APPENDIX 9-4

WATER FRAMEWORK DIRECTIVE COMPLIANCE ASSESSMENT REPORT

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WATER FRAMEWORK DIRECTIVE COMPLIANCE ASSESSMENT
PROPOSED CUNLAGHFADDA GREEN ENERGY PROJECT, CO. MAYO

FINAL REPORT

Prepared for:

CUNLAGHFADDA GREEN ENERGY LTD

Prepared by:

HYDRO-ENVIRONMENTAL SERVICES

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1. INTRODUCTION

1.1 BACKGROUND

Hydro-Environmental Services (HES) were requested by Cunlaghfadda Green Energy Ltd, to complete a Water Framework Directive (WFD) Compliance Assessment for a planning application for the Proposed Project.

The purpose of this WFD 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 water bodies with the potential to be impacted, describe the proposed mitigation measures and determine if the Proposed Project is in compliance with the objectives of the WFD.

This WFD Compliance Assessment is intended to supplement the EIAR submitted as part of the wind farm planning application. As detailed in Section 1.1.1 of EIAR Chapter 1, the following references are used throughout the EIAR and this document: the "Proposed Project", the "Proposed Wind Farm", the "Proposed Grid Connection" and the "Site".

This report has been compiled using the following data sources:

- Environmental Protection Agency database (www.epa.ie);
- Water Framework Directive online databases (www.catchments.ie);
- Observation recorded during various site visits as described in Section 9.2.2 of the EIAR;
- Drainage mapping as described in Section 9.3.5 of the EIAR; and,
- Surface Water Quality sampling as described in Section 9.3.8 of the EIAR.

1.2 STATEMENT OF AUTHORITY

Hydro-Environmental Services (HES) are a specialist hydrological, hydrogeological and environmental practice that delivers a range of water and environmental management consultancy services to the private and public sectors across Ireland and Northern Ireland. HES was established in 2005, and our office is located in Dungarvan, County Waterford. We routinely complete impact assessments for hydrology and hydrogeology for a large variety of project types including wind farms.

This WFD assessment was prepared by Michael Gill, Conor McGettigan and Nitesh Dalal.

Michael Gill (P. Geo., B.A.I., MSc, Dip. Geol., MIEI) is an Environmental Engineer/Hydrologist with over 24 years' environmental consultancy experience in Ireland. Michael has completed numerous hydrological and hydrogeological impact assessments of wind farms in Ireland. He has also managed EIAR assessments for infrastructure projects and private residential and commercial developments. In addition, he has substantial experience in wastewater engineering and site suitability assessments, contaminated land investigation and assessment, wetland hydrology/hydrogeology, water resource assessments, surface water drainage design and SUDs design, and surface water/groundwater interactions. For example, Michael has worked on the EIS/EIARs for Slievecallan Wind Farm, Cahermurphy (Phase I & II) Wind Farm, Carrownagowan Wind Farm, Garrane Green Energy Project and over 100 other wind farm related projects across the country.

Conor McGettigan (BSc, MSc) is an Environmental Scientist with over 5 years' experience in the environmental sector in Ireland. Conor holds an M.Sc. in Applied Environmental Science (2020) and a B.Sc. in Geology (2016) from University College Dublin. Conor routinely prepares the hydrology and hydrogeology chapters of environmental impact assessment reports for wind farm developments. Conor has worked on the EIARs for over 20 no. wind farms projects across the country, including Ballivor Wind Farm, Seskin Wind Farm, Lackareagh Wind Farm,

Knockshanvo Wind Farm, Garrane Green Energy Project and Gannow Renewable Energy Development.

Nitesh Dalal (B.Tech, PG Dip., MSc) is an Environmental Scientist with over 7 years' experience in environmental consultancy and environmental management in India. Nitesh holds a M.Sc. in Environmental Science from University College Dublin (2024), a PG Diploma in Health, Safety and Environment from Annamalai University, India (2021) and B.Tech. in Environmental Engineering (2016) from Guru Gobind Singh Indraprastha University, India (2016). Nitesh has been involved in the preparation of the land, soils and geology chapters of environmental impact assessment reports for several renewable energy developments. Nitesh has worked on the EIARs for several wind farms projects across the country, including Gannow Renewable Energy Development and Littleton Wind Farm.

1.3 WATER FRAMEWORK DIRECTIVE

The EU Water Framework Directive (2000/60/EC), as amended by Directives 2008/105/EC, 2013/39/EU and 2014/101/EU ("**WFD**"), was established to ensure the protection of the water environment. The Directive was transposed in Ireland by the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003).

The WFD requires that all member states protect and improve water quality in all waters, with the aim of achieving good status by 2027 at the latest. Any new development must ensure that this fundamental requirement of the WFD is not compromised.

The WFD is implemented through the River Basin Management Plans (RBMP) which comprises a six-yearly cycle of planning, action and review. The RBMP includes identifying river basin districts, water bodies, 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 the third cycle covers the period from 2022 to 2027[1]. The RBMPs are forward looking.

The Water Action Plan 2024 is Ireland's 3rd River Basin Management Plan (2022 - 2027). The objectives of the Water Action Plan 2024 have been integrated into the design of the Proposed Project and include:

- Ensure full compliance with relevant EU legislation;
- Prevent deterioration;
- Meet the water standards and objectives for designated protected areas;
- Protect high-status waters; and,
- Implement targeted action and pilot schemes in focus sub-catchments aimed at (i) targeting water bodies close to meeting their objective and (ii) addressing more complex issues that will build knowledge for future cycles.

Our understanding of these objectives is that water bodies, regardless of whether they have 'Poor' or 'High' status, should be treated the same in terms of the level of protection and mitigation measures employed.

[1] *The WFD RBMP cycles are forward looking plans, so 2009-2015 (1st Cycle), 2016-2021 (2nd Cycle), and 2022-2027 (3rd Cycle) are the plans and they use status from the previous 6 years.*
The EPA updates status every three years, but they also complete an additional assessment mid-RBMP cycle. The mid-cycle status does not get reported to the Commission.
The linkage between the two is that the 2nd Cycle plan uses the 2009-2015 status, the 3rd Cycle plan uses the 2016-2021 status. The 2013-2018 status was not used in the RBMP and the 2019-2024 status will not be used in the next RBMP.

2. WATERBODY IDENTIFICATION AND CLASSIFICATION

2.1 INTRODUCTION

This section identifies those Surface Waterbodies (SWBs) and Groundwater Bodies (GWBs) with potential to be affected by the Proposed Project and reviews any available WFD information.

2.2 SURFACE WATERBODY IDENTIFICATION

Regionally, the Site lies between the boundary of 2 no. WFD surface water catchments. The north and south of the Site is mapped in the Moy and Killala Bay Catchment within Hydrometric Area 34 whilst the centre of the Site is mapped in the Corrib Catchment within Hydrometric Area 30.

Within the Corrib Catchment, the Site is mapped in the Robe River sub-catchment (Robe_SC_010) and the Robe_030 WFD river sub basin. The nearest mapped SWB within the Robe_030 WFD river sub-basin is Drumady Lough, located immediately adjacent to the southeastern boundary of the Site. It is noted that despite being mapped on the EPA databases, that Drumady Lough is not recognized as a lake waterbody by the WFD (note that this may be due to its limited hydrological significance in terms of the wider catchment as features below a certain threshold are not always delineated as individual waterbodies by the WFD). A stream which forms part of the Robe_030 SWB outflows from Drumady Lough, and flows to the south where it discharges into the Robe River after approximately 5.5km. The Robe River continues in a south westerly direction with the Robe_060 SWB discharging into Lough Mask approximately 18.5km from the Site.

Within the Moy & Killala Bay Catchment, the Site is mapped in the Castlebar River sub-catchment (Castlebar_SC_020) and 2 no. WFD river sub-basins. The Site is mapped in the Meander_010 WFD river sub-basin in the south and the Tullymore (Mayo)_010 WFD river sub-basin in the north. Nambrackkeagh Lough is situated directly south of the Site within the Meander_010 WFD river sub-basin. Nambrackkeagh Lough is not recognized as a lake waterbody by the WFD. The Meander River (Meander_010 SWB) emerges from Nambrackkeagh Lough and flows in a southerly direction before veering to the northwest and feeding into the Manulla River (Manulla_020 SWB). The Manulla River continues to the north with the Manulla_0340 SWB discharging into the Castlebar River (Castlebar_030 SWB) approximately 16.6km northwest of the Site. From this point the Castlebar River, referred to locally as the Toormore and Clydagh Rivers, meanders to the north before the Castlebar_040 SWB discharges into Lough Cullin. Note that there is a difference between local river names and the names assigned by the WFD. Please refer to **Table A** below.

The northern portion of the Site resides within the Tullymore (Mayo)_010 WFD river sub basin. The Meander River flows within the southeast of the Site, approximately 372m southwest of T5. The Tullymore Stream is located ~5km northwest of the Site and flows to the north into the Little Strade River. Inspection of local base maps reveals the presence of some hydrological features which drain this section of the Site and flow to the north and discharge into Lough Fark, located ~700m to the north of the Site.

Table A: Local and WFD River Names

Local River Name	WFD River Sub-Basin	WFD Sub-Catchment
Toormore	Castlebar_030	Castlebar_SC_020
Toormore	Castlebar_040	Castlebar_SC_030
Clydagh	Castlebar_040	Castlebar_SC_030

Table B presents the catchment area of each SWB downstream of the Site as far as Lough Mask and Lough Cullin. The Meander_010 SWB in the vicinity of the Site has the smallest catchment area of ~21 km^2. The catchment area for the SWBs increases progressively downstream. Therefore, those SWBs which are located in close proximity to the Site are more susceptible to water quality impacts as a result of activities associated with the Proposed Project. The potential for the Proposed Project to impact a SWB decreases further downstream due to the increasing catchment area to the SWB and the resulting increase in flow volumes.

