TOBIN

Rooaunalaghta Green Energy Project

Appendix 9-1

Water Framework Directive Report

ROOAUNALAGHTA
Green Energy

BUILT ON KNOWLEDGE

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1. INTRODUCTION

TOBIN was requested by Rooaunalaghta Green Energy Limited (RGE) to complete a Water Framework Directive (WFD) Compliance Assessment for a planning application for a proposed project at Rooaunalaghta, Co. Mayo. The proposed project comprises the construction of 13 wind turbines and ancillary works, a 33 kV Grid Connection Route (GCR), a 110 kV Substation with associated 110 kV connection and temporary accommodation works (nodes) on the proposed Turbine Delivery Route (TDR). A full description is included in Chapter 2.

The purpose of this European Union (EU) Water Framework Directive (WFD) (2000/60/EC) Compliance Assessment is to determine if any specific components or activities associated with the proposed project will compromise WFD objectives or cause a deterioration in the status of any surface water or groundwater body and/or jeopardise the attainment of good surface water or groundwater status. This assessment will determine the waterbodies with the potential to be impacted, describe the proposed mitigation measures, and determine if the project is in compliance with the objectives of the WFD.

This WFD Compliance Assessment considers the proposed wind farm site, associated permanent and temporary infrastructure, the proposed 33 kV Grid Connection Route (GCR), the proposed 110 kV substation and all ancillary construction activities. Temporary accommodation works (nodes) associated with the Turbine Delivery Route (TDR) have been screened out as works comprise only hedge trimming and works within the existing road corridor and are not considered significant. The temporary TDR accommodation nodes could not result in a measurable effect on WFD objectives and are therefore screened out.

1.1 STATEMENT OF AUTHORITY

John Dillon and Peter McSherry, of TOBIN have completed this WFD assessment.

John Dillon (BSc., MSc., DIC, MCIWM, PGeo) is a hydrogeologist with 20 years geological/ hydrogeological experience in groundwater development, wind farm and major infrastructure developments. John has authored numerous Hydrology, Hydrogeology and Water Quality EIAR chapters for a range of renewable projects including wind farms. John is familiar with the proposed wind farm for the Rooaunalaghta Green Energy Project, and has worked on other wind farms including Castlebanny, Ballincor, Lissinagroagh and Derryadd set in various ground conditions and water environments. John has undertaken site surveys in terms of karst and is the technical reviewer for this chapter and assessment.

Peter Mc Sherry (BSc., PGCert) is a hydrogeologist with over 5 years hydrogeological experience in groundwater resources, contaminated land, ground investigation and various infrastructure developments. Peter also has over 5 years' experience in environmental management with a particular focus on wastewater treatment, energy management and regulatory compliance. Peter has a master's in Hydrogeology. Peter has authored several hydrogeology reports for various infrastructure and renewable projects, including Lissinagroagh wind farm and Ballincor wind farm. Peter was involved in the site supervision of drilling and trial pits, site walkovers and baseline assessment of the EIAR chapter.

1.2 BACKGROUND

The European Union (EU) Water Framework Directive (WFD) (2000/60/EC) was established in 2000 in order to provide a framework for the protection of surface waterbodies (including rivers, lakes, coasts, estuaries and heavily modified waterbodies) and groundwater.

The Directive was transposed in Ireland by the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003 as amended together with subsequent legislation including the European Communities Environmental Objectives (Surface Waters) Regulations and the European Communities Environmental Objectives (Groundwater) Regulations 2010, as amended. The WFD is implemented through the River Basin Management Plans (RBMP) which comprises a six-yearly cycle of planning, action and review. RBMPs include identifying river basin districts, waterbodies, protected areas and any pressures or risks, monitoring and setting environmental objectives. In Ireland the first RBMP covered the period from 2010 to 2015 with the second cycle plan covering the period from 2018 to 2021 and a third cycle plan covering the period from 2022 to 2027. The Water Action Plan 2024: A River Basin Management Plan is Ireland's roadmap to protect and restore our rivers, lakes, estuaries, coastal waters and groundwaters.

The WFD requires that the ecological status of all surface waterbodies is assessed that pressures are identified and that programmes of measures are put in place in order to maintain or achieve Good Ecological Status (GES) or Good Ecological Potential (GEP) in heavily modified and artificial waterbodies. Ecological status is assessed by considering a range of biological, hydromorphological, chemical and physico-chemical quality elements as well as specific pollutants.

This report provides a WFD Compliance Assessment for the proposed project. This report forms part of the Environmental Impact Assessment Report (EIAR) and should be read in conjunction with Chapter 9 Hydrology and Hydrogeology of the EIAR. Consideration of the WFD is required for any Development application which has the potential to cause deterioration in the ecological and chemical status of a waterbody or to compromise improvements which might otherwise lead to a waterbody meeting its WFD objectives.

Any new development must therefore ensure that four objectives are satisfied:

- Objective 1: Deterioration in the ecological status of the waterbody or connected waterbodies (within the same catchment) is prevented;
- Objective 2: Impediments to the attainment of GES for the waterbody are not introduced;
- Objective 3: Attainment of the WFD objectives for the waterbody is not compromised; and
- Objective 4: Achievement of the WFD objectives in other waterbodies within the same catchment are not permanently excluded or compromised.

1.3 ASSESSMENT METHODS

This WFD Compliance Assessment evaluates the potential for the proposed project to have significant effects on WFD parameters of freshwater waterbodies. Transitional and coastal waterbodies were considered and scoped out from further assessment due to the inland location.

There is no formal Irish guidance for carrying out WFD Compliance Assessments for the freshwater environment. The Northern Ireland Environment Agency provides guidance for EIA developments on carrying out a WFD Compliance Assessment (Northern Ireland Environment Agency, 2012). No specific guidance exists for freshwater waterbodies; however, this guidance was used as the basis of the UK's Planning Inspectorate (PINS) Advisory Note 18 'Water Framework Directive' June 2017 (PINS 2017) in which it sets out the stages of an assessment. In principle, the approaches outlined in each of these guidelines are similar. These documents have been used to inform the approach taken for this WFD Compliance Assessment, which is as follows:

- **Screening**: Identify and record the current status, future objectives and any relevant activities that may influence the waterbodies in the locality of the proposed project.
- **Scoping**: For each WFD element, record where the construction, operation and/or decommissioning could affect the status.
- **Assessment**: Evaluate the extent to which activities influence (positively or negatively) the WFD elements; the likelihood of non-temporary effects; the data available for the assessment; and any next steps for data collection and evaluation as required.
- **Mitigation**: Identify where actions may be possible and appropriate to mitigate any negative effects of the development.

The assessment area was informed by the hydrological and hydrogeological study areas defined in Chapter 9 Section 9.2 and includes all relevant catchments, sub-catchments and protected areas that could potentially be affected by project-related activities. The study area was applied for assessing the wind farm and the GCR/substation. All key receptors are located within 2 km of the proposed project with downgradient/downstream receptors also assessed i.e. Lough Corrib. The 2 km study area was selected based on the extent of potentially connected hydrological and hydrogeological receptors identified during the conceptual site model development. All mapped WFD waterbodies, groundwater dependent ecosystems, designated sites and known groundwater receptors potentially influenced by the proposed project are located within this zone or downstream/down-gradient of it. The buffer therefore provides a precautionary study area that captures all credible source-pathway-receptor linkages while avoiding inclusion of receptors with no realistic hydraulic connection to the proposed project.

The proposed project is located within the Corrib Catchment, with surface water runoff ultimately draining via the Black River system towards Lough Corrib. Groundwater flow within the study area is also considered to be regionally directed towards the Black River and Lough Corrib catchment. The hydrogeological conceptual site model developed for the proposed project indicates that while localised groundwater and surface water interactions occur,

particularly within areas of shallow overburden and along discrete drainage features, groundwater flow is generally controlled by topography and bedrock structure. Consequently, potential pathways for contaminant migration are limited to local groundwater movement and established drainage networks.

The WFD assessment has been undertaken for the entirety of the proposed wind farm, associated infrastructure, the 33 kV Grid Connection Route (GCR) and the proposed 110 kV substation. Waterbody screening was undertaken based on hydraulic connectivity to project components, with consideration given to downstream surface water pathways and groundwater flow regimes. The assessment considered all WFD waterbodies that could potentially receive surface water runoff, sediment-laden runoff or groundwater-derived inputs from the proposed project during construction, operation and decommissioning.

1.3.1 Integrated Conceptual Hydrogeological Model

An integrated conceptual hydrogeological model (CSM) has been developed for the proposed project and is presented in Chapter 9 of the EIAR. The CSM is informed by desk studies, site investigations, groundwater monitoring, geophysical surveys and karst assessment and provides an evidence-based understanding of the relationship between local geology, groundwater, surface water and downstream receptors. While localised interactions between groundwater and surface water may occur within the limestone bedrock setting, no significant subsurface cavities or major karst conduits were identified within the investigated infrastructure locations. Results indicate that most turbine locations are underlain by competent limestone at shallow depths of approximately 1-2 m bgl. Areas of partially karstified or weathered limestone were identified at T2, T6 - T10 and the proposed 110 kV substation. A karst assessment is included in Appendix 8-1 of this application.

The WFD Compliance Assessment has been undertaken using a source-pathway-receptor approach and has considered potential surface water and groundwater pathways, together with the relevant WFD waterbodies, groundwater bodies and water-dependent protected areas identified within Chapter 9.

