TOBIN

Lissinagroagh Wind Farm Water Framework Directive Assessment Report

BUILT ON KNOWLEDGE

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1. INTRODUCTION

TOBIN Consulting Engineers were requested to complete a Water Framework Directive (WFD) Compliance Assessment for a Proposed Lissinagroagh Wind Farm Development between Manorhamilton and Kiltyclogher in Co. Leitrim

The purpose of this WFD Compliance Assessment is to determine if any specific components or activities associated with the proposed development 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 water bodies with the potential to be impacted, describe the mitigation measures and determine if the proposed development is in compliance with the objectives of the WFD.

The proposed wind farm site lies along the boundary between the Sligo Bay (35) WFD Catchment and the Erne (36) WFD Catchment. Within these, the site spans the WFD sub-catchments of Drowes_SC_010, Bonet_SC_010, and MacneanLoughsconnector_SC_010. The proposed GCR is located in the catchment of Sligo Bay and intercepts the sub catchments of Bonet_SC_020 and Owenmore [Sligo]_SC_030. The proposed TDR accommodations are located in the catchments of Donegal Bay North, Erne and Sligo Bay catchments. The TDR has been screened out from further assessment due to the limited scale and nature of the proposed accommodations. The route involves minor accommodations limited to localised pavement strengthening, temporary removal of signage, and minor junction modifications necessary to facilitate turbine component delivery. These accommodations will be confined to existing public road infrastructure and will not entail any in-stream works, drainage alterations, no physical modification to hydromorphological features, no change in surface water hydrology or connectivity, and no potential for direct or indirect impacts on WFD water bodies. The delivery route is therefore screened out from further WFD assessment.

In total, the proposed development area of 389 hectares (ha) extends across seven WFD river subbasins. These include Owenmore (Manorhamilton)_020, which occupies a substantial portion of the central and northern areas of the site; Lattone_010 to the northeast; and a small section of Rosfriar_010 also in the northeast. Additional subbasins include Ballagh_010 to the north, Brackary_010 to the west, and both Owenmore (Manorhamilton)_010 and Cornavannoge_010 located to the southeast of the proposed wind farm site.

1.1 BACKGROUND

The European Union (EU) Water Framework Directive (2000/60/EC) was adopted in 2000 to establish a comprehensive framework for protecting and sustainably managing all water bodies — including rivers, lakes, transitional waters (estuaries), coastal waters, heavily modified water bodies (HMWBs) and groundwater.

In Ireland, the Directive was transposed into national law through the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003), as amended. Implementation is affected via six-year planning cycles of River Basin Management Plans (RBMPs) which include assessment of water bodies, implementation of a programme of measures, and review.

Implementation takes place through six-year cycle River Basin Management Plans (RBMPs) which include identifying river basin districts (RBDs) and individual water bodies, designating protected areas, assessing pressures and risks, monitoring water quality and ecological status, setting environmental objectives, and establishing programmes of measures.

The first Irish cycle spanned approximately 2009–2015, the second 2016–2021, and the third cycle for 2022–2027 is set out in the Water Action Plan 2024: A River Basin Management Plan for Ireland (published in September 2024). According to the plan's status-reporting, of the 4,842 nationally defined water bodies, 41 % (1,963) are classified as "Not at Risk" of missing objectives, 34 % (1,649) are "At Risk" and 25 % (1,230) are "In Review". The indicators show that only around 54 % of water bodies have achieved their environmental objectives to date and thus the majority remain to be restored or protected. Key pressures include diffuse nutrient losses (nitrogen and phosphorus) from agriculture, discharges of inadequately treated wastewater, and hydromorphological changes such as drainage, channelisation and barriers to connectivity in rivers.

Given this context, for any new development it is imperative to demonstrate that the ecological and chemical status of the affected water body and any hydraulically connected water bodies will not deteriorate, that the achievement of Good Ecological Status (or Good Ecological Potential for modified waters) will not be impeded, that the statutory objectives set for the water body under the relevant RBMP will not be compromised, and that other water bodies within the catchment are not permanently excluded or undermined from reaching their objectives.

This report provides a WFD Compliance Assessment for the proposed development i.e., Lissinagroagh Wind Farm. The assessment provided in this report forms an integral part of the Environmental Impact Assessment Report (EIAR) and must be read alongside the Chapter 8: Hydrology and Hydrogeology to ensure compliance with the WFD obligations.

1.1.1 Assessment Methods

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

Currently, there is no formal WFD assessment guidance specific to freshwater environments in Ireland. However, guidance published by the Northern Ireland Environment Agency (2012) for Environmental Impact Assessment (EIA) developments has been widely referenced. This guidance also forms the basis of the UK Planning Inspectorate's Advisory Note 18: 'Water Framework Directive' (PINS, 2017), which outlines a staged approach to WFD assessments. Although originating from different jurisdictions, the methodologies presented are broadly consistent and have informed the approach adopted in this assessment.

The WFD assessment follows four key stages:

- Screening: Identify and record the current status, future objectives and any relevant activities that may influence the waterbodies in the locality of the proposed development.

- 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 and confidence inthe 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.

Where an activity is found to conflict with WFD objectives, but could achieve compliance through appropriate mitigation, such measures will be proposed.

A 2 km buffer zone was applied for assessing protected areas. A 2 km radius was assigned as suggested in Hydrogeology Chapters of Environmental Impact Statements' (IGI 2013).

For clarity and brevity purposes, the 2km buffer and the full list of identified protected sites (including those which are considered coastal water specific) are maintained for all assessments.

1.1.2 Assessment Criteria

This assessment needs to evaluate where activities may influence WFD waterbodies. Evaluation was made against those quality elements that make up the classification of ecological status. Table 1.1 illustrates the description of elements for the classification of Ecological Status that are recorded for waterbodies intersected by the proposed development. 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 development.

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

WFD Element	Description of elements for the classification of Ecological Status
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, greater than three years for biological status, Hydrology and Morphology and 12 months for Chemical status.

To inform this assessment the following datasets owned by the EPA (available at https://gis.epa.ie/EPAMaps/Water) and accessed in December 2025 ,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 2019-2024

2. STAGE 2 SCREENING AND SCOPING

On a national stage, the Environmental Protection Agency (EPA, 2022) has published the Water Quality in Ireland Report 2019-2024 which provides the latest assessment of the quality of Ireland's rivers, lakes, estuaries, coastal and groundwaters. Water quality nationally has declined. The water quality data within the application area has shown consistency. However, the overall status of surface water/rivers in the vicinity of the proposed development is 'Good' Status. The EPA describes the groundwater at the proposed development as 'Good'.

The proposed wind farm site is located on a catchment boundary between the sub-catchment of Bonet_SC_010 (35_8) which covers the majority of the proposed wind farm site and Drowes_SC_010 (36_20) to the north. Sub-catchment 36_24 (MacneanLoughsconnector_SC_010) exists to the east of the proposed windfarm site boundary. The regional natural surface water drainage pattern, in the environs of the proposed project is outlined in Figure 2.

The Sligo Bay Catchment (35)[1] is divided into 13 sub-catchments and has 100 surface water bodies and 43 groundwater bodies. In the Sligo Bay Catchment, a total of 60% of surface waterbodies were at Good or High Ecological Status in the 2016-2021 monitoring period. One hundred percent of groundwater bodies were at 'Good' status. There are 14 waterbodies with a High Ecological Status Objective (HSO) in the Sligo Bay Catchment, with eight currently not meeting their environmental objective of 'High'.

The Erne Catchment (36) is divided into 28 sub-catchments and has 259 surface water bodies and 66 groundwater bodies. A total of 32% of surface waterbodies were at Good or High Ecological Status in the 2016-2021 monitoring period. Ninety-four percent of groundwater bodies were at 'Good' status. There are seven waterbodies with a HSO in the Erne Catchment, with four currently not meeting their environmental objective of 'High'.

The River Catchment Delineation is included below in Figure 1.

[1] Catchment 35 is interchangeably named "Sligo Bay" or "Sligo Bay & Drowse" on the EPA Map Viewer (gis.epa.ie), but both designations refer to the identical Hydrometric Area 35 as defined in EPA catchment assessments.