Table B: Catchment Area Downstream of the Site

WFD River Sub-Basin	Total Upstream Catchment Area (km^2)
Robe_SC_010 and Robe_SC_020 Sub Catchments	
Robe_030	~167
Robe_040	~185
Robe_050	~261
Robe_060	~309
Castlebar_SC_020 and Castlebar_SC_030 Sub Catchments	
Meander_010	~21
Manulla_020	~108
Manulla_030	~140
Manulla_040	~170
Castlebar_030	~275
Castlebar_040	~355
Tullymore (Mayo)_010	~26
Manulla_010	~64

As stated above, both Drumady Lough and Nambrackkeagh Lough lakes are not recognized as a Lake waterbody by the Water Framework Directive (WFD). However, these lakes do exist immediately adjacent to the Site, and collect the majority of surface water runoff from the local drainage networks within the Site. Due to the large volume of water within the lake segments they will provide a domain that allows for initial settlement and dilution processes to occur, thereby reducing potential effects further downstream along the Meander and Robe SWBs. However, the Proposed Project does not rely on the dilution or treatment capacity of these lakes. The Proposed Project design, drainage systems and mitigation measures will ensure the protection of all waterbodies regardless of whether they are identified by the WFD.

Figure A below is a local hydrology map of the area.

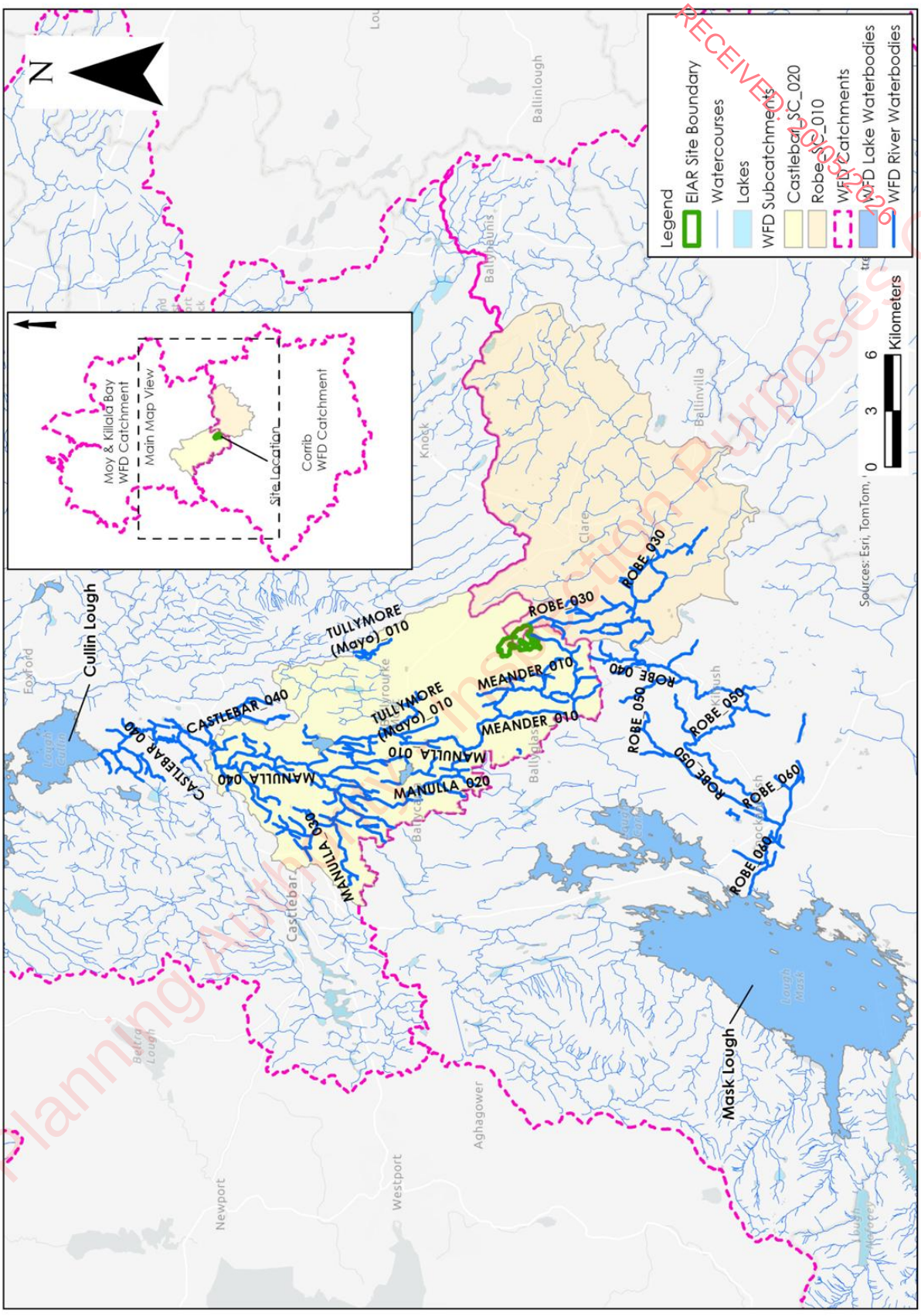

Figure A: Local Hydrology Map

2.3 SURFACE WATER BODY CLASSIFICATION

A summary of the WFD status and risk result for Surface Water Bodies (SWBs) downstream of the Proposed Project are shown in **Table C**. The overall status is based on the ecological, chemical and quantitative status of each SWB.

Local Groundwater Body (GWB) and Surface water Body (SWB) status information is available from (www.catchments.ie).

Within the Moy & Killala Catchment, the Meander_010 SWB achieved "High" status in the latest cycle (2019-2024). This was an improvement from the "Good" status which this SWB has achieved previously. Further downstream, the Manulla (Manulla_020, _030 and _040 SWBs) and Castlebar (Castlebar_030 and _040 SWBs) are of "Good" status. This represented an improvement in status for the Manulla_020, Manulla_030 and Castlebar_030 SWBs. Lough Cullin achieved "Moderate" status in the 3 no. most recent WFD cycles.

The Meander_010 SWB is "not at risk" of failing to meet its WFD objectives. The risk status of the Manulla_020 SWB is currently under review. The Manulla_030 SWB has been deemed to be "at risk" with hydromorphology and industrial activities acting as significant pressures on this SWB. Further downstream the Manulla_040 and the Castlebar_040 SWBs are deemed to be "not at risk". The Castlebar_030 is considered to be "at risk" and is under significant pressure from hydromorphological pressures. Lough Cullin is also deemed to be "at risk" with agricultural activities and the zebra mussel invasive species listed as significant pressures.

Within the Moy & Killala Bay Catchment, the Tullymore (Mayo)_010 SWB has a current WFD status of "High" and is currently "not at risk" of failing to meet its WFD objectives. The Tullymore (Mayo)_010 river discharges into Manulla_010 SWB which achieved "Poor" status in the latest WFD cycle. The Manulla_010 SWB is considered to be "at risk" with agriculture being the identified pressure.

Within the Corrib Catchment, the Robe_030 and the Robe_040 SWBs achieved "Good" and "Moderate" status respectively. This represented a deterioration in status for the Robe_040 SWB. Further downstream the Robe_050 is of "Poor" status whilst the Robe_060 and Lough Mast are of "Good" status.

The Robe_030 SWB in the vicinity of the Site is considered to be "not at risk" whilst the risk status of the Robe_040 SWB is under review. Further downstream the Robe_050, Robe_060 and Lough Mask are "at risk". Hydromorphology is the significant pressure impacting on the Robe_050 SWB, perhaps due to the presence of arterial drainage schemes accelerating erosion processes linked to altered morphology for land drainage. These schemes have led to a significant amount of siltation according to the 3rd Cycle Draft Corrib Catchment Report (HA 30), (EPA,2021). Agriculture is the significant pressure identified for the Robe_060 SWB. Agriculture, domestic wastewater and zebra mussel invasive species are the significant pressures negatively impacting on the Lough Mask.

The SWB status for the 2019-2024 WFD cycle are shown on **Figure B.**

Table C: Summary WFD Information for River Water Bodies

SWB	Overall Status 2013-2018	Overall Status 2016-2021	Overall Status 2019-2024	Risk Status 3rd Cycle	Pressures
Moy & Killala Catchment					
Meander_010	Good	Good	High	Not at risk	None
Manulla_020	Good	Moderate	Good	Review	None
Manulla_030	Poor	Moderate	Good	At risk	Hydromorphology & industry
Manulla_040	Moderate	Good	Good	Not at risk	None
Castlebar_030	Moderate	Moderate	Good	At risk	Hydromorphology
Castlebar_040	Good	Good	Good	Not at risk	None
Lough Cullin	Moderate	Moderate	Moderate	At risk	Agriculture & Invasive Species
Tullymore (Mayo)_010	Poor	High	High	Review	None
Manulla_010	Poor	Poor	Poor	At Risk	Agriculture
Corrib Catchment					
Robe_030	Good	Good	Good	Not at risk	None
Robe_040	Good	Good	Moderate	Review	None
Robe_050	Moderate	Moderate	Poor	At risk	Hydromorphology
Robe_060	Moderate	Moderate	Good	At risk	Agriculture
Lough Mask	Good	Good	Good	At risk	Agriculture, domestic wastewater & Invasive Species

2.4 GROUNDWATER BODY IDENTIFICATION

The GSI map the Site to be underlain by the Dinantian Pure Bedded Limestones (www.gsi.ie). These rocks are classified by the GSI as a Regionally Important Aquifer - Karstified (conduit).

The Site is mapped to be underlain by 2 no. Groundwater Bodies (GWBs). The north and south of the Site are underlain by the Swinford GWB (IE_WE_G_0033) whilst the central section of the Site is underlain by the Cong Robe GWB (IE_WE_G_0019). The boundaries of these GWBs in the area of the Site is the same as the boundaries of the regional surface water catchments.

2.5 GROUNDWATER BODY CLASSIFICATION

The GWBs are assigned a status based on the assessment of groundwater chemical and quantitative figures.