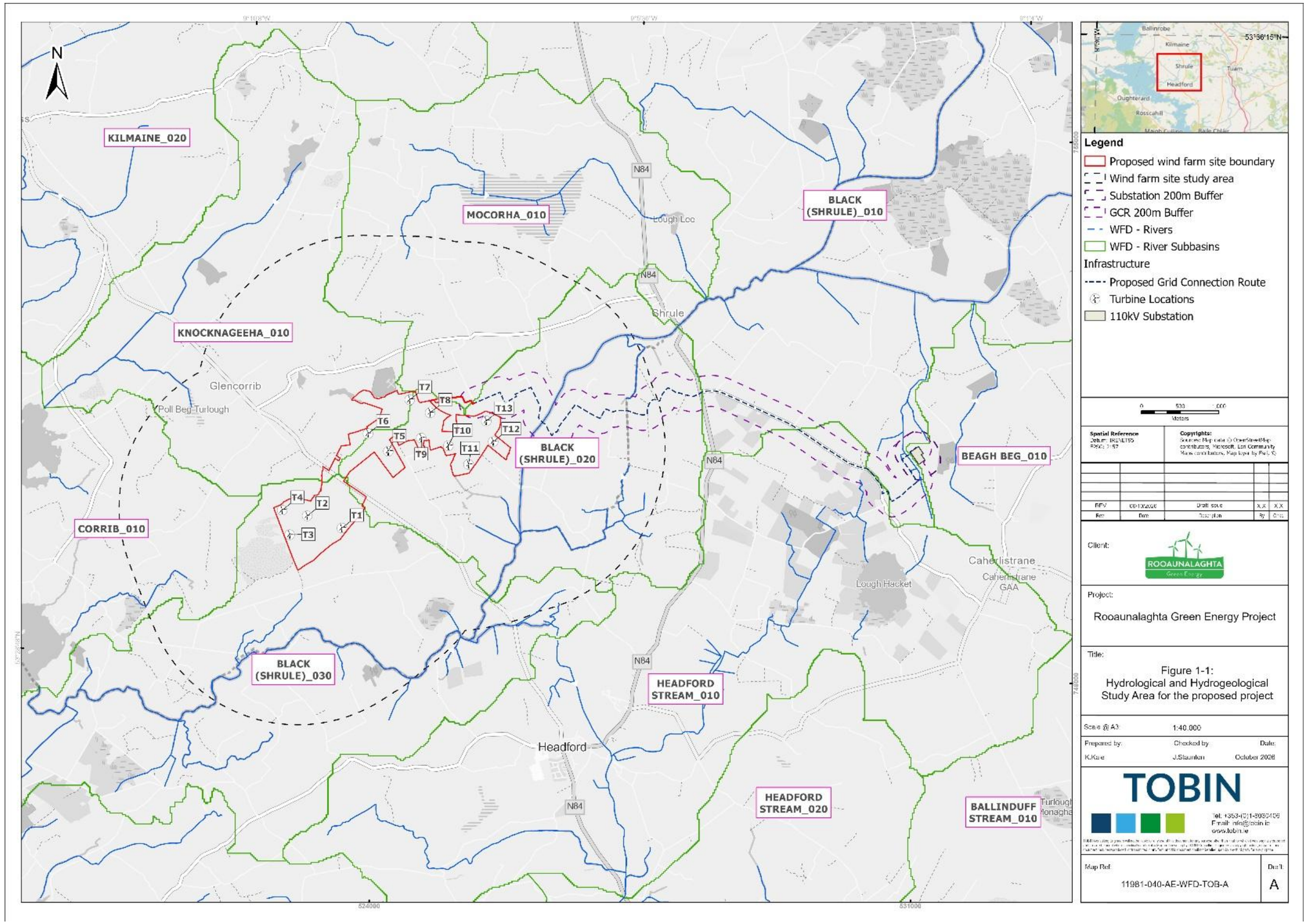


Figure 1-1-Study Area for Proposed Wind Farm Site and Grid Connection Route (GCR)

1.3.2 Assessment criteria

This assessment needs to evaluate where activities during the construction, operation and decommissioning phases may influence WFD waterbodies. Evaluation will be made against those quality elements that make up the classification of ecological status. For the freshwater waterbodies that intersect the proposed project, these are shown in **Table 1-1**. Ecological Status is defined as alteration from 'natural' conditions; see the official WFD normative definitions in the box below.

Table 1-1: Description of elements for the classification of Ecological Status that are recorded for those waterbodies intersected by the proposed project.

WFD element	*Description of elements for the classification of Ecological Status*
Biological Status	*Composition and abundance of aquatic flora (including macrophytes and phytobenthos).* *Composition and abundance of benthic invertebrate fauna.* *Composition, abundance and age structure of fish fauna.*
Chemical Status	*Elements that support the biological elements including:* • *Temperature,* • *pH,* • *Ammonia,* • *Phosphate.*
Hydrology Status	*Quantity of water flow.* *Connection to groundwater bodies.*
Morphology Status	*River depth and width variation.* *Structure and substrate of the riverbed.* *Structure of the riparian zone.*

Source: WFD Directive 2000/60/EC

This assessment is reliant on identifying those effects that are non-temporary i.e., three years for Biological status, Hydrology status and Morphology status, and 12 months for Chemical status.

To inform this assessment the following datasets owned by the EPA and available online have been used:

- Catchment Data - River Waterbodies GIS,
- Catchment Data - Lake Waterbodies GIS,
- Surface Water Classification Status and Objectives results for 2019-2024,
- Groundwater Classification Status and Objectives results for 2019-2024.

2. STAGE 2 SCREENING AND SCOPING

2.1 SCREENING

On a national stage, the Environmental Protection Agency (EPA, 2025) has published the Water Quality in Ireland Summary Report 2019-2024 which provides the latest assessment of the quality of Ireland's rivers, lakes, estuaries, coastal and groundwaters. The number of waterbodies in satisfactory condition (high or good status) across rivers, lakes, estuaries and canals declined since the last assessment which covered the period 2016-2021. In contrast, coastal waters and groundwaters improved slightly over the assessment period.

The proposed wind farm and GCR lies within the Corrib (ID 30) Water Framework Directive (WFD) Catchment. The regional natural surface water drainage pattern, in the environs of the proposed project is outlined in Figure 2-1 in Chapter 2 of this EIAR. The screening exercise has identified those waterbodies that are present within the study area of the proposed wind farm site and GCR. All relevant waterbodies and protected areas are located within this study area.

The proposed wind farm site and GCR lies within the Black (Shrule_020), Black (Shrule_030), Knocknageeha_010, and Mocorha_010 river sub basins. The majority of the proposed wind farm site drains towards the Black (Shrule) river and Lough Corrib. The Black (Shrule) river flows along the northeast and south site boundary of the proposed wind farm site, before entering Lough Corrib. The proposed wind farm site and GCR are hydrologically connected to Lough Corrib.

The Black (Shrule)_020 waterbody is assigned a "Good" overall ecological status by the EPA, with strong performance for most physical, chemical and supporting ecological indicators in the SW 2019-2024 monitoring period. The Corrib Upper is also given a "Good" overall ecological status in the SW 2019-2024 monitoring period.

Transitional and coastal waters are not considered by this WFD Compliance Assessment, having been assessed and scoped out from further assessment as part of the screening exercise.

2.1.1 Surface Waterbodies

There are no EPA mapped rivers/watercourses on the proposed wind farm site as detailed in Chapter 9, Volume II of the EIAR. The river waterbody types located in the study area are primarily small to medium sized streams and rivers with low to moderate gradient. The naming of the streams and rivers varies between the historical maps, OSi maps and the EPA catchment maps.

The proposed wind farm site lies within the Black (Shrule_020), Black (Shrule_030), Knocknageeha_010, and Mocorha_010 river sub basins. The proposed wind farm site lies within the Corrib (30) surface water catchment. The majority of the proposed wind farm site drains towards the Black (Shrule) river and Lough Corrib. The Black (Shrule) river flows along the northeast and south site boundary of the proposed wind farm site, before entering Lough Corrib. The Corrib_010 watercourse is located approximately 1.4 km to the southwest of turbine T3 and is hydrologically connected to Lough Corrib.



The proposed GCR crosses two EPA watercourses, namely the Black River (Black (Shrule_020) and the Shancloon Stream (Black (Shrule) _010) and two drainage channel crossings. Two first order streams that are mapped on the EPA maps are not present on site. It also crosses two drainage ditches.

Table 2-1: Relevant Waterbody Status (https://www.catchment.ie)

WFD Subbasin	WFD Code	Location	Current Water Quality Status 2019-2024	Water Quality Risk
Black (Shrule)_030	IE_WE_30B02 0600	Proposed Wind Farm Study Area	Good	Not at Risk
Black (Shrule)_020	IE_WE_30B02 0300	Proposed Wind Farm Study Area	Good	At Risk
Black (Shrule)_010	IE_WE_30B02 0200	Proposed Wind Farm Study Area & GCR	Poor	At Risk
Corrib_010	IE_WE_30C02 0300	Proposed Wind Farm Study Area	Good	Not at Risk
Knocknageeha _010	IE_WE_30K22 0930	Proposed Wind Farm Study Area	Moderate	Review
Mocorha_010	IE_WE_30M33 0920	Proposed Wind Farm Study Area	Good	Not at Risk
Headford Stream_010	IE_WE_30H01 0200	Proposed GCR	Moderate	Review

A summary of the waterbody status within the proposed project study area is included in Table 2-1. Table 2-2 summarizes catchments hydrologically connected to the proposed project, including catchment name, sub catchment, river name and associated infrastructure, as well as the WFD status in 2019-2024.

