project as the levels of air pollution and dust are	

[49] NBDC 2 km hectads: N01V, N11A, N11F, N002, N10Z, N10E, N10J

[50] Musseau, R., Angelier, F., Bichet, C., Millet, M., Rousselle, C., Moreau, J., and Bustamante, P.C. (2023). Sensitivity of the European Kingfisher (Alcedo atthis) to global change: evidence from home range features and contaminations by trace elements and organic pollutants, a case study in the marshes of Western Europe.

Site Code	Site Name	Direct Line Distance (km)	Qualifying Feature (Qualifying Interest and Special Conservation Interest)	Potential Effects (Source-Pathway-Receptor Model)	Considered further in screening [Y/N]
				unlikely to exceed those for a road scheme. The SPA is located over 23.3 km from the Project site. Therefore, there is no pathway for effects.	

3.5 Assessment of Potential Effects

3.5.1 Effects of the Proposed Project Alone

As shown in Table 3-1, with regards to the wind farm site, two SAC (River Shannon Callows SAC, and Lough Derg, North-east Shore SAC) and four SPAs (River Little Brosna Callows SPA, Middle Shannon Callows SPA, Slieve Bloom Mountains SPA and Lough Derg (Shannon) SPA) were recommended for further assessment when considering the S-P-R model for potential effects. Details of the LSE are provided below.

With regards to the grid connection site, five European sites, River Shannon Callows SAC, Lough Derg, North-east Shore SAC, Middle Shannon Callows SPA, River Little Brosna Callows SPA (via potential ex-situ use of the wetland habitat of Middle Shannon Callows SPA) and Lough Derg (Shannon) SPA were recommended for further assessment. Further details are given below.

River Shannon Callows SAC

Firstly, there is direct hydrological connectivity between the Project site (both the wind farm site and grid connection site), and River Shannon Callows SAC. The Project has the potential to affect this SACs in several ways.

In the absence of mitigation, suspended solids, nutrients and other pollutants generated during the construction and decommissioning of the project could enter the SAC via run-off into connected watercourses. This could negatively affect Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* through a reduction in water quality.

This could also indirectly impact otter. The release of contaminated surface water run-off into local watercourses connected to the SAC could reduce water quality, cause algal blooms and/or smoother spawning beds of fish species. Ultimately resulting in negative effects on the fish populations upon which otter prey. Consequently, negatively impacting otter.

Secondly, activities undertaken during the construction/decommissioning of the Project could cause increased noise, vibration, new sources of lighting and increased human presence. Consequently, resulting in disturbance/displacement of otters, associated with the SAC, from watercourses within or in the immediate vicinity of the Project site.

Thirdly, in the absence of mitigation, construction and decommissioning activities could cause physical injury or mortality of otter.

Lough Derg, North-east Shore SAC

Lough Derg, North-east Shore SAC is hydrologically connected to the Project site (wind farm site and grid connection site) via the Rapemills river. The habitat Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*) [91E0] is dependant on surface waterbodies. There is therefore the potential for suspended solids, nutrients and other pollutants generated during the construction and decommissioning of the Project to negatively affect this habitat.

River Little Brosna Callows SPA

River Little Brosna Callows SPA is not hydrologically connected to the Project site (wind farm site or grid connection site). However, due to the close proximity of Middle Shannon Callows SPA to this SPA, there is the possibility that SCI species from River Little Brosna Callows SPA utilize the wetland habitat within Middle Shannon Callows for ex-situ foraging. Therefore, as Middle Shannon Callows SPA is hydrologically connected to the Project site there is the potential for suspended solids, nutrients and other pollutants generated during the construction and decommissioning of the Project to negatively affect the wetland habitat of Middle Shannon Callows SPA which are potentially utilised by SCI species from River Little Brosna Callows SPA**.**

The wind farm site may present a collision risk for SCI birds of these SPAs. With regards to River Little Brosna Callows SPA, black-headed gull, lapwing and golden plover were recorded during flight activity surveys and have been selected for further assessment. Collision of a bird with turbine rotors is almost certain to result in the death of the bird. The frequency and likelihood of a collision occurring depends on several factors which include aspects of the size and behaviour of the bird (including their use of a site), the nature of the surrounding environment, and the structure and layout of the wind turbines.

Middle Shannon Callows SPA

A study of the watercourses revealed that there is hydrologically connectivity between the Project site (both the wind farm site and the grid connection site) and Middle Shannon Callows SPA.Therefore, there is potential to negatively affect the wetland habitat through a reduction in water quality as a result of polluted surface water run-off flowing into local watercourses that are hydrologically connected to the SPA.In addition, the wind farm site may also present a collision risk for lapwing, golden plover and black-headed gull which were recorded during flight activity surveys and have been selected for further assessment. Collision of a bird with turbine rotors is almost certain to result in the death of the bird. The frequency and likelihood of a collision occurring depends on several factors which include aspects of the size and behaviour of the bird (including their use of a site), the nature of the surrounding environment, and the structure and layout of the wind turbines.

Slieve Bloom Mountains SPA

The qualifying interest for Slieve Bloom Mountains SPA, located approximately 11.89 km south-east of the wind farm site and approximately 8.5 km from the grid connection route, is hen harrier. A total of seven flights (of individual birds) of this raptor species were recorded during flight activity surveys. Therefore, hen harrier may be subject to collision risk with the operational turbine blades. Collision with the moving turbine blades would likely result in severe injury or mortality.

Lough Derg (Shannon) SPA

A study of the watercourses revealed that there is hydrologically connectivity between the Project site (both the wind farm site and the grid connection site) and Lough Derg (Shannon) SPA. Therefore, there is potential to negatively affect the wetland habitat through a reduction in water quality as a result of polluted surface water run-off flowing into local watercourses that are hydrologically connected to the SPA.

3.5.2 In-Combination Effects

There is the potential for other plans and projects, specifically any other land use changes and other proposed wind farms to also impact upon the designated features of the following six European sites; Lough Derg, North-east Shore SAC, River Shannon Callows SAC, River Little Brosna Callows SPA, Middle Shannon Callows SPA,Slieve Bloom Mountains SPA and Lough Derg (Shannon) SPA. Therefore, LSE cannot be excluded for these European sites when the Project is considered in combination with other plans and projects.

Where there are no pathways for impacts between the Project site and any European sites (as set out in Table 3-1 and Table 3-2 above) LSE can be excluded for the Project in combination with other plans and projects.

4.0 AA Screening Conclusion

Based on the Source–Pathway–Receptor assessment and on the basis of objective scientific information, one or more credible pathways for significant effects on European sites have been identified. The analysis has taken account of the characteristics of the proposed project, the ecological sensitivities of the qualifying interests and special conservation interests, the relevant site-specific Conservation Objectives, the known threats and pressures identified in Article 17 and Article 12 reporting, and potential in-combination effects with other plans and projects.

Having regard to the identified pathways for effect, and applying the precautionary principle in accordance with Article 6(3) of the Habitats Directive, it cannot be excluded that the proposed project, individually or in combination with other plans or projects, is likely to have a significant effect on the following European site(s) in view of their Conservation Objectives:

- River Shannon Callows SAC (for wind farm sites and grid connection site),
- Lough Derg, North-east Shore SAC (wind farm site and grid connection site),
- River Little Brosna Callows SPA (wind farm site and grid connection site),
- Middle Shannon Callows SPA (wind farm site and grid connection site),
- Slieve Bloom Mountains SPA (wind farm site only), and
- Lough Derg (Shannon) SPA (wind farm site and grid connection site).

This information is presented in this report will allow the Competent Authority to make their determination regarding the need for a Stage 2 Appropriate Assessment regarding likely significant effects on European Sites resulting from the proposed project, in accordance with and fulfilment of the requirements of Article 6 of the Habitats Directive and derived Regulations.

5.0 Natura Impact Statement

The AA process builds on the information provided in the AA Screening (Section 3.0), considering the details of the Proposed Project outlined in Section 2.0 and assesses the potential for effects to the ecological integrity of each of the European sites identified with sources and pathways to effects to sensitive receptors.

5.1 Information on European Sites

5.1.1 Lough Derg, North-east Shore SAC

Lough Derg, North-east Shore SAC has site specific conservation objectives (NPWS, 2019). These provide clarity on the definition of favourable conservation condition for the qualifying interests of the SAC, and state whether the qualifying interests are favourable or unfavourable. The conservation objectives for the for QIs for which there is considered to be an ecological connection are summarised in Table 5-1.

Table 5-1 Conservation Objectives - Lough Derg, North-east Shore SAC

QI	Conservation Objectives (CO)		
	CO	Attribute	Target
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	To restore the favourable conservation condition of Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) in Lough Derg, North-East Shore SAC	Habitat area	Area stable or increasing, subject to natural processes. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002241.pdf
		Habitat distribution	No decline. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002241.pdf
		Woodland size	Area stable or increasing. Where topographically possible, “large” woods at least 25ha in size and “small” woods at least 3ha in size. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002241.pdf
		Woodland structure: cover and height	Total canopy cover at least 30%; median canopy height at least 7m; native shrub layer cover 10–75%; native herb/dwarf shrub layer cover at least 20% and height at least 20cm; bryophyte cover at least 4%. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002241.pdf
		Woodland structure: community diversity and extent	Maintain diversity and extent of community types. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002241.pdf
		Woodland structure: natural regeneration	Seedlings, saplings and pole age-classes of target species for 91E0* woodlands and other native tree species occur in adequate proportions to ensure survival of woodland canopy. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002241.pdf
		Hydrological regime: flooding	Appropriate hydrological regime necessary for maintenance of alluvial vegetation.

QI	Conservation Objectives (CO)		
	CO	Attribute	Target
		depth/height of water table	https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002241.pdf
		Woodland structure: dead wood	At least 19 stems/ha of dead wood at least 20cm diameter. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002241.pdf
		Woodland structure: veteran trees	No decline. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002241.pdf
		Woodland structure: indicators of local distinctiveness	No decline. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002241.pdf
		Woodland structure: indicators of overgrazing	All five indicators of overgrazing absent. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002241.pdf
		Vegetation composition: native tree cover	No decline. Native tree cover at least 90% of canopy; target species cover at least 50% of canopy. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002241.pdf
		Vegetation composition: typical species	At least 1 target species for 91E0* woodlands present; at least 6 positive indicator species for 91E0* woodlands present. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002241.pdf
		Vegetation composition: negative indicator species	Negative indicator species cover not greater than 10%; regeneration of negative indicator species absent. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002241.pdf
		Vegetation composition: problematic native species	Cover of common nettle (Urtica dioica) less than 75%. https://www.npws.ie/sites/default/files/protected-sites/conservation_objectives/CO002241.pdf
Alkaline fens	To maintain the favourable conservation condition of Alkaline fens in Lough Derg, Northeast Shore SAC, which is defined by	Habitat area	Area stable or increasing, subject to natural processes
		Habitat distribution	No decline, subject to natural processes
		Ecosystem function: soil nutrients	Maintain soil pH and nutrient status within natural ranges
		Ecosystem function: peat formation	Maintain active peat formation, where appropriate

QI	Conservation Objectives (CO)		
	CO	Attribute	Target
	the following list of attributes and targets:	Ecosystem function: hydrology - groundwater levels	Maintain, or where necessary restore, appropriate natural hydrological regimes necessary to support the natural structure and functioning of the habitat
		Ecosystem function: hydrology - surface water flow	Maintain, or where necessary restore, as close as possible to natural or semi-natural drainage conditions
		Ecosystem function: water quality	Maintain appropriate water quality, particularly pH and nutrient levels, to support the natural structure and functioning of the habitat
		Community diversity	Maintain variety of vegetation communities, subject to natural processes
		Vegetation composition: brown mosses	Maintain adequate cover of typical brown moss species
		Vegetation composition: typical vascular plants	Maintain adequate cover of typical vascular plant species
		Vegetation composition: native negative indicator species	Cover of native negative indicator species at insignificant levels
		Vegetation composition: non-native species	Cover of non-native species less than 1%
		Vegetation composition: native trees and shrubs	Cover of scattered native trees and shrubs less than 10%
		Vegetation composition: soft rush and common reed cover	Total cover of soft rush (*Juncus effusus*) and common reed (*Phragmites australis*) less than 10%
		Vegetation structure: litter	Total cover of litter not more than 25%
		Physical structure: disturbed bare ground	Cover of disturbed bare ground not more than 10%

QI	Conservation Objectives (CO)		
	CO	Attribute	Target
		Physical structure: tufa formations	Disturbed proportion of vegetation cover where tufa is present is less than 1%
		Indicators of local distinctiveness	No decline in distribution or population sizes of rare, threatened or scarce species associated with the habitat; maintain features of local distinctiveness, subject to natural processes

5.1.2 River Shannon Callows SAC

River Shannon Callows SAC has site specific conservation objectives (NPWS, 2022). These provide clarity on the definition of favourable conservation condition for the qualifying interests of the SAC, and state whether the qualifying interests are favourable or unfavourable. The conservation objectives for the for QIs for which there is considered to be an ecological connection are summarised in **Table 5-2**.

Table 5-2: Conservation Objectives for the Qualifying Interests of River Shannon Callows SAC

QI	Conservation Objectives (CO)		
	CO	Attribute	Target
Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)	To maintain the favourable conservation condition of Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae) in River Shannon Callows SAC	Habitat area	Area stable or increasing, subject to natural processes.
		Habitat distribution	No decline, subject to natural processes
		Woodland size	Area stable or increasing. Where topographically possible, "large" woods at least 25 ha in size and "small" woods at least 3 ha in size
		Woodland structure: cover and height	Total canopy cover at least 30%; median canopy height at least 7 m; native shrub layer cover 10-75%; native herb/dwarf shrub layer cover at least 20% and height at least 20 cm; bryophyte cover at least 4%
		Woodland structure: community diversity and extent	Maintain diversity and extent of community types
		Woodland structure: natural regeneration	Seedlings, saplings and pole age-classes of target species for 91E0 woodlands and other native tree species occur in adequate proportions to ensure survival of woodland canopy

QI	Conservation Objectives (CO)		
	CO	Attribute	Target
		Hydrological regime: flooding depth/height of water table	Appropriate hydrological regime necessary for maintenance of alluvial vegetation
		Woodland structure: dead wood	At least 19 stems/ha of dead wood at least 20 cm diameter
		Woodland structure: veteran trees	No decline
		Woodland structure: indicators of local distinctiveness	No decline in distribution and, in the case of red listed and other rare or localised species, population size
		Woodland structure: indicators of overgrazing	All five indicators of overgrazing absent
		Vegetation composition: native tree cover	No decline. Native tree cover at least 90% of canopy; target species cover at least 50% of canopy
		Vegetation composition: negative indicator species	Negative indicator species cover not greater than 10%; regeneration of negative indicator species absent
		Vegetation composition: problematic native species	Cover of common nettle (Urtica dioica) less than 75%
Otter	To maintain the favourable conservation condition of otter (*Lutra lutra*) in River Shannon Callows SAC	Distribution	No significant decline
		Extent of terrestrial habitat	No significant decline. Area mapped and calculated as 282.1 ha
		Extent of freshwater (river) habitat	No significant decline. Length mapped and calculated as 146.7 km
		Couching sites and holts	No significant decline
		Fish biomass available	No significant decline
		Barriers to connectivity	No significant increase

5.1.3 River Little Brosna Callows SPA

River Little Brosna Callows SPA has site specific conservation objectives (NPWS, 2025). These provide clarity on the definition of favourable conservation condition for the qualifying

interests of the SPA, and state whether the qualifying interests are favourable or unfavourable. The conservation objectives for the QIs for which there is considered to be an ecological connection are summarised in Table 5-3.

Table 5-3: Conservation Objectives for the Qualifying Interests of River Little Brosna Callows SPA

QI	Conservation Objectives (CO)		
	CO	Attribute	Target
Golden plover	To maintain the favourable conservation condition of golden plover at the River Little Brosna Callows SPA	Winter population trend	Long term winter population trend is stable or increasing
		Winter spatial distribution	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population target
		Disturbance at wintering site	Disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and spatial distribution
		Barriers to connectivity and site use	Barriers do not significantly impact the wintering population's access to the SPA or other ecologically important sites outside the SPA
		Forage spatial distribution, extent and abundance	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target
		Roost spatial distribution and extent	Sufficient number of locations, area and availability of suitable roosting habitat to support the population target
		Supporting habitat: area and quality	Sufficient area of utilisable habitat available in ecologically important sites outside the SPA
Lapwing	To maintain the favourable conservation condition of lapwing at the River Little Brosna Callows SPA	Winter population trend	Long term winter population trend is stable or increasing
		Winter spatial distribution	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population target
		Disturbance at wintering site	Disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and spatial distribution

QI	Conservation Objectives (CO)		
	CO	Attribute	Target
		Barriers to connectivity and site use	Barriers do not significantly impact the wintering population's access to the SPA or other ecologically important sites outside the SPA
		Forage spatial distribution, extent and abundance	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target
		Roost spatial distribution and extent	Sufficient number of locations, area and availability of suitable roosting habitat to support the population target
		Supporting habitat: area and quality	Sufficient area of utilisable habitat available in ecologically important sites outside the SPA
Black-headed gull	To maintain the Favourable conservation condition of black-headed gull at the River Little Brosna Callows SPA	Winter population trend	Long term winter population trend is stable or increasing
		Winter spatial distribution	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population target
		Disturbance at wintering site	Disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and spatial distribution
		Barriers to connectivity and site use	Barriers do not significantly impact the wintering population's access to the SPA or other ecologically important sites outside the SPA
		Forage spatial distribution, extent and abundance	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target
		Roost spatial distribution and extent	Sufficient number of locations, area and availability of suitable roosting habitat to support the population target
		Supporting habitat: area and quality	Sufficient area of utilisable habitat available in ecologically important sites outside the SPA
Wetlands	To maintain the favourable conservation condition of	Wetland habitat area	No significant loss to wetland habitat within the SPA, other than that occurring from natural patterns of variation

QI	Conservation Objectives (CO)		
	CO	Attribute	Target
	wetlands in Middle Shannon Callows SPA	Wetland habitat quality and functioning	No significant impact on the quality or functioning of the wetland habitat within the SPA, other than that occurring from natural patterns of variation

5.1.4 Middle Shannon Callows SPA

Middle Shannon Callows SPA has site specific conservation objectives (NPWS, 2022). These provide clarity on the definition of favourable conservation condition for the qualifying interests of the SPA, and state whether the qualifying interests are favourable or unfavourable. The conservation objectives for the for QIs for which there is considered to be an ecological connection are summarised in **Table 5-4**.