The Swinford and Cong Robe GWBs achieved 'Good' status in the 3 no. most recent WFD cycles. The Swinford GWB is 'not at risk' whilst the Cong Robe GWB is deemed to be 'at risk' of failing to meet its WFD objectives. This GWB is under significant pressure from anthropogenic and agricultural activities.

Table D: Summary WFD Information for Groundwater Bodies

GWB	Overall Status 2013-2018	Overall Status 2016-2021	Overall Status 2019-2024	Risk Status 3rd Cycle	Pressures
Swinford	Good	Good	Good	Not at risk	None
Cong Robe	Good	Good	Good	At risk	Anthropogenic and agriculture

2.6 ZONE OF INFLUENCE

The potential Zone of Influence (ZOI) for the Proposed Project extends to the following SWBs and GWBs.

- River waterbodies: Meander_010, Manulla_010 to Manulla_040, Tullymore (Mayo)_010, Castlebar_030, Castlebar_040 and Robe_030 to Robe_060 SWBs;
- GWBs: Swinford and Cong Robe GWBs; and
- Lake waterbodies: Lough Cullin and Lough Mask.

2.7 PROTECTED AREA IDENTIFICATION

The WFD requires that activities are also in compliance with other relevant legislation, as considered below. Nature conservation designations, bathing waters, Nutrient Sensitive Areas (NSA's), shellfish protected areas and Drinking Water Protected Area's (DWPA) within the vicinity of the Site are considered as part of the assessment.

2.7.1 Nature Conservation Designations

Within the Republic of Ireland designated sites include Natural Heritage Areas (NHAs), Proposed Natural Heritage Areas (pNHAs), Special Areas of Conservation (SACs), candidate Special Areas of Conservation (cSAC) and Special Protection Areas (SPAs).

Ramsar sites are wetlands of international importance designated under the Ramsar Convention (adopted in 1971 and came into force in 1975), providing a framework for the conservation and wise use of wetlands and their resources.

Within the Moy and Killala Bay Catchment The nearest downstream designated site to the Site is the River Moy SAC (Site Code: 002298) located ~1.95km to the west. This SAC is hydrologically connected to the Site via the Meander River. The length of the hydrological flowpath between the Site and the SAC is ~4.6km. The River Moy SAC follows the course of the Meander, Manulla and Castlebar rivers and further encompasses Lough Cullin downstream of the Site. Lough Cullin itself is also mapped as part of the Lough Conn and Lough Cullin SPA (004228).

Within the Corrib Catchment, the closest downstream designated sites via the River Robe are the Lough Carra/Mask Complex SAC (Site Code: 001774) and Lough Mask SPA (Site Code: 004062). The length of the hydrological flowpath between the Site and Lough Mask is >38km.

There are several groundwater dependent SAC's and pNHA's within 10km of the Site (10km is considered to be an appropriate radius based upon the hydrogeological conditions at the site which are characterised by high rates of surface water runoff). These groundwater dependent designated sites include the Mountpleasant School Turlough pNHA, Slishmeen Turlough pNHA, Balla Turlough SAC/pNHA and Carrowkeel Turlough SAC/pNHA. These groundwater dependent designated sites are located in excess of 5km from the Site. Given the underlying GSI mapped Regionally Important Karst Aquifer there is a low potential for groundwater flows in the underlying bedrock to bypass the Meander River and other surface water features and migrate towards these receptors. However, based on site investigation data (no karst features at the Site, no shallow bedrock, bedrock is protected by a thick layer of overburden) such connectivity is considered to be very limited.

2.7.2 Bathing Waters

Bathing waters are those designated under the Bathing Water Directive (76/160/EEC) or the later revised Bathing Water Directive (2006/7/EC).

There are no bathing water sites located in the vicinity of the Site or in the ZoI. The nearest bathing water site is Bertra Beach, Murrisk (IEWEBWC350_0000_0100) located roughly 38km to the west.

2.7.3 Nutrient Sensitive Areas

Nutrient Sensitive Areas (NSA) 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 NSAs within close proximity to the Site. The closest NSA is on the Castlebar River which is located downstream of the Site. This NSA is associated with the Castlebar_030 and Castlebar_040 SWBs. Further downstream, Lough Cullin is also declared as a nutrient sensitive area.

NSA objectives are being met in both of the Castlebar River and Lough Cullin NSA's.

2.7.4 Shellfish Waters

The Shellfish Waters Directive (2006/113/EC) aims to protect or improve shellfish waters in order to support shellfish life and growth.

There are no Shellfish protected area sites within the vicinity of the Site or within the ZoI. The closest shellfish protected area is Clew Bay (East of Old Head) (IEPA2_0006) located 30km west of the Site.

2.7.5 Salmonid Waters

The Manulla River (Manulla_020 to Manulla_040 SWBs) are identified as designated Salmonid Waters.

2.7.6 Drinking Water

There are no surface water DWPAs in the immediate vicinity of the Site. Downstream from the Site via the Robe River is the Lough Mask DWPA (IE_WE_30_665a) which is 21km to the Site.

Meanwhile, all GWBs within the catchment are listed as DWPAs.

Section 9.3.15 of Chapter 9 of the EIAR also details additional water supplies in the local area which are not identified by the WFD DWPA designation. These include the Cullentra and Rathnacreeva schemes located downstream of the Site on the Meander River.

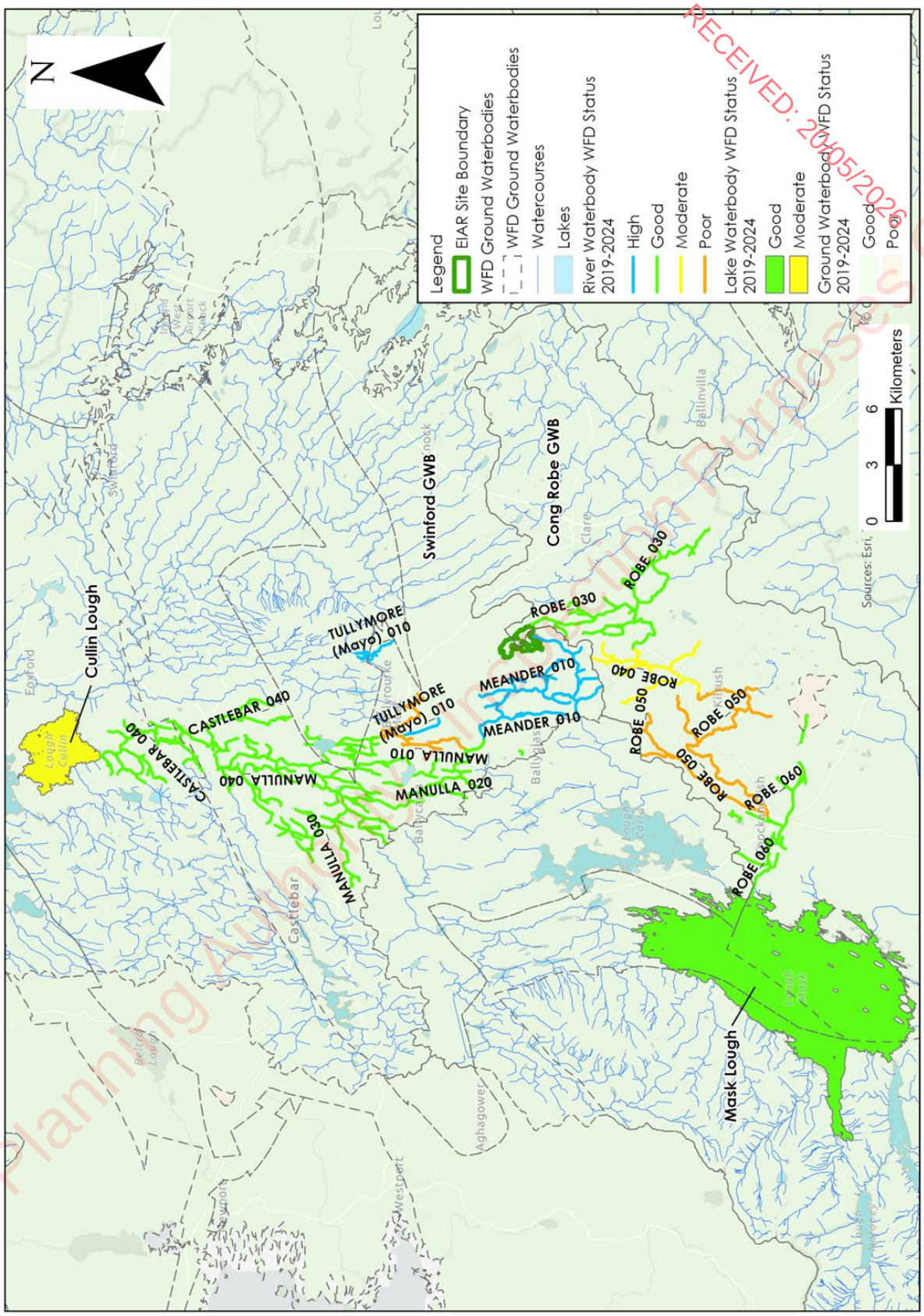

Figure B: WFD Groundwater and Surface Waterbody Status (2019-2024)

3. WFD SCREENING

3.1 SURFACE WATER BODIES

The SWBs in the immediate vicinity and downstream of the Site are shown in **Figure A** and described in **Section 2.2** above.

With consideration for the construction, operational and decommissioning phases of the Proposed Project, it is considered that the Robe_030, Robe_040 and Robe_050 SWBs in the Corrib Catchment will be included in the WFD Compliance Assessment due to their proximal location to the Site. The Proposed Project must not in any way result in a deterioration in the status of these river waterbodies and/or prevent them from meeting the biological and chemical characteristics for good status in the future.

Meanwhile, the Robe_060 SWB has been screened out of the WFD Compliance Assessment due to its distant location from the Site and the increasing volumes of water within the River Robe (the catchment of the Robe_060 SWB is >300km^2). Lough Mask has also been screened out due to the large volumes of water within the lake and its large catchment area. The Proposed Project would have no potential to cause a deterioration of the WFD status of these SWBs. Note that the Proposed Project does not rely in any way upon the dilution or assimilative capacity of any downstream SWB. The mitigation measures prescribed in Section 4.3 ensure the protection of all watercourses in the vicinity and downstream of the Site.