Table 2-2: WFD Catchment and Subbasin Summary

Catchment	Hydrometric Area	Sub catchment	River Subbasin	Relevant Rivers /streams	Proposed Project Infrastructure in each catchment	WFD status 2019-2024
Corrib Catchment	***HA30***	Kilmaine_SC_010	**Knocknageeha_010**	Knocknageeha_010	Proposed Wind Farm Study Area	Moderate
		Black [Shrule]_SC_010	**Mocorha_010**	Mocorha_010	Proposed Wind Farm Study Area	Good
			Black (Shrule)_020	Black (Shrule)_020	Proposed Wind Farm Study Area	Good
			Black (Shrule)_030	Black (Shrule)_030	Proposed Wind Farm Study Area	Good
			Black (Shrule)_010	Black (Shrule)_010	Proposed GCR, Substation	Poor
		Corrib_SC_010	**Corrib_010**	Corrib_010	Proposed Wind Farm Study Area	Good
		Clare [Galway]_SC_060	**Headford Stream_010**	Headford Stream_010	Proposed GCR	Moderate

2.1.1.1 *Corrib Catchment*

The Corrib Catchment includes the area drained by the River Corrib and all streams entering tidal water between Renmore Point and Nimmo's Pier, Galway, draining a total area of 3,112 km^2. The largest urban centre in the catchment is Galway City. The other main urban centres in this catchment are Tuam, Ballinrobe, Claremorris and Ballyhaunis (EPA 2024[1]). The Corrib catchment is divided into 19 subcatchments and has 97 river waterbodies, 30 lake waterbodies, one transitional waterbody, no coastal waterbodies and 31 groundwater bodies (EPA 2024).

The proposed wind farm site is located northeast of Headford town, to the west and east of the R334 regional road.

Black [Shrule]_SC_010

The Black [Shrule]_SC_010 Subcatchment includes the majority of the proposed wind farm site and the Mocorha_010, Black (Shrule)_020, Black (Shrule)_030, and Black (Shrule)_010 river waterbodies.

Corrib_SC_010

The Corrib_SC_010 Subcatchment is located downstream of the proposed wind farm site and GCR.

Kilmaine_SC_010

The Kilmaine_SC_010 Subcatchment includes the northwestern section of the proposed wind farm site and the Knocknageeha_010 river waterbody.

Clare [Galway]_SC_060

The Clare [Galway]_SC_060 Subcatchment includes the proposed GCR.

2.1.2 Groundwater Bodies

The groundwater body (GWB) is the groundwater management unit under the WFD. Groundwater bodies are subdivisions of large geographical areas of aquifers so that they can be effectively managed in order to protect the groundwater and linked surface waters[2]. The GWB is defined as a distinct volume of groundwater, including recharge and discharge areas with little flow across the boundaries. The majority of the study area and all of the proposed wind farm site is underlain by the Clare-Corrib GWB. Towards the northwest and west, the study area is underlain by the Cong-Robe GWB and to the north lies the GWDTE – Shule Turlough (SAC000525).

[1] www.catchment.ie (accessed June 2026)

[2] https://www.gsi.ie/en-ie/programmes-and-projects/groundwater/activities/understanding-ireland-groundwater/Pages/Groundwater-bodies.aspx (accessed June 2026)

The groundwater body descriptions are available from the GSI website[3] and the 'status' is obtained from the WFD website[4] and the EPA website[5]. The Clare-Corrib and Cong-Robe GWBs are classified as being at 'Good' status as shown on Table 2-3.

Table 2-3: Summary of groundwater bodies

EU_CD Code	Name	GWB status (2019-2024)	WFD Risk
IE_WE_G_0020	Clare-Corrib	Good	Not at risk
IE_WE_G_0019	Cong-Robe	Good	At risk
IE_WE_G_0012	Shrule Turlough	Good	Not at risk

The groundwater in all GWBs is assessed as being of Good quantitative and chemical status. The Clare-Corrib, Cong-Robe and Shrule Turlough groundwater bodies have been screened in as construction activities will be undertaken in the GWBs.

Shrule Turlough GWB is located to the north of the proposed wind farm site and GCR and north west of the proposed 110 kV substation, and represents a groundwater-dependent ecosystem associated with the karst network.

2.1.3 Lake waterbodies

Lough Corrib is located approximately 3.1 km to the southwest of the proposed T3 turbine location. The Corrib Upper waterbody (IE_WE_30_666b) is assigned a 'Good' ecological status or potential under the SW 2019-2024 monitoring programme.

2.1.4 Transitional and coastal waters

Transitional and coastal waters are not considered by this WFD Compliance Assessment, having been assessed and scoped out from further assessment as part of the screening exercise.

The screening exercise has identified those waterbodies that are present within a study area of the proposed wind farm site, GCR and proposed 110 kV substation and downgradient water bodies.

2.1.5 Water quality data

There are both chemical and physical data available for the Black (Shrule)_030 Black (Shrule)_020, Black (Shrule)_010, and the Corrib_010 river waterbody (EPA, 2024b). The Black (Shrule)_010 waterbody is the only waterbody within the study area with 'Poor' overall ecological status with strong performance for most physical, chemical and supporting ecological indicators in the SW 2019-2024 monitoring period, with only biological status or potential, fish status or potential valued at poor status and dissolved oxygen indicating failed status. Table 9-7 of Chapter 9 of the EIAR lists the WFD waterbodies within the proposed wind

[3] www.gsi.ie (accessed June 2026)

[4] www.wfdireland.ie (accessed June 2026)

[5] www.epa.ie (accessed June 2026)

farm study area, and GCR study areas and their corresponding water quality status (EPA, 2024a).

Figure 1-1 depicts Surface Water Features/Local Catchment Delineation in relation to the proposed project. Each of the streams flowing through or adjacent to the proposed wind farm site has its own sub-catchment area. The delineation of these catchment boundaries is also visible in Figure 1-1.

2.2 SCOPING AND ASSESSMENT RESULTS

The WFD requires that activities are also in compliance with other relevant legislation, as considered below. The following are looked at within the study area as part of the assessment.

2.2.1 Protected areas

Protected Areas identified under Article 6 of the WFD include drinking water protected areas, nutrient sensitive waters, bathing waters, designated European sites and groundwater dependent terrestrial ecosystems (GWDTEs). There are no shellfish waters or bathing water sites within the study area or downgradient of the proposed wind farm, GCR or proposed 110 kV substation.

2.2.1.1 Nature Designations

These are areas designated for the protection of habitats or species, where maintaining or improving the status of water is important for their protection (Table 2-4).

Table 2-4: Nature Designations area

Site ID	Site Classification	Site Code	Proximity to the proposed wind farm site	Connection to the proposed wind farm site
Cloughmoyne	SAC & pNHA	000479	c. 50 m west of turbine T3.	via proximity to proposed wind farm site boundary
Lough Hacket	pNHA	001294	c. 1.1 km south of the proposed 110 kV substation	via Headford Stream_010
Shrule Turlough	SAC & pNHA	000525	c. 2.0 km north of turbine T7.	via Mocorha_010
Lough Corrib	SAC & pNHA	000297	c. 350 m east of turbine T12.	Yes - via hydrological and hydrogeological connection to Black (Shrule) river.
Rostaff Turlough	pNHA	000385	c. 1.2 km southeast of turbine T1.	Yes - via connection to Black Shrule river.

Construction phase impacts have been identified as being possible in Chapter 9 of the EIAR; these are mitigated through specific measures set out in Chapter 9 , in the Surface Water Management Plan (SWMP), Appendix 2-6, and within the Construction Environmental Management Plan (CEMP) in Appendix 2-2 of the EIAR.

Construction, operation and decommissioning activities have been considered in this assessment. The construction phase of the proposed project has the greatest potential to affect WFD status. Operation of the wind farm should present no significant effects of any kind on surface waterbodies. Maintenance and repair and decommissioning of the proposed wind farm are identified to present similar types of impacts as construction activities but of a lower order magnitude. Therefore, the worst-case scenario is the construction activity on the waterbodies which are hydrologically connected to the proposed project. The assessment is informed by relevant literature, experience from wind farm construction and expert judgement.

2.2.2 Hydromorphology

No significant hydromorphological impacts are anticipated because no significant channel modifications are proposed, no watercourse diversions are required, drainage discharges will occur at greenfield runoff rates and no alteration of river morphology is predicted, based on the implementation of the proposed mitigation measures and best practice construction and drainage controls. These measures will minimise the potential for bank disturbance, erosion, sediment mobilisation and changes to flow pathways, thereby avoiding any material alteration to channel form or hydromorphological condition.

One crossing of the Shancloon Stream is required approximately 200 m from the proposed 110 kV substation. The proposed cable will cross the watercourse by undercrossing a new box culvert. The proposed culvert will upgrade and widen an existing culvert which does not have sufficient flow capacity for 1:1000 year flows. This will increase the channel capacity here.

No significant hydromorphology effects are anticipated for any waterbody hydrologically connected to the proposed project.

2.2.3 Groundwater bodies

The screening assessment identified three groundwater WFD designated water bodies that potentially interact with the proposed wind farm, GCR and proposed 110 kV substation. No groundwater WFD designated water bodies were screened out. Details of WFD designated water bodies are given in Table 2-3.

Groundwater WFD designated water body quality elements include the following:

- Quantitative status elements: saline intrusion, water balance, Groundwater Dependent Terrestrial Ecosystems (GWDTEs) test, dependent surface WFD designated water body status
- Chemical status elements: drinking water protected area (DWPA), general chemical test, GWDTEs test, dependent surface WFD designated water body status and saline intrusion.