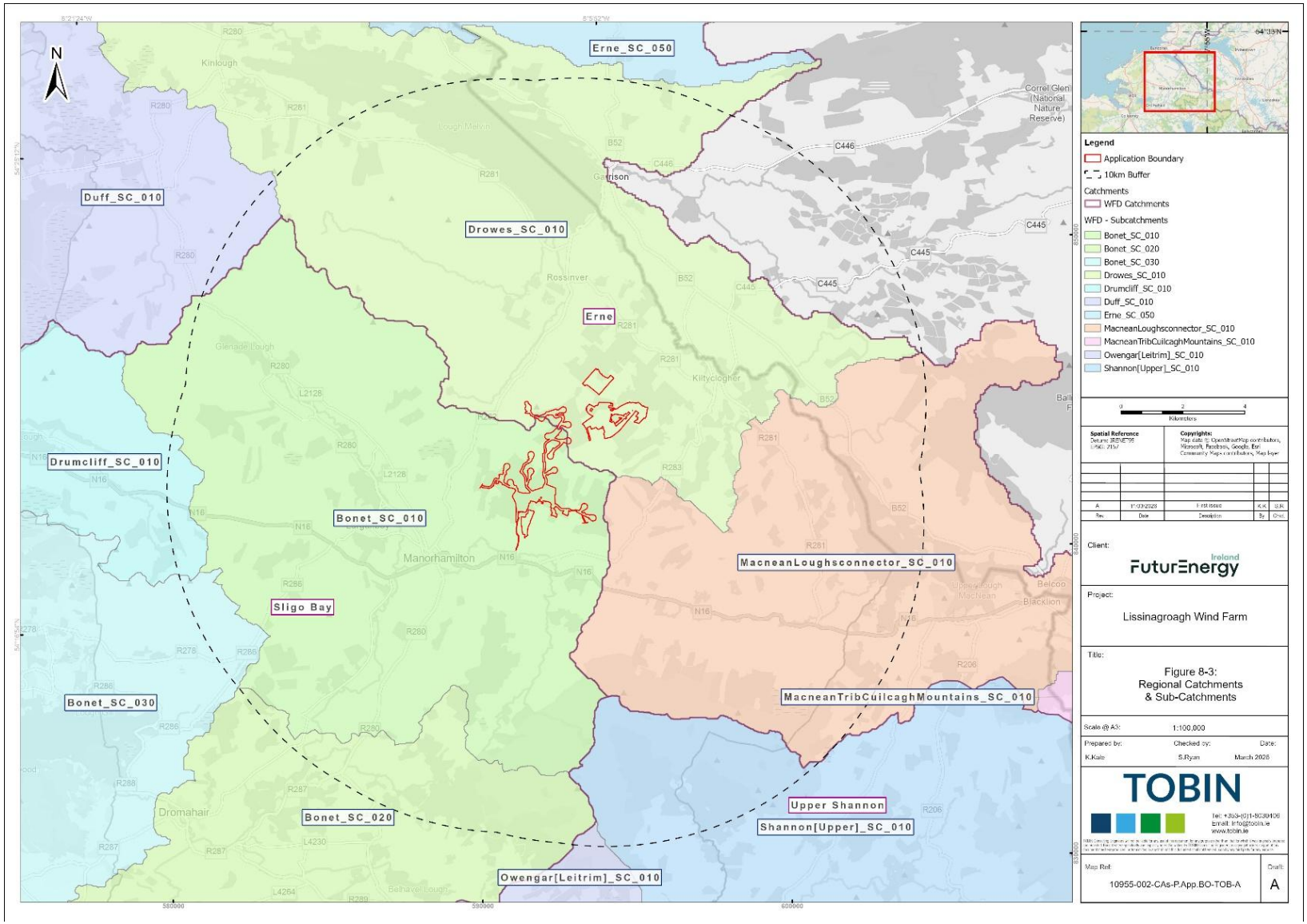

Figure 2-1 - River Catchment Delineation

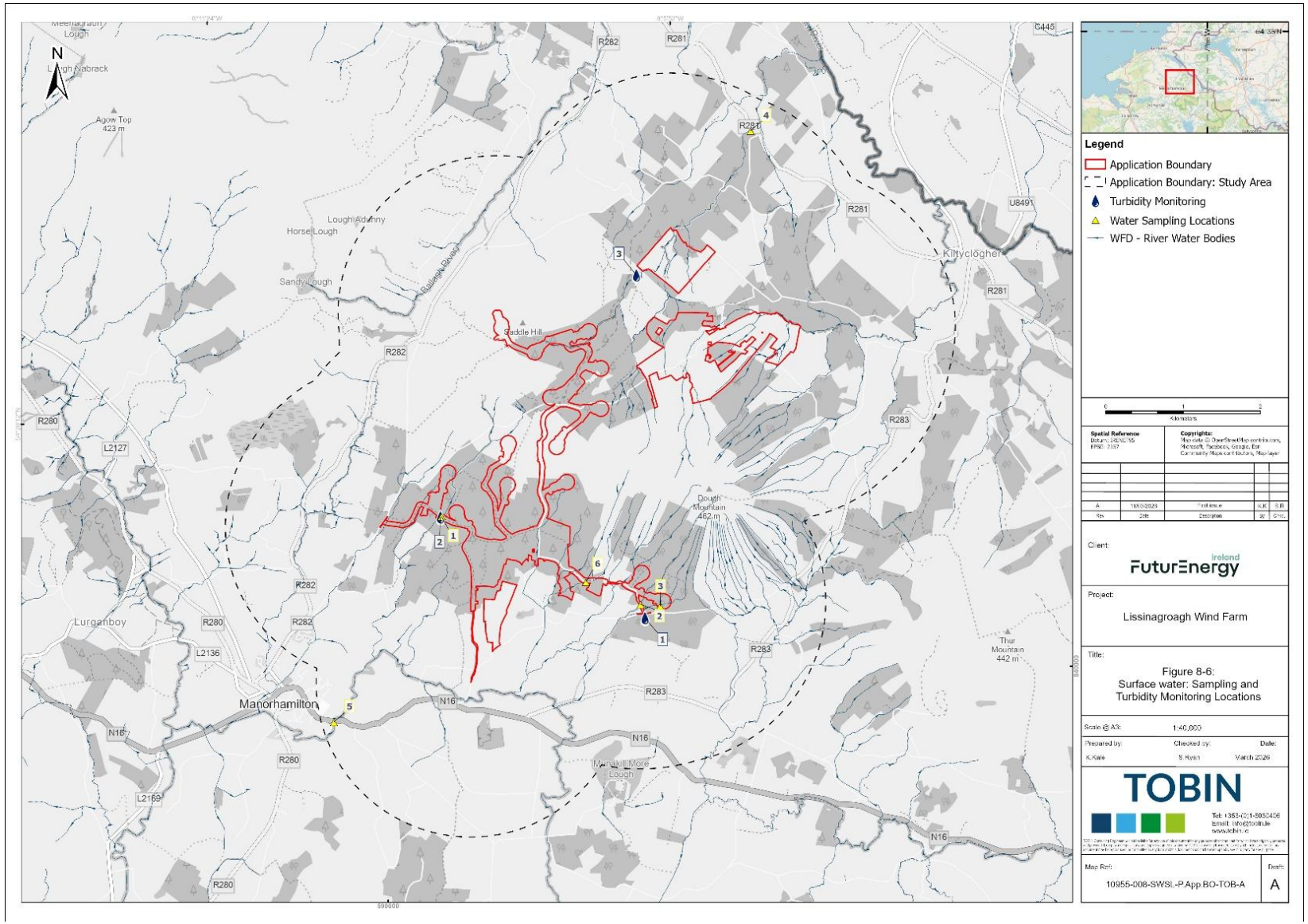

Figure 2-2 - Regional natural surface water drainage pattern, in the environs of the proposed project

2.1.1 Surface Water Bodies

The proposed wind farm site is located on the boundary of the Sligo Bay & Drowse (ID: 35) WFD Catchment and the Erne (ID: 36) WFD Catchment. Furthermore, the proposed wind farm site is subdivided between the WFD sub catchment of Drowes_SC_010, Bonet_SC_010 and MacneanLoughsconnector_SC_010.

The Sligo Bay Catchment includes streams entering tidal water in Sligo Bay and between Lenadoon Point and Aughrus Point, Co. Donegal.

The proposed wind farm site is subdivided between seven WFD River subbasins. These include the Owenmore(Manorhamilton)_020, which takes up a significant proportion in the central region and to the north of the proposed wind farm site, the Lattone_010, to the north east, with a small segment of Rosfriar_010 also located to the north east of the proposed wind farm site , the Ballagh_010 to the north, the Brackary_010 to the west, with the Owenmore (Manorhamilton)_010 and the Cornavannoge_010 located to the south east of the proposed wind farm site.

The proposed TDR accommodations are located in the catchments of Donegal Bay North, Erne and Sligo Bay catchments. The proposed GCR is located in the catchment of Sligo Bay and intercepts the sub catchments of Bonet_SC_020 and Owenmore [Sligo]_SC_030. The proposed GCR and TDR are located within several river basins as detailed in Table 3. No instream works are proposed on the GCR or TDR.