Table 5-4: Conservation Objectives for the Qualifying Interests of Middle Shannon Callows SPA

QI	Conservation Objectives (CO)		
	CO	Attribute	Target
Golden plover	To maintain the favourable conservation condition of golden plover in Middle Shannon Callows SPA	Winter population trend	Long term winter population trend is stable or increasing
		Winter spatial distribution	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population target
		Disturbance at wintering site	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and spatial distribution
		Barriers to connectivity and site use	The number, location, shape and area of barriers do not significantly impact the wintering population's access to the SPA or other ecologically important sites outside the SPA
		Forage spatial distribution, extent and abundance	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target
		Roost spatial distribution and extent	Sufficient number of locations, area and availability of suitable roosting habitat to support the population target

QI	Conservation Objectives (CO)		
	CO	Attribute	Target
		Supporting habitat: area and quality	Sufficient area of utilisable habitat available in ecologically important sites outside the SPA
Lapwing	To restore the favourable conservation condition of lapwing in Middle Shannon Callows SPA	Winter population trend	Long term winter population trend is stable or increasing
		Winter spatial distribution	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population target
		Disturbance at wintering site	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and spatial distribution
		Barriers to connectivity and site use	The number, location, shape and area of barriers do not significantly impact the wintering population's access to the SPA or other ecologically important sites outside the SPA
		Forage spatial distribution, extent and abundance	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target
		Roost spatial distribution and extent	Sufficient number of locations, area and availability of suitable roosting habitat to support the population target
Black-headed gull	To restore the favourable conservation condition of black-headed gull in Middle Shannon Callows SPA	Winter population trend	Long term winter population trend is stable or increasing
		Winter spatial distribution	Sufficient number of locations, area, and availability (in terms of timing and intensity of use) of suitable habitat to support the population target
		Disturbance at wintering site	The intensity, frequency, timing and duration of disturbance occurs at levels that do not significantly impact the achievement of targets for population trend and spatial distribution
		Barriers to connectivity and site use	The number, location, shape and area of barriers do not significantly impact the wintering population's access to

QI	Conservation Objectives (CO)		
	CO	Attribute	Target
			the SPA or other ecologically important sites outside the SPA
		Forage spatial distribution, extent and abundance	Sufficient number of locations, area of suitable habitat and available forage biomass to support the population target
		Roost spatial distribution and extent	Sufficient number of locations, area and availability of suitable roosting habitat to support the population target
		Supporting habitat: area and quality	Sufficient area of utilisable habitat available in ecologically important sites outside the SPA
Wetlands	To maintain the favourable conservation condition of wetlands in Middle Shannon Callows SPA	Wetland habitat area	No significant loss to wetland habitat within the SPA, other than that occurring from natural patterns of variation
		Wetland habitat quality and functioning	No significant impact on the quality or functioning of the wetland habitat within the SPA, other than that occurring from natural patterns of variation

5.1.5 Slieve Bloom Mountains SPA

Slieve Bloom Mountains SPA has site specific conservation objectives (NPWS, 2022). These provide clarity on the definition of favourable conservation condition for the qualifying interests of the SPA, and state whether the qualifying interests are favourable or unfavourable. The conservation objectives for the for QIs for which there is considered to be an ecological connection are summarised in **Table 5-5**.

Table 5-5: Conservation Objectives for the Qualifying Interests of Slieve Bloom Mountains SPA

QI	Conservation Objectives (CO)		
	CO	Attribute	Target
Hen harrier	To restore the favourable conservation condition of hen harrier in Slieve Bloom Mountains SPA	Population size	Maintain numbers at or above 5–10 confirmed breeding pairs
		Productivity rate	Maintain at least 1.0–1.4 fledged young per confirmed pair
		Spatial utilisation by breeding pairs	Maintain at least 82-97% spatial utilisation of the SPA by breeding pairs
		Extent and condition of heath and bog and associated habitats	Maintain the extent and quality of this resource to support the targets relating to population size, productivity rate and spatial utilisation

QI	Conservation Objectives (CO)		
	CO	Attribute	Target
		Extent and condition of low intensity managed grasslands and associated habitats	Maintain the extent and quality of this resource to support the targets relating to population size, productivity rate and spatial utilisation
		Extent and condition of hedgerows	Maintain the length and quality of this resource to support the targets relating to population size, productivity rate and spatial utilisation
		Age structure of forest estate	Achieve an even and consistent distribution of age-classes across the forest estate
		Disturbance to breeding sites	Disturbance occurs at levels that does not significantly impact upon breeding hen harrier

5.1.6 Lough Derg (Shannon) SPA

Lough Derg (Shannon) SPA has site specific conservation objectives (NPWS, 2024). These provide clarity on the definition of favourable conservation condition for the qualifying interests of the SPA, and state whether the qualifying interests are favourable or unfavourable. The conservation objectives for the for QIs for which there is considered to be an ecological connection are summarised in Table 5-6.

Table 5-6: Conservation Objectives for the Qualifying Interests of Lough Derg (Shannon) SPA

QI	Conservation Objectives (CO)		
	CO	Attribute	Target
Wetland habitat area	To maintain the favourable conservation condition of Wetland habitats in Lough Derg (Shannon) SPA	Wetland habitat area	No significant loss to wetland habitat within the SPA, other than that occurring from natural patterns of variation
		Wetland habitat quality and functioning	No significant impact on the quality or functioning of the wetland habitat within the SPA, other than that occurring from natural patterns of variation

5.2 Effects on the Integrity of European Sites 'Alone'

5.2.1 Approach to Assessing Collision Risk for SPAs

A predicted increase in mortality of less than 1% relative to background mortality is a widely used screening metric in collision risk assessment, on the basis that an increase of this magnitude is generally considered unlikely to result in a detectable effect on a population. This metric is applied throughout this assessment, in respect of both the Project alone and in-combination with other plans and projects (Section 5.3), as an initial screening step.

However, the test to be applied within this NIS is not whether the 1% threshold is exceeded, but whether the Project, alone or in combination with other plans or projects, can be excluded, beyond reasonable scientific doubt, from having an adverse effect on the integrity of the European site concerned, having regard to its Conservation Objectives. A 1% screening threshold assessed in isolation does not, of itself, address this question, particularly for a qualifying population that is already declining, or that is subject to a Conservation Objective to restore favourable conservation condition. Accordingly, and in addition to the 1% screening metric, this assessment considers the population trend of the qualifying interest at the relevant site, and the specific attributes and targets set out in each SPA site's Conservation Objectives, including, where applicable, whether the population trend target requires the population to be maintained or restored, and whether the predicted level of additional mortality is capable of preventing achievement of that target.

The 1% metric is accordingly treated as an initial screening step rather than as the sole basis for concluding on the absence of an adverse effect on site integrity. Where predicted mortality falls below this threshold, and the site's Conservation Objectives and current population trend indicate no other basis for concern, this is considered sufficient to exclude an adverse effect on the integrity of the European site concerned. Where the threshold is exceeded, or the qualifying population is in decline or subject to a Restore objective, more detailed consideration of population trend and Conservation Objective attainment is undertaken, as set out for the relevant species and site throughout this assessment.

Collision estimates are presented using the NatureScot default avoidance rates (SNH, 2018) unless species-specific post-construction evidence supports a different rate. For golden plover and lapwing, an avoidance rate of 99.5% has been adopted as the primary basis for assessment, for the reasons set out in Section 5.2.4, with the 98% default presented throughout for reference. Where the conclusion for a species depends on the use of 99.5% rather than 98%, this is stated in the relevant assessment together with the evidence relied upon. In this NIS, that applies to the in-combination assessment of golden plover and lapwing at Middle Shannon Callows SPA and River Little Brosna Callows SPA (Section 5.3.2), where the 98% reference figures exceed the 1% threshold. At Middle Shannon Callows SPA, golden plover also marginally exceeds 1% at 99.5% once Ballincor Wind Farm is included; this is addressed in Table 5-13.

5.2.2 Lough Derg, North-east Shore SAC

Alkaline fen

Alkaline fen is a groundwater-dependant habitat. The Project lies within the same groundwater body as Lough Derg, North-east Shore SAC (Banagher GWB (IE_SH_G_040).

Due to the nature of wind farm developments and underground electricity lines (grid connection), being near surface construction activities, impacts on groundwater are generally negligible and surface water is generally the main sensitive receptor assessed during impact assessments, especially in peatland environments.

The primary risks to groundwater at the project would be from cementitious materials, hydrocarbon spillage and leakages and potential piling works at turbine bases. Most of these are common potential impacts on all construction sites (such as road works and industrial sites).

The bedrock aquifers are not likely to be sensitive to pollution to due low groundwater vulnerability. This is because the majority of the project site, is covered in basin peat which in turn is underlain by marl, clays and glacial tills and these layers act as a protective cover to the underlying bedrock aquifer.

The underlying glacial deposits are not mapped as an aquifer, but they are likely to be used locally as a water supply and therefore they can also be classed as Sensitive to pollution.

The underground electricity line route passes over locally important sand and aquifers which lack the protective layers of peat, clays and glacial tills. These aquifers are sensitive to pollution as they are more vulnerable.

Rath GWS is considered to have High Importance and sensitive in terms of potential effects from the underground electricity line works only.

Considering the nature of the groundwater environment, discussed above, negative effects on groundwater quality are assessed to be unlikely. As such, there will be no effect on the integrity of this qualifying interest.

Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*

Lough Derg, North-east Shore SAC is hydrologically connected to the Project site (both the wind farm site and the grid connection site). With regards to the wind farm site, a first order watercourse, West Galros (EPA code 25W44), briefly flows within the Project site. In addition, another first order watercourse, Eglish 25 (EPA code 25E18) flows south adjacent to the wind farm site. Both of these watercourses are tributaries of Rapemills_010 (European code: IE_SH_25R010300), second order watercourse which flows into River Shannon Callows SAC which then discharges to Lough Derg. The Rapemills river flows alongside the grid connection site.

During construction, decommissioning, and to a lesser extent, during operation (in the form of routine maintenance) of the Project there is potential for the release of:

- Suspended solids,
- Nutrients, and
- Other pollutants, (such as hydrocarbons, contaminated waste-water, and cement-based products).

All identified pathways outlined above have the potential to impact upon alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior.*

5.2.3 River Shannon Callows SAC

Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior and Otter*

River Shannon Callows SAC is hydrologically connected to the Project site (both the wind farm site and the grid connection site).

With regards to the wind farm site, a first order watercourse, West Galros (EPA code 25W44), briefly flows within the Project site. In addition, another first order watercourse, Eglish 25 (EPA code 25E18) flows south adjacent to the wind farm site. Both of these watercourses are tributaries of Rapemills_010 (European code: IE_SH_25R010300), second order watercourse which flows into River Shannon Callows SAC. The Rapemills river flows alongside the grid connection site.

During construction, decommissioning, and to a lesser extent, during operation (in the form of routine maintenance) of the Project there is potential for the release of:

- Suspended solids,
- Nutrients, and
- Other pollutants, (such as hydrocarbons, contaminated waste-water, and cement-based products).

All identified pathways outlined above have the potential to impact upon alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior.*

In addition, in the absence of mitigation, otter could be indirectly effected. Otter signs (mostly spraints) were identified at a total of four sites on the Rapemills River (Please see Appendix G for more details) during aquatic surveys in 2025

The release of contaminated surface water run-off into local watercourses connected to the SAC could reduce water quality, cause algal blooms and/or smoother spawning beds of fish species. Ultimately resulting in negative effects on the fish populations upon which otter prey. Consequently, negatively impacting otter.

Furthermore, activities undertaken during the construction/decommissioning of the Project could cause increased noise, vibration, new sources of lighting and increased human presence. Consequently, resulting in disturbance/displacement of otters, associated with the SAC, from watercourses within or in the immediate vicinity of the Project site.

Also, in the absence of mitigation, construction and decommissioning activities could cause physical injury or mortality of otter.

5.2.4 River Little Brosna Callows SPA

River Little Brosna Callows SPA is located approximately 6.39 km west of the wind farm site. The SCI for this SPA, for which there is connectivity, are golden plover, lapwing, and black-headed gull.

Golden plover

Golden plover were also observed during flight activity surveys. A total of 9 flight lines and 178 birds were recorded across the two years of surveys.

Assuming a 98% avoidance rate[51] there was a mean annual collision rate of 2.89 (best case scenario) - 3.03 (maximum) collisions per year. The most recent population estimate for this species at River Little Brosna Callows SPA is 6,934.8 birds (I-WeBS; BirdWatch Ireland, 2026), compared with a reference population of 12,818 birds given in the conservation objectives. On the most recent estimate, the predicted increase in annual mortality (taking into account the current level) is 0.155% (best case scenario) and 0.162% (maximum) (0.083% and 0.087% against the conservation objectives reference population). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant.

In addition to the NatureScot 98% default avoidance rate (SNH, 2018), there is empirical evidence that a higher, species-specific avoidance rate is more appropriate for golden plover. Gittings (2022)[52] reviewed post-construction collision monitoring data from operational wind farms in the UK and concluded that avoidance rates of 99.6% to 99.8% would generate more realistic modelled outputs for non-breeding golden plover. The same monitoring showed lapwing also avoiding turbines at rates well in excess of 99%.

This evidence was relied upon in the collision risk assessment for Brittas Wind Farm, Co. Tipperary (ABP-321454-24), which modelled golden plover and lapwing at 99.5% (described as precautionary) and 99.8%, with the 98% default retained for reference. In her report to the Inspector, the Inspectorate Ecologist considered this approach and concluded: "I consider that the avoidance rate of 99.5% is acceptable for the CRM for golden plover and lapwing"[53]. An

[51] SNH. (2018). Wind Farm Impacts on birds - Use of Avoidance Rates in the NaturaScot Wind Farm Collision Risk Model

[52] Gittings, T. (2022). Golden plover avoidance rate assessment prepared for Ballivor Wind Farm, An Bord Pleanála case reference ABP-316212-23.

[53] Flynn, M. (2026). Report to the Inspector on ecology (Inspectorate Ecologist), ABP-321454-24, Brittas Wind Farm, para. 4.1.12. Appendix 4 to the Inspector's Report. An Coimisiún Pleanála, 6 February 2026.

Coimisiún Pleanála granted permission for Brittas Wind Farm on 2 April 2026, accepting and adopting the Appropriate Assessment carried out in the Inspector's report.

On this basis, an avoidance rate of 99.5% has been adopted as the primary rate for golden plover in this assessment. This rate is below the lowest rate supported by the post-construction evidence (99.6%) and is therefore precautionary relative to that evidence. It is also the rate accepted for golden plover in the Brittas determination. The 98% default is retained throughout as a reference scenario, and a 99.8% scenario is presented to show sensitivity to the upper end of the evidence range. This approach is consistent with NatureScot guidance (SNH, 2018), which states that assessments should "*point to any evidence from existing post-construction monitoring on the respective or similar bird species which might indicate what levels of avoidance are best supported by evidence*".

While the empirical evidence is based on monitoring at wind farms in a different habitat type, it should be noted that the avoidance rates presented in the NS guidance are not dependent on habitat type and are consistently used for all wind farms throughout Ireland and the UK, regardless of habitat type. NatureScot accepts that species-specific avoidance rates can be based on data from any country in which the species occurs. For example, the species-specific avoidance rate for kestrel is derived from raptor data from a wind farm in Spain, the white-tailed eagle avoidance rate is based on "*sufficient evidence from flight behaviour and collision monitoring studies in Norway for vulnerability to collisions*", and the avoidance rate for swans is derived from a study conducted in the Netherlands.

A comparable departure from the 98% default has been applied for lapwing. The post-construction monitoring reviewed by Gittings (2022) also recorded lapwing avoiding turbines at rates well in excess of 99%, and the Brittas Wind Farm assessment (ABP-321454-24) modelled lapwing at 99.5% and 99.8% on the same basis. The Inspectorate Ecologist's acceptance of 99.5% in that case, quoted above, applied expressly to both golden plover and lapwing. An avoidance rate of 99.5% has therefore been adopted as the primary rate for lapwing, with 98% retained as a reference scenario. The evidence base for lapwing is less extensive than for golden plover, and 99.5% should not be read as a rate derived from a dedicated lapwing collision study. It is an evidence-informed assumption within the range indicated by the monitoring data and accepted in a recent Irish determination. Where the conclusion for lapwing depends on this rate, that is stated in the assessment (Section 5.3.2).

Using the 99.5% avoidance rate, there was a mean annual collision rate of 0.72 (minimum) or 0.76 birds maximum and an annual mortality increase of 0.039% (minimum) and 0.041% (maximum). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant.

Using the 99.8% avoidance rate, there was a mean annual collision rate of 0.29 (minimum) or 0.31 birds (maximum) and an annual mortality increase of 0.016% (minimum) and 0.017% (maximum). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant.