Although the works required to provide the proposed wind farm, GCR and proposed 110 kV substation are minimal at a GWB scale, there is potential to affect the status of the underlying GWB if unmitigated. Groundwater bodies are scoped in for further assessment and therefore included in the Impact Assessment stage (Section 3) for the construction phase.



3. STAGE 3: COMPLIANCE ASSESSMENT

The proposed project has been assessed for its potential to impact each of the WFD quality elements, and as a result have the potential to impact upon the status of the waterbody or its ability to achieve its objectives in relation to those elements or impact upon Protected Areas.

WFD Compliance Assessment primarily considers the operation of a scheme. However, potential construction impacts are also considered if they have the potential for significant long-term change.

The assessment presented below is informed by the integrated conceptual hydrogeological model described above and in Chapter 9 of the EIAR. For each WFD quality element, the assessment considers whether a credible source–pathway–receptor linkage exists and whether the proposed mitigation measures are sufficient to interrupt or control that pathway such that deterioration of WFD status and WFD objectives will not be compromised will not occur.

The WFD Compliance Assessment follows the structure of Chapter 9 in so far as the three main phases of the proposed project are considered separately in the first instance. The potential for cumulative effects on a waterbody as a result of multiple elements of the proposed project potentially impacting upon them is considered in Step 3 of the assessment. The cumulative effect with other existing and proposed planned projects is considered in section 4.2.

The principal activities that may contribute to effects are:

- Construction works - earthworks, and construction and upgrade of access tracks (especially near waterbodies).
- Operational phase – maintenance works and accidental leaks and spills.
- Decommissioning – similar as during construction, but on a smaller scale.

3.1 CONSTRUCTION PHASE

Without mitigation actions, the proposed project has the potential to affect the water quality of waterbodies at the proposed wind farm site.

The factors that can affect water quality and associated aquatic habitats are associated with:

1. Nutrient release such as nitrogen and phosphorus;
2. Contamination events associated with accidental leaks and spills of fuel or other chemicals;
3. Physical modification to streams including increased flow; and
4. Sedimentation of streams.

A CEMP (Appendix 2-2) and SWMP (Appendix 2-6) will be implemented. Impacts in this section are thus the residual effects identified in Chapter 6 and Chapter 9 for each quality element of



each WFD waterbody. The measures incorporated into the CEMP and SWMP are embedded mitigation.

3.1.1 Groundwater Bodies

During the construction phase, no direct discharges to groundwater are proposed, aside from the infiltration of runoff following treatment. Water required for construction activities—such as wheel wash, dust suppression, and sanitary facilities—will be imported and stored in construction compounds, thereby avoiding reliance on local groundwater resources.

Localised dewatering is proposed as part of the construction works. Ground investigations have identified groundwater at approximately 4 m to 6.5 m below ground level. Localised temporary dewatering will be required; however, no large-scale or prolonged groundwater abstraction is proposed.

Where encountered, shallow recharge areas will be used to reinfiltrate water and maintain the natural hydrogeological regime. This approach is intended to prevent any significant alteration to groundwater flow paths or recharge dynamics.

However, the abstraction will be limited in duration and depth and scale in comparison to the WFD designated water body, and therefore the works do not have the potential to significantly increase/decrease rates of abstraction from the groundwater WFD designated water body.

The footprint of the works is small in relation to the scale of the WFD designated water body and therefore there is no significant change to recharge anticipated. As a result, there will be no change to the status of the quantitative elements of the WFD designated water body. The proposed works will not significantly increase pollution concentrations within the groundwater WFD designated water body. The proposed wind farm will result in construction works (16 ha) distributed over a 222 ha site. Design measures such as SuDS and hydrocarbon interceptors will be utilised on the proposed project. During the operational phase the operational wind farm will have a corresponding reduction on agricultural activity, one of the main sources of nutrient enrichment. The works are also unlikely to mobilise significant contamination on a greenfield site. The works are therefore unlikely to impact groundwater quality at the scale of the groundwater WFD designated water body. As a result, there will be no change to the status of the chemical elements of the WFD designated water body.

3.1.2 Surface Water Bodies

3.1.2.1 Biological Quality Elements

Potential impacts on biological quality elements are assessed in Chapter 6 of the EIAR. A summary is provided here and includes the likely residual effects following implementation of mitigation and control measures.

Site clearance, excavation activities and stockpiling of material have the potential to result in run off and nutrients, while sediment entering water bodies during construction could stunt macrophyte growth, enhance filamentous algae growth, limit dissolved oxygen capacity and

reduce the ecological quality of watercourses ultimately causing increased mortality of fish and other aquatic organisms.

Through the implementation of specific mitigation, no long-term impacts on WFD biological quality elements are foreseen, as there are not likely to be any residual significant adverse effects on important ecological features.

Impacts from the drainage are likely to be temporary and localised. Additional inputs of sediment may arise from runoff entry points if this leads to scouring of riverbanks which could also alter natural flow dynamics within the channel should mitigation not be in place. Furthermore, discharges from attenuation ponds could lead to scour of the beds and banks unless outfalls are appropriately designed. Any impacts from discharges will be minimised by managing suspended solid concentrations so they do not exceed 25 mg/l and ensuring discharge rates are controlled to limit scour and limit any impacts to species inhabiting the water bodies.

During periods of heavy and/or prolonged rainfall, sediment could enter nearby water bodies. Once in the receiving water body, channel bed habitats could be impacted due to smothering of bed materials reducing available foraging, nesting and refuge habitats used by fish and macroinvertebrates. In addition, the physiological functioning of fish may be affected due to gill damage caused by suspended solids.

Implementation of the mitigation is set out in Chapter 20, and the use of location specific measures as detailed in Appendix 2-2 CEMP, impacts will be minimised and will not result in deterioration of biological quality elements.

In-channel and riparian habitats could be temporarily impacted from disturbance during construction locally. As all wastewater from welfare facilities will be collected and removed off site, any risk of deteriorating water quality which could impact on biological quality elements will be minimised.

Potential impacts from the construction which may result in a loss of suitable habitat for fish, macroinvertebrates and macrophytes. Potential impacts from the removal of riparian vegetation include the localised loss of riparian habitat and may cause localised bank destabilisation. This could result in the displacement of material which may settle on the channel beds, altering the composition and structure of the substrate used by inhabiting or foraging species. However, no riparian habitats will be lost. Additional impacts on habitats may arise from the accidental release of oil from machinery which could also alter bed and bank composition. Through implementation of the specific mitigation any effects will be considered short-term and localised.

3.1.2.2 Chemical and Physico-chemical Quality Elements

Potential impacts on water quality are assessed in Chapter 9 of the EIAR. A summary is provided here and includes the likely residual effects following implementation of mitigation and control measures. The proposed wind farm site is underlain by a 'Regionally Important Aquifer (Rkc)- Karstified (Conduit). Infiltration to ground occurs on site with overland flow towards the Black river and its tributaries during extreme rainfall events. The proposed wind farm site and site of the proposed GCR/substation will locally alter recharge however

groundwater will continue to recharge to ground across the proposed wind farm site. Surface water runoff will be treated and discharged in a controlled manner to allow for infiltration to ground.

During construction, the principal potential risk to receiving surface waters is the mobilisation of suspended sediments from temporary ground disturbance, excavation works and construction traffic. However, the risk of sediment transfer to downstream is substantially reduced by the location of the proposed works, together with the implementation of embedded mitigation measures. Construction activities will be undertaken in a phased manner with the extent of exposed ground minimised at any one time. Surface water generated within construction areas will be managed through temporary drainage infrastructure, including interceptor drains, settlement measures and attenuation features designed to slow runoff velocities and promote the settlement of suspended particles before water leaves the working area.

The surface water runoff generated during rainfall events will therefore be expected to be intercepted and treated within the site drainage system before reaching natural drainage pathways. Any residual fine sediment entering drainage ditches or watercourses would be subject to further dilution within the receiving environment. As a result, sediment inputs would be temporary, highly localised and of insufficient magnitude to cause measurable changes in water quality, ecological status or supporting biological quality elements within downstream WFD waterbodies. Consequently, the potential for sediment-related deterioration of ecological status is considered negligible.

The proposed project does not involve activities that would generate significant sources of nutrients during either the construction or operational phases. No additional wastewater discharges, agricultural activities, intensive land-use changes or routine nutrient-bearing effluents are associated with the development. Potential nutrient releases during construction would be limited to very small quantities associated with disturbed soils and organic materials within excavated areas.

Where vegetation and soils are temporarily disturbed, standard erosion and sediment control measures will prevent the export of soil particles that may contain naturally occurring nutrients. As nutrients such as phosphorus are typically transported in association with suspended sediment particles, the implementation of effective sediment control measures also significantly reduces the potential for nutrient migration. Furthermore, any minor nutrient concentrations that may enter receiving waters would be subject to rapid dilution within the receiving drainage network and would not result in measurable changes in nutrient concentrations, trophic status or biological productivity within connected WFD waterbodies.

The potential for sediment or nutrient impacts on groundwater is similarly limited. Excavations associated with the proposed project are localised, and no significant dewatering activities are proposed. Surface water management measures will ensure that sediment-laden runoff is controlled at source, thereby preventing infiltration of contaminated runoff to underlying soils and groundwater.

Refuelling, fuel storage and chemical handling activities will be undertaken in designated areas, further reducing the likelihood of contaminants entering groundwater pathways.



The borrow pit will be excavated to 5 m below ground level (bgl) and therefore will locally affect groundwater levels. Turbine foundations will typically be excavated to 4 m bgl, the final depth will be confirmed at detailed design stage. Till like soils and bedrock occur at the proposed wind farm site. Dewatering will likely be required to construct the turbine foundations and borrow pit and could potentially result in a temporary localised decrease in water levels.