In the Moy & Killala Catchment, the Meander_010, Manulla_020, Manulla_030 and Tullymore (Mayo)_010 SWBs will be included in the impact assessment due to their close proximity to the Site or their location directly downstream of the Site. The Proposed Project must not in any way result in a deterioration in the status of these river waterbodies and/or prevent them from meeting the biological and chemical characteristics for good status in the future.

Meanwhile, the Manulla_040, Castlebar_030 and Castlebar_040 SWBs has been screened out of the WFD Compliance Assessment due to their distant location from the Site and the increasing volumes of water within these rivers. Lough Cullin has also been screened out due to the large volumes of water within the lake and its large catchment area. The Proposed Project would have no potential to cause a deterioration of the WFD status of these SWBs. Note that the Proposed Project does not rely in any way upon the dilution or assimilative capacity of any downstream SWB. The mitigation measures prescribed in Section 4.3 ensure the protection of all watercourses in the vicinity and downstream of the Site.

With the relatively large increase in water volumes found in both Lough Mask and Lough Cullin, all SWBs downstream of these lakes have not been assessed as there is no significant potential for effects.

3.2 GROUNDWATER BODIES

With respect to GWBs, the Swinford and Cong-Robe GWBs are carried through to the WFD Compliance Assessment due to their location directly underlying the Site.

3.3 PROTECTED AREAS

The River Moy SAC will be brought through into the WFD Compliance Assessment as it lies downstream of the Site via the Meander River.

Lough Conn and Lough Cullin SPA is screened out of the WFD Compliance Assessment due to its distance from the site (~40km), its increased catchment area and large volumes of water within the lake making the SPA less susceptible to potential impacts associated with the Proposed Project.

The Lough Carra/Mask Complex SAC and Lough Mask SPA, will not be screened in due to the large volumes of water within the lake and its large catchment area, making it less susceptible to potential impacts on the designated sites associated with the Proposed Project.

Given that the GSI map the bedrock underlying the Site as a Regionally Important Karst Aquifer the groundwater dependent designated sites within 8km of the Site have been included for the purposes of a conservative impact assessment. The 8km radius is considered to be sufficient given the local hydrogeological regime which exists at the Site which is dominated by high rates of surface water runoff and restricted groundwater recharge. These designated sites include Mountpleasant School Turlough pNHA, Slishmeen Turlough pNHA, Balla Turlough SAC/pNHA and Carrowkeel Turlough SAC/pNHA.

The Castlebar River NSA (Castlebar_030 and Castlebar_040) will not be included in the WFD Compliance Assessment due to its significant downstream distance from the Site (~30km), the large catchment area of the associated SWBs (as outlined in **Table B**) and the high flow volumes within the Castlebar River. Similarly, the Lough Cullin NSA has also been screened out.

The bathing waters at Bertra Beach, Murrisk have been screened out due to their distal location from the Site.

The Manulla_020 to Manulla_040 salmonid waters are located downstream, but in close proximity of the Site, and are included in the assessment.

The Castlebar_030, Castlebar_040 and Lough Cullin salmonid waters has been screened out due to their significant downstream distance from the Site, and the large volumes of water within these SWBs.

Lough Mask DWPA will not be included in the WFD Compliance Assessment as it is located a significant distance (21 km) downstream of the Site and contains a large volume of water, making it less susceptible to potential water quality impacts associated with the Proposed Project.

3.4 WFD SCREENING SUMMARY

A summary of WFD Screening discussed above is shown in **Table E**.

Table E: Screening of WFD water bodies located within the study area

Type	WFD Classification	Waterbody Name/ID	Inclusion in Assessment	Justification
Surface Water Body	**Moy & Killala WFD Catchment**			
	River	Meander_010	**Yes**	The Site is mapped within the Meander_010 WFD river sub-basin. An assessment is required to consider the potential impacts of the Proposed Project on this SWB.
	River	Manulla_020	**Yes**	The Manulla_020 SWB is located directly downstream of the Meander_010 SWB and in close proximity to the Site. An assessment is required to consider the potential impacts of the Proposed Project on this SWB.
	River	Manulla_030	**Yes**	The Manulla_030 SWB is located downstream of the Manulla_020 SWB An assessment is required to consider the potential impacts of the Proposed Project on this SWB.
	River	Manulla_040	No	The Manulla_040 SWB has been screened out due to its distant location from the Site and the increasing volumes of water within the river. The Proposed Project has no potential to affect the status of this SWB.
	River	Castlebar_030	No	The Castlebar_030 SWB has been screened out due to its distant location from the Site and the increasing volumes of water within the river. The Proposed Project has no potential to affect the status of this SWB.
	River	Castlebar_040	No	The Castlebar_040 SWB has been screened out due to its distant location from the Site and the increasing volumes of water within the river. The Proposed Project has no potential to affect the status of this SWB.
	Lake	Lough Cullin	No	The Castlebar_040 SWB has been screened out due to its distant location from the Site and the large volumes of water within this lake. The Proposed Project has no potential to affect the status of this SWB.
	River	Tullymore (Mayo)_010	**Yes**	The Site is mapped within the Tullymore(Mayo)_010 WFD river sub-basin An assessment is required to consider the potential impacts of the Proposed Project on this SWB.
	River	Manulla_010	**Yes**	The Manulla_010 SWB is located downstream of the Tullymore (Mayo)_010 SWB. An assessment is required to consider the potential impacts of the Proposed Project on this SWB.
	Corrib WFD Catchment			
	River	Robe_030	**Yes**	The Site is mapped within the Robe_030 WFD river sub-basin. An assessment is required to consider the potential impacts of the Proposed Project on this SWB.
	River	Robe_040	**Yes**	The Robe_040 SWB is located directly downstream of the Robe_030 SWB. An assessment is required to consider the potential impacts of the Proposed Project on this SWB.
	River	Robe_050	**Yes**	The Robe_050 SWB is located directly downstream of the Robe_040 SWB. An assessment is required to consider the potential impacts of the Proposed Project on this SWB.
	River	Robe_060	No	The Robe_060 SWB has been screened out due to its distant location from the Site and the increasing volumes of water within the river. The Proposed Project has no potential to affect the status of this SWB.
	Lake	Lough Mask	No	Lough Mask is screened out of the assessment due to its distant location from the Site and the large volumes of water within this lake waterbody. The Proposed Project has no potential to

				affect Lough Mask.
Groundwater Bodies				
Groundwater Body	Groundwater	Cong-Robe	**Yes**	The Site is mapped to overlie the Cong-Robe GWB. An assessment is required to consider the potential impacts of the Proposed Project on this GWB.
	Groundwater	Swinford	**Yes**	The Site is mapped to overlie the Swinford GWB. An assessment is required to consider the potential impacts of the Proposed Project on this GWB.
Protected Areas				
Protected Areas	Nature Conservation Sites	River Moy SAC	**Yes**	The River Moy SAC is located downstream of the Site via the Meander River. An assessment is required to consider the potential impacts of the Proposed Project on this protected area.
		Lough Conn and Lough Cullin SPA	No	Lough Conn and Lough Cullin SPA is screened out of the WFD Compliance Assessment due to its significant distance downstream of the Site (~40km) and the large volumes of water within these lakes. The Proposed Project has no potential to affect the SPA.
		Mountpleasant School Turlough pNHA	**Yes**	The GSI map bedrock underlying the Site as a Regionally Important Karst Aquifer and any groundwater at the Site could be connected to this Turlough. Mountpleasant School Turlough pNHA has been included for the purposes of a conservative WFD Compliance Assessment.
		Slishmeen Turlough pNHA	**Yes**	The GSI map bedrock underlying the Site as a Regionally Important Karst Aquifer and any groundwater at the Site could be connected to this Turlough. Slishmeen Turlough pNHA has been included for the purposes of a conservative WFD Compliance Assessment.
		Balla Turlough SAC & pNHA	**Yes**	The GSI map bedrock underlying the Site as a Regionally Important Karst Aquifer and any groundwater at the Site could be connected to this Turlough. Balla Turlough SAC & pNHA has been included for the purposes of a conservative WFD Compliance Assessment.
		Carrowkeel Turlough SAC & pNHA	**Yes**	The GSI map bedrock underlying the Site as a Regionally Important Karst Aquifer and any groundwater at the Site could be connected to this Turlough. Carrowkeel Turlough SAC & pNHA has been included for the purposes of a conservative WFD Compliance Assessment.
		Towerhill House SAC	No	There is no hydrological connectivity to this SAC. The Proposed Project has no potential to affect the SAC.
		Lough Carra/Mask Complex SAC	No	Lough Carra/Mask Complex SAC will not be screened in due to its distant location from the Site and the large volumes of water within the lake. The Proposed Project has no potential to affect the SAC.
		Lough Mask SPA	No	Lough Mask SPA will not be screened in due to its distant location from the Site and the large volumes of water within the lake. The Proposed Project has no potential to affect the SAC.
	Bathing Waters	Bertra Beach, Murrisk	No	The bathing waters at Bertra Beach, Murrisk have been screened out due to their distant location from the Site. The Proposed Project has no potential to cause a deterioration to the bathing area.
	Nutrients Sensitive Areas	Castlebar River	No	The Castlebar River NSA has been screened out due to its distant location from the Site and the large volumes of water within the Castlebar River. The Proposed Project has no potential to affect the Castlebar River NSA.
		Lough Cullin	No	Lough Cullin NSA is screened out of the assessment due to its distant location from the Site and the large volumes of water within the lake. The Proposed Project has no potential to affect

				Lough Cullin NSA.
	Shellfish Protected Areas	Clew Bay (East of Old Head)	No	The designated shellfish areas at Clew Bay (East of Old Head) have been screened out due to their distant location from the Site. The Proposed Project have no potential to cause a deterioration to the shellfish waters.
	Salmonid Waters	Manulla_020 to Manulla_040	**Yes**	The Manulla_020 to Manulla_040 salmonid waters are located in close proximity to the Site and downstream of the Site. An assessment is required to consider the potential impacts of the Proposed Project on these Salmonid Waters.
		Castlebar_030 and Castlebar_040	No	The Castlebar_030 and Castlebar_040 salmonid waters have been screened out due to their distant location from the Site and the large volumes of water within the river. The Proposed Project has no potential to affect these salmonid waters.
		Lough Cullin	No	The Lough Cullin Salmonid water is screened out of the assessment due to its distant location from the Site and the large volumes of water within the lake. The Proposed Project has no potential to affect Lough Cullin salmonid water.
	Drinking Water Protected Areas	Lough Mask DWPA	No	Lough Mask DWPA is screened out of the assessment due to its distant location from the Site and the large volumes of water within the lake. The Proposed Project has no potential to affect the DWPA.