Lapwing

Lapwing were recorded flying through the Project site. Specifically, a total of 129 flight lines of 255 birds were observed. Using data from the flight activity surveys, CRM has been completed, using the default avoidance rate of 98%, which indicated that the wind farm could result in 0.64 (minimum) or 0.69 (maximum) collisions per year. The most recent population estimate for this species at River Little Brosna Callows SPA is 4,787.2 birds (I-WeBS; BirdWatch Ireland, 2026), compared with a reference population of 7,841 birds given in the conservation objectives. On the most recent estimate, the predicted increase in annual mortality (taking into account the current level) is 0.045% (minimum) or 0.049% (maximum) (0.027% and 0.030% against the conservation objectives reference population). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant.

Using the 99.5% avoidance rate, there was a mean annual collision rate of 0.15 (minimum) or 0.18 (maximum) and an annual mortality increase of 0.011% (minimum) and 0.013% (maximum). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant.

Black-headed gull

Black-headed gull are also at risk of collision with the turbines. Based on flight data, 76 black-headed gull flight lines (and 253 birds) were recorded during the breeding season only. No black-headed gull were recorded within the zone of influence during winter surveys, with the nearest winter records located approximately 1.7km from the proposed development. Irish breeding black-headed gull are largely resident and may form part of the wider wintering population present in Ireland (Wernham et al., 2002), and black-headed gull are known to travel comparable or greater distances between breeding/roosting sites and foraging or wintering areas. Given this, and in the absence of any study establishing a defensible connectivity distance for this species and population type, a credible pathway exists whereby individuals from this breeding population could contribute to the SPA's wintering qualifying interest.

Assuming a 99.2% avoidance rate, there was a mean annual collision rate of 0.17 (minimum) or 0.19 (maximum). Based on the site synopsis population of 1,939 birds, the predicted increase in annual mortality is 0.088% (minimum) or 0.098% (maximum). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant.

Wetland

River Little Brosna Callows SPA is not hydrologically connected to the Project site (wind farm site or grid connection site). However, due to the close proximity of Middle Shannon Callows SPA to this SPA, there is the possibility that SCI species from River Little Brosna Callows SPA utilize the wetland habitat within Middle Shannon Callows for ex-situ foraging. Therefore, as Middle Shannon Callows SPA is hydrologically connected to the Project site there is the potential for suspended solids, nutrients and other pollutants generated during the construction and decommissioning of the Project to negatively affect the wetland habitat of Middle Shannon Callows SPA which are potentially utilised by SCI species from River Little Brosna Callows SPA**.**

5.2.5 Middle Shannon Callows SPA

Wetland

Middle Shannon Callows SPA is hydrologically connected to the Project site (both the wind farm site and the grid connection site).

With regards to the wind farm site, a first order watercourse, West Galros (EPA code 25W44), briefly flows within the Project site. In addition, another first order watercourse, Eglish 25 (EPA code 25E18) flows south adjacent to the wind farm site. Both of these watercourses are tributaries of Rapemills_010 (European code: IE_SH_25R010300), second order watercourse which flows into Middle Shannon Callows SPA. The Rapemills river flows alongside the grid connection site.

During construction, decommissioning, and to a lesser extent, during operation (in the form of routine maintenance) of the Project there is potential for the release of:

- suspended solids,
- nutrients, and
- other pollutants, (such as hydrocarbons, contaminated waste-water, and cement-based products).

All identified pathways outlined above have the potential to impact upon the wetland habitat of the SPA.

SCI species

The Middle Shannon Callows SPA has the following SCI for which there is considered to be connectivity; lapwing, golden plover and black-headed gull.

Lapwing

Lapwing were recorded flying through the Project site. Specifically, a total of 129 flight lines of 255 birds were observed. Using data from the flight activity surveys, CRM has been completed, based on a 98% avoidance rate, which indicated that the wind farm could result in 0.64 (minimum) or 0.69 (maximum) collisions per year. The latest population count for this species at Middle Shannon Callows SPA, based on the conservation objectives[54], is 2,159 birds. The predicted increase in annual mortality (taking into account the current level) on that size of population is 0.10% (minimum) or 0.108% (maximum). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant.

Using the 99.5% avoidance rate, there was a mean annual collision rate of 0.15 (minimum) or 0.18 (maximum) and an annual mortality increase of 0.024% (minimum) and 0.028% (maximum). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant.

Golden plover

Golden plover were also observed during flight activity surveys. A total of 9 flight lines and 178 birds were recorded across the two years of surveys.

Assuming a 98% avoidance rate[55] there was a mean annual collision rate of 2.89 (minimum) - 3.03 (maximum) collisions per year. The latest population count for this species at Middle Shannon Callows SPA, based on the conservation objectives[54], is 5,130 birds. The predicted increase in annual mortality (taking into account the current level) on that size of population is 0.208% (minimum) and 0.218% (maximum). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant.

As set out above for River Little Brosna Callows SPA, an avoidance rate of 99.5% has been adopted as the primary rate for golden plover, with 98% retained as a reference scenario and 99.8% presented as an upper-bound sensitivity scenario.

Using the 99.5% avoidance rate, there was a mean annual collision rate of 0.72 (minimum) or 0.76 birds (maximum) and an annual mortality increase of 0.052% (minimum) and 0.055% (maximum). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant.

Using the 99.8% avoidance rate, there was a mean annual collision rate of 0.29 (minimum) or 0.31 birds (maximum) and an annual mortality increase of 0.021% (minimum) and 0.022% (maximum). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant.

Black-headed gull

Black-headed gull are also at risk of collision with the turbines. Based on flight data, 76 black-headed gull flight lines (and 253 birds) were recorded during the breeding season only. No

[54] NPWS. (2022). Conservation Objectives: Middle Shannon Callows SPA 004096. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage

[55] SNH. (2018). Wind Farm Impacts on birds - Use of Avoidance Rates in the NaturaScot Wind Farm Collision Risk Model

black-headed gull were recorded within the zone of influence during winter surveys, with the nearest winter records located approximately 1.7km from the proposed development. Evidence of black-headed gull breeding was also recorded approximately 1.7km from the proposed development. Irish breeding black-headed gull are largely resident and may form part of the wider wintering population present in Ireland (Wernham et al., 2002), and black-headed gull are known to travel comparable or greater distances between breeding/roosting sites and foraging or wintering areas. Given this, and in the absence of any study establishing a defensible connectivity distance for this species and population type, a credible pathway exists whereby individuals from this breeding population could contribute to the SPA's wintering qualifying interest.

Assuming a 99.2% avoidance rate, there was a mean annual collision rate of 0.17 (minimum) or 0.19 (maximum). Based on the conservation objectives population of 1,055[54], the predicted increase in annual mortality is 0. 161% (minimum) or 0.180% (maximum). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant.

5.2.6 Slieve Bloom Mountains SPA

Slieve Bloom Mountains SPA, situated approximately 11.89 km south-east of the wind farm site, is designated for a single SCI - hen harrier.

Hen harrier

Hen harrier were recorded in flight within the Project site, A total of seven flights (of individual birds) of this raptor species were recorded during flight activity surveys. Therefore**,** assuming a 99% avoidance rate, there was a mean annual collision rate of 0.005 (approximately one collision every 200 years) (minimum and maximum permutations) predicted. Based on the site synopsis population of 16 birds (8 pairs), the predicted increase in annual mortality is 0.164% (minimum and maximum permutations). The predicted increase in annual mortality is not significant.

5.2.7 Lough Derg (Shannon) SPA

Hydrological Connectivity

One of the conservation objectives of this SPA is to maintain the favourable conservation condition of the wetland habitat at Lough Derg (Shannon) SPA as a resource for the regularly-occurring migratory waterbirds that utilise it. There is hydrological connectivity between Lough Derg (Shannon) SPA and the Project site via the Rapemills River and River Shannon.

Therefore, suspended solids, nutrients and other pollutants, generated during the construction and/or decommissioning of the wind farm, could enter the SPA and negatively affect the wetland habitat. Overall, without mitigation, the risk is considered to be low.

Ecological Connectivity

Lough Derg (Shannon) SPA is situated approximately 19.93 km from the Project site. Of its SCI species, only cormorant was recorded during flight activity surveys, as two flights of single birds during non-breeding season 2022/23. As set out in Table 3-1, the SPA lies beyond the 10–15 km core foraging range of cormorant, and no ecological pathway is considered to exist. For completeness, the CRM predicted a negligible collision rate for cormorant of <0.01 collisions per year (approximately one collision every 200 years) (Appendix F). Even if all such collisions involved birds from the SPA population, this would represent an increase in annual mortality of approximately 0.06% against the latest IWeBS five-year mean count of 71 birds, and approximately 0.002% against the baseline reference value of 2,176 birds, both well below the 1% threshold. The SPA is therefore assessed in this NIS on the basis of hydrological connectivity only.

5.3 Effects on the Integrity of European Sites 'In Combination'

5.3.1 Plans

The following development plans have been reviewed and taken into consideration:

- Eastern and Midlands Regional Spatial and Economic Strategy 2020-2032 (RSES),
- Offaly County Development Plan 2021 – 2027,
- National Biodiversity Action Plan, and
- BNM (2026). Galros Bog. Draft Cutaway Bog Decommissioning and Rehabilitation Plan 2026.

The review examined policies and objectives relating to designated sites for nature conservation, biodiversity, protected species, sustainable land use and preservation of surface water quality. Key policies are summarised in Table 5-7 and Appendix A.

Table 5-7: Assessment of relevant plans

Plan	Policies for the protection of European Sites	Development allocations with potential for in combination effects
Regional Spatial and Economic Strategy 2020-2031	**RPO 5.4** Encourage the prioritisation of Site-Specific Conservation Objectives (SSCO) for all sites of Conservation Value, designated in EU Directive (i.e. SACs, SPAs) to integrate with the development objectives of this Strategy. **RPO 5.5** Conserve and protect European sites and their integrity. **RPO 5.7** Ensure that all plans, projects and activities requiring consent arising from the RSES are subject to the relevant environmental assessment requirements including SEA, EIA and AA as appropriate.	Not applicable.
Offaly County Development Plan 2021-2027	**NHP-01**: It is Council policy to prohibit any development that would be harmful to or that would result in a significant deterioration of habitats and/or disturbance of species in a Special Protection Area (SPA), Special Area of Conservation (SAC) and candidate Special Area of Conservation (cSAC), Natural Heritage Area (NHA) and Proposed Natural Heritage Area (pNHA) **NHP-08**: It is Council policy to protect, conserve and enhance the county's biodiversity and natural heritage including wildlife (flora and fauna), habitats, landscapes and/or landscape features of importance to wildlife or which play a key role in the conservation and management of natural resources such as water. **NHP-11:** It is Council policy to conserve, protect and enhance where possible wildlife habitats such as rivers, streams, canals, lakes, and associated wetlands including reed-beds and swamps, ponds, springs, bogs, fens, trees, woodlands and scrub, hedgerows and other boundary types such as stone walls and ditches which occur outside of designated areas providing a network of habitats and corridors essential for wildlife to flourish. **NHP-12**: It is Council policy to ensure that peatland areas, which are designated for protection under international and national legislation, are conserved and managed appropriately to conserve their ecological, archaeological, cultural and educational significance.	No development allocations identified within the development plan were found to occur within the wider area surrounding the Project Site. However, the Plan provides a framework for land use developments and activities with potential for construction and operation source effects throughout the County.

Plan	Policies for the protection of European Sites	Development allocations with potential for in combination effects
	NHP-12: It is Council policy to ensure that peatland areas, which are designated for protection under international and national legislation, are conserved and managed appropriately to conserve their ecological, archaeological, cultural and educational significance. **NHP-22:** It is Council policy to encourage, pursuant to Article 10 of the Habitats Directive, the management of features of the landscape, such as traditional field boundaries, important for the ecological coherence of the Natura 2000 site(s) network and essential for the migration, dispersal and genetic exchange of wild species. **NHP-24:** It is Council policy to protect, conserve and enhance the county's biodiversity and natural heritage including wildlife (flora and fauna), habitats, landscapes and/or landscape features of importance to wildlife or which play a key role in the conservation and management of natural resources such as water. **NHO-01**: It is an objective of the Council to ensure that any development proposal in the vicinity of, or affecting a designated site, complies with the provisions relating Appropriate Assessment and SEA requirements and the Council will consult with the appropriate statutory environmental authority in this regard. **NHO-02:** It is an objective of the Council to conserve and protect the natural heritage of the county and to conserve and protect European and National designated sites within the county including Special Protection Areas (SPAs), Special Areas of Conservation (SACs), candidate Special Areas of Conservation (cSACs), Natural Heritage Areas (NHAs), Proposed Natural Heritage Areas (pNHAs), Ramsar Sites, Statutory Nature Reserves, Biogenetic Reserves and Wildfowl Sanctuaries.	

Table 5-8: Assessment of Galros Bog Draft Cutaway Bog Decommissioning and Rehabilitation Plan 2026

Plan	Summary	Development allocations with potential for in combination effects
Galros Bog Draft Cutaway Bog Decommissioning and Rehabilitation Plan 2026.	• The key objective of peatland rehabilitation is environmental stabilisation. This means developing habitats and vegetation back onto the bare peat (putting a "skin" back onto the peat), and minimising effects to downstream waterbodies. • Rehab measures will include drain-blocking and other measures to raise water levels to the surface of the bog, thus encouraging the development of naturally functioning cutaway peatland habitats. • It is a guiding principle of Bord na Móna rehabilitation planning that no actions or activities will be undertaken that would negatively impact on adjacent land. No boundary drains will be blocked. Water will still leave the bog via the existing outlets. • The project has been designed so that its construction, drainage, peat/spoil management and reinstatement measures are compatible with, and do not prejudice, the wider rehabilitation and environmental stabilisation objectives for Galros Bog	Not applicable.

5.3.2 Projects

In-combination effects can occur where a proposed project results in individually non-significant impacts that, when considered in-combination with impacts of other proposed or permitted plans and projects, can result in significant effects.

Other plans and projects that should be considered when establishing cumulative effects are:

- Proposals for which consent has been applied but which are awaiting determination;
- Projects which have been granted consent, but which have not yet been started, or which have been started but are not yet completed (i.e., under construction);
- Proposals which have been refused permission, but which are subject to appeal, and the appeal is undetermined;
- Constructed developments whose full environmental effects are not yet felt and therefore cannot be accounted for in the baseline; or
- Developments specifically referenced in a National Policy Statement, a National Plan or a Local Plan.

A search of recent (within the last five years) planning applications was carried out for applications that may give rise to in combination effects with the Project.

All planning applications within a 20 km radius[56] of all SPAs under assessment with the potential for in-combination effects through 'project-related activities leading to injury or mortality of species, or reductions in population size or density' i.e. collision risk was undertaken. A search within a 2 km radius was made for all SPAs under assessment with the potential for in-combination effects through 'project-related activities causing disturbance/displacement of species.

With regards to in-combination effects on River Shannon Callows SAC and Lough Derg (Shannon) SPA, as a result of surface water run-off carrying suspended silt and contaminants into local watercourses, a 5 km radius around the Project site was used as this is considered to be the limit of realistic hydrological connectivity given the transient nature of this riverine SAC and dilution effect.

Sources consulted included the EIA portal, An Coimisiún Pleanála, Offaly County Council, and Tipperary County Council planning lists.

It is assumed that all planning permissions granted more than 5 years ago have been completed and therefore are considered through the existing environment section.

Table 5-9 to Table 5-12 lists the recent planning applications considered to be sufficiently significant and/or large in scale to warrant examination for in combination effects with the Project.

[56] Irish Wind Energy Association (IWEA) (2012). *Best Practice Guidelines for the Irish Wind Energy Industry*. Dublin: Irish Wind Energy Association.

Table 5-9: Projects Considered for In-Combination Effects for River Shannon Callows SAC, Middle Shannon Callows SPA (wetland habitat only) and Lough Derg (Shannon) SPA

Project name	Distance from Project site (approx. km)	Planning Reference	Description
Cush Wind Farm (Phase I)	Adjacent	An Coimisiún Pleanála reference: ABP-318816-24	Wind farm consisting of 8 turbines and associated infrastructure
Cush Wind Farm Phase I Section 146B Alteration Request, Co. Offaly	Adjacent	ACP-324405-26	Request to alter the permitted Cush Wind Farm Phase I development to provide for design flexibility in respect of the permitted turbine dimensions.
Summit Solar Ltd Solar Farm	0.01	Offaly County Council planning references: 20/476, 21/622, and 22/368	Solar Farm Development
Solar Farm, Ballindown, Co. Offaly	1.7	Offaly County Council planning reference: 21/227	Solar Farm Development
Derrinlough Briquette Factory	3.5	Offaly County Council planning reference: 14/251	The construction of a new workshop building.
Kilcormac Solar Farm	3.6	Offaly County Council planning reference: 23/74	Solar Farm Development
Cloghan Wind Farm	4.0	Offaly County Council planning ref: 14/188 An Coimisiún Pleanála ref: PL 19.244053	A wind farm consisting of nine turbines and associated infrastructure
		Offaly County Council planning reference: 19/404	10-year planning permission for amendments to the development permitted under An Coimisiún Pleanála reference PL19.244053 (Offaly County Council reference PL2/14/188) to provide changes including an increase in the overall wind turbine height from 150 m to 169 m, and the re-siting of wind turbines T1, T2, T4, T6, T7 and T9 by up to 19 m.