Portions of the proposed wind farm site have been classed as having weathered limestone. In these areas, specific mitigation measures may be required, i.e micropiles and geogrid reinforcement. Any karst feature encountered will be managed in accordance with the Karst Protocol (see Appendix 8-1 and CEMP (Appendix 2-2)).

The site and surrounding areas are served by public and group water mains which run along the local and regional roads including the R334, L1615 and N84. As with any construction site, the main risk to groundwater at the site is from hydrocarbon and cement spillage and leakages at excavations locations. The proposed SuDS drainage works will mimic the existing hydrological/hydrogeological regime thereby avoiding significant changes to groundwater flow volumes.

There are no likely significant effects on groundwater flow within the proposed wind farm site.

Through implementation of the specific mitigation any effects will be considered short-term and localised.

3.1.2.3 Hydromorphological Quality Elements

Potential effects on hydromorphology are assessed in Chapter 9 of the EIAR. A summary is provided here and includes the likely residual effects following implementation of mitigation and control measures.

Through implementation of the mitigation set out, no risk to the hydromorphology of the waterbodies is anticipated.

3.1.3 Protected Areas and Designated Sites

Potential impacts on Protected Areas and designated sites are assessed in Chapter 6 of the EIAR and the standalone Natura Impact Statement.

Following implementation of mitigation measures outlined in Appendix 2-2 (CEMP), it is not considered likely that there would be deleterious impacts on the qualifying features for the Protected Areas identified.

The assessment of hydrologically connected protected areas, demonstrates that any potential effects would be short-term, localised and effectively mitigated. No significant alterations to groundwater flow, surface water flow, water quality or supporting hydromorphological conditions are predicted. The proposed project therefore does not present a risk of deterioration to any WFD protected area and will not adversely affect the conservation objectives or water-dependent qualifying interests associated with these designated sites.

3.2 OPERATIONAL PHASE

3.2.1 Groundwater Bodies

During the operational phase, no direct discharges to groundwater are proposed. Water will be treated in the SuDS drainage network with limited site maintenance activity occurring.

3.2.2 Surface water bodies

3.2.2.1 Biological Quality Elements

Potential impacts on biological quality elements are assessed in Chapter 6 of the EIAR. A summary is provided here and includes the likely residual effects following implementation of mitigation and control measures.

During the operational phase there would be no process water discharges. Surface water runoff from roads and other impermeable areas will be managed by a sustainable drainage system (SuDS). Foul wastewater on site will be contained and transported to a licensed Wastewater Treatment Plant (WwTP). No likely significant effects on waterbodies are predicted as a result of the proposed wind farm and GCR/substation.

No indirect impacts on habitats or protected species are likely as a result of the proposed wind farm. Assuming that the mitigation and compensation measures outlined in Chapter 6 (Biodiversity) are adopted in full, there are not likely to be any residual significant adverse effects on important ecological features.

3.2.2.2 Chemical and Physio-chemical Quality Elements

Potential impacts on water quality are assessed in Chapter 9 of the EIAR. A summary is provided here and includes the likely residual effects following implementation of mitigation and control measures.

During the operational phase there would be no process water discharges. Surface water runoff from roads and other impermeable areas will be managed by a sustainable drainage system (SuDS). Rainwater will be collected from the proposed 110 kV substation roof areas and harvested for reuse. Foul wastewater on site will be contained and transported to a licensed Wastewater Treatment Plant (WwTP). No likely significant effects on waterbodies are predicted as a result of the proposed wind farm and GCR/substation.

3.2.2.3 Hydromorphological Quality elements

Potential impacts on hydromorphology are assessed in Chapter 9 of the EIAR. A summary is provided here and includes the likely residual effects following implementation of mitigation and control measures.

The operation of the proposed wind farm is not considered likely to have any likely significant effect on hydromorphological quality elements.

3.2.2.4 Protected Areas and Designated Sites

The designated sites that are hydrologically connected to the proposed wind farm site are summarised in Table 3-1.

Table 3-1: Designated sites in the proposed study area

Site ID	Site Classification	Site Code	Proximity to the proposed wind farm site	Connection to the proposed wind farm site
Cloughmoyne	SAC & pNHA	000479	c. 50 m west of turbine T3.	No direct discharge to Cloughmoyne, Cloughmoyne is a designated for limestone pavement
Lough Hacket	pNHA	001294	c. 1.1 km south of the proposed 110 kV substation	Substation is not located in the catchment. Section (1 km) of cable located in catchment
Shrule Turlough	SAC & pNHA	000525	c. 2.0 km north of turbine T7.	via Mocorha_010
Lough Corrib	SAC & pNHA	000297	c. 350 m east of turbine T12.	via Black (Shrule) river.
Rostaff Turlough	pNHA	000385	c. 1.2 km southeast of turbine T1.	via connection to Black Shrule river

Based on the proposed design and SuDS measures, the impacts on levels and flows would be indistinguishable from baseline conditions; and would meet the WFD requirements under existing and future climate conditions. As a result, it is not considered likely that the proposed wind farm and GCR/substation would result in any likely significant effect on the qualifying features of these protected areas.

3.2.3 Compliance Assessment Summary

The site-specific impacts of the proposed wind farm and GCR/substation on the biological, physico-chemical and hydromorphological quality elements of the waterbodies are shown in the assessment above and summarised in Table 3-2.

Table 3-2: WFD: Assessment Summary

Receptor	Potential risk to receptor?	*Note the risk issue(s) for impact assessment*
Hydromorphology	No	*No instream works are proposed as part of the proposed wind farm and proposed 110 kV substation. Culvert upgrade required for Shancloon stream crossing. Temporary Dam and Flume proposed on the Shancloon stream. Surface water drainage flow and volume will be at greenfield runoff rates and will not significantly change as a result of the proposed wind farm and GCR/substation.*
Biology:	Yes	*Short term, the proposed wind farm has the potential to increase sediment and nutrient runoff, but it is controlled through mitigation. Temporary Dam and Flume proposed on the Shancloon stream. Mitigation measures are detailed in the CEMP and SWMP.*

Receptor	Potential risk to receptor?	*Note the risk issue(s) for impact assessment*
Water quality	Yes	*Short term, the proposed wind farm will not significant increase sediment and nutrients on a water body level. Mitigation measures are detailed in the CEMP and SWMP.*
Protected areas and Designated Sites	*Yes*	*The proposed wind farm is located within 2 km of the Cloughmoyne SAC and pNHA, Lough Hacket pNHA, Shrule Turlough SAC and pNHA, Lough Corrib SAC and pNHA, and Rostaff Turlough pNHA. Approximately 1 km of the GCR is located within the Lough Hackett catchment, works are confined to the road corridor, excavations are temporary and localised, and no significant alteration of drainage patterns or groundwater flow is anticipated* *A CEMP and SWMP will be implemented as part of the proposed project. The construction and operation of the proposed wind farm will not significantly change the current level of surface water or groundwater volume or flow.*

3.3 Assessment of Proposed Project Against Programme of Measures

Within each RBMP, there is a list of measures, or environmental improvements, which have been identified by the RBMP, to meet the target date set by the WFD. Part of this WFD Compliance Assessment is to consider measures and assess whether a proposed project can contribute to them or might obstruct any of them from being delivered. All water bodies listed above are moderate to good status, with the exception of Black [Shrule]_010. The Black [Shrule]_010 waterbody was assigned a "Poor" biological status or potential with a "pass" for supporting chemistry conditions in the SW 2019-2024 monitoring period.

The Water Action Plan 2024 identifies a Programme of Measures to achieve and maintain Water Framework Directive objectives. The Corrib Catchment include protection of surface water quality, prevention of sediment and nutrient losses, protection of groundwater quality, and maintenance of hydromorphological conditions within watercourses.

The key Programme of Measures (PoMs) are set out within the Water Action Plan 2024 (RBMP 2022-2027) and summarised below. The Plan identifies measures across the principal pressure sectors affecting water quality in Ireland. The main Programme of Measures include:

- Agriculture;
- Physical modifications to rivers, lakes and transitional waters (hydromorphology);
- Forestry;
- Urban wastewater treatment;
- Urban runoff;
- Domestic wastewater treatment systems (septic tanks);
- Peatlands;
- Extractive industry and mining activities;

- Contaminated land and polluted sites;
- Drinking water source protection;
- Water abstraction controls;
- Invasive alien species management;
- Groundwater protection;
- Other industrial and commercial pressures;
- Measures to address unknown or uncharacterised pressures;
- Monitoring, enforcement and catchment management measures.

Nutrient Pollution relates to excessive levels of phosphorus and nitrogen from agricultural runoff. These diffuse nutrients can lead to eutrophication. Physical Modifications relate to changes to the river's natural flow (channelisation) and structure, such as barriers and drainage works and affect water quality.

The Programme of Measures most relevant to the proposed project relate to the prevention of sediment, nutrient and hydrocarbon pollution; protection of groundwater resources; maintenance of river hydromorphological conditions; management of contaminated land; and application of best-practice environmental controls during construction activities. Through implementation of the CEMP, SWMP, SuDS, sediment and erosion controls, fuel management procedures and water quality monitoring, the proposed project is consistent with these measures and will not impede their delivery.