Table 2-1: Water Body Status (https://www.catchment.ie) within 2km of the proposed wind farm site

Waterbody Code	Name	Status 2013-2018	Status 2016-2021	Current Status / Risk 2019-2024
IE_NW_36C040400	Cornavannoge_010	Good	High	Good/Not at Risk
IE_NW_35R320460	Rosfriar_010	Good	Good	Good/Review
IE_WE_35O080400	Manorhamilton_020 Owenmore	Good	Good	Good/Not at Risk
IE_WE_35O080220	Manorhamilton_010 Owenmore	Good	Good	Good/Not at Risk
IE_NW_35B010400	Ballagh_010	Good	Good	Good/Review
IE_WE_35B100500	Brackery_010	Moderate	Good	Good / Not at Risk
IE_NW_35L660960	Lattone_010	Good	Good	Good/Review

The Environmental Protection Agency (EPA) has been conducting biological water quality monitoring on Irish rivers and streams since the 1970s. To evaluate historical and current water quality in watercourses hydrologically connected to the proposed development, relevant EPA datasets were reviewed. In accordance with the Water Framework Directive (WFD), water bodies are classified as having Bad, Poor, Moderate, Good, or High status, based on assessments of biological communities, chemical quality, hydromorphological characteristics, and flow regime. Biological status is determined using the Q-value index, which rates water quality from

Q1 (Poor) to Q5 (High) based on the composition of macroinvertebrate communities. The most recent national assessment is presented in the EPA's Water Quality in Ireland 2025 report.

Table 2-2: Catchments, Sub-Catchments & Waterbodies - Proposed TDR and GCR

Catchment (Catchment ID)	WFD Sub-catchment (Sub-catchment ID)	River Network EPA Name (Segment Code)	River Waterbody WFD Status 2019-2024 (River Name & Code)	River Waterbody WFD Risk 2019-2024	Project Area
Donegal Bay North (37)	Stragar_SC_010 (37_3)	Oily_020 (37-1273)	Moderate Oily_020 IE_NW_37O010200	At Risk	TDR
Sligo Bay (35)	Bonet_SC_030 (35_10)	Garavogue_010 (35_3792)	Poor Garavogue_010 (IE_WE_35G010200)	At Risk	GCR
Sligo Bay (35)	Bonet_SC_030 (35_10)	Willsborough Stream_010 (35_3278)	Moderate Willsborough Stream_010 (IE_WE_35W010300)	At Risk	TDR
Sligo Bay (35)	Bonet_SC_010 (35_8)	Owenmore Manorhamilton_020 (35_978)	Good Owenmore Manorhamilton_020 (IE_WE_35O080400)	Not at Risk	GCR
Sligo Bay (35)	Bonet_SC_020 (35_6)	Bonet_050	Good Bonet_050 IE_WE_35B060630	Review	GCR
Erne (36)	Erne_SC_050 (36_27)	Abbey_010	Good Abbey_010 IE_WE_35A010300	Review	TDR

In the vicinity of the proposed wind farm site, the nearest EPA biological monitoring station is located at a bridge near Black Park House on the Owenmore River, downstream of the site, as illustrated in Figure 2-4. Relevant Q-values for hydrologically connected watercourses are provided in Table 2-3. The most recent monitoring within the Bonet sub-catchment was undertaken in 2021, while the last recorded survey in the Lattone sub-catchment dates to 1990.

Table 2-3 Q-Values at various EPA monitoring stations

Monitoring Station Details					
WFD Sub-catchments	Bonet_SC_010				Drowes_SC_010
WFD River Sub Basin	Brackary_010	Owenmore (Manorhamilton)_010	Owenmore (Manorhamilton)_020		Ballagh_010
Station Name	Bridge u/s Owenmore River –D/S of PWF	Br near Black Park-House- U/S of PWF	Bridge W. of Leminea D/S of PWF	Curley Bridge D/S of PWF	Bridge W. of Tullyskerherny D/S of PWF
Station Code	RS35B100500	RS35O080220	RS35O080260	RS35O080300	RS35B010200
Date	Q-Value				
1990	3-4	ND[2]	4-5	5	5
1994	3-4	4	ND	ND	ND
1997	3	ND	ND	ND	ND
2000	4	4-5	ND	ND	ND
2003	4	4	ND	ND	ND
2006	4	4-5	ND	ND	ND
2009	4	4	ND	ND	ND
2012	4	4	ND	ND	ND
2015	4	4	ND	ND	ND
2018	3-4	4	ND	ND	ND
2021	4	4	ND	ND	ND

Based on the results recorded at the EPA water monitoring stations, the overall quality in the area surrounding the proposed wind farm site, has been of 'moderate' to 'good' status, with occasions of 'high' status. However, as outlined in Table 2-3, regular monitoring did not occur in the Owenmore (Manorhamilton)_020 or Ballagh_010 WFD River SubBasin, with monitoring ceasing in 1990.

[2] ND = No data

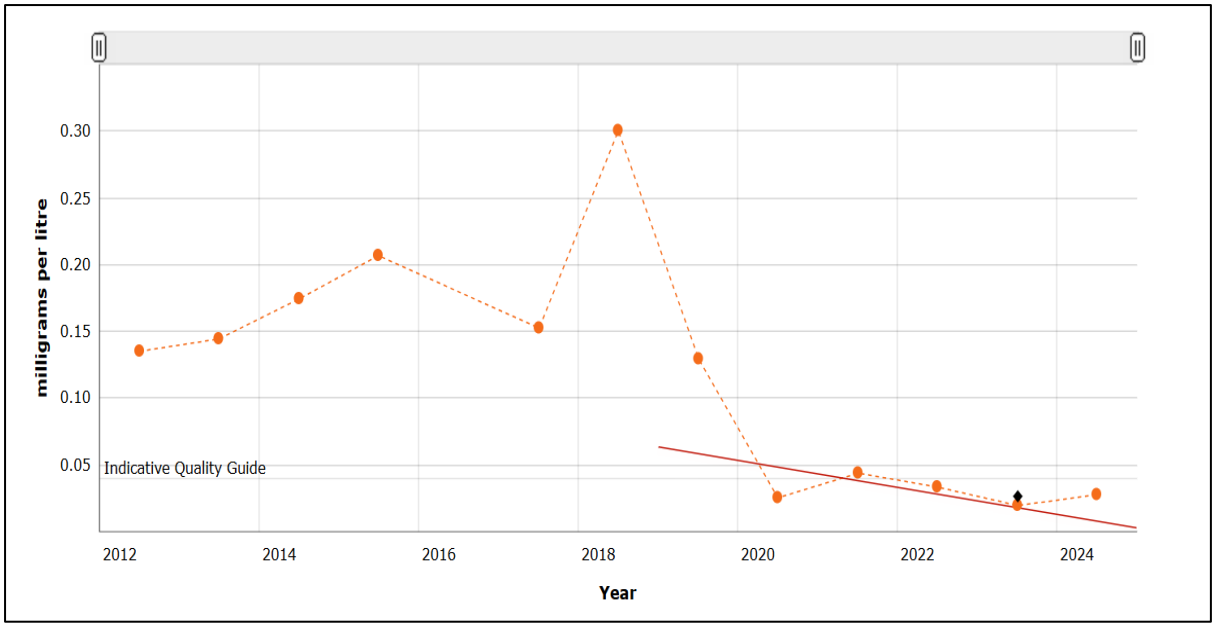

Figure 2-3- Ammonium Concentrations Bridge u/s Bonet River confluence

Summary data for ammonium at the EPA monitoring station RS35O080400 (Bridge u/s Bonet River confluence) is included below in Table 4. Based on a Mann-Kendell[3] statistical analysis, several trends are noted in the data from 2012 to 2024. Ammonium concentrations in the river show an initial increase from 2012 to a peak around 2018, followed by a strong and sustained decline towards 2024. Over the first half of the record, values rise from roughly 0.14 to just above 0.30 milligrams per litre, indicating a deterioration in water quality. After 2018, concentrations drop sharply and continue to decrease year on year, with recent measurements falling close to or below the indicative quality guide, suggesting a marked improvement in water quality. Monitoring station RS35O080400 is located 2.2 km from the study area boundary on the Owenmore (Manorhamilton)_020 river, approximately 600 m prior to the confluence with the Bonet_030 river.

[3] The Mann Kendall Trend Test is a non-parametric test used to analyse data collected over time for consistently increasing or decreasing trends.

Table 2-4: Annual Average Ammonium - RS35O080400 (Bridge u/s Bonet River confluence)

Bridge u/s Bonet River confluence		*Total Results*
Year	Average Ammonium Concentration (mg/l)	
2012	0.136	13
2013	0.145	13
2014	0.175	12
2015	0.207	12
2017	0.153	11
2018	0.300	12
2019	0.129	11
2020	0.026	11
2021	0.044	12
2022	0.034	12
2023	0.020	10
2024	0.028	14

The Bonet sub-catchment (35-8) is dominated by agriculture. Agriculture is the top significant pressure impacting 49% of the 37 At Risk waterbodies within the Sligo Bay & Drowes Catchment, followed by 19% impacted by forestry and 16% by hydromorphological pressures. The WFD classified the surface waters as not at risk of not achieving good status by 2027 (www.epa.ie). Where waterbodies have been classed as 'At Risk', significant pressures have been identified.