Project name	Distance from Project site (approx. km)	Planning Reference	Description
Stonestown Solar Farm	4.2	Offaly County Council planning reference: 26/60237	Solar Farm Development

Table 5-10: Projects Considered for In-Combination Effects for River Little Brosna Callows SPA

Project name	Distance (approx. km) from SPA	Direction from SPA	Planning Reference	Description
Cush Wind Farm (Phase I)	1.65	W	An Coimisiún Pleanála reference: ABP-318816-24	Wind farm consisting of 8 turbines and associated infrastructure
Cush Wind Farm Phase I Section 146B Alteration Request, Co. Offaly	1.65	W	ACP-324405-26	Request to alter the permitted Cush Wind Farm Phase I development to provide for design flexibility in respect of the permitted turbine dimensions.
Meenwaun Wind Farm	4.82	NE	Offaly County Council planning reference: 15/44	A wind farm consisting of four turbines and associated infrastructure
Derrinlough Wind Farm	8.95	NE	An Coimisiún Pleanála reference: PA19.306706	A wind farm consisting of 21 turbines and associated infrastructure
Cloghan Wind Farm	9.62	NE	Offaly County Council planning reference: 14/188 An Coimisiún Pleanála reference: PL 19.244053	A wind farm consisting of nine turbines and associated infrastructure
			Offaly County Council planning reference: 19/404	10-year planning permission for amendments to the development permitted under An Coimisiún Pleanála reference PL19.244053 (Offaly County Council reference PL2/14/188) to provide changes including an increase in the overall wind turbine height from 150 m to 169 m, and the re-

Project name	Distance (approx. km) from SPA	Direction from SPA	Planning Reference	Description
				siting of wind turbines T1, T2, T4, T6, T7 and T9 by up to 19 m.
Carrig Renewables Wind Farm	10.87	S	Tipperary County Council planning reference: 23/60763	A wind farm consisting of seven turbines and associated infrastructure
Carrig and Skehanagh Wind Farm	11.67	S	Tipperary County Council planning reference: 51/23495	A wind farm consisting of four turbines and associated infrastructure
Leabeg Wind Farm	17.89	NE	Offaly County Council planning reference: 20/70 An Coimisiún Pleanála reference: PL 19.244053	A wind farm consisting of two turbines and associated infrastructure
Ballincor Wind Farm	7.5	S	An Coimisiún Pleanála reference: PAX92.324279	Proposed wind farm and associated infrastructure (in planning)
Lea Mor Renewable Energy Community Wind Turbine	19	NE	Offaly County Council planning reference: 24/60326; An Coimisiún Pleanála reference: ABP-321244-24	Single wind turbine, substation and associated development

Table 5-11: Projects Considered for In-Combination Effects for Middle Shannon Callows SPA

Project name	Distance (approx. km) from SPA	Direction from SPA	Planning Reference	Description
Meenwaun Wind Farm	5.04	NW	Offaly County Council planning reference: 15/44	A wind farm consisting of four turbines and associated infrastructure

Project name	Distance (approx. km) from SPA	Direction from SPA	Planning Reference	Description
Derrinlough Wind Farm	5.68	NW	An Coimisiún Pleanála ref: PA19.306706	A wind farm consisting of 21 turbines and associated infrastructure
Cush Wind Farm Phase I	9.37	SE	An Coimisiún Pleanála reference: ABP-318816-24	Wind farm consisting of 8 turbines and associated infrastructure
Cush Wind Farm Phase I Section 146B Alteration Request, Co. Offaly	9.37	SE	ACP-324405-26	Request to alter the permitted Cush Wind Farm Phase I development to provide for design flexibility in respect of the permitted turbine dimensions.
Cloghan Wind Farm	9.62	NE	Offaly County Council planning reference: 14/188 An Coimisiún Pleanála reference: PL 19.244053	A wind farm consisting of nine turbines and associated infrastructure
			Offaly County Council planning reference: 19/404	10-year planning permission for amendments to the development permitted under An Coimisiún Pleanála reference PL19.244053 (Offaly County Council reference PL2/14/188) to provide changes including an increase in the overall wind turbine height from 150 m to 169 m, and the re-siting of wind turbines T1, T2, T4, T6, T7 and T9 by up to 19 m.
Carrig Renewables Wind Farm	10.58	S	Tipperary County Council planning reference: 23/60763	A wind farm consisting of seven turbines and associated infrastructure

Project name	Distance (approx. km) from SPA	Direction from SPA	Planning Reference	Description
Carrig and Skehanagh Wind Farm	11.66	S	Tipperary County Council planning reference: 51/23495	A wind farm consisting of four turbines and associated infrastructure
Leabeg Wind Farm	12.51	NE	Offaly County Council planning reference: 20/70 An Coimisiún Pleanála reference: PL 19.244053	A wind farm consisting of two turbines and associated infrastructure
Ballincor Wind Farm	14	S	An Coimisiún Pleanála reference: PAX92.324279	Proposed wind farm and associated infrastructure (in planning)
Lea Mor Renewable Energy Community Wind Turbine	14	E	Offaly County Council planning reference: 24/60326; An Coimisiún Pleanála reference: ABP-321244-24	Single wind turbine, substation and associated development

Table 5-12: Projects Considered for In-Combination Effects for Slieve Bloom Mountains SPA

Project name	Distance (approx. km) from SPA	Direction from SPA	Planning Reference	Description
Monaincha Bog Wind Farm (Gate 3)	2.70	S	Tipperary County Council planning reference: reference	A wind farm consisting of ten wind turbine and associated infrastructure
Cloghan Wind Farm	9.62	NE	Offaly County Council planning ref: 14/188 An Coimisiún Pleanála ref: PL 19.244053	A wind farm consisting of nine turbines and associated infrastructure
			Offaly County Council planning reference: 19/404	10-year planning permission for amendments to the development permitted under An Coimisiún Pleanála reference PL19.244053 (Offaly County Council reference PL2/14/188) to provide changes including an increase in the overall wind turbine height from 150 m to 169 m, and the re-siting of wind turbines T1, T2, T4, T6, T7 and T9 by up to 19 m.
Cush Wind Farm Phase I	11.65	W	An Coimisiún Pleanála reference: ABP-318816-24	Wind farm consisting of 8 turbines and associated infrastructure
Cush Wind Farm Phase I Section 146B Alteration Request, Co. Offaly	11.65	W	ACP-324405-26	Request to alter the permitted Cush Wind Farm Phase I development to provide for design flexibility in respect of the permitted turbine dimensions.
Leabeg Wind Farm	13.90	NW	Offaly County Council planning reference: 20/70	A wind farm consisting of two turbines and associated infrastructure.

Project name	Distance (approx. km) from SPA	Direction from SPA	Planning Reference	Description
			An Coimisiún Pleanála ref: PL 19.244053	
Carrig Renewables Wind Farm	14.18	W	Tipperary County Council planning reference: 23/60763	A wind farm consisting of seven turbines and associated infrastructure
Moanvane Wind Farm	14.21	NE	Offaly County Council planning reference: 17/335	A wind farm consisting of twelve turbines and associated infrastructure
Carrig and Skehanagh Wind Farm	14.44	W	Tipperary County Council planning reference: 51/23495	A wind farm consisting of five turbines and associated infrastructure
Derrinlough Wind Farm	15.14	NW	An Coimisiún Pleanála ref: PA19.306706	A wind farm consisting of 21 turbines and associated infrastructure
Meenwaun Wind Farm	16.05	NW	Offaly County Council planning reference: 15/44	A wind farm consisting of four turbines and associated infrastructure
Mount Lucas Wind Farm	19.29	NE	Offaly County Council planning reference: 09/453	A wind farm consisting of 22 turbines and associated infrastructure; permission was granted for 32 turbines
Ballincor Wind Farm	10	W	An Coimisiún Pleanála reference: PAX92.324279	Proposed wind farm and associated infrastructure (in planning)
Lea Mor Renewable Energy	14	NW	Offaly County Council planning reference: 24/60326; An	Single wind turbine, substation and associated development

Project name	Distance (approx. km) from SPA	Direction from SPA	Planning Reference	Description
Community Wind Turbine			Coimisiún Pleanála reference: ABP-321244-24	

5.3.2.1 In-combination Effects on Lough Derg, North-East Shore SAC, River Shannon Callows SAC, Middle Shannon Callows SPA (wetland habitat only) and Lough Derg (Shannon) SPA

The pathway that could affect Lough Derg, North-East Shore SAC, River Shannon Callows SAC ,Middle Shannon Callows SPA (wetland habitat only) and Lough Derg (Shannon) SPA is through a reduction in water quality due to polluted surface water, generated as a result of the Project, entering local watercourses connected to the SAC. This reduction in water quality could affect the following QIs River Shannon Callows SAC: Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* and otter. The wetland habitat of Middle Shannon Callows SPA and Lough Derg (Shannon) SPA may also be affected. An in-combination effect could occur if other projects, within a 5 km radius around the Project site, are timed to be constructed and/or decommissioned while this Project is being constructed and/or decommissioned, producing a decline in water quality, or in series, with an ongoing reduction in water quality.

Furthermore, activities undertaken during the construction/decommissioning of the Project could disturbance/displacement, physical injury or mortality of otters, associated with the SAC. Other projects in the vicinity of the Project site, if timed to be constructed and/or decommissioned while this Project is constructed and/or decommissioned, could result in an in-combination effect.

Of the Projects listed in Table 5-9, the following have already been constructed; Derrinlough briquette factory and Cloghan Wind Farm. Therefore, the construction of these Projects can not cause in-combination effects. Cloghan Wind Farm received permission for an operational period of 25 years from the data of the first commissioning of the wind farm. The Cloghan Wind Farm was commissioned in 2023 and therefore, unless an extension to the operational period is requested and granted, shall be decommissioned in 2048. The operational lifespan of the Project is proposed to be 35-years following the full commissioning of the wind farm. Hence, decommissioning of these two wind farms will not occur at the same time and in-combination effects will not occur.

The Project, together with the permitted Cush Wind Farm Phase I and the 146B alteration, is expected to be constructed as part of a single coordinated construction programme. They are also likely to be decommissioned simultaneously. However, the NIS for Cush Wind Farm Phase I determined that ‘with the identified mitigation measures in place, it can be concluded, beyond all reasonable scientific doubt that the Project, either alone or in combination with other plans or projects will not undermine the conservation objectives of any European sites. It can therefore be concluded that the Project would not have an adverse effect on the integrity of any European site. Therefore, in-combination effects will not occur.

With regards to in-combination effects with Summit Solar Ltd Solar Farm, this solar farm has received permission but has not yet been constructed. Therefore, there is the potential for in-combination effects during construction and decommissioning phase, and if both the Project and solar farm are constructed/decommissioned at the same time or sequentially. According to the NIS for this solar farm only potential impacts to otter as a result of changes to water quality, and disturbance, were considered further. However, the report states ‘it is considered highly unlikely that pollutants could impact on the water quality of the Middle Shannon Callows SPA’. With the implementation of precautionary mitigation measures it was stated that ‘It can therefore be concluded that the construction/operational activity at the site will not have any adverse effects on either the surface or groundwater quality of the watercourses in the vicinity of the Site, or on the protected Natura 2000 sites and their designated conservation interests located downstream.’ In addition, with mitigation measure it was concluded that the proposed development will not result in any adverse effects on otter. Therefore, there is no potential for in-combination effects from the construction and decommissioning of the Project and this solar farm on the River Shannon Callows SAC, Middle Shannon Callows SPA (wetland habitat only) and Lough Derg (Shannon) SPA.

The permitted solar farm in Ballindown, Co. Offaly hasn't been constructed yet. Hence, if the Project and this solar farm undergo construction and/or decommissioning at the same time, or sequentially, there is the potential for in-combination effects. According to the NIS for this solar farm only potential impacts to otter as a result of changes to water quality were considered further. However, due to the nature of the proposed development works, the fact that there will be no direct discharges to surface water and the distances separating the sites from all Natura sites, it is considered highly unlikely that pollutants could impact on the water quality of the Middle Shannon Callows. Based on the implementation of mitigation measures it was concluded that the site 'will not have any adverse effects on either the surface or groundwater quality of the watercourses I the vicinity of the site, or on the protected Natura 2000 sites and their designated conservation interests located downstream.

Kilcormac Solar Farm has also been permitted not yet constructed. Therefore, there is the potential for in-combination effects during construction and decommissioning phase, and if both the Project and solar farm are constructed/decommissioned at the same time or sequentially. The AA screening for Kilcormac Solar Farm concluded that no pathways for likely significant effects on any European sites were identified. Therefore, there is no potential for in-combination effects.

The proposed Stonestown Solar Farm has no pathway for effects on the River Shannon Callows SAC and therefore there is no potential for in-combination effects.

Overall, there is no potential for in-combination effects from any of the above projects in conjunction with the Project on Lough Derg, North-east Shore SAC, River Shannon Callows SAC, the wetland habitat of the Middle Shannon Callows SPA or Lough (Derg) Shannon SPA.

5.3.2.2 In-combination Effects on River Little Brosna Callows SPA, Middle Shannon Callows and Slieve Bloom Mountains SPA

Collision risk in-combination effects for River Little Brosna Callows SPA, Middle Shannon Callows SPA and Slieve Bloom Mountains SPA are detailed in Table 5-13 below. The approach to assessing significance set out in Section 5.2.1 applies equally to the in-combination assessment presented in this section. Collision estimates for other wind farms derived using a 98% avoidance rate have been rescaled to the avoidance rate applied to the Project by reference to the residual (non-avoided) collision fraction, i.e. multiplied by (1 − A) / (1 − 0.98). This gives factors of 0.25, 0.10 and 0.40 for avoidance rates of 99.5%, 99.8% and 99.2% respectively. This is valid because collision estimates derived using the Band model are directly proportional to (1 − A). In-combination totals at 98% for all schemes are also presented for reference.

The collision estimates used for Cush Wind Farm Phase I are those from the updated collision risk modelling undertaken by SLR in 2026 in support of the Section 146B alteration request (ACP-324405-26). That modelling assessed the minimum and maximum turbine dimensions within the altered dimension range sought, rather than the turbine originally permitted, and the maximum estimate from each range has been used in the in-combination totals below. The Phase I figures therefore represent the worst case across the altered dimension range and remain appropriate for this assessment. They were derived at the 98% avoidance rate, consistent with the basis on which Phase I was assessed and permitted, and have been rescaled as described above where a different avoidance rate is applied.

Table 5-13: In-combination effects of collision risk for each of the SPAs identified with connectivity to the Project

SPA	Collision risk bird species identified for further assessment	Projects that pose a collision risk within 20 km of the SPA	In-combination Effects Calculation and Rational
River Little Brosna Callows SPA	Golden plover Lapwing Black-headed gull	Cush Wind Farm Meenwaun Wind Farm Derrinlough Wind Farm Cloghan Wind Farm Carrig Renewables Wind Farm Carrig and Skehanagh Wind Farm Leabeg Wind Farm Ballincor Wind Farm Lea Mor Renewable Energy Community Wind Turbine	**Golden plover**: no collision risk was recorded for this species for Leabeg Wind Farm, Cloghan Wind Farm, and Carrig and Skehanagh Wind Farm. 14.191 collisions/year was predicted for Derrinlough Wind Farm. The collision risk for golden plover at Meenwaun Wind Farm was considered to be of 'very low significance'. 2.345 and 6.94 (maximum) collisions/year was predicted for Carrig Renewables Wind Farm and Cush Wind Farm phase I, respectively. 7.9–9.4 collisions/year were predicted for Ballincor Wind Farm, derived using an evidence-based avoidance rate of 99.6% (Gittings, 2022), and 0.377 collisions/year for Lea Mor Renewable Energy Community Wind Turbine (98% avoidance rate). For the Project, based on a 99.5% avoidance rate, there are 0.76 collisions/year predicted (maximum). In addition, for the Project, based on a 99.8% avoidance rate there are 0.31 collisions/year (maximum) predicted. Therefore, the in-combination collision risk for golden plover associated with River Little Brosna Callows SPA, based on a 99.5% avoidance rate is 14.623–16.123. The in-combination collision risk for this species based on a 99.8% collision rate is 6.646–7.396. Ballincor Wind Farm is included at its submitted avoidance rate of 99.6% in the 99.5% and 98% scenarios and rescaled to 99.8% in the 99.8% scenario. Based on the most recent population estimate for golden plover at River Little Brosna Callows SPA (6,934.8; BirdWatch Ireland, 2026), the predicted annual increase in mortality, based on a 99.5% avoidance rate, is 0.78–0.86%. The predicted annual increase in mortality based on a 99.8% avoidance rate is 0.36–0.40%. Both are less than the 1% threshold commonly used to determine effect significance. For reference, at the 98% avoidance rate (applied to all

SPA	Collision risk bird species identified for further assessment	Projects that pose a collision risk within 20 km of the SPA	In-combination Effects Calculation and Rational
			schemes other than Ballincor Wind Farm), the in-combination collision risk is 34.783–36.283 collisions/year, equating to a predicted annual increase in mortality of 1.86–1.94%, which exceeds the 1% threshold. The conclusion for golden plover at this SPA therefore depends on the use of the 99.5% avoidance rate, which, for the reasons set out in Section 5.2.4, is considered the more reliable estimate and was accepted for golden plover in the Brittas Wind Farm determination (ABP-321454-24). Against the reference population given in the conservation objectives (12,818), the equivalent figures are 0.42–0.47% (99.5%), 0.19–0.21% (99.8%) and 1.01–1.05% (98%). Therefore, the in-combination collision risk, at the evidence-based avoidance rates, for golden plover associated with this SPA is not significant and there will be no adverse effects on the integrity of the SPA population. **Lapwing**: no collision risk was recorded for this species for Leabeg Wind Farm, Meenwaun Wind Farm, and Carrig and Skehanagh Wind Farm. 0.714 collisions/year was predicted for Cloghan Wind Farm. 1.875 collisions/year was predicted for Derrinlough Wind Farm. 2.941 collisions/year was predicted for Carrig Renewables Wind Farm. 4.271 collisions/year was predicted for Cush Wind Farm phase I. 1.4–1.6 collisions/year were predicted for Ballincor Wind Farm and 7.641 collisions/year for Lea Mor Renewable Energy Community Wind Turbine, both at a 98% avoidance rate. 0.69 collisions/year (maximum) was predicted for the Project based on a 98% avoidance rate. However, 0.18 collisions/year are predicted for the Project based on a 99.5% avoidance rate. Therefore, the in-combination collision risk for lapwing associated with River Little Brosna Callows SPA, based on a 98% avoidance rate is 19.532–19.732. The in-combination collision risk for this species based on a 99.5% collision rate is 4.890–4.940. Based on the most recent population estimate for lapwing at River Little Brosna Callows SPA (4,787.2; BirdWatch Ireland, 2026), the