4. WFD COMPLIANCE ASSESSMENT

4.1 PROPOSALS

The Proposed Project is defined in Chapter 4 of the EIAR.

Due to the nature of wind farm developments (and associated grid connections and TDR works), being near-surface construction activities, impacts on groundwater are generally negligible and surface water is generally the main sensitive receptor assessed during impact assessments. The primary risks to groundwater at the Site will be chemical pollution of groundwater from cementitious materials, hydrocarbon spillage and leakages. Potential piling works also have the potential to impact groundwater levels.

The primary risk to surface waters will be entrained suspended sediments (peat and soil particles) in site runoff during earthworks and tree felling along with release cement-based compounds and/or hydrocarbons. The Proposed Project may also result in changes to surface water runoff volumes and flow patterns.

There are a number of potential adverse effects to both surface water and groundwater.

4.2 POTENTIAL EFFECTS

4.2.1 Construction Phase (Unmitigated)

4.2.1.1 Potential Effects on Surface Water Quality

Construction phase activities including tree felling, site levelling/construction and building turbine foundation excavation, borrow pit excavation, access roads, hardstand areas and peat and spoil management areas, will require earthworks resulting in removal of vegetation cover and excavation of peat, soil and subsoils. The main risk will be from surface water runoff from bare soil/peat during construction works.

Hydrocarbons and cement-based compounds will be used during the construction phase. Accidental spillage during refuelling of construction plant with petroleum hydrocarbons is a significant pollution risk to surface waters at all construction sites. The accumulation of small spills of fuels and lubricants during routine plant use can also be a pollution risk. Hydrocarbon has a high toxicity to humans, and all flora and fauna, including fish, and is persistent in the environment. It is also a nutrient supply for adapted micro-organisms, which can rapidly deplete dissolved oxygen in waters, resulting in the death of aquatic organisms.

Release of untreated effluent from wastewater systems also has the potential to impact on surface waters.

Clear felling of ~0.7ha of coniferous forestry plantation is also proposed. It is also proposed to permanently remove 2.5 ha of scrub and mosaics of scrub. Potential surface water quality effects from felling include the release of elevated concentrations of suspended solids and nutrient release which has the potential to affect downstream surface water quality. In addition, the biodiversity enhancement works will have the potential to release suspended solids to surface waters.

There are no crossings proposed of EPA mapped watercourses or SWBs. There are several crossings proposed over existing manmade drains within the Site.

Construction phase activities can result in the release of suspended solids and pollutants in runoff water and could result in an increase in the suspended sediment load, resulting in increased turbidity, increased pH and contamination which in turn could affect the water quality and fish stocks in the downstream SWBs.

The SWBs likely to be most impacted by these activities include those in close proximity to the Site including the Robe_030, Meander_010 and Tullymore (Mayo)_010 SWBs. Further downstream, the potential for water quality effects will decrease downstream due to the increasing volumes of water within the respective SWBs.

A summary of potential status change to SWBs arising from surface water quality impacts from earthworks during the construction phase of the Proposed Project in the unmitigated scenario are outlined in **Table F**.

Table F: Potential Effects on Surface Water Quality During the Construction Phase (Unmitigated)

SWB	WFD Code	Current Status	Assessed Potential Status Change
Meander_010	IE_WE_34M050400	High	Good
Manulla_020	IE_WE_34M010225	Good	Good
Manulla_030	IE_WE_34M010300	Good	Good
Tullymore (Mayo)_010	IE_WE_34T560640	High	Good
Manulla_010	IE_WE_34M010100	Poor	Poor
Robe_030	IE_WE_30R010310	Good	Moderate
Robe_040	IE_WE_30R010400	Moderate	Moderate
Robe_050	IE_WE_30R010600	Poor	Poor

4.2.1.2 Potential Effects on Groundwater Quality/Quantity (Unmitigated Scenario)

The accidental spillage of hydrocarbons, the release of effluent from wastewater treatment systems and the release of cement-based products have the potential to negatively impact on groundwater water quality at the Site.

In addition, groundwater seepages may occur in turbine base excavations, and the borrow pit excavation and this will create additional volumes of water to be treated by the drainage management system.

Furthermore, temporary dewatering of excavations may drawdown the local groundwater table.

However, due to the shallow nature of the proposed works, and the scale of the Site in comparison to the scale of the Swinford (~564km^2) and Cong-Robe GWBs (~440 km^2) there is no significant potential for works at the Site to change the overall status of the underlying GWBs.

A summary of potential status change to GWBs arising from potential groundwater quality impacts during the construction phase of the Proposed Project in the unmitigated scenario are outlined in **Table G**.

Table G: Potential Effects on Groundwater Quality/Quantity During the Construction Phase (Unmitigated)

GWB	WFD Code	Current Status	Assessed Potential Status Change
Swinford	IE_WE_G_0033	Good	Good
Cong-Robe	IE_WE_G_0019	Good	Good

4.2.1.3 Potential Effects on Protected Areas

The surface water connections from the Site could potentially transfer poor quality surface water that may affect the conservation objectives of the River Moy SAC. Any deterioration in surface water quality at the Site also has the potential to affect the Manulla River (Manulla_020 to Manulla_040 SWBs) designated salmonid waters.

Any deterioration in groundwater quality could potentially impact local groundwater dependent designated sites including the Mountpleasant School Turlough pNHA, Slishmeen Turlough pNHA, Balla Turlough SAC/pNHA and Carrowkeel Turlough SAC/pNHA due to the karstic nature of the mapped bedrock. However, the local hydrogeology at the Site is characterised by high rates of surface water runoff and low rates of groundwater recharge. The bedrock at the Site is protected by thick overburden deposits which create a low vulnerability setting whereby surface water is the primary receptor. These sites are included only for the purposes of a conservative assessment.

4.2.2 Operational Phase (Unmitigated)

Potential effects associated with the operational phase of the Proposed Project will be much reduced in comparison to the construction phase. Any effects will occur at the Site and will be associated with minor maintenance works.

4.2.2.1 Potential Effects on Surface Water Quantity

Progressive replacement of the soil or vegetated surfaces with impermeable surfaces could potentially result in an increase in the proportion of surface water runoff reaching the surface water drainage network. This could potentially increase runoff from the Site and increase flood risk downstream of the Proposed Project.

A quantitative analysis presented in Section 9.5.3.1 of the EIAR demonstrates that the Proposed Project infrastructure, in the absence of any mitigation measures, will only result in a negligible increase in surface water runoff of 0.135% in comparison to baseline runoff rates at the Proposed Wind Farm. This is due to the small footprint of the Proposed Project and the high rates of surface water runoff which characterise the baseline hydrological environment.

A summary of potential status change to SWBs arising from increased runoff during the operation phase of the Proposed Project in the unmitigated scenario are outlined in **Table H**.

Table H: Potential Effects on Surface Water Flows During the Operational Phase (Unmitigated)

SWB	WFD Code	Current Status	Assessed Potential Status Change
Meander_010	IE_WE_34M050400	High	High
Manulla_020	IE_WE_34M010225	Good	Good
Manulla_030	IE_WE_34M010300	Good	Good
Tullymore (Mayo)_010	IE_WE_34T560640	High	High
Manulla_010	IE_WE_34M010100	Poor	Poor
Robe_030	IE_WE_30R010310	Good	Good
Robe_040	IE_WE_30R010400	Moderate	Moderate
Robe_050	IE_WE_30R010600	Poor	Poor

4.2.2.2 Potential Surface Water Quality Effects

During the operational phase, the potential for silt-laden runoff is much reduced compared to the construction phase. In addition, all permanent drainage controls will be in place and the disturbance of ground and excavation works will be complete. Some minor maintenance works may be completed, such as maintenance of site entrances, internal roads and hardstand areas. These works would be of a very minor scale and would occur infrequently. Potential sources of sediment laden water would only arise from surface water runoff from small areas where new material is added during maintenance works.

A summary of potential status change to SWBs arising from surface water quality impacts during the operation phase of the Proposed Project in the unmitigated scenario are outlined in **Table I**.

Table I: Potential Effects on Surface Water Quality During the Operational Phase (Unmitigated)

SWB	WFD Code	Current Status	Assessed Potential Status Change
Meander_010	IE_WE_34M050400	High	High
Manulla_020	IE_WE_34M010225	Good	Good
Manulla_030	IE_WE_34M010300	Good	Good
Tullymore (Mayo)_010	IE_WE_34T560640	High	High
Manulla_010	IE_WE_34M010100	Poor	Poor
Robe_030	IE_WE_30R010310	Good	Good
Robe_040	IE_WE_30R010400	Moderate	Moderate
Robe_050	IE_WE_30R010600	Poor	Poor

4.2.2.3 Potential Effects on Groundwater Quality

The risks to groundwater quality are the same as those described in **Section 4.2.1.2** but of a lesser extent than during the construction phase due to the limited activity at the Site with only minor maintenance required during the operational phase.

A summary of potential status change to GWBs arising from groundwater quality impacts during the operation phase of the Proposed Project in the unmitigated scenario are outlined in **Table J**.