A summary of the catchment is included in Table 2-5 WFD Catchment and Sub-basin SummaryTable 2-5. The regional natural surface water drainage pattern, in the environs of the proposed wind farm site, is outlined in Figure 4.

Table 2-5 WFD Catchment and Sub-basin Summary for the proposed wind farm site and GCR

Catchment (Catchment ID)	WFD Sub-catchment (Sub catchment ID)	River Network EPA Name (Segment Code)	River Waterbody WFD Status 2019-2024 (River Name & Code)	River Waterbody WFD Risk 2019-2024
Sligo Bay & Drowse (35)	Bonnet_SC_010 (35_8)	Skreeny (35_1147)	Good Owenmore (Manorhamilton)_020 (IE_WE_35O080400)	Not at risk
		Skreeny (35_1148)		
		Skreeny (35_4030)		
		Null (35_1146)		
		Null (35_2951)		
		Saddle_Hill (35_2785)		
		Tawnyfeacle (35_3306)		
		Null (35_2909)		
		Null (35_4070)		
		Null (35_3973)		
		Null (35_4086)		
		Mt_Dough (35_3841)		
		Mt Dough (35_3971)		
		Null (35_3726)		
		Null (35_3727)		
		Null (35_3907)		
		Null (35_4059)		
		Null (35_4204)		
		Null (35_565)		
		Null (35_4003)		
		Moneenshinnagh35 (35_2814)		
		Moneenshinnagh35 (35_2999)		
		Moneenshinnagh35 (35_4204)		
		Moneenshinnagh35 (35_3834)		

Catchment (Catchment ID)	WFD Sub-catchment (Sub catchment ID)	River Network EPA Name (Segment Code)	River Waterbody WFD Status 2019-2024 (River Name & Code)	River Waterbody WFD Risk 2019-2024
		Null (35_2998)		
		Lissinagroagh 35 (35_4210)		
		Lissinagroagh 35 (35_219)		
		Tawnylust(35_518)		
		Null (35_4203)		
		Curraghfore (35_3220)	Good Brackary_010 (IE_WE_35B100500)	Not at risk
		Curraghfore (35_3221)		
		Faughary (35_3219)		
		Moneenshinnagh 35 (35_4208)	Good Owenmore (Manorhamilton)_010 (IE_WE_35O080220)	Not at risk
		Owenmore (35_965)		
		Loughaphonta 35 (35_4207)		
		Loughaphonta 35 (35_279)		
Erne (36)	Drowes_SC_010 (36_20)	Lisdarush (36_7150)		Under Review[4]
		Lisdarush (36_7062)		
		Null (36_7063)		

- [4] Water bodies in Review have insufficient information to determine the risk or have had measures implemented but some additional monitoring is required to confirm that the expected improvements have been achieved.

Catchment (Catchment ID)	WFD Sub-catchment (Sub catchment ID)	River Network EPA Name (Segment Code)	River Waterbody WFD Status 2019-2024 (River Name & Code)	River Waterbody WFD Risk 2019-2024
		Lattone_35 (36_7118)	Good Lattone_010 IE_NW_35L660960	
		Null (36_7264)		
		Null (36_7107)		
		Null (36_6843)		
		Null (36_6778)		
		Null (36_6507)		
		Null (36_6508)		
		Lattone 35 (36_6842)		
		Null (36_6596)		
		Null (36_7264)		
		Ballagh 35 (36_6370)	Good Ballagh_010 IE_NW_35B010400	Under Review
		Ballagh 35 (36_6369)		
		Ballagh 35 (36_6369)		
		Shasmore (36_6368)		
		Rosfriar (36_6811)	Good Rosfriar_010 IE_NW_35R320460	Under Review
Erne (36)	MacneanLoughsconnector_SC_010 36_24	Tawnylust _Barr (36_1756)	High Cornavannoge_010 IE_NW_36C040400	Not at Risk
		Tawnylust _Barr (36_871)		
		Tawnylust _Barr (36_552)		
		Tawnylust Barr Upper (36_2050)		
		Cornavannoge (36_2159)		
		Cornavannoge (36_2107)		
		Cornavannoge (36_2108)		
		Cornavannoge (36_2051)		

Catchment (Catchment ID)	WFD Sub-catchment (Sub catchment ID)	River Network EPA Name (Segment Code)	River Waterbody WFD Status 2019-2024 (River Name & Code)	River Waterbody WFD Risk 2019-2024
		Cornavannoge (36_2551)		
		Cornavannoge (36_2552)		
		Cornavannoge (36_1173)		
		Cornavannoge (36_1726)		
		Cornavannoge (36_1721)		
		Tawnyunshinagh (36_2188)		
		Tawnyunshinagh (36_2393)		
		Tawnyunshinagh (36_2338)		
		Tawnyunshinagh (36_873)		
		Tawnyunshinagh (36_875)		
		Tawnyunshinagh (36_335)		
		Lissinagroagh 36 (36_868)		
		Lissinagroagh 36 (36_869)		
		Blackmountain (36_2109)		
		Lughawnagh (36_2553)		
		Lissinagroagh 36 (36_870)		
		Mullaun 36 (36_2019)		

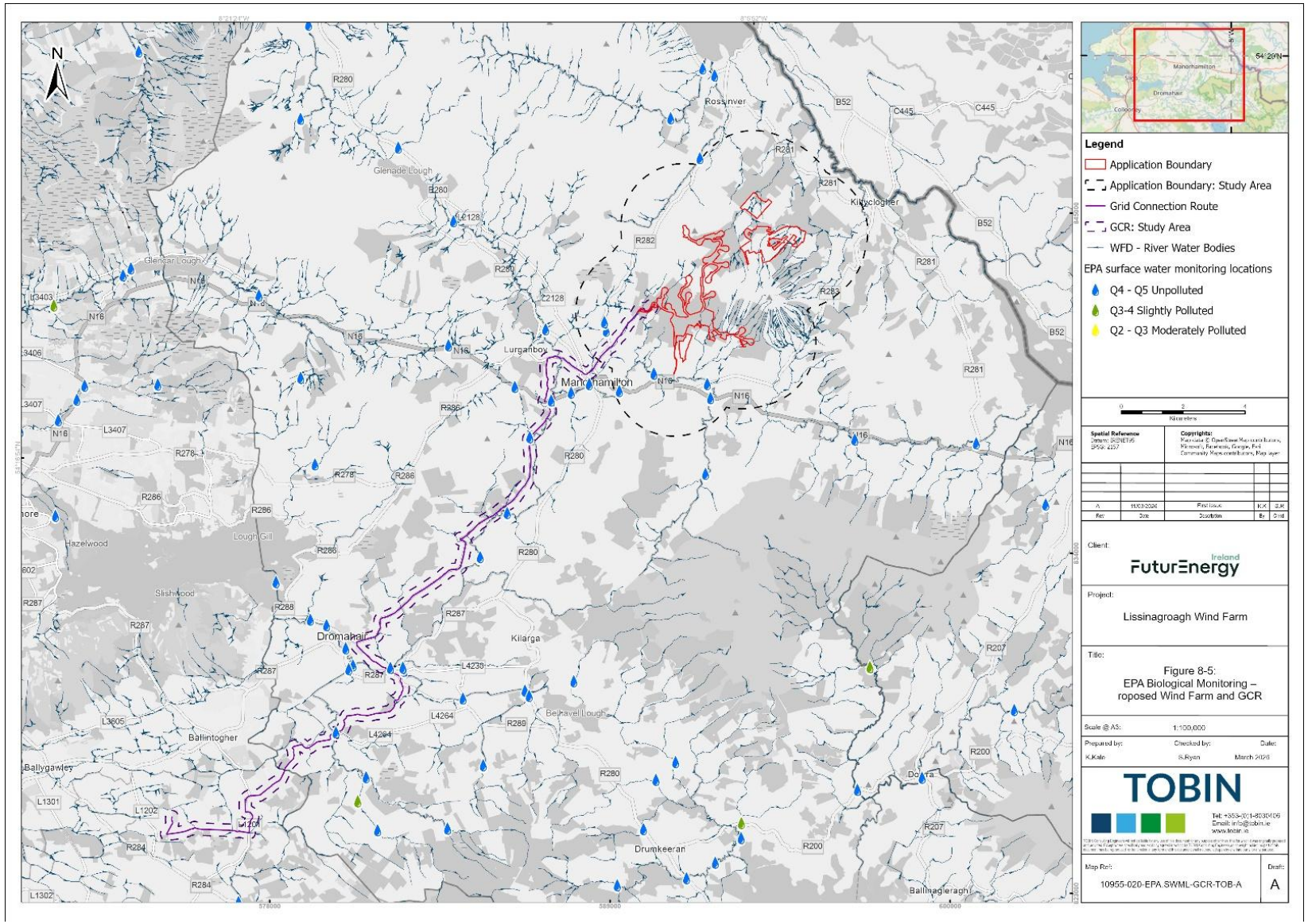

Figure 2-4 - Regional surface water features and EPA monitoring locations at the proposed wind farm and GCR

2.1.1.1 River Catchment

Sligo Bay & Drowes Catchment (35)

The Sligo Bay & Drowes Catchment includes streams entering tidal water in Sligo Bay and between Lenadoon Point and Aughrus Point, Co. Donegal. The catchment area is 1,866km². The largest urban centre is Sligo. The other main urban centres are Ballymote, Collooney, Ballysadare and Manorhamilton. The Sligo Bay & Drowes Catchment is divided into 13 sub-catchments and has 100 surface water bodies and 43 groundwater bodies.