SPA	Collision risk bird species identified for further assessment	Projects that pose a collision risk within 20 km of the SPA	In-combination Effects Calculation and Rational
			predicted annual increase in mortality, based on an avoidance rate of 98% is 1.38–1.40%, which exceeds the 1% threshold. The predicted annual increase in mortality based on a 99.5% avoidance rate is 0.35%, which is less than the 1% threshold commonly used to determine effect significance. The conclusion for lapwing at this SPA therefore depends on the use of the 99.5% avoidance rate, for the reasons set out in Section 5.2.4. Lea Mor Renewable Energy Community Wind Turbine, approximately 19 km from the SPA, is included as a precaution and accounts for most of the increase. Against the reference population given in the conservation objectives (7,841), the equivalent figures are 0.85% (98%) and 0.21% (99.5%). Hence, in-combination collision risk, at the evidence-based avoidance rate, for lapwing associated with this SPA is not significant and there will be no adverse effects on the integrity of the SPA population. **Black-headed gull**: no collision risk was recorded for this species for Leabeg Wind Farm, Cloghan Wind Farm, Meenwaun Wind Farm, and Carrig and Skehanagh Wind Farm. Derrinlough Wind Farm predicted 1.97 collisions/year. for Carrig Renewables Wind Farm predicted 1.49 collisions/year. 0.96 collisions/year (maximum) were predicted for Cush Wind Farm phase I. Ballincor Wind Farm predicted 0.31–0.43 collisions/year (99.2% avoidance rate) and Lea Mor Renewable Energy Community Wind Turbine predicted 0.965 collisions/year (98% avoidance rate, rescaled to 99.2%). Based on a 99.2% avoidance rate, 0.19 collisions/year (maximum) was predicted for the Project. Therefore, the in-combination collision risk, based on a 99.2% avoidance rate, for black-headed gull associated with River Little Brosna Callows SPA is 2.654–2.774 collisions/year. Based on the most recent population estimated for this species at River Little Brosna Callows SPA (1,939) the predicted annual increase in mortality is 1.37–1.43%. The predicted in-combination collision risk

SPA	Collision risk bird species identified for further assessment	Projects that pose a collision risk within 20 km of the SPA	In-combination Effects Calculation and Rational
			is therefore low (i.e. 1-5% increase) in the context of the SPA population of black-headed gull. No SPA-specific population trend is available for black-headed gull at River Little Brosna Callows SPA. The conservation objective for the SPA is to maintain (rather than restore) favourable conservation status, indicating no assessed requirement for population recovery at the time objectives were set. In the absence of site-specific trend data, the national BoCCI trend for black-headed gull in the Republic of Ireland (-58% over 20 years[57];) was applied as a precautionary proxy. On this basis, the population could be smaller by thousands of birds over the next 35 years under a 'do nothing' scenario, i.e. without the Project and other wind farms considered for in-combination collision risk assessment. Thus, the likely maximum number of deaths due to in-combination collision risk (approximately tens of birds over 35 years) would only result in a marginal increase in the rate of population decline for this species and would not hinder any conservation actions undertaken for the maintenance of favourable conservation condition for this species. Furthermore, collision risk for black-headed gull associated with River Little Brosna Callows SPA was assessed using annual activity data (in-combination) and breeding season activity data (Project alone) rather than data restricted to the winter period covered by the SPA's qualifying interest. Generally, this reflects the absence of season-specific flight activity data for the in-combination sites concerned. Given that the Project and other wind farms considered in-combination are located within 20 km of the SPA, and that black-headed gull is known to range widely from breeding colonies, with

[57] Gilbert et al. (2021). Birds of Conservation Concern in Ireland 4: 2020-2026. Irish Birds. 43: 1-22.

SPA	Collision risk bird species identified for further assessment	Projects that pose a collision risk within 20 km of the SPA	In-combination Effects Calculation and Rational
			GPS-tracked foraging flights recorded up to 27 km from the colony during the breeding season (Jakubas et al., 2020[58]), it was not considered possible to reliably exclude connectivity between birds recorded at these sites and the SPA's wintering qualifying interest population. The use of unrestricted (rather than winter-only) activity data therefore represents a precautionary approach to the assessment of collision risk for this SPA and the true in-combination collision risk for this SPA population is likely to be lower. No adverse effects on the integrity of the SPA population is anticipated regarding collision risk.
Middle Shannon Callows SPA	Lapwing Golden plover Black-headed gull	Meenwaun Wind Farm Derrinlough Wind Farm Cush Wind Farm Cloghan Wind Farm Carrig Renewables Wind Farm Carrig and Skehanagh Wind Farm Leabeg Wind Farm Ballincor Wind Farm Lea Mor Renewable Energy Community Wind Turbine	**Lapwing**: No collision risk was recorded for this species for Leabeg Wind Farm, Meenwaun Wind Farm, and Carrig and Skehanagh Wind Farm. 0.714 collisions/year was predicted for Cloghan Wind Farm. 1.875 collisions/year was predicted for Derrinlough Wind Farm. 2.941 collisions/year was predicted for Carrig Renewables Wind Farm. 4.271 collisions/year was predicted for Cush Wind Farm phase I. 1.4–1.6 collisions/year were predicted for Ballincor Wind Farm and 7.641 collisions/year for Lea Mor Renewable Energy Community Wind Turbine, both at a 98% avoidance rate. 0.69 collisions/year (maximum) was predicted for the Project based on a 98% avoidance rate. However, 0.18 collisions/year are predicted for the Project based on a 99.5% avoidance rate. Therefore, the in-combination collision risk for lapwing associated with Middle Shannon Callows SPA, based on a 98% avoidance rate is 19.532–19.732. The in-combination collision risk for this species based on a 99.5% collision rate is 4.890–4.940.

[58] Jakubas, D., Iliszko, L.M., Strøm, H., Helgason, H.H. & Stempniewicz, L. (2020). Intercolony variation in foraging flight characteristics of black-headed gulls *Chroicocephalus ridibundus* during the incubation period. *Ecology and Evolution*, 10(10), 4270–4283.

SPA	Collision risk bird species identified for further assessment	Projects that pose a collision risk within 20 km of the SPA	In-combination Effects Calculation and Rational
			Based on the most recent population estimated for lapwing at Middle Shannon Callows SPA (2,159) the predicted annual increase in mortality, based on an avoidance rate of 98% is 3.07–3.10%. At the 98% reference rate, the in-combination increase in mortality is 3.07–3.10% (approximately 19.5–19.7 birds per year), which exceeds the 1% threshold. At the primary 99.5% rate, it is 0.77–0.78% (approximately 4.9 birds per year), which is below it. The conclusion for lapwing at this SPA therefore depends on the use of the 99.5% avoidance rate. For the reasons set out in Section 5.2.4, 99.5% is considered the more reliable estimate: the 98% rate is a generic default not derived from lapwing data, post-construction monitoring has recorded lapwing avoiding turbines at rates well in excess of 99% (Gittings, 2022), and 99.5% was expressly accepted for lapwing by the Inspectorate Ecologist in the Brittas Wind Farm determination (ABP-321454-24). Collision estimates for the other schemes have been rescaled to 99.5% on the same basis, so the in-combination total is like-for-like. As the Conservation Objective for lapwing at this SPA is to restore favourable conservation condition, the population trend has been considered further in line with Section 5.2.1. The SPA lapwing population declined by 84% between the baseline period (1995/96 and 1999/20) and the most recent assessment period (2018-19 and 2020/21) (NPWS, 2022). At 99.5%, in-combination collision mortality of approximately 4.9 birds per year equates to approximately 170 birds over the 35-year operational period, against a current SPA population of 2,159 birds. The Project itself contributes 0.18 collisions/year (approximately six birds over 35 years); most of the in-combination total arises from other schemes, principally Cush Wind Farm Phase I, Carrig Renewables Wind Farm and Lea Mor Renewable Energy Community Wind Turbine. At this level, in-combination collision mortality would not be expected to be a material factor in whether the population trend can be returned to

SPA	Collision risk bird species identified for further assessment	Projects that pose a collision risk within 20 km of the SPA	In-combination Effects Calculation and Rational
			a stable or increasing trajectory and would not hinder conservation actions undertaken to restore the population. The in-combination collision risk is therefore not significant and there will be no adverse effects on the integrity of the SPA population.. **Golden plover**: no collision risk was recorded for this species for Leabeg Wind Farm, Cloghan Wind Farm, and Carrig and Skehanagh Wind Farm. 14.191 collisions/year was predicted for Derrinlough Wind Farm. The collision risk for golden plover at Meenwaun Wind Farm was considered to be of 'very low significance'. 2.345 and 6.94 (maximum) collisions/year was predicted for Carrig Renewables Wind Farm and Cush Wind Farm phase I, respectively. 7.9–9.4 collisions/year were predicted for Ballincor Wind Farm, derived using an evidence-based avoidance rate of 99.6% (Gittings, 2022), and 0.377 collisions/year for Lea Mor Renewable Energy Community Wind Turbine (98% avoidance rate). For the Project, based on a 99.5% avoidance rate, there are 0.76 collisions/year predicted (maximum). In addition, for the Project, based on a 99.8% avoidance rate there are 0.31 collisions/year (maximum) predicted. Therefore, the in-combination collision risk for golden plover associated with Middle Shannon Callows SPA, based on a 99.5% avoidance rate is 14.623–16.123. The in-combination collision risk for this species based on a 99.8% collision rate is 6.646–7.396. Ballincor Wind Farm is included at its submitted avoidance rate of 99.6% in the 99.5% and 98% scenarios and rescaled to 99.8% in the 99.8% scenario. Based on the most recent population estimated for golden plover at Middle Shannon Callows SPA (5,130) the predicted annual increase in mortality, based on a 99.5% avoidance rate, is 1.06–1.17%. The predicted annual increase in mortality based on a 99.8% avoidance rate is 0.48–0.53%. For reference, at the 98% avoidance rate (applied to all schemes other than Ballincor Wind Farm), the in-

SPA	Collision risk bird species identified for further assessment	Projects that pose a collision risk within 20 km of the SPA	In-combination Effects Calculation and Rational
			combination collision risk is 34.783–36.283 collisions/year, equating to a predicted annual increase in mortality of 2.51–2.62%, which exceeds the 1% threshold. The conclusion for golden plover at this SPA therefore depends on the use of the 99.5% avoidance rate. For the reasons set out in Section 5.2.4, 99.5% is considered the more reliable estimate: post-construction monitoring indicates avoidance of 99.6% to 99.8% for non-breeding golden plover (Gittings, 2022), so 99.5% is itself precautionary relative to the evidence, and it was accepted for golden plover by the Inspectorate Ecologist in the Brittas Wind Farm determination (ABP-321454-24). At the primary 99.5% rate, in-combination mortality is 1.06–1.17%, marginally above the 1% threshold, and at 99.8% it is 0.48–0.53%. The exceedance at 99.5% arises almost entirely from the inclusion of Ballincor Wind Farm (7.9–9.4 collisions/year), which lies approximately 14 km from Middle Shannon Callows SPA and approximately 7.5 km from River Little Brosna Callows SPA. This is beyond the c. 12 km core winter foraging range for golden plover (Gillings & Fuller, 1999) applied at screening stage in this NIS, the same basis on which River Suck Callows SPA was screened out. Golden plover using the Ballincor site are therefore more likely to be associated with River Little Brosna Callows SPA, where its collisions are also counted in full; attributing the full in-combination total to both SPAs counts the same birds twice. Excluding Ballincor Wind Farm, in-combination mortality at the 99.5% rate is 0.49%. The Project itself contributes 0.76 collisions/year, equivalent to 0.055% of background mortality and approximately 5% of the in-combination total. The Conservation Objective for golden plover at the SPA is to maintain favourable conservation condition, and the SPA population trend is a 24% increase since the baseline period (NPWS, 2022). Therefore, the in-combination collision risk for golden plover associated with this SPA is not significant and there will be no adverse effects on the integrity of the SPA population.

SPA	Collision risk bird species identified for further assessment	Projects that pose a collision risk within 20 km of the SPA	In-combination Effects Calculation and Rational
			Black-headed gull: no collision risk was recorded for this species for Leabeg Wind Farm, Cloghan Wind Farm, Meenwaun Wind Farm, and Carrig and Skehanagh Wind Farm. Derrinlough Wind Farm predicted 1.97 collisions/year, Carrig Renewables Wind Farm predicted 1.49 collisions/year and 0.96 collisions/year (maximum) were predicted for Cush Wind Farm phase I. Ballincor Wind Farm predicted 0.31–0.43 collisions/year (99.2% avoidance rate) and Lea Mor Renewable Energy Community Wind Turbine predicted 0.965 collisions/year (98% avoidance rate, rescaled to 99.2%). Based on a 99.2% avoidance rate, 0.19 collisions/year (maximum) was predicted for the Project. Therefore, the in-combination collision risk, based on a 99.2% avoidance rate, for black-headed gull associated with Middle Shannon Callows SPA is 2.654–2.774 collisions/year. Based on the most recent population estimate for this species at Middle Shannon Callows SPA (1,055 individuals; 2-year mean of peak counts, winters 2018/19 and 2020/21; NPWS 2022[59]), the predicted annual increase in mortality is 2.52–2.63%. The conservation objective for black-headed gull at Middle Shannon Callows SPA is to restore favourable conservation condition, with the population trend target requiring the long-term winter population trend to be stable or increasing (NPWS, 2022[54]). The national waterbird monitoring scheme (I-WeBS) does not comprehensively monitor this species, and a robust national trend is therefore not available (Lewis et al., 2019, cited in NPWS, 2022[54]); the SPA-specific trend is accordingly the most robust evidence base available. This shows a decline of 13% between the baseline period (1995/96–1999/2000) and the most recent assessment period

[59] NPWS (2022) Conservation Objectives: Middle Shannon Callows SPA 004096. Version 1. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

SPA	Collision risk bird species identified for further assessment	Projects that pose a collision risk within 20 km of the SPA	In-combination Effects Calculation and Rational
			(2018/19–2020/21), a period of approximately 22 years (NPWS, 2022[54]). Based on this trend, the population could be smaller by approximately hundreds of birds over the next 35 years under a 'do nothing' scenario, i.e. without the Project and other wind farms considered for in-combination collision risk assessment. The likely maximum number of deaths due to in-combination collision risk (approximately tens of birds over 35 years) represents a small addition to this background rate of decline. Given the scale of this addition relative to the decline already evident at the SPA, in-combination collision mortality at this level would not be expected to be a material factor in whether the population trend can be brought to a stable or increasing trajectory and would not be expected to hinder conservation actions undertaken for the recovery of the population. Furthermore, collision risk for black-headed gull associated with Middle Shannon Callows SPA was assessed using annual activity data (in-combination) and breeding season activity data (Project alone) rather than data restricted to the winter period covered by the SPA's qualifying interest. Generally, this reflects the absence of season-specific flight activity data for the in-combination sites concerned. Given that the Project and other wind farms considered in-combination are located within 20 km of the SPA, and that black-headed gull is known to range widely from breeding colonies, with GPS-tracked foraging flights recorded up to 27 km from the colony during the breeding season (Jakubas et al., 2020[60]), it was not considered possible to reliably exclude connectivity between birds recorded at these sites and the SPA's wintering qualifying interest

[60] Jakubas, D., Iliszko, L.M., Strøm, H., Helgason, H.H. & Stempniewicz, L. (2020). Intercolony variation in foraging flight characteristics of black-headed gulls *Chroicocephalus ridibundus* during the incubation period. *Ecology and Evolution*, 10(10), 4270–4283.

SPA	Collision risk bird species identified for further assessment	Projects that pose a collision risk within 20 km of the SPA	In-combination Effects Calculation and Rational
			population. The use of unrestricted (rather than winter-only) activity data therefore represents a precautionary approach to the assessment of collision risk for this SPA and the true in-combination collision risk for this SPA population is likely to be lower. No adverse effect on the integrity of the SPA population with respect to collision risk is anticipated.
Slieve Bloom Mountains SPA	Hen harrier	Cush Wind Farm Monaincha Bog Wind Farm (Gate 3) Cloghan Wind Farm Leabeg Wind Farm Carrig Renewables Wind Farm Moanvane Wind Farm Carrig and Skehanagh Wind Farm Derrinlough Wind Farm Meenwaun Wind Farm Mount Lucas Wind Farm Ballincor Wind Farm Lea Mor Renewable Energy Community Wind Turbine	**Hen harrier**: No ecology reporting, including environmental impact assessment and AA screening/NIS, was available for Monaincha Bog Wind Farm (Gate 3), perhaps due to the age of the project. No collision risk was recorded for hen harrier at Mount Lucas Wind Farm, Carrig and Skehanagh Wind Farm, Meenwaun Wind Farm and Leabeg Wind Farm. 0.001 collisions/year was predicted at Moanvane Wind Farm. 0.005 collisions/year were predicted for both Carrig Renewables Wind Farm and Derrinlough Wind Farm. 0.006 collisions/year was predicted for Cloghan Wind Farm. At Cush Wind Farm phase I and the Project 0.0077 and 0.005 collisions/year were predicted, respectively. 0.01–0.02 collisions/year were predicted for Ballincor Wind Farm and 0.0003 collisions/year for Lea Mor Renewable Energy Community Wind Turbine (both at a 99% avoidance rate). Therefore, the in-combination collision risk for hen harrier associated with Slieve Bloom Mountains SPA is 0.040–0.050 collisions/year. Based on the most recent population estimated for this species at Slieve Bloom Mountain SPA (16 birds; Ruddock et al. 2024) the predicted annual increase in mortality is 1.32–1.64%, which exceeds the 1% threshold. The Project itself contributes 0.005 collisions/year (0.16%). The population figure of 16 birds excludes non-breeding floaters, so this percentage is itself precautionary. Given the exceedance, the restore objective and the small size of the SPA population, the population trend has been considered further in line with Section 5.2.1.