Table J: Potential Effects on Groundwater Quality During the Operational Phase (Unmitigated)

GWB	WFD Code	Current Status	Assessed Potential Status Change
Swinford	IE_WE_G_0033	Good	Good
Cong-Robe	IE_WE_G_0019	Good	Good

4.3 MITIGATION MEASURES

In order to mitigate against the potential negative effects on surface and groundwater quality, quantity and flow patterns, mitigation measures will be implemented during the construction and operational phases of the Proposed Project. These are outlined below.

4.3.1 Construction Phase

4.3.1.1 Mitigation Measures to Protect Surface Water Quality during Clear Felling Operations

Tree felling operations will conform to current best practice Forest Service regulations, policies and strategic guidance documents as well as Coillte and DAFM guidance documents, including the specific guidelines listed below, to ensure that felling, planting and other forestry operations result in minimal potential negative effects to the receiving environment.

- Forestry Standards Manual (Forest Service, 2015);
- Forest Protection Guidelines (Forest Service, 2002);
- Forest Operations and Water Protection Guidelines (Coillte, 2013);
- Forestry and Water Quality Guidelines (Forest Service, 2000b);
- Forestry and the Landscape Guidelines (Forest Service, 2000c);
- Forests and Water, Achieving Objectives under Ireland's River Basin Management Plan 2018-2021 (DAFM, 2018);
- Coillte Planting Guideline SOP; and,
- Code of Best Forest Practice (Forest Service, 2000).

Mitigation by Avoidance:
There is a requirement in the Forest Service Code of Practice and in the FSC Certification Standard for the installation of buffer zones adjacent to aquatic zones at planting stage. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document "Forestry and Water Quality Guidelines".

The setback distance from sensitive hydrological features mean that adequate room is maintained for the proposed mitigation measures (discussed below) to be properly installed and operate effectively. The buffer/setback zone will:

- Avoid physical damage (river/stream banks and river/stream beds) to watercourses and the associated release of sediment;
- Avoid soil disturbance and compaction within close proximity to surface watercourses;

- Avoid the entry of suspended sediment from works into watercourses; and,
- Avoid the entry of suspended sediment from the drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone.

In addition to the application of buffer/setback zones, the following supplementary mitigation measures will be employed during felling works as follows:

Mitigation by Design:
Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods which are set out as follows:

- Machine combinations (i.e. handheld or mechanical) will be chosen which are most suitable for ground conditions and which will minimise soils disturbance;
- All machinery will be operated by suitably qualified personnel;
- Checking and maintenance of roads and culverts will be on-going through any felling operation. No tracking of vehicle through watercourses will occur, as vehicles will use road infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during felling works;
- Machines will traverse the Site along specified off-road routes (referred to as racks);
- The location of racks will be chosen to avoid wet and potentially sensitive areas;
- Brash mats will be placed on the racks to support the vehicles on soft ground, reducing mineral soil disturbance and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal should take place when they become heavily used and worn. Provision should be made for brash mats along all off-road routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall;
- Silt fences will be installed at the outfalls of existing drains downstream of felling areas. No direct discharge of such drains to watercourses will occur. Sediment traps and silt fences will be installed in advance of any felling works and will provide surface water settlement for runoff from work areas and will prevent sediment from entering downstream watercourses. Accumulated sediment will be carefully disposed of at pre-selected spoil repository areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground;
- In areas particularly sensitive to erosion it will be necessary to install double or triple sediment traps and increase buffer zone width. These measures will be reviewed on Site during construction;
- Double silt fencing will also be put down slope of felling areas which are located in close proximity to streams and/or relevant watercourses;
- Drains and silt traps will be maintained throughout all felling works, ensuring that they are clear of sediment build-up and are not severely eroded;
- Timber will be stacked in dry areas, and outside watercourse buffer zones. Check dams and silt traps will be emplaced on the down gradient side of timber storage/processing sites;
- Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water runoff;
- All refuelling will be completed outside of the designated 50m hydrological buffer zones. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; and,
- Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors.

Silt Traps:
Silt traps will be strategically placed down-gradient within forestry drains near streams. The main purpose of the silt traps and drain blocking is to slow water flow, increase residence time, and allow settling of silt in a controlled manner.

Pre-emptive Site Drainage Management:
The works programme for the felling operations will also take account of weather forecasts and predicted rainfall in particular. Operations will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast.

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

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

Timing of Proposed Project Felling Works:
Felling will only be carried out during periods of no or low 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.

Drain Inspection and Maintenance:

- The following items will be carried out during pre-felling inspections and after:
- Communication with tree felling operatives in advance to determine whether any areas have been reported where there is unusual water logging or bogging of machines;
- Inspection of all areas reported as having unusual ground conditions;
- Inspection of main drainage ditches and outfalls. During pre-felling inspections the main drainage ditches will be identified. Ideally the pre-felling inspection will be carried out during rainfall;
- Following tree felling all main drains will be inspected to ensure that they are functioning;
- Extraction tracks within 10m of drains will be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground;
- Culverts on drains exiting the Site, if impeded by silt or debris, will be unblocked; and,
- All accumulated silt will be removed from drains and culverts, and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall.

Surface Water Quality Monitoring:
Sampling will be completed before, during (if the operation is conducted over a protracted time) and after the felling activity. The 'before' sampling will be conducted within 4 weeks of the felling activity commencing, preferably in medium to high water flow conditions. The "during" sampling will be undertaken once a week or after rainfall events. The 'after' sampling will comprise as many samplings as necessary to demonstrate that water quality has returned to pre-activity status (i.e. where an impact has been shown).

4.3.1.2 Mitigation Measures to Prevent the Entrainment of Suspended Solids in Surface Water

Mitigation by Avoidance
The key mitigation measure during the construction phase is the avoidance of sensitive hydrological features where possible, by application of suitable buffer zones. The design of the Proposed Project (Proposed Wind Farm and Proposed Grid Connection) has avoided the crossing of EPA mapped watercourses on site. There is one EPA mapped watercourse located within the Site, this being the Meander River which at its nearest point is located c.372m southwest of T5. No works are proposed within the 50m hydrological buffer associated with this watercourse.

Drumady Lough and Nambrackkeagh Lough are located immediately adjacent to the Site, both of which are located at least 200m away from any proposed infrastructure. No works are proposed within the delineated 100m lake buffer with the exception of some treeline planting

and native woodland planting. These works within the lake buffer zones do not pose a significant risk to the hydrological environment. Indeed, the presence of trees would protect water quality in the long-term by providing erosion interception and stability.

The large setback distance from sensitive hydrological features means that adequate room is maintained for the proposed drainage mitigation measures (discussed below) to be properly installed and operate effectively. The proposed buffer zone will:

- Avoid physical damage (river/stream banks and river/stream beds) to watercourses and associated release of sediment;
- Avoid excavations within close proximity to surface watercourses;
- Avoid the entry of suspended sediment from earthworks into watercourses; and,
- Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone.

Mitigation by Design:

- Source controls:
  - Interceptor drains, vee-drains, diversion drains, flume pipes, erosion and velocity control measures such as use of sand bags, oyster bags filled with gravel, filter fabrics, and other similar/equivalent or appropriate systems.
  - Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas.
- In-Line controls:
  - Interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sand bags, oyster bags, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems.
- Treatment systems:
  - Temporary sumps and ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbuster, and/or other similar/equivalent or appropriate systems.

It should be noted that for the Site, an extensive network of forestry, peat and agricultural drains already exist, and these will be integrated and enhanced as required and used within the Proposed Wind Farm drainage system. The integration of the existing forestry drainage network and the Proposed Wind Farm network is relatively simple. The key elements being the upgrading and improvements to existing water treatment elements, such as in line controls and treatment systems, including silt traps, settlement ponds and buffered outfalls.

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

- Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system, there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the Site drainage into the existing site drainage network. This will reduce the potential for any increased risk of downstream flooding or sediment transport/erosion;
- Silt traps will be placed in the existing drains upstream of any streams where construction works / tree felling is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area;
- Runoff from individual turbine hardstanding areas will be not discharged into the existing drain network but discharged locally at each turbine location through settlement ponds and buffered outfalls onto vegetated surfaces;
- Buffered outfalls which will be numerous over the Site will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the Site; and,

- Drains running parallel to the existing roads requiring widening will be upgraded, widening will be targeted to the opposite side of the road. Velocity and silt control measures such as check dams, sand bags, oyster bags, flow limiters, weirs, baffles, silt fences will be used during the upgrade construction works. Regular buffered outfalls will also be added to these drains to protect downstream surface waters.

Pre-commencement Temporary Drainage Works

Prior to the commencement of construction works (new road/hardstand, turbine foundation installs or upgrade of existing roads) the following key temporary drainage measures will be installed:

- All existing land and forestry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using forestry check dams/silt traps;
- Clean water interceptor drains will be installed upgradient of the works areas;
- Check dams/silt fence arrangements (silt traps) will be placed in all existing that have surface water flows; and,
- A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone.

Silt Fences:

Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids such as those present in the peat and tills that overlie the Site. This will act to prevent entry to watercourses of sediment, released from excavation of sub-soils, and entrained in surface water runoff. Inspection and maintenance of these structures during the construction phase is critical to their functioning to stated purpose. They will remain in place throughout the entire construction phase. Double silt fences will be placed within drains down-gradient of all construction areas inside the hydrological buffer zones (100m lake buffer).

Silt Bags:

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

Settlement Ponds:

The Proposed Project footprint has been divided into drainage catchments (based on topography, outfall locations, catchment size) and stormwater runoff rates based on the 10-year return period rainfall event were calculated for each catchment. These flows were then used to design settlement ponds for each drainage catchment. The settlement ponds are designed for 11hr or 24hr retention times used to settle out medium silt (0.006mm) and fine silt (0.004mm) respectively (EPA, 2006).