Bonet_SC_010

Bonet_SC_010 is a Water Framework Directive River sub-catchment within the Sligo Bay & Drowse catchment (Hydrometric Area 35), encompassing the upper and middle reaches of the River Bonet and associated tributaries in Co. Leitrim. The sub-catchment feeds downstream water bodies, including Glencar Lough and ultimately Sligo Bay, and contains EPA river and lake monitoring stations that track ecological status, nutrients and hydromorphological pressures.

The Brackary_010 and Owenmore (Manorhamilton)_020 and their tributaries drain the southern and western section of the proposed wind farm site. T2, T6- T14 are located in the Owenmore (Manorhamilton)_020 river basin with the western site entrance located in the Brackary_010. The Brackary_010 and Owenmore (Manorhamilton)_020 flow to the southwest, before joining Lough Gill located approximately 13 km downstream of the proposed wind farm site.

The Cornavannoge_010 and its tributaries are located to the east and southeast of the wind farm boundary, flowing in a southeast direction, eventually draining into Lough Macnean Upper. The Owenmore (Manorhamilton)_010 drains a small portion of the south of the site, flowing in a southerly direction, before ultimately flowing into Munakill More Lough.

Erne Catchment (36)

The Erne Catchment includes the area drained by the River Erne and all streams entering tidal water between Aughrus Point and Kildoney Point, Co. Donegal. This is a cross-border catchment with a surface area of 4,415km², 2,512km² of which is located within the Republic of Ireland. The largest urban centre is Cavan Town. The other main urban centres are Bundoran, Ballyshannon, Clones, Ballybay, Cootehill and Belturbet. The Erne Catchment is divided into 28 sub-catchments and has 259 surface water bodies and 66 groundwater bodies.

Drowes_SC_010

Drowes_SC_010 is a Water Framework Directive River sub-catchment within the Erne catchment, covering the River Drowes and its main tributaries draining to Lough Melvin on the Leitrim–Fermanagh border, extending into Northern Ireland. The Drowes_010 river water body forms the principal channel in this sub-catchment, flowing into Lough Melvin and providing the main hydrological link between upland headwaters and the lake, which is designated for its high-status salmonid and other aquatic interests. Land use in the sub-catchment is

predominantly pasture and commercial forestry with areas of peatland, and catchment characterisation has identified pressures from forestry operations, agriculture and localised hydromorphological alterations that can affect sediment and nutrient inputs to Lough Melvin and downstream waters.

The northern and northwest section of the proposed wind farm are located in the Ballagh_010 and Lattone_010 rivers and their tributaries. T3 is located in the Ballagh river basin with T1, T4 and T5 located in the Lattone river basin. The Ballagh, drains to the northeast and into Lough Melvin, located approximately 5.2 km downstream of the proposed wind farm site. The Lattone_010 flows to the northeast and north of the proposed wind farm to the County River (Carran West) and Lough Melvin. T2 is located between the Owenmore (Manorhamilton)_020 and the Lattone_010 river basin. The northeast section of the proposed wind farm is located in the Rosfriar river sub basin.

MacneanLoughsconnector_SC_010

MacneanLoughsconnector_SC_010 is a Water Framework Directive River sub-catchment within the Erne catchment that hydrologically links the Upper and Lower Lough Macnean system to downstream Erne waters. The sub-catchment is characterised by predominantly wet and peaty soils.

There is no proposed infrastructure in the MacneanLoughsconnector_SC_010 sub-catchment.

Table 6 below illustrates the designated sites in proximity to the proposed development. It further describes whether the designated site is hydrologically connected to the proposed development. Refer to Chapter 06 Biodiversity of this EIAR and the Natura Impact Statement (NIS) submitted with the planning application package for further details on these sites.

Table 2-6 Designated Sites within the Proposed Wind Farm Study Area

Site ID	Site Classification	Site Code	Proximity to the proposed wind farm turbine footprint	Hydrological Connection to the proposed wind farm site
Lough Gill SAC	SAC	IE001976	1.8 km	Hydrologically connected to the proposed wind farm site via the Owenmore (Manorhamilton)_020 and Brackary_010 rivers and associated tributaries.
Lough Melvin	SAC	IE00428	2.2 km	Hydrologically connected via the Lattone_010 River and the Ballagh_010 and associated tributaries.
Dough/Thur Mountains	NHA	IE002384	0.1 km	This site is designated for peatlands and overlaps with the proposed windfarm site within the mid-eastern sections. Hydrologically connected via the Lattone_010, the Rosfriar_010, the Owenmore (Manorhamilton)_020. The site is downstream of the NHA.

Site ID	Site Classification	Site Code	Proximity to the proposed wind farm turbine footprint	Hydrological Connection to the proposed wind farm site
Lough Melvin	pNHA	IE000428	2.2 km	Hydrologically connected via the Lattone_010 River and the Ballagh_010 and associated tributaries.
Arroo Mountain	SAC	IE001403	1.6 km	Not hydrologically connected to the proposed development.

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[5]. The GWB is defined as a distinct volume of groundwater, including recharge and discharge areas with little flow across the boundaries. The proposed wind farm site and associated study area are situated between seven WFD groundwater bodies (Table 7): the Glenaniff (IE_NW_G_043) to the northwest, the Kilcoo (IEGBNI_NW_G_017) to the north, the Kiltyclogher (IE_NW_G_074) to the northeast, the Killarga South (IE_WE_G_0056) extending across the central and eastern portions of the site, and the Killarga (IE_WE_G_0055), Dromahair (IE_WE_G_0054), and Glencar (IE_WE_G_0060) to the southwest.

Hydrogeological Characteristics of Each Groundwater Body

Glenaniff GWB (IE_NW_G_043):

No abstraction or discharge data is available. This groundwater body consists of a highly karstified aquifer, typically characterised by highly variable transmissivity, borehole yields, and spring outputs. A strong interconnection exists between groundwater and surface water, as evidenced by swallow holes and caves near low-permeability rock boundaries. Features such as dolines, caves, turloughs, springs, and 'losing' or 'gaining' streams facilitate direct exchange between surface and groundwater. Consequently, water quality in both systems is often similar, and any contamination can be rapidly transmitted.

Kiltyclogher GWB (IE_NW_G_074):

Comprised mainly of low-transmissivity rocks, typically <20 m²/d and possibly <10 m²/d in shale-dominated areas. Sandstone (Lm aquifer) units have higher fissure permeability, with transmissivity values ranging from 10–50 m²/d. Groundwater discharges locally to streams, rivers, small springs, and seeps. Due to the generally poor aquifer productivity, significant groundwater–surface water interactions are unlikely, and baseflow contributions to streams are expected to be low, except locally in Lm aquifers.

Killarga and Killarga South GWBs (IE_WE_G_0055 & IE_WE_G_0056):

[55]https://www.gsi.ie/en-ie/programmes-and-projects/groundwater/activities/understanding-ireland-groundwater/Pages/Groundwater-bodies.aspx

These karstified aquifers exhibit high transmissivity (up to ~2000 m²/d) and low storativity. Groundwater movement occurs along fissures, faults, joints, and bedding planes, which are widened by karstification, substantially increasing permeability. A high degree of interconnection exists between surface and groundwater, reflected by the presence of karst features. Due to relatively low-permeability subsoils, stream density is high, and any surface water contamination can be rapidly transmitted into the groundwater system, and vice versa.

Glencar GWB (IE_WE_G_0060):

This groundwater body exhibits extensive karstification, with transmissivity values ranging from 1 to over 2000 m²/d and low storativity (approximately 0.01–0.02). As in other karstified systems, there is a strong interaction between surface and groundwater. High stream density results from low-permeability subsoils, and contaminants can migrate rapidly between surface and subsurface systems.

Dromahair GWB (IE_WE_G_0054):

A poorly productive aquifer with transmissivity values typically between 0.1–10 m²/d, potentially higher near faults. Storativity is low (<0.5%). Groundwater discharges locally to streams, rivers, small springs, and seeps. Due to low aquifer productivity, significant groundwater–surface water interactions are not expected, and baseflow contributions are likely minimal.