SPA	Collision risk bird species identified for further assessment	Projects that pose a collision risk within 20 km of the SPA	In-combination Effects Calculation and Rational
			Hen harrier in the Slieve Bloom SPA have increased by 12.0% increase over the last 17 years (Ruddock et al. 2024). However, this trajectory is unlikely to continue indefinitely at a constant rate. Hen harrier breeding success and territory occupancy in Ireland are strongly influenced by the availability and quality of suitable upland habitat (principally heath/shrub and bog), with breeding success shown to be compromised by unfavourable landscape composition and, at a national scale, by the loss of open upland habitat to forest expansion (Caravaggi et al. 2019[61]; Caravaggi et al. 2020[62]). As the population approaches the capacity of available suitable habitat within the SPA, growth is expected to decelerate accordingly, independent of any additional mortality pressure. Habitat availability within the SPA, rather than incremental in-combination collision mortality of the magnitude predicted here, is therefore likely to be the primary factor governing the population's future trajectory. Against this context, the likely maximum number of deaths due to in-combination collision risk (approximately one to two birds over 35 years) would represent a very small increment relative to the habitat-driven constraints already acting on the population. This level of mortality would not be expected to materially alter the population's trajectory, nor would it hinder any conservation actions undertaken to restore the favourable conservation condition of the SPA population.

[61] Caravaggi, A., Irwin, S., Lusby, J., O'Toole, L., Mee, A., Nagle, T., O'Neill, S., Tierney, D., McCarthy, A. & O'Halloran, J. (2019). Factors influencing Hen Harrier *Circus cyaneus* territory site selection and breeding success. *Bird Study* 66: 366–377.

[62] Caravaggi, A., Irwin, S., Lusby, J., McCarthy, A., Mee, A., Nagle, T. & O'Halloran, J. (2020). Forest management and Hen Harrier *Circus cyaneus* conservation in Ireland. *Irish Birds* 42: 1–12.

SPA	Collision risk bird species identified for further assessment	Projects that pose a collision risk within 20 km of the SPA	In-combination Effects Calculation and Rational
			No adverse effects on the integrity of the SPA population is anticipated regarding collision risk.

5.3.2.3 Project In-combination Effects Conclusion

The assessment has considered whether the effects of the Project could act in-combination with those arising from other relevant plans and projects, including through effects on water quality, disturbance and displacement, and collision risk.

While effects arising from the Project alone have been identified and are addressed elsewhere in this NIS, the assessment above demonstrates that these effects will not be materially increased through interaction with the other plans and projects considered. Accordingly, no additional adverse effects on the integrity of Lough Derg, North-east Shore SAC, Lough Derg (Shannon) SPA, River Shannon Callows SAC, River Little Brosna Callows SPA, Middle Shannon Callows SPA or Slieve Bloom Mountains SPA will arise because of the Project acting in-combination with other plans or projects.

5.4 Implications for the Conservation Objectives

This section briefly summarises the conservation objectives of each of the European sites with pathways for potential effects and considers the sources for unmitigated impacts regarding the conservation objectives of each QI individually, regarding the project alone and in-combination with other plans and projects.

Table 5-14: Implications for the Conservation Objectives

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
Lough Derg, North-East Shore SAC	002241	19.65km from the wind farm site 20.46km from the grid connection site	To restore the favourable conservation condition of: • habitat area, • habitat distribution, • woodland size, • woodland structure: cover and height, • woodland structure: community diversity and extent, • woodland structure: natural regeneration, • hydrological regime: flooding	<u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There is hydrological connectivity between the Project site (both wind farm site and grid connection site) and Lough Derg, North-East Shore SAC. Therefore, suspended solids, nutrients and other pollutants generated during the construction and decommissioning of the project could enter the SAC via run-off into connected watercourses. This could negatively affect Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* through a reduction in water quality.	<u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There are no in-combination effects.

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
			depth/height of water table, • woodland structure: dead wood, • woodland structure: veteran trees, • woodland structure: indicators of local distinctiveness, • woodland structure: indicators of overgrazing, • vegetation composition: native tree cover, • vegetation composition: negative indicator species,		

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
			• vegetation composition: typical species, and • vegetation composition: problematic native species of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)		
River Shannon Callows SAC	000216	7.80 km from the wind farm site 9.06 km from the grid connection site	To maintain the favourable conservation condition of: • habitat area, • habitat distribution, • woodland size,	<u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There is hydrological connectivity between the Project site (both wind farm site and grid connection site) and River Shannon Callows SAC. Therefore, suspended solids, nutrients and other pollutants	<u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There are no in-combination effects.

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
			• woodland structure: cover and height, • woodland structure: community diversity and extent, • woodland structure: natural regeneration, • hydrological regime: flooding depth/height of water table, • woodland structure: dead wood, • woodland structure: veteran trees, • woodland structure: indicators of	generated during the construction and decommissioning of the project could enter the SAC via run-off into connected watercourses. This could negatively affect Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* through a reduction in water quality.	

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
			local distinctiveness, • woodland structure: indicators of overgrazing, • vegetation composition: native tree cover, • vegetation composition: negative indicator species, and • vegetation composition: problematic native species of Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)		

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
			To maintain the favourable conservation condition of: • distribution, • extent of terrestrial habitat, • extent of freshwater (river) habitat, • couching sites and holts, • fish biomass available, and • barriers to connectivity of otter.	<u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There is hydrological connectivity between the Project site (both wind farm and grid connection site) and River Shannon Callows SAC. This could indirectly impact otter. The release of contaminated surface water run-off into local watercourses connected to the SAC could reduce water quality, cause algal blooms and/or smoother spawning beds of fish species. Ultimately resulting in negative effects on the fish populations upon which otter prey. <u>Project-related activities causing disturbance/displacement of species</u> Activities undertaken during the construction/decommissioning	<u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There are no in-combination effects. <u>Project-related activities causing disturbance/displacement of species</u> There are no in-combination effects. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> There are no in-combination effects. .

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
				of the Project (both wind farm and grid connection site) could cause increased noise, vibration, new sources of lighting and increased human presence. Consequently, resulting in disturbance/displacement of otters, associated with the SAC, from watercourses within or in the immediate vicinity of the Project site. <u>Project-related activities leading to injury or mortality of species, or reductions in population size or density.</u> In the absence of mitigation, construction and decommissioning activities could cause physical injury or mortality of otter.	

River Little Brosna Callows SPA	004086	6.39 km	To maintain the favourable conservation condition of: • winter population trend, • winter spatial distribution, • disturbance at wintering site, • barriers to connectivity and site use, • forage spatial distribution, extent and abundance, • roost spatial distribution and extent, and • supporting habitat: area and quality of golden plover	<u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> Golden plover were also observed during flight activity surveys. A total of 9 flight lines and 178 birds were recorded across the two years of surveys. Assuming a 98% avoidance rate there was a mean annual collision rate of 2.89 (minimum) - 3.03 (maximum) collisions per year. The most recent population estimate for this species at River Little Brosna Callows SPA is 6,934.8 birds (I-WeBS; BirdWatch Ireland, 2026); the conservation objectives reference population is 12,818 birds. The predicted increase in annual mortality (taking into account the current level) on the most recent estimate is 0.155% (minimum) and 0.162% (maximum), and not significant. In addition to the SNH (2018)[51]98% default avoidance rate, there has been recent research that shows that for golden plover, an avoidance rate of 99.5% or	<u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> The in-combination collision risk for golden plover associated with River Little Brosna Callows SPA, based on a 99.5% avoidance rate is 14.623–16.123. The in-combination collision risk for this species based on a 99.8% collision rate is 6.646–7.396. Based on the most recent population estimate for golden plover at River Little Brosna Callows SPA (6,934.8) the predicted annual increase in mortality, based on a 99.5% avoidance rate, is 0.78–0.86%. The predicted annual increase in mortality based on a 99.8% avoidance rate is 0.36–0.40%. At the 98% reference rate the figure is 1.86–1.94%, so the conclusion depends on the 99.5% avoidance rate (Section 5.2.4). Therefore, the in-

				99.8% may be more appropriate. Consequently, we have presented the results using all three avoidance rates to show the range of possible collision estimates. Using the 99.5% avoidance rate, there was a mean annual collision rate of 0.72 (minimum) or 0.76 birds maximum and an annual mortality increase of 0.039% (minimum) and 0.041% (maximum). For both the best- and worst-case scenarios, the predicted increase in annual mortality is not significant. Using the 99.8% avoidance rate, there was a mean annual collision rate of 0.29 (minimum) or 0.31 birds (maximum) and an annual mortality increase of 0.016% (minimum) and 0.017% (maximum), and not significant.	combination collision risk, at the evidence-based avoidance rates, for golden plover associated with this SPA is not significant and there will be no adverse effects on the integrity of the SPA population.

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
			To maintain the favourable conservation condition of: • winter population trend, • winter spatial distribution, • disturbance at wintering site, • barriers to connectivity and site use, • forage spatial distribution, extent and abundance, • roost spatial distribution and extent, and • supporting habitat: area and quality	<u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> Lapwing were recorded flying through the Project site. Specifically, a total of 129 flight lines of 255 birds were observed. Using data from the flight activity surveys, CRM has been completed, using the default avoidance rate of 98%, which indicated that the wind farm could result in 0.64 (minimum) or 0.69 (maximum) collisions per year. The reference population for this species at Little Brosna Callows SPA, based on the conservation objectives67, is 7,841 birds; the most recent population estimate is 4,787.2 birds (I-WeBS; BirdWatch Ireland, 2026). The predicted increase in annual mortality (taking into account the current level) on the most recent estimate is 0.045%	<u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> The in-combination collision risk for lapwing associated with River Little Brosna Callows SPA, based on a 98% avoidance rate is 19.532–19.732. The in-combination collision risk for this species based on a 99.5% collision rate is 4.890–4.940. Based on the most recent population estimate for lapwing at River Little Brosna Callows SPA (4,787.2) the predicted annual increase in mortality, based on an avoidance rate of 98% is 1.38–1.40%. The predicted annual increase in mortality based on a 99.5% avoidance rate is 0.35%, so the conclusion

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
			of lapwing	(minimum) or 0.049% (maximum). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant. Using the 99.5% avoidance rate, there was a mean annual collision rate of 0.15 (minimum) or 0.18 (maximum) and an annual mortality increase of 0.011% (minimum) and 0.013% (maximum). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant.	depends on the 99.5% avoidance rate (Section 5.2.4). Hence, in-combination collision risk, for both avoidance rates, for lapwing associated with this SPA is not significant and there will be no adverse effects on the integrity of the SPA population.
			To maintain the favourable conservation condition of: • winter population trend, • winter spatial distribution,	<u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> Black-headed gull are also at risk of collision with the turbines. Based on flight data, 76 black-headed gull flight lines (and 253 birds) were recorded.	<u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> The in-combination collision risk, based on a 99.2% avoidance rate, for black-headed gull associated with River

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
			• disturbance at wintering site, • barriers to connectivity and site use, • forage spatial distribution, extent and abundance, • roost spatial distribution and extent, and • supporting habitat: area and quality of black-headed gull	Assuming a 99.2% avoidance rate, there was a mean annual collision rate of 0.17 (minimum) or 0.19 (maximum). Based on the site synopsis population of 1,939 birds, the predicted increase in annual mortality is 0.088% (minimum) or 0.098% (maximum). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant.	Little Brosna Callows SPA is 2.654–2.774 collisions/year. Based on the most recent population estimated for this species at River Little Brosna Callows SPA (1,939) the predicted annual increase in mortality is 1.37–1.43%. The predicted in-combination collision risk is therefore low (i.e. 1-5% increase) in the context of the SPA population of black-headed gull. As further explained in Table 5-10, the likely maximum number of deaths due to in-combination collision risk (approximately tens of birds over 35 years) would only result in a marginal increase in the rate of population decline for this species and would not hinder any conservation actions undertaken for the maintenance of

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
					favourable conservation condition for this species. No adverse effects on the integrity of the SPA population is anticipated regarding collision risk.
			To maintain the favourable conservation condition of: • Wetland habitat area • Wetland habitat quality and functioning of wetland and waterbirds	A study of the watercourses revealed that there is no hydrological connectivity between the Project site and River Little Brosna Callows SPA. However, due to the close proximity of Middle Shannon Callows SPA to this SPA, there is the possibility that SCI species from River Little Brosna Callows SPA utilize the wetland habitat within Middle Shannon Callows for ex-situ foraging. Therefore, as Middle Shannon Callows SPA is hydrologically connected to the Project site there is the potential for suspended solids, nutrients and other pollutants generated during the construction and	<u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There is no potential for in-combination effects.

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
				decommissioning of the Project to negatively affect the wetland habitat of Middle Shannon Callows SPA which are potentially utilised by SCI species from River Little Brosna Callows SPA.	
Middle Shannon Callows SPA	004096	7.80 km	To restore the favourable conservation condition of: • winter population trend, • winter spatial distribution, • disturbance at wintering site, • barriers to connectivity and site use, • forage spatial distribution,	<u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> Lapwing were recorded flying through the Project site. Specifically, a total of 129 flight lines of 255 birds were observed. Using data from the flight activity surveys, CRM has been completed, based on a 98% avoidance rate, which indicated that the wind farm could result in 0.64 (minimum) or 0.69 (maximum) collisions per year. The latest population count for this species at Middle Shannon Callows SPA, based on the conservation objectives, is	<u>Project-related activities causing disturbance/displacement of species</u> There is no potential for in-combination effects. Project-related activities leading to injury or mortality of species, or reductions in population size or density Therefore, the in-combination collision risk for lapwing associated with Middle Shannon Callows SPA, based on a 98% avoidance rate is 19.532–19.732. The in-combination collision risk

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
			extent and abundance, • roost spatial distribution and extent, and • supporting habitat: area and quality of lapwing	2,159 birds. The predicted increase in annual mortality (taking into account the current level) on that size of population is 0.10% (minimum) or 0.108% (maximum). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant. Using the 99.5% avoidance rate, there was a mean annual collision rate of 0.15 (minimum) or 0.18 (maximum) and an annual mortality increase of 0.024% (minimum) and 0.028% (maximum). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant.	for this species based on a 99.5% collision rate is 4.890–4.940. Based on the most recent population estimated for lapwing at Middle Shannon Callows SPA (2,159) the predicted annual increase in mortality, based on an avoidance rate of 98% is 3.07–3.10%. At the primary 99.5% avoidance rate, the predicted annual increase in mortality is 0.77–0.78%. The conclusion for this species depends on the use of 99.5%, which is supported by post-construction evidence and was accepted for lapwing in the Brittas Wind Farm determination (Section 5.2.4). Having regard to the population trend and the restore objective (Table 5-13), in-

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
					combination collision risk is not significant and there will be no adverse effects on the integrity of the SPA population.
			To maintain the favourable conservation condition of: • winter population trend, • winter spatial distribution, • disturbance at wintering site, • barriers to connectivity and site use, • forage spatial distribution, extent and abundance,	<u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> Golden plover were observed during flight activity surveys. A total of 9 flight lines and 178 birds were recorded across the two years of surveys. Assuming a 98% avoidance rate there was a mean annual collision rate of 2.89 (minimum) - 3.03 (maximum) collisions per year. The latest population count for this species at Middle Shannon Callows SPA, based on the conservation objectives[54], is 5,130 birds The predicted increase in annual mortality (taking into account the current level) on that size of	<u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> The in-combination collision risk for golden plover associated with Middle Shannon Callows SPA, based on a 99.5% avoidance rate is 14.623–16.123. The in-combination collision risk for this species based on a 99.8% collision rate is 6.646–7.396. Based on the most recent population estimated for golden plover at Middle Shannon Callows SPA (5,130) the

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
			• roost spatial distribution and extent, and • supporting habitat: area and quality of golden plover	population is 0.208% (minimum) and 0.218% (maximum). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant. Using the 99.5% avoidance rate, there was a mean annual collision rate of 0.72 (minimum) or 0.76 birds maximum and an annual mortality increase of 0.052% (minimum) and 0.055% (maximum). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant. Using the 99.8% avoidance rate, there was a mean annual collision rate of 0.29 (minimum) or 0.31 birds (maximum) and an annual mortality increase of 0.021% (minimum) and 0.022% (maximum). For both the best- and worst-case scenario, the predicted	predicted annual increase in mortality, based on a 99.5% avoidance rate, is 1.06–1.17%. The predicted annual increase in mortality based on a 99.8% avoidance rate is 0.48–0.53%. At the 98% reference rate, the increase is 2.51–2.62%. The marginal exceedance at 99.5% arises almost entirely from Ballincor Wind Farm, which lies beyond the c. 12 km core winter foraging range of golden plover from this SPA; excluding it, the figure is 0.49% (Table 5-13). The conclusion for this species depends on the use of 99.5%, which is supported by post-construction evidence and was accepted for golden plover in the Brittas Wind Farm determination (Section 5.2.4). Therefore, the in-

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
				increase in annual mortality is not significant.	combination collision risk for golden plover associated with this SPA is not significant and there will be no adverse effects on the integrity of the SPA population.
			To restore the favourable conservation condition of: • winter population trend • winter spatial distribution • disturbance at wintering site • barriers to connectivity and site use • forage spatial distribution,	<u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> Black-headed gull are at risk of collision with the turbines. Based on flight data, 76 black-headed gull flight lines (and 253 birds) were recorded. Assuming a 99.2% avoidance rate, there was a mean annual collision rate of 0.17 (minimum) or 0.19 (maximum). Based on the conservation objectives population of 1,05572, the predicted increase in annual mortality is 0.161%	<u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> Therefore, the in-combination collision risk, based on a 99.2% avoidance rate, for black-headed gull associated with Middle Shannon Callows SPA is 2.654–2.774 collisions/year. Based on the most recent population estimated for this species at Middle Shannon Callows SPA (1,055) the predicted annual

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
			extent and abundance • roost spatial distribution and extent • supporting habitat: area and quality of black-headed gull	(minimum) or 0.180% (maximum). For both the best- and worst-case scenario, the predicted increase in annual mortality is not significant.	increase in mortality is 2.52–2.63%. The conservation objective for black-headed gull at Middle Shannon Callows SPA is to restore favourable conservation condition, with the population trend target requiring the long-term winter population trend to be stable or increasing (NPWS, 2022[54]). The national waterbird monitoring scheme (I-WeBS) does not comprehensively monitor this species, and a robust national trend is therefore not available (Lewis et al., 2019, cited in NPWS, 2022[54]); the SPA-specific trend is accordingly the most robust evidence base available. This shows a decline of 13% between the baseline period (1995/96–1999/2000) and the most recent assessment period

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
					(2018/19–2020/21), a period of approximately 22 years (NPWS, 2022[54]). Based on this trend, the population could be smaller by approximately hundreds of birds over the next 35 years under a 'do nothing' scenario, i.e. without the Project and other wind farms considered for in-combination collision risk assessment. The likely maximum number of deaths due to in-combination collision risk (approximately tens of birds over 35 years) represents a small addition to this background rate of decline. Given the scale of this addition relative to the decline already evident at the SPA, in-combination collision mortality at this level would not be expected to be a material factor in

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
					whether the population trend can be brought to a stable or increasing trajectory and would not be expected to hinder conservation actions undertaken for the recovery of the population. Based on this and as explained further in Table 5-11, there will be no adverse effects on the integrity of the SPA population.
			To maintain the favourable conservation condition of: • Wetland habitat area • Wetland habitat quality and functioning of wetland and waterbirds	<u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> Middle Shannon Callows SPA is hydrologically connected to the Project site (both the wind farm sites and the grid connection site). With regards to the wind farm site, a first order watercourse, West Galros (EPA code	<u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There is no potential for in-combination effects.