The proposed project will result in a small scale reduction to the agricultural output within the river and groundwater bodies however at River subbasin or groundwater body scale there is no measurable effect. Similarly there is a proposed culvert replacement however the effect is not significant at a river basin scale. The proposed project does not introduce any wastewater discharge to surface water or groundwater and does not require any significant modification of watercourses. Construction-phase risks principally relate to temporary sediment release, and drainage modification; however, these risks are managed through the implementation of the Construction Environmental Management Plan, Surface Water Management Plan, Sustainable Drainage Systems and pollution prevention measures.

Any potential effects are confined to temporary construction activities and will be controlled through the implementation of the CEMP, SWMP, sediment and erosion controls, pollution prevention measures and environmental monitoring. Following completion of the works, the site will continue to drain within the existing catchment and groundwater regime.

4. MITIGATION MEASURES

The design team has integrated measures into the project's design and construction methodology (referred to as embedded mitigation). These measures are inherent to the project and are outlined in Chapters 2 of the EIAR, and Grid Construction Methodology (see Appendix 2-3).

4.1 MITIGATION BY AVOIDANCE

The fundamental mitigation measure to be implemented during each phase of the proposed wind farm and GCR/substation will be avoidance of sensitive hydrological or hydrogeological receptors wherever possible through project design. This key principle is referred to as "mitigation by avoidance". This principle has been adopted during the design of the turbine and associated infrastructure layout. The final site layout plan has been identified as the optimal layout design available for protecting existing habitats and the existing hydrological regime of the site, while at the same time incorporating engineering and other environmental constraints.

Buffer zones are intended to drive the design process by minimising or avoiding the risk to surface water features by restricting construction disturbance to outside these zones, in turn protecting riparian vegetation and providing potential for filtering of runoff from the site and maintaining the baseline hydrological and drainage regime at the site. In terms of surface waters, a 50 m buffer was selected based on established Irish wind farm practice and precautionary application of hydrological protection measures.

Where distances are less than 50 m relocation of turbines is undertaken or additional mitigation is required. The buffer applied to all EPA mapped surface water features i.e., mapped streams, rivers, lakes. There are no streams within 50 m of the proposed turbines.

Given the karstic setting, a 30 m buffer is applied to doline or karst features with additional controls including SuDS, interceptor drains and sediment management have been incorporated. The dolines identified on site appear to be dropout dolines which resulted from localised settlement but represent areas of surface water ponding with low infiltration capacity. The 30 m buffer provides sufficient separation to reduce sediment transfer, and provide additional opportunity for attenuation and treatment of runoff.

A precautionary 300 m groundwater receptor buffer has been adopted based on the site topography and experience from major infrastructure projects in karst aquifers. In this buffer zone area, additional mitigation measures will be applied to ensure the maximum reduction in potential risks to waterbodies.

4.1.1 Mitigation by design

The descriptive mitigation measures outlined in this Chapter will be applied to the development design and construction methodologies with a view to avoiding any likely significant adverse effects to water quality in the receiving surface water network. The aims in relation to embedded mitigation measures by design described in the EIAR are further clarified here.

Foundation design will be confirmed during detailed design following additional geotechnical investigations. Where competent limestone is encountered, gravity foundations may be



utilised. If significant karstification or unsuitable ground conditions are identified, foundation solutions may include excavation and replacement, engineered improvement or piling. Any karst feature encountered will be managed in accordance with the Karst Protocol (see Appendix 8-1 and CEMP (Appendix 2-2)).

4.1.1.1 Nature-based Solutions.

Nature based solutions will be adopted at the proposed project and have been incorporated into the design. Nature based solutions include Sustainable Drainage Systems (SuDS), which will be employed to attenuate runoff and reduce the hydrological response to rainfall at the site. Extending or maximising this approach sufficiently has the potential to attain net beneficial effects i.e., a net reduction in runoff rates at the site, beneficial effects on water quality and reducing flood risk to downstream flood risk areas. One of the main objectives of nature-based solutions and SuDS is to create an array of runoff stilling areas / standing water and promote diffuse discharge and recharge of runoff at the proposed site.

4.1.1.2 Constructed Drainage

The proposed wind farm site and 110 kV substation drainage will be integrated into the existing surface water network. The drainage incorporated into the design will facilitate the collection of surface water runoff from upstream of the proposed wind farm infrastructure and provide a buffered redistribution of cleaner runoff downstream following passage through the constructed treatment train, as described further in the Surface Water Management Plan (SWMP), in Appendix 2-6.

While desk studies, detailed walkover and site investigations have not identified significant karst conduits within the proposed infrastructure areas, the possibility of encountering previously unidentified minor karst features during excavation cannot be entirely excluded. In the event that a karst feature is identified, the Karst Protocol will be implemented (see Appendix 8-1 and CEMP (Appendix 2-2)). Works will cease locally, the feature will be assessed by the Project Hydrogeologist and appropriate engineering and environmental controls implemented. This may include redesign, sealing of pathways or additional groundwater protection measures. Consequently, the presence of an unidentified karst feature would not be expected to result in deterioration of groundwater or surface water body status.

Unsaturated Zone Protection: HD45/15 guidance specifies that infiltration systems require either a minimum consistent thickness of 2m unsaturated subsoil or 1m of "appropriate material" (engineered fill) beneath the invert level . Where these conditions cannot be met, lining of conveyance and attenuation systems is required. A 2-metre over-excavation is backfilled with engineered subsoil meeting TII specifications (with a minimum of 10% fines and a hydraulic conductivity between $5x10^{-5}$ and $5x10^{-7}$ m/s)

Karst Feature Separation: Drainage systems should be at least 15m away from karst features indicating enhanced bedrock permeability as per TII specifications.

Pre-Treatment: Vegetation-based systems like grassed channels, swales, and linear wetlands will be used to provide treatment before any infiltration occurs . This approach is essential to maximise treatment.



Exposed earth following topsoil stripping could act as a source of sediment following rainfall, which once in the watercourses, could lead to altered substrate composition temporarily. The exposure of soils associated with site preparation has the potential to be a source of fine sediment that could enter waterbodies during periods of rainfall. Through implementation of the mitigation set out in Appendix 2-2 (CEMP), any indirect risk to the hydromorphology of the waterbodies will be minimal.

Due to the location and nature of construction works and the implementation of the mitigation set out in Appendix 2-2 (CEMP), there will be no detrimental effects on hydromorphological quality elements associated with the construction of the site compound and site preparation activities.

Through implementation of the mitigation set out in Appendix 2-2 (CEMP), any impacts on waterbodies would be temporary and localised. Such discharges will discharge at greenfield runoff rates.

Any additional run-off or water from de-watering during construction will be treated (e.g. to remove sediment) within the limits of the proposed wind farm and GCR/substation and discharged to local drains/swales.

Runoff from construction will be attenuated and treated as appropriate before being allowed to infiltrate or discharge from the proposed wind farm and GCR/substation, ensuring that any sediment build-up or pollutants are captured on site rather than released into the wider environment.

During the construction phase, all works associated with the construction of the GCR will be undertaken in accordance with the guidance contained within CIRIA Document C811 'Environmental Good Practice on Site' (CIRIA, 2023). Groundwater pumped from excavations will be treated to remove silt by the use of silt bags. When undertaking HDD works, turbidity monitoring will be undertaken.

The principle behind SuDS devices is to reduce the quantity of discharge from developments such as the proposed wind farm and 110 kV substation to predevelopment flows and to improve the quality of run-off. The SuDS devices, as part of the proposed wind farm design, mimic existing greenfield runoff in terms of volume, rate of runoff and quality of runoff. For the proposed wind farm the quantity of run-off will be decreased to greenfield rates by providing SuDs methods such as surface water settlement ponds.

Interceptor drains will be installed up-gradient of all proposed wind farm and 110 kV substation infrastructure, at strategic locations to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained.

Swales will be implemented to control run-off from the surface running to lower water levels in the subgrade, to control surface water and to carry this flow to outlet points. Swales along access tracks will be installed in advance of the main construction phase.

Swales will provide additional storage of storm water, located on an at-gradient basis. Given the steep longitudinal gradients on some sections of the access track, regular check dams will be employed within the trackside swale on these sections to reduce the flow velocity and provide settlement opportunity.



Swales will be re-vegetated following excavation. Vegetation will reduce the flow velocity, treat potential pollutants, increase filtration and silt retention.

Settlement ponds will be located downstream of road swale sections and at hardstand locations, as illustrated on Drawing 11981-2040, to manage/buffer volumes of runoff discharging from the drainage system during periods of high rainfall, thereby reducing the hydraulic loading to watercourses. Settlement ponds are designed in consideration of the greenfield runoff rates.

Any settlement pond design is based on primary settling out of suspended solids from aqueous suspension. Settlement ponds will be installed alongside the formation of the road and will be fenced off for safety.

Further embedded design measures include the following:

- Hazardous substances (fuel, oils, chemicals) will be stored in bunded areas (110% capacity) with impermeable bases; and
- All concrete will be mixed off-site and imported into the site. All concrete bowsers (trucks) will be washed down at a dedicated concrete washout off-site at least 50 m from a drainage ditch or watercourse. Concrete washings will not be disposed of on-site to any surface or ground water feature. All washings will be removed off-site and treated at a licensed facility.

The following standard practice pollution control measures will be incorporated into the CEMP (Appendix 2-2) for the project, which the contractor will be obliged to follow to remove any risk of a pollution incident:

- Near-stream construction work will only be carried out during the period permitted by IFI (2016)[6] guidance document *"Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites"*, that is, May to September inclusive. The excavation, installation and reinstatement process for the general GCR works will take on average of two days to complete a 100-metre section similar to minor road works. The proposed HDD will be undertaken over a 2-3 day period with additional time to install the launch and reception pits. The proposed HDD is designed to avoid direct effects on streams in accordance with the IFI guidance (2016)[7] guidance document *"Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites"*. A HDD crossing is proposed for one EPA watercourse crossing (Black River).