Kilcoo GWB (IEGBNI_NW_G_017):

No abstraction or discharge data are available. The aquifer is highly karstified, displaying significant variability in transmissivity, borehole yields, and spring outputs. Spring yields may be substantial, and recharge occurs rapidly, often through conduit flow at very high velocities (hundreds of metres per hour). Storativity is correspondingly low. The average recharge for the Kilcoo GWB is estimated at approximately 268 mm/year.

Table 2-7 Summary of groundwater bodies

EU_CD Code	Name	GWB status (2013-2018)	GWB status (2016-2021)	GWB status (2019-2024)	WFD Risk Status
IE_NW_G_043	Glenaniff	Good	Good	Good	Not at Risk
IEGBNI_NW_G_017	Kilcoo	Good	Good	Good	Not at Risk
IE_NW_G_074	Kiltyclogher	Good	Good	Good	Not at Risk
IE_G_0056	Killarga South	Good	Good	Good	Not at Risk
IE_WE_G_0055	Killarga	Good	Good	Good	Not at Risk
IE_WE_G_0060	Glencar	Good	Good	Good	Not at Risk
IE_WE_G_0054	Dromahair	Good	Good	Good	Not at Risk

Groundwater is often used as a source of drinking water supply. No registered groundwater abstraction exists within the study area for the proposed wind farm development. The nearest

groundwater abstraction borehole is located within the Moneenshinnagh townland, within the Killarga South (IE_WE_G_0056) waterbody, approximately 500 m from the project study area.

The (Zone of Contribution) ZOC of a groundwater source is effectively a groundwater catchment. The ZOC's are influenced by the hydrogeology of a given area, and are determined from the consideration of:

- The total outflow at the source;
- The recharge to the associated groundwater flow system;
- Groundwater flow directions and gradients; and
- Subsoil and bedrock permeabilities.

No abstraction points or public water Supply ZOCs are mapped within the project study area.

The groundwater in the proposed wind farm site is assessed as being of Good quantitative and chemical status. This is expected to continue. The bedrock is generally overlain by moderately shallow soil and peat deposits. No significant dissolution features (i.e., karst) were observed from visual appraisal of the proposed wind farm site, to be located within 30 m from any turbine location and are not anticipated to be impacted by the proposed development. No karst features are recorded within the GSI Karst Database of Ireland within the wind farm site boundary.

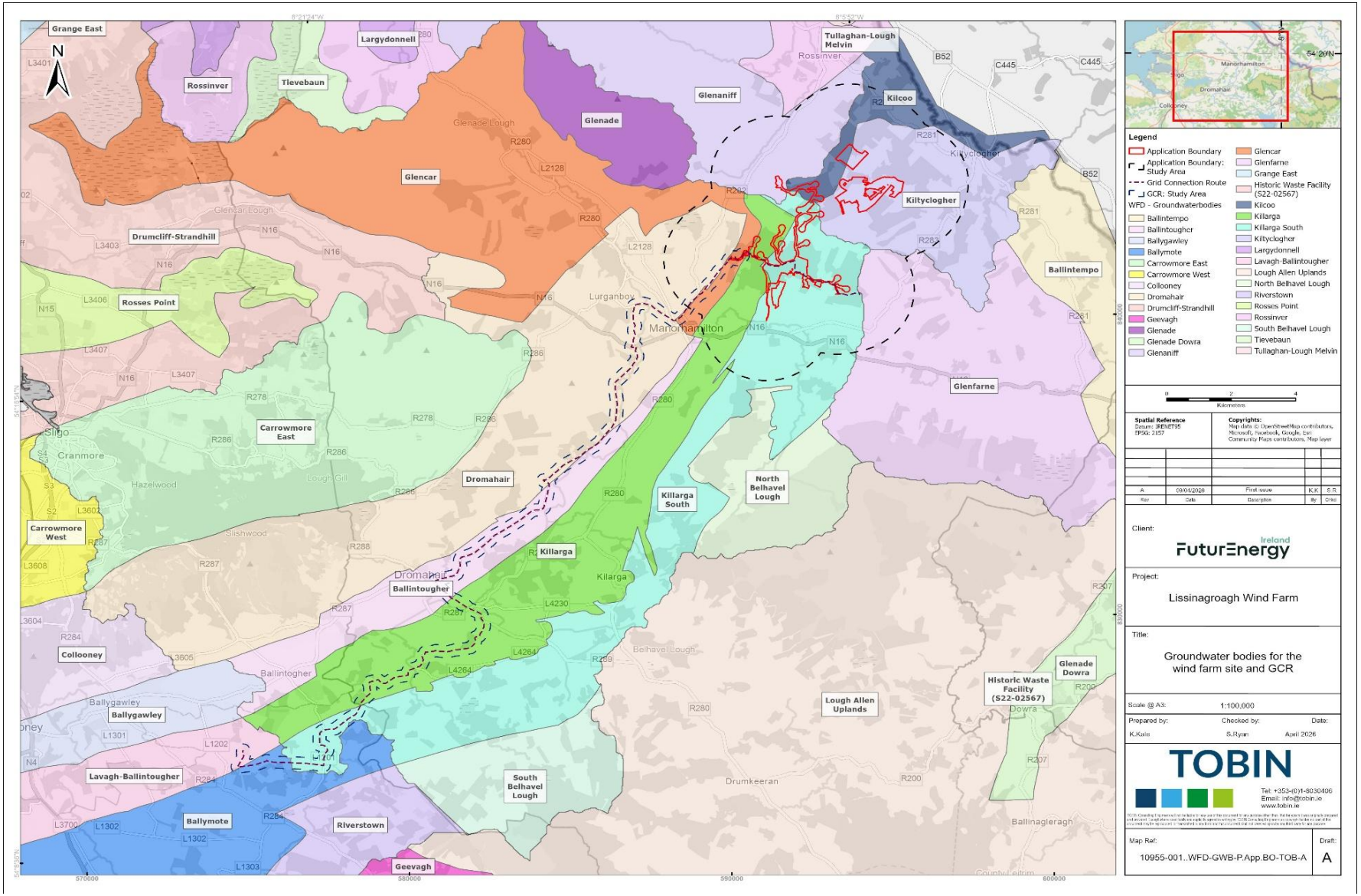

Figure 2-5: Groundwater bodies mapped within the Windfarm site and GCR

2.1.3 Lake water Bodies

The hydrological pathway from the proposed wind farm site includes three WFD lake water bodies. The Melvin (IE_NW_35_160) to the north of the proposed development, is a large surface waterbody (more than 22 km^2) to which several of the river water bodies described in **Section 2.1.1**, are connected to. The Macnean Upper (IE_NW_36_673) to the east of the proposed development, is a large surface waterbody (9.9 km^2). The proposed Wind Farm Site is located upstream and hydrologically connected to Lough Gill (Gill SO) (IE_WE_35_158) via 10 WFD river waterbodies. Gill SO is a large surface waterbody, with a surface area of greater than 13 km^2. The three waterbodies were indicated to be failing to achieve good chemical surface water status during the 2016-2021 monitoring programme. Table 2-8 below provides further information on the lake waterbody statuses.

There are no Register of Protected Areas (RPA) nutrient sensitive lakes and estuaries in hydrological connection with the proposed wind farm site and there are no RPA shellfish/pearl mussel areas within the proposed wind farm site. The lake drinking water protected areas (DWPA) are represented by the full extent of the Water Framework Directive (WFD) lake waterbodies from which there is a known qualifying abstraction of water for human consumption as defined under Article 7 of the WFD. Lough Melvin is mapped as a lake DWPA.

Table 2-8: Summary of Lake Chemical and Ecological Status (https://www.catchment.ie)

Waterbody Code	Name	2007-2009	2010-2012	2010-2015	2013-2018	2016-2021	2019-2024
Chemical							
IE_NW_35_160	Melvin	Good	Good	Good	Good	Failing to achieve good	n/a
IE_NW_36_673	Macnean Upper	Good	Good	Good	Good	Failing to achieve good	n/a
IE_NW_35_158	Gill SO	Good	Good	Good	Good	Failing to achieve good	n/a
Ecological							
IE_NW_35_160	Melvin	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
IE_NW_36_673	Macnean Upper	Moderate	Moderate	Moderate	Poor	Poor	Moderate
IE_NW_35_158	Gill SO	Moderate	Moderate	Poor	Moderate	Poor	Moderate

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 by the WFD assessment, due to the inland location of the study area.

The scoping exercise has identified those river waterbodies that are present within a 2 km buffer zone of the proposed wind farm site.

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 as part of the assessment (as mentioned above, in line with guidance a 2 km buffer zone was applied in this assessment). A 2 km radius was assigned as suggested in Hydrogeology Chapters of Environmental Impact Statements' (IGI 2013).

The GCR and TDR work areas were screened out of the WFD assessment due to the limited work areas associated with these components, which pose negligible risk of compromising WFD objectives or causing deterioration in nearby water body status.