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
				25W44), briefly flows within the Project site. In addition, another first order watercourse, Eglish 25 (EPA code 25E18) flows south adjacent to the wind farm site. Both of these watercourses are tributaries of Rapemills_010 (European code: IE_SH_25R010300), second order watercourse which flows into the SPA. The Rapemills river flows alongside the grid connection site. During construction, decommissioning, and to a lesser extent, during operation (in the form of routine maintenance) of the Project there is potential for the release of suspended solids, nutrients, and other pollutants, (such as hydrocarbons, contaminated waste-water, and cement-based products). All identified pathways outlined above have the	

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
				potential to impact upon the wetland habitat of the SPA.	
Slieve Bloom Mountains SPA	004160	11.89 km	To restore the favourable conservation condition of: • population size, • productivity rate, • spatial utilisation by breeding pairs, • extent and condition of heath and bog and associated habitats, • extent and condition of low intensity managed grasslands and associated habitats,	<u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> Hen harrier were recorded in flight within the Project site (wind farm only). A total of seven flights (of individual birds) of this raptor species were recorded during flight activity surveys. Therefore, assuming a 99% avoidance rate, there was a mean annual collision rate of 0.005 (approximately one collision every 200 years) predicted. Based on the latest population of 16 birds (8 pairs, Ruddock et al. 2024) the predicted increase in annual mortality is 0.164%, and not significant.	<u>Project-related activities leading to injury or mortality of species, or reductions in population size or density</u> The in-combination collision risk for hen harrier associated with Slieve Bloom Mountains SPA is 0.040–0.050 collisions/year. Based on the most recent population estimated for this species at Slieve Bloom Mountain SPA (16 birds; Ruddock et al. 2024) the predicted annual increase in mortality is 1.32–1.64%, which exceeds the 1% threshold; the Project contributes 0.16%. Hen harrier in the Slieve Bloom SPA have undergone a 12.0% increase over the last 17

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
			• extent and condition of hedgerows, • age structure of forest estate, and • disturbance to breeding sites of hen harrier		years (Ruddock et al. 2024). However, this trajectory is unlikely to continue indefinitely at a constant rate. Hen harrier breeding success and territory occupancy in Ireland are strongly influenced by the availability and quality of suitable upland habitat (principally heath/shrub and bog), with breeding success shown to be compromised by unfavourable landscape composition and, at a national scale, by the loss of open upland habitat to forest expansion (Caravaggi et al. 2019[63]; Caravaggi et al. 2020[64]). As the population approaches the capacity of available

[63] Caravaggi, A., Irwin, S., Lusby, J., O'Toole, L., Mee, A., Nagle, T., O'Neill, S., Tierney, D., McCarthy, A. & O'Halloran, J. (2019). Factors influencing Hen Harrier *Circus cyaneus* territory site selection and breeding success. *Bird Study* 66: 366–377.

[64] Caravaggi, A., Irwin, S., Lusby, J., McCarthy, A., Mee, A., Nagle, T. & O'Halloran, J. (2020). Forest management and Hen Harrier *Circus cyaneus* conservation in Ireland. *Irish Birds* 42: 1–12.

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
					suitable habitat within the SPA, growth is expected to decelerate accordingly, independent of any additional mortality pressure. Habitat availability within the SPA, rather than incremental in-combination collision mortality of the magnitude predicted here, is therefore likely to be the primary factor governing the population's future trajectory. Against this context, the likely maximum number of deaths due to in-combination collision risk (approximately one to two birds over 35 years) would represent a very small increment relative to the habitat-driven constraints already acting on the population. This level of mortality would not be expected to materially alter the

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
					population's trajectory, nor would it hinder any conservation actions undertaken to restore the favourable conservation condition of the SPA population. No adverse effects on the integrity of the SPA population is anticipated regarding collision risk.
Lough Derg (Shannon) SPA	04058	19.93 km from the wind farm site 20.59 km from the grid connection site	To maintain the favourable conservation condition of: • Wetland habitat area • Wetland habitat quality and functioning • of wetland and waterbirds	<u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There is hydrological connectivity between the Project site (both wind farm site and grid connection site) and Lough Derg (Shannon) SPA via the Rapemills River and the River Shannon. Therefore, suspended solids, nutrients and other pollutants generated during the construction and	<u>Surface water run-off carrying suspended silt and contaminants into local watercourses</u> There is no potential for in-combination effects.

Site Name	Site Code	Distance (direct line)	Conservation Objectives (summary) of QFs (considered for further assessment	For the Project Alone	For the Project In-combination with other Plans and Projects
				decommissioning of the Project could enter the SPA via run-off into connected watercourses. This could negatively affect the wetland habitat of the SPA through a reduction in water quality. Given the distance downstream, the risk without mitigation is considered to be low.	

5.5 Mitigation Measures

The sources for impacts which have been identified above have been considered in the preparation and design of the mitigation measures for the Project.

The ecological mitigation measures presented within the EIAR address the full range of ecological receptors and potential effects associated with the Project. The mitigation measures presented below are specific to the Appropriate Assessment and relate only to those sources of effect for which pathways to the qualifying interests, special conservation interests and/or conservation objectives of European sites have been identified. They therefore represent the measures required to avoid or reduce potential adverse effects on the integrity of European sites and should be read in conjunction with the wider ecological mitigation measures presented in the EIAR.

The Developer will be responsible for implementing proposed avoidance and mitigation measures during construction and the operator will be responsible for the same during operation and decommissioning.

5.5.1 Construction Phase

5.5.1.1 Water Quality

Earthworks (Removal of Vegetation Cover, Excavations and Stock Piling) Resulting in Suspended Solids Entrainment in Surface Water

Mitigation by Avoidance

The key mitigation measure during the construction phase is the avoidance of sensitive aquatic areas by using a 50m buffer. Only the underground electricity line is within a 50m buffer zone.

Specific mitigation measures, incorporated into the design of the project and through implementation of best practice methodologies (discussed below) will be employed where work inside buffer zones is proposed.

The generally large setback distance from sensitive hydrological features at the project site ensures that sufficient space is provided for the installation of drainage mitigation measures (discussed below) and to ensure their effective operation. The proposed buffer zone will ensure:

- Avoidance of physical damage to watercourses, and associated release of sediment;
- Avoidance of excavations within close proximity to surface water courses;
- Avoidance of the entry of suspended sediment from earthworks into watercourses; and,
- Avoidance of the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone.

Mitigation by Prevention

The following section details the measures which will be put in place during the construction phase to ensure that surface water features are protected from the release of silt or sediment and to ensure that all surface water runoff is fully treated and attenuated to avoid the discharge of dirty water.

- Source controls to limit the likelihood for ‘dirty water’ to occur:

  - Interceptor drains, vee-drains, diversion drains, flume pipes, erosion and velocity control measures such as use of sand bags, oyster bags filled with clean washed gravel, filter fabrics, and other similar/equivalent or appropriate systems;
  - Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas or other similar/equivalent or appropriate measures.
- In-Line controls to ensure appropriate management of silt laden water:
  - Interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sand bags, oyster bags, straw bales, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps/attenuation lagoons, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems.
- Treatment systems to fully attenuate silt laden waters prior to discharge:
  - Temporary sumps and attenuation ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbuster, and/or other similar/equivalent or appropriate systems; and
  - The existing settlement ponds lagoons on the BnM lands.

It should be noted for this site that an extensive network of bog drains already exists, and these will be integrated and enhanced as required and used within the wind farm drainage system. The wind farm drainage will coexist with the BnM bog rehabilitation plan.

The integration of the existing land drainage network and the proposed wind farm network is common practice in wind energy developments and will also result in benefits to surrounding lands.

The main elements of interaction with existing drains will be as follows:

- Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system, there will be no direct discharge (without treatment for sediment reduction and attenuation for flow management) of runoff from the wind farm drainage into the existing site drainage network. This will reduce the likelihood of any increased risk of downstream flooding or sediment transport/erosion;
- Silt traps will be placed in the existing drains upstream of any streams where construction works is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area; and
- Buffered outfalls, which will be numerous over the site, will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the site.

Water Treatment Train

While the silt/sediment ponds and lagoons are assessed as providing a sufficient level of protection to avoid any deterioration in downstream water quality; a final line of defence can be provided by a water treatment train such as a ‘Siltbuster’, if required. If the discharge water from construction areas fails to be of a high quality, then a filtration treatment system (such as a ‘Siltbuster’ or similar equivalent treatment train [sequence of water treatment processes]) will be used to filter and treat all surface discharge water collected in the dirty water drainage system. This water treatment train will apply for the entirety of the construction phase.

Silt Fences

Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids. This will act to prevent entry to watercourses of sand and gravel sized sediment, released from excavation of mineral sub-soils of glacial and glacio-fluvial origin, and entrained in surface water runoff. Inspection and maintenance of these structures during construction phase is critical to their functioning to stated purpose. They will remain in place throughout the entire construction phase. Double silt fences will be emplaced within drains down-gradient of all construction areas inside the hydrological buffer zones to provide an additional layer of protection in these areas.

Silt Bags

Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, most of the sediment is retained by the geotextile fabric allowing filtered water to pass through. Silt bags will be used with natural vegetation filters or sedimats (sediment entrapment mats, consisting of coir or jute matting) placed at the silt bag location to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure.

Existing BnM/Galros Bog Settlement Ponds/lagoons

The project infrastructure on the BnM lands (i.e. turbines T9 – T11 and spoil deposition areas) have the added benefit of the existing settlement ponds/lagoon providing additional attenuation and any future measures introduced as part of the rehabilitation plan.

Management of Runoff from Soil Deposition Areas

It is proposed that excavated overburden/spoil will be utilised for reinstatement of excavated areas etc. and for landscaping purposes. Excess material, or material which is unsuitable for this purpose, will be stored, permanently, at 1 no. dedicated spoil deposition area located southeast of proposed turbine T11 as well as smaller deposition areas at each of the 3 no. turbine locations.

All proposed spoil deposition areas are located outside the 50m stream buffer zone.

During the initial placement of spoil in the deposition areas, silt fences, straw bales and biodegradable matting will be used to control surface water runoff. Double silt fencing will be placed along the edge of each bog drain that intercepts the deposition areas.

Drainage from overburden deposition areas will ultimately be into to the existing bog drain network where it is proposed that check dams will be installed every 20m or so to create a series of settlement ponds, before being discharged.

The spoil deposition area drainage on the BnM lands have the added benefit of the existing settlement ponds/lagoons.

Spoil deposition areas will be sealed with a digger bucket and vegetated as soon possible to reduce sediment entrainment in runoff. Once re-vegetated and stabilised, spoil deposition areas will no longer be a likely source of silt laden runoff. Surface water protection infrastructure will be left in place until the areas have stabilised.

Underground Electricity Line Installation Works

Mitigation measures which are outlined below will be implemented to ensure that silt laden or contaminated surface water runoff from the trenching work does not discharge directly to the Rapemills River:

All existing dry drains that intercept the works area will be temporarily blocked down-gradient of the works using temporary check dams/silt traps (e.g. straw bales);

Clean water diversion drains will be installed upgradient of the works areas, as required;

Check dams/silt fence arrangements (silt traps or straw bales) will be placed in all existing drains that have surface water flows and also along existing roadside drains;

A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zones;

At drain crossing locations, where open trenching is required, damming and over pumping method will be used to manage flows in the drain.

Specific mitigation measures relating to the directional drilling at the crossing location are detailed below.

Horizontal Directional Drilling (HDD)

The following mitigation will be carried out during directional drilling works:

- Firstly, the crossing works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance of vegetation;
- A minimum 10m vegetated buffer will be maintained between the HDD working areas, including launch and receiving pits, and the riverbank. Plant entry into this buffer will be avoided. Where limited access within the buffer is demonstrably unavoidable, ground-protection mats will be used and the duration and extent of access will be minimised. There will be no storage of material/equipment, excavated material or overnight parking of machinery inside the 10m buffer zone ;
- Double silt fencing will be placed upslope of the buffer zone on each side of the watercourse.
- Mats will be used underneath the excavator, inside the 10 metre vegetative buffer zone, to prevent soil erosion/rutting and potential surface water quality impacts from localised surface water runoff;
- Temporary storage of excavated material will be undertaken outside of the 10m buffer on flat ground or within a local hollow area. A containment berm will be placed downslope of the excavated material which in turn will be surrounded by secondary silt fence protection to prevent saturated soil from flowing back into the watercourse;
- Operation of machinery and use of equipment within the 10m buffer will be kept to a minimum to avoid any unnecessary disturbance;
- There will be no refuelling allowed within 50m of the watercourse crossing;
- All plant will be checked for purpose of use prior to mobilisation at the watercourse crossing; and,
- Works shall not take place during periods of heavy rainfall and will be scaled back or suspended if heavy rain is forecasted.

Mitigation Measures relating to the use of a mixture of a natural, inert and fully biodegradable drilling fluid such as Clear Bore™ and water for directional drilling include:

- The area around the Clear Bore™ batching, pumping and recycling plants will be bunded using terram and sandbags in order to contain any spillages;
- One or more lines of silt fences will be placed between the works area and adjacent rivers and streams on both banks;
- Accidental spillage of fluids will be cleaned up immediately and transported off site for disposal at a licensed facility; and,

- Adequately sized skips will be used for temporary storage of drilling arisings during directional drilling works. This will ensure containment of drilling arisings and drilling flush.

A Fracture Blow-out (Frac-out) Prevention and Contingency Plan will be prepared by the drilling contractor prior to construction and will include the following measures:

The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used);

The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage;

A double row of silt fencing will be placed between the works area and the adjacent river;

Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility;

Adequately sized skips will be used where temporary storage of arisings are required;

The drilling process/pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse;

This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped;

Any frac-out material will be contained and removed off-site;

- The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix; and,
- If the risk of a further inadvertent return remains high, the drilling methodology and alignment will be reviewed within the assessed works corridor before drilling recommences.

Pre-emptive Site Drainage Management

The works programme for the initial construction stage of the development will also take account of weather forecasts, and predicted rainfall in particular. Large excavations and movements of soil/subsoil or vegetation stripping will be suspended or scaled back if prolonged or intense rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast.

The following forecasting systems are available and will be used on a daily basis at the site to direct proposed construction activities:

- General Forecasts: Available on a national, regional and county level from the Met Eireann website (www.met.ie/forecasts). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates;
- Meteo Alarm: Alerts to the possible occurrence of severe weather for the next 2 days. Less useful than general forecasts as only available on a provincial scale;
- 3 hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events;
- Rainfall Radar Images: Images covering the entire country are freely available from the Met Eireann website (www.met.ie/latest/rainfall_radar.asp). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3 hour record is given and is updated every 15 minutes. Radar images are not predictive; and,

- Consultancy Service: Met Eireann provide a 24 hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest.

Using the safe threshold rainfall values will allow work to be safely controlled (from a water quality perspective) in the event of an impending high rainfall intensity event.

Works will be suspended if forecasting suggests either of the following is likely to occur:

- >10 mm/hr (i.e. high intensity local rainfall events);
- >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or,
- >half monthly average rainfall in any 7 days.

Prior to works being suspended the following control measures will be completed:

- Secure all open excavations;
- Provide temporary or emergency drainage to prevent back-up of surface runoff; and,
- Avoid working during heavy rainfall and for up to 24-hours after heavy events to ensure drainage systems are not overloaded.

Timing of Site Construction Works

The construction of the site drainage system will be carried out, at the respective locations, prior to other activities being commenced. The construction of the drainage system will only be carried out during periods of, where possible, no rainfall, therefore avoiding runoff. This will avoid the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses. Construction of the drainage system during this period will also ensure that attenuation features associated with the drainage system will be in place and functional for all subsequent construction works.