[6] IFI (2016) *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites* https://www.fisheriesireland.ie/media/guidelines-on-protection-of-fisheries-during-construction-works-in-and-adjacent-to-waters *[Accessed September 2026].*

[7] IFI (2016) *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites, available at* https://www.fisheriesireland.ie/media/guidelines-on-protection-of-fisheries-during-construction-works-in-and-adjacent-to-waters *[Accessed September 2026].*

- On completion of the works, all apparatus, plant, tools, offices, sheds, surplus materials, rubbish and temporary erections or works of any kind will be removed from the site;
- All works must follow the guidance set out in the Guidance document entitled: CIRIA guidance note Control of Water Pollution from Construction Sites (CIRIA, 2001);
- A 24-hour, seven-day week Emergency Response protocol will be drawn up and implemented. This will be implementable in the unlikely event of an accidental spillage of chemicals, hydrocarbons or release of sediment to the surface or ground water system;
- All excavated material will be removed to suitable stockpile areas;
- Stockpiling will be limited to areas where the ground is stable and well drained;
- Spoil disposal areas will be located where the risk of soil erosion and water quality deterioration is minimal and must also have an adequate buffer from aquatic zones;
- Where spoil disposal areas are bunded, the bunds will extend to a level above the top of the spoil;
- Any water discharge from the stockpiles will be monitored. Runoff water will be prevented from flowing directly into the site adjacent drainage channels;
- All machinery will be regularly maintained and checked for leaks. Services will not be undertaken within 50 m of aquatic features. Servicing will be undertaken on level, hard surfaced designated areas;
- An adequate supply of spill kits and hydrocarbon adsorbent packs will be available at labelled stations throughout the sites with all vehicles on-site carrying spill kits. All relevant personnel will be fully trained in the use of the equipment. Any used spill kits will be disposed of appropriately off-site; and,
- All equipment and machinery will be cleaned prior to entry as a bio security measure. This is to avoid transfer of invasive species on equipment and machinery which may have been used elsewhere to the receiving catchment.

Construction phase activity will follow the relevant IFI biosecurity protocols found at http://www.fisheriesireland.ie/Biosecurity/biosecurity.html.

The proposed HDD crossing will be completed in the summer months to avoid periods of potential flooding. This time period coincides with the period of lowest expected rainfall and, therefore, minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses. Mitigation measures in relation to the proposed GCR route are outlined in the CEMP in Appendix 2-2 of the EIAR. Mitigation measures applicable to HDD include:

- A competent and experienced Contractor will be appointed to undertake the HDD works;
- The Contractor will prepare a HDD Method Statement using industry best practice and relevant guidance to inform the optimal methodology for the works. The Method

Statement will include ***biosecurity*** controls and an incident response plan for any potential frac-out;

- The Contractor will undertake the directional drilling in accordance with industry best practice including British Standard EN 16191:2014 Tunnelling machinery, safety requirements and CIRIA C648 '*Control of water pollution from linear construction projects Technical Guidance*' (CIRIA, 2006a);
- The contractor will ensure that all personnel working on site are trained in pollution incident control response. A regular review of weather forecasts of heavy rainfall is required to avoid works in very wet conditions. The Contractor will be required to prepare a response plan in advance of the works commencing;
- Weather conditions will be considered when planning construction activities to minimise the risk of runoff from site, no works will be scheduled when an orange or red weather warning is in place;
- There will be no storage of fuels/drilling fluid within 30 m of a watercourse;
- Provision of exclusion zones and barriers (sand bags and silt fences) between any excavated material and any surface water features will be installed to prevent sediment washing into the receiving water environment. Silt fences will be installed and the contractor will ensure that silt fences are regularly inspected and maintained during the construction phase;
- Clay (Bentonite) based drilling fluids will not be used; instead, inert food-grade, biodegradable drilling fluids will only be used for these works. The drill profile will achieve a minimum 1.5m depth beneath the riverbed.
- To prevent loss of drilling fluids or 'frac-out' from occurring, a series of actions and controls will be implemented; the drill fluids operator will monitor drill fluid density, viscosity and solids content on an ongoing basis, to ensure that the fluid does not increase in viscosity, requiring additional pressure to maintain mobility;
- Viscometers will be used to measure drill fluid gel strength and shear strength. Filtrate can also be measured to calculate the amount of filter cake building up on the internal wall of the bore. Any increases in pump pressure experienced by the drill operator will be investigated immediately to prevent the risk of pressure build up within the annulus. In some circumstances, depending on the drilling equipment used, the pilot drill borehole assembly will be fitted with a down hole pressure monitor to measure pressure in the annulus between the drill and the bore wall. This will give an early indication of pressure build up in the hole and allow the drill operator to prevent a 'frac-out'. If there is a risk of a 'frac-out' a number of measures will be implemented including:
    - pumping a high viscous drilling fluid with a higher density to the risk zone; and
    - circulate and pump loss circulation material (typically cork or manufactured inert polymers) to the risk zone to seal the risk zone, grouting of the risk zone, and, or launch a packer before the risk zone.

- Reception pits will be situated outside of the riparian zone. A buffer zone width of 30 m or greater will be maintained from the drainage channel;
- The contractor will implement procedures to maximise the recirculation or reuse of drilling fluid to minimise waste disposal;
- Disposal of drilling fluids will be the responsibility of the contractor to an approved and licensed waste facility;
- Monitoring of the drilling operations will be undertaken at all times by the contractor under the supervision of an Ecological Clerk of Works (ECoW) with stop works authority. The monitoring will include visual inspection of the pits and monitoring of the volume of returns flowing back to the entry pit. The monitoring personnel will be in constant communication with the drilling rig operator and thus will be able to immediately cease drilling if necessary; and
- As part of the SWMP, pre-Construction and construction phase baseline water quality monitoring will be undertaken.

With regard to the Shancloon stream crossing:

- Instream works will be scheduled during periods of low flow and undertaken within the appropriate fisheries working window, as set out in IFI (2016)[8] guidance document *"Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites"*,
- Prior to commencement of the Shancloon stream crossing works, appropriate sediment and erosion control measures, including geotextile silt curtains, straw bales, silt fences or equivalent filtration measures, will be installed downstream of the works area, to minimise the release of suspended solids and to protect downstream water quality.
- The Shancloon Stream is a historically straightened, heavily modified watercourse characterised by a U-shaped channel. Owing to its small catchment area and limited contributing flows, the watercourse exhibited semi-dry conditions in summer period including the August 2026 aquatic survey, with only isolated standing pools present and no observable flow.
- To facilitate the crossing works, temporary upstream and downstream dams will be installed using sandbags and water-filled dams, and flume pipe(s) will be placed to convey all stream flows around the work area. Once the diversion system is operational, the existing culvert will be removed and the crossing works undertaken within the isolated section of channel.

[8] IFI (2016) *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites* https://www.fisheriesireland.ie/media/guidelines-on-protection-of-fisheries-during-construction-works-in-and-adjacent-to-waters *[Accessed February 2026].*

- Any residual water within the work area will be directed to a temporary sump and removed by pumping. Where ground conditions are suitable, water will be discharged to a vegetated infiltration area. Where infiltration is not feasible due to saturated ground conditions, water will first be directed through an appropriately sized settlement tank prior to discharge. This will ensure that suspended sediments are removed before any water leaves the work area.
- Installation of the cable ducting will then be undertaken within the isolated and dewatered section of channel. On completion of the works, the stream bed, banks and culvert crossing will be reinstated to their original profile and condition, the temporary diversion structures will be removed, and natural surface water flows will be restored. All disturbed areas will be stabilised as soon as practicable to minimise the potential for erosion and sediment mobilisation.

4.2 CUMULATIVE EFFECTS

Cumulative impacts may also occur between this proposed wind farm/GCR/substation and other proposed and existing developments as discussed in Section 9.8 of Chapter 9. Where waterbodies in the same catchments are crossed by multiple projects, any impacts may be additive, and the effects may accumulate downstream of the points where the waterbodies are intersected.

The river subbasins were selected for the cumulative assessment of hydrology and hydrogeology effects as it represents a conservative zone of Influence beyond which cumulative interactions are not credible for this topic. As listed in Chapter 4, there are a number of relevant applications for renewable energy projects in the region of the proposed wind farm site, as illustrated in Figure 9-10 of the EIAR. The primary potential for cumulative effects will occur during the construction phase of the proposed project, as this is when earthworks and excavations will be completed. The footprint of the proposed wind farm site does not overlap with other wind farms and therefore the potential for significant cumulative effects is limited. If construction for these projects overlap or run concurrently with the proposed project, construction related effects would occur (either significant or not significant).

To the north of the proposed wind farm site is Carrowoughteragh quarry, operated by P&D Lydon. A proposed temporary access track may connect to the Carrowoughteragh quarry during the construction stage of the proposed project. Water levels in the quarry are <25mOD and blasting is regularly carried out there as part of the stone extraction method.