2.2.1 Protected areas.

Nutrient sensitive areas comprise Nitrate Vulnerable Zones and polluted waters designated under the Nitrates Directive (91/676/EEC) and areas designated as sensitive areas under the Urban Wastewater Treatment Directive (UWWTD)(91/271/EEC).

- There are no shellfish waters within 2 km of the proposed wind farm site;
- There are no bathing water sites within 2 km of the proposed wind farm site;
- There are no nutrient sensitive sites within 2 km of the proposed wind farm site; and
- There are no SPAs within 2 km of the proposed wind farm site.
- A small portion of one SAC (Lough Gill SAC) is mapped within 2 km of the proposed wind farm site, approximately 1.3 km south of the proposed windfarm site.

2.2.2 Nature Designations

These are areas previously designated for the protection of habitats or species where maintaining or improving the status of water is important for their protection. They comprise the aquatic part of Natura 2000 sites – Special Protection Areas (SPAs) designated under the Birds Directive (79/409/EEC) and Special Areas of Conservation (SACs) designated under the Habitats Directive (92/43/EEC). Natural Heritage Areas (NHAs) are Ireland's basic wildlife designation under the Wildlife (Amendment) Act 2000, protecting habitats and species nationally. Table 2-9 illustrates the Natural Heritage sites within 5 km buffer from proposed wind farm site.

Table 2-9: National Heritage Sites within the 5 km Initial ZOI from proposed wind farm site

Site Name [Code]	Distance from Proposed Windfarm Site (km)
Dough/Thur Mountains NHA [002384]	0.1
Arroo Mountain pNHA [0002103]	1.9
Lough Melvin pNHA [0000428]	2.4
Bonet River pNHA [00001404]	4.0
Boleybrack Mountain pNHA [002032]	4.4

2.2.3 Hydromorphology

This section provides a summary of the known existing hydromorphology risk issues for the associated water bodies. A summary is provided in Table 10 below.

Table 2-10: Hydromorphological Assessment

Assessment Questions	Lake Water Bodies	River Water Bodies	Groundwater Bodies
Consider if your activity could impact on the hydromorphology (morphology or water flow) of a water body at high status.	No. No changes to lake water bodies anticipated.	No. Surface water drainage flow and volume will not significantly change.	No. No GWB classified as 'At Risk'.
Consider if your activity could significantly impact the hydromorphology of any water body?	No. Surface water drainage flow and volume will not significantly change.	No. Surface water drainage flow and volume will not significantly change.	No. Groundwater recharges and flow volumes will not significantly change.
Consider if your activity is in a water body that is heavily modified for the same use as your activity?	No. Not a heavily modified water body.	No. Not a heavily modified water body.	No. Not a heavily modified water body.

3. STAGE 3: COMPLIANCE ASSESSMENT

The proposed wind farm 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 water body 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 WFD Compliance Assessment follows the structure of Chapter 8 (Hydrology and Hydrogeology) in so far as the three main phases of the proposed development are considered separately in the first instance. The potential for cumulative impacts on a water body as a result of multiple elements of the proposed development potentially impacting upon them is considered in Step 3 of the assessment.

The principal activities that may contribute to effects are:

- Construction works - earthworks, and construction and upgrade of access roads (especially near streams).
- 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 Development has the potential to affect the water quality and hydromorphology of streams 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 Construction Environmental Management Plan (CEMP) (Chapter 2 Appendix 2-4) and Surface Water Management Plan (SWMP) (Chapter 2, Appendix 2-8) will be implemented. Impacts in this section are thus the residual impacts identified in Chapter 6 (Biodiversity) and Chapter 8 (Hydrology and Hydrogeology) for each quality element of each WFD water body. The measures incorporated into the CEMP and SWMP are embedded mitigation.

3.1.1 Biological Quality Elements

Potential impacts on biological quality elements are assessed in Chapter 6 (Biodiversity) of the EIAR. A summary is provided below and includes the likely residual effects following implementation of mitigation and control measures (refer to Construction and Environmental Management Plan (CEMP) and Surface Water Management Plan (SWMP) in Appendix 2-4 and 2-8, respectively.

The clear span watercourse crossing techniques to be used for the construction of the proposed development are not anticipated to have any significant direct impact on habitats within the affected WFD water bodies.

Sediment entering water bodies during construction could impair visibility making it difficult for fish to forage or risk physiological damage to their gills, although this would be short-term until dilution or flushing has taken place. Through the implementation of specific mitigation outlined in the SWMP (Appendix 2-8) and use of clear span crossings, no long-term impacts on WFD biological quality elements are foreseen.

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 25mg/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 the 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 19, and the use of location specific measures as detailed in (Chapter 2 Appendix 2-6), ensures that 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 to a licensed facility, 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. Additional impacts on habitats may arise from the accidental release of oil from machinery which could also alter bed and bank composition.

3.1.2 Chemical and Physico-chemical Quality Elements

Potential impacts on water quality are assessed in Chapter 8 (Hydrology and Hydrogeology) of the EIAR. A summary is provided below and includes the likely residual effects following implementation of mitigation and control measures.

Construction activities, including vegetation clearance, soil stripping, earthworks, foundation excavations, and grid cable trenching, have the potential to temporarily affect surface water quality through sediment-laden runoff, dewatering, and accidental pollution (e.g. hydrocarbons

or concrete spillages). Through implementation of the specific mitigation any impacts will be considered short-term and localised.

3.1.3 Hydromophological Quality elements

Potential impacts on hydromorphology are assessed in Chapter 8 (Hydrology and Hydrogeology) of the EIAR. A summary is provided below and includes the likely residual effects following implementation of mitigation and control measures.

The watercourse crossing technique and use of clear span bridges which are used for the construction of the proposed wind farm are not anticipated to have any direct impact on hydromorphology of the water bodies. Through implementation of the mitigation set out in the CEMP (Appendix 2-4) any indirect risk to the hydromorphology of the water bodies will be minimal.

3.1.4 Protected Areas

Potential impacts on Protected Areas are assessed in Chapter 6 (Biodiversity) of the EIAR.

There are no direct effects on Annex I habitats within the Natura 2000 network, from the proposed development. Thus, the proposed wind farm would not result in likely significant negative residual effects, at the local geographic scale.

Following implementation of mitigation measures outlined in Appendix 2-4 (CEMP), it is considered that there would be no significant residual effect at any geographic scale.

3.2 Operational Phase

3.2.1 Biological Quality Elements

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

The operation of the proposed wind farm would also result in an impact of negligible concern to the distribution and abundance of suitable foraging habitat. No indirect impacts on Annex I habitats within the Natura 2000 network or protected species are likely as a result of the proposed project, operation phase.

3.2.2 Chemical and Physico-chemical Quality Elements

Potential impacts on water quality are assessed in Chapter 8 (Hydrology and Hydrogeology) 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 will be no process water discharges. Surface water runoff from roads and other impermeable areas will be managed by sustainable drainage system (SuDS). Rainwater will be collected from roof areas and harvested before being re-circulated. A hydrocarbon interceptor will be installed at the construction compound and at the proposed substation site with regular inspection and maintenance, to ensure optimal performance.

Chemicals and fuel will be stored in bunded areas and used in accordance with the manufacturer's instructions and EPA guidelines.

Foul wastewater on site will be contained and transported to a licenced Wastewater Treatment Plant (WwTP). No impacts on water bodies are considered likely.

Due to the design measures and limited activities during the operational phase, the proposed wind farm site is likely to have negative, direct, long-term, not significant to slight effect on the surface water quality.

The negligible impacts predicted for in terms of levels and water quality mean that any impacts on inputting water bodies would also be negligible at most.

3.2.3 Hydromorphological Quality elements

Potential impacts on hydromorphology are assessed in Chapter 8 (Hydrology and Hydrogeology) of the EIAR. A summary is provided here and includes the likely residual effects following implementation of mitigation and control measures.

The operation phase of the proposed project will have a not significant negative long-term effect on hydromophological quality elements. through the application of identified mitigation measures and appropriate management throughout the operation phase of the wind farm.

3.2.4 Protected Areas

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 development would result in any deleterious impacts on the qualifying features of these protected areas.

3.3 DECOMMISSIONING PHASE

3.3.1 Biological Quality Elements

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

The decommissioning phase of the proposed wind farm would also result in an impact of negligible concern to the distribution and abundance of suitable foraging habitat. No indirect impacts on Annex I habitats within the Natura 2000 network or protected species are likely as a result of the proposed project, decommissioning phase.

3.3.2 Chemical and Physico-chemical Quality Elements

Potential impacts on water quality are assessed in Chapter 8 (Hydrology and Hydrogeology) of the EIAR. A summary is provided here and includes the likely residual effects following implementation of mitigation and control measures.