Monitoring

Prior to the commencement of development, a detailed Site Drainage Plan and SWMP will be prepared to detail the siting and composition of the surface water management measures. The respective plans, which will form part of a detailed Construction Environmental Management Plan (CEMP), will be prepared prior to the commencement of development.

The CEMP will also include a detailed Water Quality Monitoring Plan for the monitoring of surface waters in the vicinity of the construction site by a designated Environmental Manager. The monitoring programme will comprise field testing and laboratory analysis of a range of agreed parameters. The civil works contractor, who will be responsible for the construction of the site drainage system, and Environmental Manager will undertake regular inspections of the drainage system to ensure that all measures are functioning effectively. The surface water sampling locations used in NIS (i.e. SW1 – SW4) will be used during construction activities. Regular inspections of all installed drainage systems will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended.

Any excess build-up of silt levels that may decrease the effectiveness of the drainage feature, will be removed and disposed of in an appropriate manner.

Excavation Dewatering and Effects on Surface Water Quality

The management of excavation dewatering (pumping), particularly in relation to any accumulation of water in foundations or underground electricity line trenches, and subsequent treatment prior to discharge into the drainage network will be undertaken as follows:

- Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations, will be put in place;
- The interceptor drainage will be discharged to the site constructed drainage system or onto natural vegetated surfaces and not directly to surface waters to ensure that Greenfield runoff rates are mimicked;
- If required, pumping of excavation inflows will prevent build-up of water in the excavation;
- The pumped water volumes will be discharged via volume and silt/sediment ponds and settlement lagoons adjacent to excavation areas, or via specialist treatment systems such as a Siltbuster unit;
- There will be no direct discharge to surface watercourses, and therefore no risk of hydraulic loading or contamination will occur;
- Daily monitoring of wind farm excavations by the Environmental Manager will occur during the construction phase. If high levels of seepage inflow occur, excavation work at this location will cease immediately and a geotechnical assessment undertaken; and,
- A mobile 'Siltbuster' or similar equivalent specialist treatment system will be available on-site for emergencies. Siltbusters are mobile silt traps that can remove fine particles from water using a proven technology and hydraulic design in a rugged unit. The mobile units are specifically designed for use on construction-sites. They will be used as final line of defence if needed.

Release of Hydrocarbons during Construction and Storage

Mitigation measures proposed to avoid release of hydrocarbons at the site are as follows:

- The volume of fuels or oils stored on site will be minimised. All fuel and oil will be stored in an appropriately bunded area within the temporary construction compound. Only an appropriate volume of fuel will be stored at any given time. The bunded area will be roofed to avoid the ingress of rainfall and will be fitted with a storm drainage system and an appropriate oil interceptor;
- All bunded areas will have 110% capacity of the volume to be stored;
- On site refuelling of machinery will be carried out using a mobile double skinned fuel bowser. The fuel bowser, a double-axel custom-built refuelling trailer will be re-filled at the temporary compound and will be towed around the site by a 4x4 jeep to where plant and machinery is located. No refuelling will be permitted at works locations within the 50m hydrological buffer. The 4x4 jeep will also be fully stocked with fuel absorbent material and pads in the event of any accidental spillages. The fuel bowser will be parked on a level area in the construction compound when not in use and only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations to avoid any accidental leakages;
- All plant and machinery used during construction will be regularly inspected for leaks and fitness for purpose;
- Spill kits will be readily available to deal with and accidental spillages;
- All waste tar material arising from road cuttings (from trenching or other works in public roads) will be removed off-site and taken to a licensed waste facility. Due to the potential for contamination of soils and subsoils, it is not proposed to utilise this material for any reinstatement works; and

- An outline emergency plan for the construction phase to deal with accidental spillages is contained within the Planning-Stage CEMP (Annex 3.4). This emergency plan will be further developed prior to the commencement of development, and will be agreed with the Planning Authority as part of the detailed CEMP.

Release of Cement-Based Products

The following mitigation measures are proposed to ensure that the release of cement-based products is avoided:

- No batching of wet-cement products will occur on site. Ready-mixed concrete will be brought to site as required and, where possible, pre-cast products will be utilised;
- All drain crossings will utilise pre-cast products and the use of wet-cement products within the hydrological buffer will be avoided;
- Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. Chute cleaning will be undertaken at lined cement washout ponds with waters being stored in the temporary construction compound, removed off site and disposed of at an approved licensed facility. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed;
- Weather forecasting will be used to ensure that prolonged or intense rainfall is not predicted during concrete pouring activities; and,
- The concrete pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event.

Hydrological Impacts on Designated Sites

The proposed mitigation measures for protection of surface water quality, which will include buffer zones and robust drainage control measures (i.e. interceptor drains, swales, silt/settlement ponds, settlement lagoons), will ensure that the quality of runoff from development areas will be very high. Accordingly, no further mitigation measures are assessed as being required.

An “imperceptible, temporary effect” on local streams and rivers would, if it occurs, be extremely localised and of a very short duration (i.e. hours). Therefore, considering the imperceptible effects on local surface water quality along increased dilution capacity of downstream river waterbodies, significant indirect hydrological or water quality effects on the downstream designated sites will not occur.

Effects on the WFD Status

No additional targeted measures are required or proposed in respect of the WFD assessment. The strict implementation of the measures set out in the preceding sections will ensure that the status of both surface water and groundwater bodies in the vicinity of the site will be maintained.

With regard to treatment standards, the drainage system has been designed to achieve compliance with surface water Environmental Quality Standards (EQS) in the downstream receiving waters. Details of monitoring proposals, to ensure this compliance, is described in the Planning-Stage SWMP.

The application of the drainage management as outlined will ensure compliance with EU Surface Water Regulations and WFD requirements while also maintaining the baseline hydrology of the site.

As such, the project is compliant with the requirements of the Water Framework Directive (2000/60/EC) and the Groundwater Directive (2006/118/EC).

Effects on Rath GWS Source

The below mitigation only applies to the underground electricity line.

No refuelling or handling of fuels/oil/lubricants/chemicals will be permitted within 100m of the mapped source protection area boundary.

In addition, to prevent potential leaching of cement from the electricity cable trenching, a geotextile liner will be placed around the founding layer (lean mix concrete) where concrete is to be poured.

Also, there will be clear signage in place inside the source protection area to remind construction workers that the area is inside a drinking water protection area and that there are restrictions around the use of fuels/oil/lubricants/chemicals.

Risk of Flooding during the Underground Electricity Line Construction

The first point of mitigation is ongoing monitoring of weather forecasts and weather warnings. The project Environmental Manager (EM) or the site Ecological Clerk of Works (ECoW) will be responsible for monitoring weather forecasts during the construction phase.

When the forecast indicates rainfall exceeding any of the works-suspension thresholds set out above, or where a Met Éireann Status Yellow or higher rainfall warning is issued, the planned responses detailed below will be implemented.

A potential high intensity rainfall event would likely be identified 3-5 days in advance, with more accurate forecasts of severity within 24-48 hours of occurrence. Preparations for a flood event would begin from the initial indications that there may be a high rainfall event. This would allow time for the preparation and the implementation of additional emergency mitigation measures.

A managed retreat from the fluvial flood zone will be implemented in the event of a forecasted high intensity rainfall event and/or weather warning related to rainfall. This will include the following:

- Any areas where soil/subsoil is exposed at the surface will be compacted firmly with a digger bucket of a suitably sized excavator.
- Open trenches will be backfilled and compacted.
- Existing sediment control measures will be removed, as these may be washed away and deposited elsewhere by the floodwaters.
- All plant, machinery and equipment will be removed from the flood zones.
- Works will be postponed in the event of flood or high flows in the river.

Exposed soils/peat (exposed temporary stockpiles) will be covered with plastic sheeting during all relatively heavy rainfall events and during periods where works have temporarily ceased before completion at a particular area (e.g., overnight and weekends).

Cessation of all construction works until the storm event, including the storm runoff has passed. All construction works will cease during storm events such as yellow warning rainfall events. Following heavy rainfall events, and before construction works recommence, the project site will be inspected and corrective measures implemented to ensure safe working conditions e.g. dewatering of standing water in open excavations, etc.

5.5.1.2 Otters

A pre-construction walkover survey of the project will be undertaken. This will search for otter holts/couches, which could change over time. If any are identified, then appropriate exclusion zone(s) will be implemented and construction activities timed to avoid sensitive periods, such as the breeding season.

The following will be implemented to reduce the possibility of direct and indirect effects on otters:

- limiting construction works to daylight hours;
- providing exit points for any excavations (e.g. escape planks or spoil runs) so otters do not become trapped; and
- a suitably qualified Ecologist will be employed for the duration of the construction period to make contractors aware of the otter sensitivities of the project and to undertake surveys for breeding or resting otters throughout the construction period, enforcing exclusion areas (150 m) as required. If in the unlikely event that exclusion zones cannot be implemented, advice will be sought from NPWS, and appropriate avoidance and mitigation measures will be put in place and an application will be made to NPWS for a derogation licence if required.

5.5.2 Operation phase

5.5.1.1. Water Quality

The operation phase drainage system of the project is described below:

- Interceptor drains will be installed up-gradient of all infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed over the ground by means of a level spreader;
- Swales/road side drains will be used to collect runoff from access tracks, turbine hardstanding areas and compound areas which may contain entrained suspended sediment, and channel it to settlement ponds for sediment settling;
- Transverse drains ('grips') will be constructed, where appropriate, in the surface layer of access tracks to divert any runoff into swales/track side drains;
- Check dams will be used along sections of access tracks drains to intercept silts at source. Check dams will be constructed from a 40mm non-friable crushed rock or similar;
- Swales and check dams will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses; and,
- Settlement ponds will be designed in accordance the greenfield runoff rate requirements; and,
- Imported rock for construction purposes and road surfacing will be strong, well-graded limestone which will be resistant to erosion and have a low likelihood to generate fines in hardstand runoff.

The operation of the underground grid connection will not result in any likely hydrological or water quality effects and therefore do not require mitigation measures.

Mitigation measures relating to oils and fuels are as follows:

- Fuels stored on site will be minimised. Any storage areas will be bunded appropriately for the fuel storage volume for the time period of the construction;
- Any oil storage tanks will be located in a concrete bund, impervious to rainwater ingress, capable of holding 110% of the stored oil volume;

- Turbine transformers will be located within the turbines, and any leaks will be fully contained within the turbine thus eliminating any pathway for leakages to affect land and soil;
- Maintenance vehicles will be regularly inspected for leaks and fitness for purpose; and

An emergency plan for the operation phase to deal with accidental spillages will be contained within Environmental Management Plan. Spill kits will be available to deal with accidental spillages.

5.5.2. Decommissioning Phase

Mitigation measures for decommissioning will be similar to those for the construction phase; however, the magnitude required will be less, as track and turbine installation will not be required.

5.6 Monitoring

5.6.1 General Pre-Construction Confirmation Surveys

Checks for nesting birds and/or wintering birds will be required for construction undertaken during the bird breeding season and/or winter season, respectively. If nests/wintering birds are recorded, ongoing monitoring and appropriate exclusion zones will be implemented to determine when and where works can proceed. If exclusion zones cannot be implemented, NPWS will be contacted and based on their advice, additional avoidance and mitigation measures will be implemented, with relevant licences applied for, if required.

5.6.2 Birds (Post-Construction)

Based on current best-practice guidelines[65], a targeted range of flight activity surveys and collision monitoring (carcass searching) will be undertaken during the breeding and non-breeding seasons in years 1, 2 and 3 post construction, to monitor the rate of avian turbine collisions and identify any significant unforeseen adverse effects. Thereafter, if the rate of turbine strikes is as low as predicted by the CRM (which is highly precautionary), the monitoring should no longer be required. If monitoring indicates potentially significant levels of collision mortality for IEF birds, potential mitigation measures will be developed and implemented (including the possibility of turbine curtailment), and further monitoring will also be identified, to ensure there are no significant effects on any IEF birds. Proposed mitigation and monitoring measures will be agreed with the planning authority prior to implementation.

5.6.3 Water Quality Monitoring

Prior to the commencement of development, a detailed Site Drainage Plan and Surface Water Management Plan will be prepared to detail the siting and composition of the surface water management measures. The respective plans, which will form part of a detailed Construction Environmental Management Plan (CEMP), will be prepared prior to the commencement of development.

The CEMP will also include a detailed Water Quality Monitoring Plan for the monitoring of surface waters in the vicinity of the construction site by a designated Environmental Manager. The monitoring programme will comprise field testing and laboratory analysis of a range of agreed parameters. The civil works contractor, who will be responsible for the construction of the site drainage system, and Environmental Manager will undertake regular inspections of the drainage system to ensure that all measures are functioning effectively. The surface water

[65] SNH. (2009). Guidance on Methods for Monitoring Bird Populations at Onshore Wind Farms SNH, Perth

sampling locations used in the project Environmental Impact Assessment Report (i.e. SW1 – SW4) will be used during construction activities. Regular inspections of all installed drainage systems will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended.

Any excess build-up of silt levels that may decrease the effectiveness of the drainage feature, will be removed and disposed of in an appropriate manner.

Table 5-15: Summary of mitigation measures, implementation mechanisms, effectiveness, monitoring and reporting arrangements to avoid or reduce potential adverse effects on the integrity of European sites and their Conservation Objectives.

Description of the measures, details on implementation, effectiveness, monitoring							
Effect	**European site**	**Mitigation measures**	**How the measure will contribute to avoiding/reducing the effects on the integrity European Sites**	**How it will be implemented and by whom**	**Demonstrate its effectiveness (e.g. Based on scientific evidence/expert rationale)**	**Timescale of implementation,**	**Proposed monitoring scheme and reporting requirements**
Surface water run-off carrying suspended silt and contaminants into local watercourses	Lough Derg, North-East Shore SAC	The mitigation measures for the Project are detailed in section 5.5.	These measures will prevent suspended sediment and other pollution from entering nearby watercourses, thereby blocking a pathway for effects on these European Sites.	Measures will be implemented by the Contractor	These measures are based on the Water Framework Directive Programme of Measures. Water quality monitoring) will detect any deterioration in water quality arising from construction activities at an early stage, allowing works to cease and corrective measures to be implemented immediately. This prevents the release and downstream spread of silt,	For the duration of construction, operational and decommissioning phase.	The Environmental Manager and Ecological Clerk of Works will monitor the implementation of the mitigation measures with regular reporting to client.
	River Shannon Callows SAC						
	River Little Brosna Callows SPA						
	Middle Shannon Callows SPA						
	Lough Derg SPA						

Description of the measures, details on implementation, effectiveness, monitoring							
					hydrocarbons, concrete leachate and other pollutants that could otherwise damage aquatic habitats and species. By maintaining water quality and preventing habitat degradation, the measure safeguards the ecological conditions required to support the qualifying interests of the European site. Accordingly, the conservation objectives and site integrity will not be adversely affected, either alone or in combination with other plans or projects.		
Project-related activities causing	River Shannon	Mitigation measures are	These measures will ensure that any holts/couches are	Measures will be implemented	Guidance from NatureScot recognises the	For the duration of construction, operational and	The Environmental Manager and

Description of the measures, details on implementation, effectiveness, monitoring							
disturbance/displacement of species	Callows SAC	detailed in section 5.5	not disturbed and that otters are not disturbed during their most active periods (dawn and dusk). Measures have been put in place to avoid entrapment of otters within the excavations.	by the Contractor and overseen by an ECoW	effectiveness of these measures[66]	decommissioning phase.	Ecological Clerk of Works will monitor the implementation of the mitigation measures with regular reporting to client.
Project-related activities leading to injury or mortality of species, or reductions in population size or density.	River Shannon Callows SAC	Mitigation measures are detailed in section 5.5	These measures will ensure works will not occur when otters are most active (dawn and dusk). Measures have also been put in place to avoid entrapment of otters within the excavations.	Measures will be implemented by the Contractor and overseen by an ECoW	Guidance from NatureScot recognises the effectiveness of these measures	For the duration of construction and decommissioning phase	The Environmental Manager and Ecological Clerk of Works will monitor the implementation of the mitigation measures with regular reporting to client.
	River Little Brosna Callows SPA	No mitigation required	n/a	n/a	n/a	n/a	Post-construction monitoring. Please see section 5.6.2 for more details.

[66] NatureScot. (2024). Standing advice for planning consultation – otters. Accessed online at: https://www.nature.scot/doc/standing-advice-planning-consultations-otters

Description of the measures, details on implementation, effectiveness, monitoring							
	Middle Shannon Callows SPA	No mitigation required	n/a	n/a	n/a	n/a	Post-construction monitoring. Please see section 5.6.2 for more details.
	Slieve Bloom Mountains SPA	No mitigation required	n/a	n/a	n/a	n/a	Post-construction monitoring. Please see section 5.6.2 for more details.

5.7 Conclusions

This report presents a detailed AA Screening (**Section 3.0**) and NIS (**Section 5.0**), together with all supporting information, to inform the competent authority in making its own complete, precise and definitive findings in respect of the potential effects of the Project on the integrity of European sites.

The assessment has examined, based on best available scientific knowledge, those impact pathways identified as having the potential to affect conservation objectives, including disturbance, habitat loss or degradation, changes in hydrological and hydrogeological conditions, collision risk, displacement and barrier effects, both alone and in combination with other plans and projects.

The assessment demonstrates that, with the implementation of the mitigation measures identified in this report, the Project will not result in loss of habitat area, sustained deterioration of habitat condition, or population-level effects on qualifying features within any European site. Mitigation measures have been specifically designed to avoid or reduce effects associated with identified pathways.

On this basis, and subject to the competent authority's independent assessment, it is concluded that beyond scientific doubt that the Project, either alone or in combination with other plans or projects, will not adversely affect the integrity of any European site, in view of their conservation objectives, and will not undermine the ability of those sites to maintain or restore their QIs or SCIs to favourable conservation condition.