Carrowoughteragh quarry has the potential to interact through the local groundwater and surface water environment. However, the potential for significant cumulative effects is considered low. Ground disturbance associated with the quarry is long established and no significant effects have occurred. The construction of the wind farm, and access tracks to the quarry, will be temporary and spatially limited, while groundwater encountered during excavations is expected to be confined primarily to shallow groundwater. The quarry



represents an established activity within the receiving environment and there is no evidence that the combined groundwater abstraction, dewatering or excavation activities would result in significant changes to regional groundwater levels, groundwater flow patterns or groundwater-dependent receptors. Furthermore, implementation of standard construction-phase control measures, including management of dewatering discharges, sediment controls and pollution prevention measures, will minimise the potential for cumulative impacts on groundwater quality and receiving surface waters. Consequently, any cumulative hydrogeological or hydrological effects arising from the combined operation of the proposed wind farm and the quarry are predicted to be negligible to minor and not significant.

Table 4-1: Mitigation Measures matrix

	Turbines	Substation and compounds	Access tracks	Borrow Pits/Spoil deposition	Grid/Substation
Utilise existing bridges and access roads			++		++
>50 m river Buffer	++	++	++	++	
>30 karst feature buffer	++	++	++	++	++
Interceptor drains	++	++	++	++	
Check Dams or similar	++	++	++	++	++
Swales			++	++	
Sediment traps		++	++	++	
Settlement ponds/Infiltration Ponds/Bioretention ponds	++	++	++	++	
Proprietary Settlement tanks	++			++	
Weather dependant	++	++	++	++	++
Silt Fences	++		++		
Concrete washout and control measures	++	++		++	++
Chemical/fuel bunds	++	++		++	++

Taking into consideration the anticipated impacts of the proposed wind farm and GCR/substation on the biological, physico-chemical and hydromorphological quality elements, following the implementation of design and mitigation measures, it is concluded that it will not compromise progress towards achieving GES or cause a deterioration of the overall GEP of any of the waterbodies that are in scope.

The WFD also requires consideration of how a new scheme might impact on other waterbodies and other EU legislation. This is covered in Articles 4.8 and 4.9 of the WFD.

Article 4.8 states: 'a Member State shall ensure that the application does not permanently exclude or compromise the achievement of the objectives of this Directive in other bodies of

water within the same river basin district and is consistent with the implementation of other Community environmental legislation'.

All waterbodies within the study area have been assessed for direct impacts. The proposed wind farm will not cause deterioration or compromise the achievement of the objectives of the WFD for any waterbody in the study area. In addition, the proposed wind farm has been assessed for the potential for cumulative impacts with other proposed wind farm and GCR/substations in the relevant river subbasin areas. The footprint of the proposed wind farm site does not overlap with other wind farms and no other existing or proposed renewable energy projects, are located within 5 km of the proposed wind farm site. One Proposed wind farm is located 6.5 km upgradient however with the proposed mitigation measures, there are no significant effects. The cumulative assessment considered existing, permitted, approved and proposed developments with the potential to interact with the same surface water or groundwater receptors. No development was identified that would result in a cumulative deterioration of WFD status when assessed in combination with the proposed wind farm and GCR/substation

Cumulative effects of this project with other developments in the region, relate to the effects on Hydrology. These developments include other existing, planned and granted developments in the environs of the proposed development and/or developments with the potential to interface with the proposed wind farm and GCR/substation in terms of environmental effects.

With the implementation of the mitigation measures it is concluded that in combination with other proposed, existing and granted energy projects and nearby developments, the proposed wind farm will not compromise the achievement of the objectives of the WFD for any waterbody. Due to the hydrogeological setting of the proposed wind farm site and the near surface nature of construction activities, cumulative effects with regard to groundwater quality or quantity arising from the proposed wind farm site with other existing and proposed developments are assessed as not likely. Therefore, the proposed wind farm complies with Article 4.8.

Article 4.9 of the WFD requires that "Member States shall ensure that the application of the new provisions guarantees at least the same level of protection as the existing Community legislation".

The Habitats Directive (1992) promotes the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats. European designated sites in the vicinity of the proposed wind farm have been assessed and are presented in the Natura Impact Statement (NIS). The NIS is a standalone document included in the planning application for the proposed wind farm. It concludes that the proposed wind farm will not adversely affect the integrity of any European site. The proposed wind farm is not considered to impact designated habitats and therefore is compliant with the Habitats Directive.

The Bathing Water Directive (BWD) (2006/7/EC) was adopted in 2006, and is the process used to measure/monitor water quality at identified bathing waters. There are no bathing waters within the proposed wind farm and GCR/substation study area.



5. CONCLUSIONS

The proposed wind farm and GCR/substation has been assessed against the objectives of the Water Action Plan 2024: Ireland's third River Basin Management Plan. The project's design, which incorporates a comprehensive surface water management system, aligns with the Plan's core aims to prevent water pollution and mitigate hydromorphological pressures. It is therefore concluded that the project will not cause deterioration in the status of any surface water or groundwater body assessed, will not jeopardise the achievement of Good surface water or groundwater status or ecological potential, and will not compromise the attainment of Good surface water or groundwater chemical or quantity status. Accordingly, the project will not undermine the implementation of the Plan's programme of measures or its environmental objectives for the Corrib Catchment.

Taking into consideration the likely effects of the proposed wind farm and GCR/substation on the biological, physico-chemical and hydromorphological quality elements, it is concluded that, following the implementation of design and mitigation measures, it will not compromise progress towards achieving GES/GEP or cause a deterioration of the overall status of the waterbodies that are in scope; it will not compromise the qualifying features of protected areas and is compliant with other relevant Directives. It can therefore be concluded that the proposed wind farm and GCR/substation is fully compliant with the requirements of the Water Framework Directive (2000/60/EC) as amended; and is consistent with other Community Environmental Legislation including the EIA Directive (2014/52/EU), the Habitats Directive (92/43/EEC) and the Birds Directive (2009/147/EC) and therefore does not require assessment under Article 4.7 of the WFD, as illustrated in Table 5-1.

Table 5-1: Compliance of the proposed wind farm with the environmental objectives of the WFD

Environmental Objective	Proposed wind farm	Compliance with the WFD Directive
No changes affecting high status sites.	There are no likely changes in relation to high status in the study area.	Yes
No changes that will cause failure to meet surface water good ecological status or potential or result in a deterioration of surface water ecological status or potential.	After consideration as part of the compliance assessment, the proposed wind farm will not cause deterioration or jeopardise the achievement of good status of the waterbodies during construction following the implementation of mitigation measures; during operation, no significant impacts are predicted.	Yes
No changes which will permanently prevent or compromise the Environmental Objectives being met in other waterbodies.	The proposed wind farm will not cause a permanent exclusion or compromise achieving the WFD objectives in any other bodies of water within the River Basin District.	Yes

Environmental Objective	Proposed wind farm	Compliance with the WFD Directive
No changes that will cause failure to meet good groundwater status or result in a deterioration groundwater status.	The proposed wind farm will not cause deterioration in the status of the groundwater bodies.	Yes

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7. GLOSSARY

Term	Definition
Artificial waterbody	A body of surface water created by human activity.
Aquifer	A subsurface layer or layers of rock or other geological strata of sufficient porosity and permeability to allow either a significant flow of groundwater or the abstraction of significant quantities of groundwater.
Coastal waterbody	Surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters.
Groundwater	All water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.
Groundwater body	A distinct volume of groundwater within an aquifer or aquifers.
Lake waterbody	A body of standing inland surface water.
Non-Temporary/Temporary	The requirement is to assess if the activities will have an effect that is non-temporary on the status of the waterbody. The terms are not currently defined within the guidance, however, for the purposes of this assessment 'temporary' is assumed to mean recovery should occur within the period of time the element in question is measured. For example, macro-invertebrates should be measured every 3 years. Therefore, temporary means less than three years for this element.
River basin	The area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta.
River Basin District	The area of land and sea, made up of one or more neighbouring river basins together with their associated groundwaters and coastal waters, which is identified under Article 3(1) of the Water Framework Directive as the main unit for management of river basins.
River Basin Management Plan	River Basin Management Plans describe the river basin district, and the pressures that the water environment faces. It shows what this means for the current state of the water environment in the river basin district, and what actions will be taken to address the pressures. It sets out what improvements are possible by 2015 and how the actions will make a difference to the local environment - the catchments, estuaries, the coast and groundwater.
River waterbody	A body of inland water flowing on the surface of the land but which may flow underground for part of its course.
Surface water	Inland waters, except groundwater; transitional waters and coastal waters,



	except in respect of chemical status for which it shall also include territorial waters.
Transitional waterbody	Bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are influenced by freshwater flows.

7.1 WFD NORMATIVE DEFINITIONS

The WFD provides normative definitions of ecological quality for the purposes of classification of overall ecological status. In surface waterbodies, these are as follows:

High status

There are no, or only very minor, anthropogenic alterations to the values of the physico-chemical and hydromorphological quality elements for the surface waterbody type from those normally associated with that type under undisturbed conditions.

The values of the biological quality elements for the surface waterbody reflect those normally associated with that type under undisturbed conditions, and show no, or only very minor, evidence of distortion.

These are type-specific conditions and communities.

Good status

The values of the biological quality elements for the surface waterbody show low levels of distortion resulting from human activity but deviate only slightly from those normally associated with the surface waterbody type under undisturbed conditions.

Moderate status

The values of the biological quality elements for the surface waterbody type deviate moderately from those normally associated with the surface waterbody type under undisturbed conditions. The values show moderate signs of distortion resulting from human activity and are significantly more disturbed than under conditions of good status.

Poor status

Waters show evidence of major alterations to the values of the biological quality elements for the surface waterbody type and the relevant biological communities deviate from those normally associated with the surface waterbody type under undisturbed conditions.

Bad status

Waters show evidence of severe alterations to the values of the biological quality elements for the surface waterbody type and large portions of the relevant biological communities normally associated with the surface waterbody type under undisturbed conditions are absent.