During the decommissioning phase there will be no process water discharges. Surface water runoff from roads and other impermeable areas will be managed by sustainable drainage system

(SuDS). Rainwater will be collected from roof areas and harvested before being re-circulated. A hydrocarbon interceptor will be installed at the construction compound and at the proposed substation site with regular inspection and maintenance, to ensure optimal performance. Chemicals and fuel will be stored in bunded areas and used in accordance with the manufacturer's instructions and EPA guidelines.

Foul wastewater on site will be contained and transported to a licenced Wastewater Treatment Plant (WwTP). No impacts on water bodies are considered likely.

Due to the design measures and limited activities during the decommissioning phase, the proposed wind farm site is likely to have negative, direct, long-term, not significant to slight effect on the surface water quality.

The negligible impacts predicted for in terms of levels and water quality mean that any impacts on inputting water bodies would also be negligible at most.

3.3.3 Hydromorphological Quality elements

Potential impacts on hydromorphology are assessed in Chapter 8 (Hydrology and Hydrogeology) of the EIAR. A summary is provided here and includes the likely residual effects following implementation of mitigation and control measures.

The decommissioning phase of the proposed project will have a not significant negative long-term effect on hydromophological quality elements. through the application of identified mitigation measures and appropriate management throughout the operation phase of the wind farm.

3.3.4 Protected Areas

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 development would result in any deleterious impacts on the qualifying features of these protected areas.

3.4 Compliance Assessment Summary

The site-specific impacts of the proposed development on the biological, physico-chemical and hydromorphological quality elements of the water bodies are shown in the assessment above and summarised in Table 11.

Table 3-1: 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 development Surface water drainage flow and volume will be at greenfield runoff rates and will not significantly change as a result of the proposed development.

Receptor	Potential risk to receptor?	*Note the risk issue(s) for impact assessment*
SACs/SPAs	No	There are no significant direct or indirect impacts on SACs/SPAs. There are no designated sites altered by the proposed development.
Biology: fish	No	The risks to the receptor during construction and operation, is from increased sediment to adjacent streams. No instream works are proposed as part of the proposed development. Surface water drainage flow and volume will not increase as a result of the proposed development, as indicated in outlined in section 8.4.2 (Chapter 8 – Hydrology and Hydrogeology) – refer also to Appendix 2-8 Surface Water Management Plan. In addition, a CEMP will be implemented.
Water quality	No	The proposed development will not increase sediment and nutrients. Mitigation measures are detailed in the CEMP and SWMP.
Other Protected areas (NHA/pNHA)	*No*	The Dough/Thur Mountains NHA site is designated for peatlands and overlaps with the proposed windfarm site boundary No works are proposed in the NHA however areas within the NHA are within the biodiversity enhancement area. The NHA is located upgradient of the proposed wind farm infrastructure. No potential for (negative) drainage effects on the NHA due to the topography and existing drainage on the peatlands. Potential for peatland enhancement within the Biodiversity enhance areas. Hydrologically connected via the Lattone_010, the Rosfriar_010, the Owenmore (Manorhamilton)_020. A CEMP and SWMP will be implemented as part of the proposed development. No construction works will occur in Other Protected areas. The operation of the proposed wind farm will not significantly change the current level of surface water or groundwater volume or flow.

3.5 Assessment of Proposed Development 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 Water Framework Directive. Part of the 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. There are no subbasins identified within the RBMP Areas for Action.

4. MITIGATION MEASURES

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. Through implementation of the mitigation set out in Appendix 2-4 (CEMP), Appendix 2-8 (SWMP), any indirect risk to the hydromorphology of the water bodies will be minimal.

Due to the location and nature of the proposed construction works and the implementation of the mitigation set out in Appendix 2-4 (CEMP) and Appendix 2-8 (SWMP) there will be no detrimental effects on hydromorphological quality elements associated with the construction of the proposed development.

Through implementation of the mitigation set out in Appendix 2-4 (CEMP) any impacts to water bodies would be temporary and localised. Such discharges will discharge at greenfield runoff rates. The drainage system is designed to manage the runoff using attenuation ponds to limit the runoff to existing levels

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

Any additional runoff from the construction activities will be attenuated and treated as appropriate before being allowed to infiltrate or discharge from the proposed development, ensuring that any sediment build-up or pollutants are captured on site rather than released into the wider environment.

Table 4-1: Mitigation Measures matrix

	Turbines	Substation and compounds	Excavated material deposition Areas	Access tracks	Borrow Pits
Utilise existing bridges and access roads				x	
>50m Buffer	x	x	X		x
Interceptor drains	x	x	X	x	x
Check Dams or similar	x	x	x	x	x
Swales				x	x
Sediment traps			x		
Level spreaders	x		x	x	
Settlement Ponds	x	x	x	x	x
Oil water separator		x			

	Turbines	Substation and compounds	Excavated material deposition Areas	Access tracks	Borrow Pits
Proprietary Settlement tanks	x	x			x
Weather dependant	x	x	x	x	x
Silt Fences	x	x	x	x	x
Clear Span Bridge				x	
Concrete washout and control measures	x	x			
Chemical/fuel bunds		x			

Taking into consideration the anticipated impacts of the proposed development 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 Good Ecological Status (GES) or cause a deterioration of the overall Good Ecological Potential (GEP) of any of the water bodies that are in scope.

Table 4-2: Compliance of the proposed development 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. (high confidence)	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 detailed compliance assessment, the proposed development will not cause deterioration in the status of the water bodies during construction following the implementation of mitigation measures; during operation, no significant impacts are predicted. (high confidence)	Yes
No changes which will permanently prevent or compromise the Environmental Objectives being met in other water bodies.	The proposed development will not compromise achieving the WFD objectives in any other bodies of water within the River Basin District. (high confidence)	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 development will not cause deterioration in the status of groundwater bodies. (high confidence)	Yes

The WFD also requires consideration of how a new scheme might impact on other water bodies 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 water bodies within the study area have been assessed for direct impacts. The proposed development will not compromise the achievement of the objectives of the WFD for any water body in the study area. In addition, the proposed wind farm has been assessed (Section 8-7 of Chapter 8) for the potential for cumulative impacts with other existing or proposed developments within 5 km of the study area. Cumulative effects of this project with other developments in the region, relate to the effects on Hydrology. These developments include other existing or planned developments (listed in Section 8-7 of Chapter 8) in the environs of the proposed development site and/or developments with the potential to provide a cumulative impact.

With the implementation of the mitigation measures it is concluded that in combination with other proposed wind farms the proposed wind farm will not compromise the achievement of the objectives of the WFD for any water body. 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 development 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 development. The NIS prepared for the proposed project concluded that, following the implementation of mitigation measures, no adverse effects on the integrity of any European site are predicted. Further information can be found in Section 5.3.7 of the Biodiversity Chapter (Chapter 5).

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 2 km of the proposed wind farm site.

5. CUMULATIVE EFFECTS

Cumulative effects may also occur between this proposed wind farm and other proposed developments (refer to Section 8.7 of the Hydrology and Hydrogeology Chapter). 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 primary potential for cumulative effects will occur during the construction phase of the proposed development as this is when earthworks and excavations will be undertaken. The potential for cumulative effects during the operational phase will be significantly reduced as there will be no exposed excavations, there will be no sources of sediment to reach watercourses, there will be no use of cementitious materials and fuels/oil will be kept to a minimum at the site. During the decommissioning phase, the potential cumulative effects are similar to the construction phase, but to a lesser degree with less ground disturbance.

There will be no potential for cumulative effects beyond the cumulative study area due to increases in flow volumes (as the catchment area increases) and increasing distance from the proposed wind farm.

No likely significant cumulative effects on the hydrological or hydrogeological environment are anticipated.

6. CONCLUSIONS

Taking into consideration the impacts of the proposed project on the biological, physico-chemical and hydromophological quality elements of the relevant waterbodies, it is concluded that, following the implementation of design and mitigation measures, it will not compromise progress towards achieving GES or cause a deterioration of the overall status of the water bodies 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 development is compliant with WFD.

7. REFERENCES

Defra (2009) WFD Expert Assessment of Flood Management Impacts. Defra, London.

Northern Ireland Environment Agency (2012) Carrying out a Water Framework Directive (WFD) assessment on EIA Developments. NIEA.

UKTAG (2008) UK Environmental Standards and Conditions (Phase 1)

UKTAG (2013) Updated Recommendations on Environmental Standards River Basin Management (2015-21) Final Report. WFD UKTAG

8. 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 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.
Confidence	Low - non-expert opinion, unsubstantiated opinion with no supporting evidence. Medium - Expert view grounded in theory but based on limited information, e.g., anecdotal evidence, or historical data. High - Estimation of potential impacts or consequences, with strong theoretical basis, using accepted methods, reliable analysis and accepted within the sector as 'fit for purpose'. This typically includes analytical methods where the methods are strong, and the science is reliable.
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.

Appendix A

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.

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