Level Spreaders and Vegetation Filters:

The purpose of level spreaders is to release treated drainage flow in a diffuse manner, and to prevent the concentration of flows at any one location thereby avoiding erosion. Level spreaders are not intended to be a primary treatment component for development surface water runoff. They are not stand alone but occur as part of a treatment train of systems that will reduce the velocity of runoff prior to be released at the level spreader. In the absence of level spreaders, the potential for ground erosion is significantly greater than not using them.

Vegetation filters are essentially end-of-line polishing filters that are located at the end of the treatment train. In fact, vegetation filters are ultimately a positive consequence of not discharging directly into watercourses which is one of the mitigation components of the

drainage philosophy. This makes use of the natural vegetation of the site to provide a polishing filter for the Site drainage prior to reaching the downstream watercourses.

Again, vegetation filters are not intended to be a single or primary treatment component for treatment of works area runoff. They are not stand alone but are intended as part of a treatment train of water quality improvement/control systems.

Water Treatment Train:
A final line of defence will be provided by a water treatment train such as a "Siltbuster". If the discharge water from construction areas fails to be of a high quality during regular inspections, then a filtration treatment system (such as a 'Siltbuster' or similar equivalent treatment train (sequence of water treatment processes) will be used to filter and treat all surface discharge water collected in the dirty water drainage system. This will apply for all of the construction phase.

Pre-emptive Site Drainage Management:
The works programme for the entire construction stage of the Proposed Project will also take account of weather forecasts, and predicted rainfall in particular. Large excavations and movements of soil/subsoil or vegetation stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast.

Management of Runoff from the Peat and Spoil Management Areas:
It is proposed that excavated peat/subsoil (spoil) will be used to reinstate the proposed borrow pit, for landscaping throughout the Site and any excess spoil will be placed in the 10 no. peat and spoil management areas. All peat and spoil management areas are located outside the 50m stream/river buffer zone, with all peat and spoil management areas being located a minimum of 500m away from EPA mapped watercourses. The closest is located ~540m northwest of the Meander River as it outflows from Lough Nambrackkeagh. Furthermore, no peat and spoil management areas are located within the delineated 100m lake buffer. The closest is ~230m to the west of Drumady Lough.

Proposed surface water quality protection measures regarding the peat and spoil management areas are as follows:

- Where applicable the vegetative topsoil layer of the peat and spoil management areas will be rolled back to facilitate placement of excavated spoil up to a maximum height of 1.5 metres, following which the vegetative-top soils layer will be reinstated;
- Where reinstatement is not possible, peat and spoil management areas will be sealed with a digger bucket and seeded as soon possible to reduce sediment entrainment in runoff;
- An interceptor drain will be installed upslope of the identified peat and spoil management areas to divert any surface water away from these areas where necessary;
- Silt fences and double silt-fences will be emplaced down-gradient of the designated peat and spoil management areas and will remain in place throughout the entire construction phase, or until reseeding has been established to a sufficient level;
- The peat and spoil management areas are enclosed and their drainage can be easily managed; and,
- Once the peat and spoil management area has been seeded and vegetation is established the risk to downstream surface water is significantly reduced.

Therefore, at each stage of the spoil management area development the above mitigation measures will be deployed to ensure protection of downstream water quality.

Timing of Site Construction Works:
Construction of the site drainage system will only be carried out during periods of low 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.

Construction of the drainage system during this period will also ensure that attenuation features associated with the drainage system will be in place and operational for all subsequent construction works.

Monitoring:
An inspection and maintenance plan for the on-site construction drainage system will be prepared in advance of commencement of any works. Regular inspections of all installed drainage systems will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended. Inspections will also be undertaken after tree felling.

Any excess build-up of silt levels at dams, the settlement pond, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed. Checks will be carried out on a daily basis.

During the construction phase field testing and laboratory analysis of a range of parameters with relevant regulatory limits and Environmental Quality Standards (EQSs) will be undertaken for each primary watercourse, and specifically following heavy rainfall events (as per the CEMP included in Appendix 4-2 of this EIAR).

Allowance for Climate Change:
Climate change rainfall projections are typically for a mid-century (2050) timeline. The projected effects of climate change on rainfall are therefore modelled towards the end of the life cycle of the Proposed Project, as the turbines have a life span of 35 years. It is likely that the long-term effects of climate change on rainfall patterns will not be observed during the lifetime of the Proposed Wind Farm. As outlined in the above sections we have designed settlement ponds for a 10-year return flow. This approach is conservative given that the Proposed Project will likely be built over a much shorter period (18-24 months), and therefore this in-built redundancy in the drainage design more than accounts for any potential short term climate change rainfall effects.

However, the settlement ponds are designed for a 10-year return flow, with built in redundancy (+20%) to account for climate change effects on rainfall.

4.3.1.3 Mitigation Measures to Protect Water Quality During Excavation Dewatering

Management of groundwater seepages and subsequent treatment prior to discharge into the drainage network will be undertaken as follows:

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

4.3.1.4 Mitigation Measures for Effects on Groundwater Levels

The Site and the proposed borrow pit are mapped to be located in a Regionally Important Karst Aquifer. Groundwater dewatering may be required as the excavation deepens. It is noted that no groundwater was encountered during the excavation of the 2 no. trial pits at the proposed borrow pit location which extended to depths of 2.3 and 2.7mbgl. Furthermore, no groundwater strikes were recorded during the drilling of the rotary core hole at the borrow pit location.

Direct rainfall and surface water runoff will be the main inflows that will require water volume and water quality management. For the avoidance of doubt, we would generally define dewatering as a requirement to temporarily drawdown the local groundwater table by means of over pumping, e.g. as would be required for the operation of a bedrock quarry in a valley floor. We consider that this example is very different in scale and operation from the proposed operation of a temporary shallow borrow pit. In order to explain this thoroughly we will outline our reasoning in a series of bullet points as follows:

- Firstly, the borrow pit area is located in an area of deep subsoils (10.6m in thickness);
- The borrow pit was selected based on the shallow depth of peat (generally less than 1m with a depth of 2.2 in the southwest), with the peat being underlain by sand and gravel subsoils;
- No groundwater strikes were encountered during the site investigations at the proposed borrow pit location;
- The bedrock encountered during the drilling did not contain any water bearing features;
- No karst features were recorded at the proposed borrow pit location;
- The borrow pit is remote from any surface water streams and/or rivers; and,
- The maximum depth of the borrow pit is 6m which is a relatively shallow excavation and not comparable to a large bedrock quarry. There will be no excavation of bedrock.

Some temporary dewatering may be required where excavations encounter granular subsoils. However, any dewatering works will be temporary, and no significant or permanent excavations are proposed in this area of the Site. There will be no significant effect on groundwater quantity as the water will be returned to the aquifer once it has been treated via the Proposed Project drainage system.

Relevant environmental management guidelines from the EPA quarry 2006 guidance document – "Environmental Management in the Extractive Industry" in relation to groundwater issues will be implemented during the construction phase. Control of groundwater within the borrow pit may be required and measures will be determined as part of the ground investigation programme. The site investigations indicate that the volumes of water requiring treatment will not be significant.

4.3.1.5 Mitigation Measures for Hydrocarbons

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

- Wherever possible, vehicles will be refuelled off-site, particularly for regular road-going vehicles;
- All plant will be inspected and certified to ensure that they are leak free and in good working order prior to use at the Site;
- On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site;
- Heavy plant and machinery will be refuelled on-site by a fuel truck, with spill kits kept onboard, that will come to the Site as required on a scheduled and organised basis;
- Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area in the construction compound when not in use

- Only designated trained operatives will be authorised to refuel plant on-site;
- Refuelling or maintenance of machinery will not occur within the delineated hydrological buffer zones;
- Fuels stored on the Site will be minimised;
- Any diesel or fuel oils stored at the temporary construction compound will be bunded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity; and,
- An emergency plan for the construction phase to deal with accidental spillages will be contained within the Construction and Environmental Management Plan (Appendix 4-5). Spill kits will be available to deal with accidental spillages.

4.3.1.6 Mitigation Measures for Cement-Based Products

- No batching of wet-concrete products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place;
- Where possible pre-cast elements for culverts and concrete works will be used;
- Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be undertaken at lined concrete washout ponds;
- Weather forecasting will be used to plan dry days for pouring concrete; and,
- The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event; and,
- At proposed turbine foundations, sand blinding, DPM, and lean-mix blinding are used to vertically contain the concrete. While the concrete is contained laterally by temporary/permanent shuttering. The concrete cures within 72hrs.

4.3.1.7 Mitigation Measures for Wastewater

- During the construction phase, a self-contained port-a-loo with an integrated waste holding tank will be used at each of the site construction compounds, maintained by the providing contractor, and removed from site on completion of the construction works;
- Water supply for the site office and other sanitation will be brought to site and removed after use from the site to be discharged at a suitable off-site treatment location; and,
- No water or wastewater will be sourced on the site, nor discharged to the Site.

4.3.1.8 Mitigation Measures in Relation to Morphological Changes and Drainage Patters

In relation to the new proposed culverts and proposed culvert upgrades at field drain crossings, the culverts will be suitably sized for the expected peak flows in the relevant drain. All culverts will be installed with a minimum internal gradient of 1% (1 in 100). Smaller culverts will have a smooth internal surface. Larger culverts may have corrugated surfaces which will trap silt and contribute to the stream ecosystem. Depending on the management of water on the downstream side of the culvert, large stone may be used to interrupt the flow of water. This will help dissipate its energy and help prevent problems of erosion. Smaller drain crossings will simply consist of an appropriately sized pipe buried in the sub-base of the access track at the necessary invert level to ensure ponding or pooling does not occur above or below the culvert and water can continue to flow as necessary.

4.3.1.9 Mitigation Measures for Siltbuster

Measures employed to prevent overdosing and potential chemical carryover:

- The siltbuster system comprises an electronic in-line dosing system which provides an accurate means of adding reagents, so overdosing cannot occur;
- Continued monitoring and water analysis of pre and post treated water by means of an inhouse lab and dedicated staff, means the correct amount of chemical is added by the dosing system;
- Dosing rates of chemical to initiate settlement is small, being in the order of 2-10 mg/L and the vast majority of the chemical is removed in the deposited sediment;
- Final effluent not meeting the discharge criteria is recycled and retreated, which has a secondary positive effect of reducing carryover; and,
- Use of biodegradable chemical agents can be used at very sensitive sites (i.e. adjacent to SACs).

4.3.1.10 Mitigation Measures for TDR Works

No significant effects will occur for the following reasons:

- All works are relatively minor and localised and cover very small areas;
- Excavation/earthworks will all be small scale; and,
- These works are distributed over a wide area.

Nevertheless, the "Pre-commencement Temporary Drainage Works" described in Section 4.3.1.2 will be employed at all the TDR works areas.

In relation to the extension of an existing culvert along a small stream along the L1506, the following mitigation measures will be implemented:

- The works will be carried out to the specification of the OPW's Construction, Replacement or Alteration of Bridges and Culverts - A Guide to Applying for Consent under Section 50 of the Arterial Drainage Act, 1945', and in consultation with Inland Fisheries Ireland;
- The works will only be done during low flow conditions and during a dry period between July and September (as required by IFI for in-stream works) to avoid the salmon spawning season and to have more favourable (dryer) ground conditions;
- During the works, the water will be isolated from the works area (e.g. over pumping or temporary damming of the channel) to prevent the entrainment of suspended solids;
- Sediment and pollution control measures, including silt fencing, will be installed and maintained for the duration of the works;
- Pollution prevention measures will be implemented with respect to hydrocarbons (refer to Section 9.5.2.5) and cement-based products (Section 9.5.2.6);
- Pre-cast concrete units will be utilised;
- Water quality will be monitored upstream and downstream of the works to ensure there is no adverse effect. Works will be suspended in the event of any observed impact until corrective measures have been undertaken.

4.3.1.11 Mitigation Measures in Relation to the Biodiversity Management and Enhancement

All proposed habitat management and enhancement works will be in accordance with the best practice Forest Service regulation, policies and strategic guidance documents as well as Coillte, DAFM and NatureScot guidance documents to ensure minimal potential negative effects on the local peat, soil and subsoil environment.

Given the nature of the restoration measures the following mitigation measures are proposed:

- Before any works are completed silt fences will be installed to limit the movement of entrained sediment in surface water runoff;
- Proposed off-road routes will be walked in advance of any machinery;
- All machinery operators will be experienced;

- The Site will be walked before a machine goes off-road;
- Bog mats will be used where the excavator is required to travel over wet ground; and,
- A low ground pressure excavator with wide tracks (1.9m or greater) will be used to reduce compaction of the peat and subsoils.

4.3.2 Operational Phase

4.3.2.1 Mitigation Measures to Prevent an Increase in Surface Water Runoff

The operational phase drainage system of the Proposed Project will be installed and constructed in conjunction with the road and hardstanding construction work as described below:

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

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

4.3.2.2 Mitigation Measures to Protect Surface Water and Groundwater Quality

The mitigation measures to protect against poor quality runoff during the operational phase of the Proposed Project are the same as those outlines in Section 4.3.1.2 above.

With regards to hydrocarbons:

- Onsite re-fuelling of normal operational vehicles will not be carried out during the operational phase of the development. These vehicles will be refuelled offsite;
- Fuels stored on site will be minimised and any hydrocarbons stored on-site will be bunded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity;
- The substation will be bunded appropriately to the volume of oils likely to be stored, and to prevent leakage of any associated chemicals and to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor;
- Oil in the turbine transformers will be fully bunded within the enclosed turbine and as such, there is no potential pathway to the water environment i.e. the pathway has been blocked;
- Any plant used during the operational phase will be regularly inspected for leaks and fitness for purpose; and,

- Spill kits will be available to deal with accidental spillages.

4.3.3 Decommissioning Phase

The potential impacts associated with decommissioning of the Proposed Project will be similar to those associated with construction but of a reduced magnitude, due to the reduced scale of the proposed decommissioning works in comparison to construction phase works.

As in the construction phase, temporary surface runoff control measures will again be put in place during decommissioning works. The drainage system will remain operational during the decommissioning phase and will serve to treat any sediment laden surface water run-off due to a renewed disturbance of soils. Following decommissioning, re-vegetation will be implemented as soon as practicable and monitored to ensure vegetation is established.

During decommissioning, it will be possible to reverse or at least reduce some of the potential effects caused during construction, and to a lesser extent operation, by rehabilitating constructed areas such as turbine bases and hard standing areas. This will be done by covering with vegetation to encourage vegetation growth and reduce run-off and sedimentation.

Other impacts such as possible soil compaction and contamination by fuel leaks will remain but will be of reduced magnitude than the construction phase because of the smaller scale of the works and reduced volumes on-site. Similar mitigation as outlined in **Sections 4.3.1.1** and Error! Reference source not found. for the construction stage will be implemented during the decommissioning phase to ensure no impacts of receiving waters.

Some of the potential impacts of water bodies will be avoided by leaving elements of the Proposed Project in place where appropriate. The substation will be retained by EirGrid as a permanent part of the national grid. The turbine bases will be rehabilitated by covering with local topsoil/peat in order to regenerate vegetation which will reduce runoff and sedimentation effects. Mitigation measures to avoid contamination by accidental fuel leakage and compaction of soil by on-site plant will be implemented as per the construction phase mitigation measures.

With the implementation of the mitigation measures outlined above no significant effects on the hydrological and hydrogeological environment will occur during the decommissioning phase of the Proposed Project.

4.3.4 Potential Effects with the Implementation of Mitigation

In all instances, the mitigation measures described in **Section 4.3** are sufficient to meet the WFD Objectives. The assessment of WFD elements for the WFD waterbodies is summarised in **Table K** below.

Table K: Summary of WFD Status for Unmitigated and Mitigated Scenarios

SWB	WFD Code	Current Status	Assessed Status - Unmitigated	Assessed Status with Mitigation Measures
Moy & Killala Bay WFD catchment				
Meander_010	IE_WE_34M050400	High	Good	High
Manulla_020	IE_WE_34M010225	Good	Good	Good
Manulla_030	IE_WE_34M010300	Good	Good	Good
Tullymore (Mayo)_010	IE_WE_34T560640	High	Good	High
Manulla_010	IE_WE_34M010100	Poor	Poor	Poor
Corrib WFD Catchment				
Robe_030	IE_WE_30R010310	Good	Moderate	Good
Robe_040	IE_WE_30R010400	Moderate	Moderate	Moderate
Robe_050	IE_WE_30R010600	Poor	Poor	Poor
Groundwater Bodies				
Swinford	IE_WE_G_0033	Good	Good	Good
Cong-Robe	IE_WE_G_0019	Good	Good	Good

5. SUMMARY AND CONCLUSION

WFD status for SWBs (Surface Water Bodies) and GWBs (Groundwater Bodies) hydraulically linked to the Site are defined in **Section 2** above.

The Proposed Project does not involve any abstraction of groundwater or significant alteration of drainage patterns. Therefore, the quantitative status (*i.e.* the available quantity (volume) of groundwater and surface water locally) to the receiving waters will remain unaltered during the construction and operational phase of the Proposed Project.

There is no direct discharge from the Site to downstream receiving waters. Mitigation for the protection of surface water during the construction, operation and decommissioning phases of the Proposed Project will ensure the qualitative status of the receiving waters will not be altered by the Proposed Project.

There is also mitigation proposed to protect groundwater quality within the Site during the construction, operational and decommissioning phases of the Proposed Project. These mitigation measures will ensure the qualitative status of the underlying GWB will not be altered by the Proposed Project.

There will be no change in GWB or SWB status in the underlying GWB or downstream SWBs resulting from the Proposed Project. There will be no change in quantitative (volume) or qualitative (chemical) status, and the underlying GWB and downstream SWBs are protected from any potential deterioration.

As such, the Proposed Project:

- will not cause a deterioration in the status of the surface and groundwater bodies assessed;
- will not jeopardise the objectives to achieve 'Good' surface water/groundwater status or ecological potential;
- does not jeopardise the attainment of 'Good' surface water/groundwater chemical status;
- does not jeopardise the attainment of 'Good' surface water/groundwater quantity status;
- does not permanently exclude or compromise the achievement of the objectives of the WFD in other waterbodies within the same river basin district;
- is compliant with the requirements of the Water Framework Directive (2000/60/EC); 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) (Note that a full list of legislation complied with in relation to hydrology and hydrogeology is included in Section 9.1.4 of EIAR Chapter 9).

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6. REFERENCES

Department of Housing, Local Government and Heritage (2024). Water Action Plan 2024. A River Basin Management Plan for Ireland.

Environmental Protection Agency (2024). Cycle 3: Moy and Killala Bay Catchment Report.

Environmental Protection Agency (2024). Cycle 3: Corrib Catchment Report.

Water Framework Directive "catchments.ie" Map Viewer (www.catchments.ie).

Directives and Legislation

Council Directive (76/160/EEC) Bathing Water and revised (2006/7/EC).

Council Directive 91/676/EEC concerning the protection of waters against pollution caused by nitrates from agricultural sources (Nitrates Directive).

Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment.

Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.

Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption.

Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy.

Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds.

Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014, amending Directive 2011/92/EU of the European Parliament and the Council of 13 December 2011 on the assessment of the impacts of certain public and private projects on the environment.

S.I. No. 293/1988: Quality of Salmon Water Regulations.

S.I. No. 722/2003 – European Communities (Water Policy) Regulations 2003.

S.I. No. 268/2006 - European Communities (Quality of Shellfish Waters) Regulations 2006.

S.I. No. 9/2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010, as amended.

S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009, as amended.

S.I. No. 350/2014 - European Union (Water Policy) Regulations 2014.

S.I. No. 351/2011 - Bathing Water Quality (Amendment) Regulations 2011.

S.I. No. 477/2011 - European Communities (Birds and Natural Habitats) Regulations 2011.