APPENDIX 9-3

Water Framework Directive Compliance Assessment

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TAURBEG WIND FARM
EXTENSION OF OPERATIONAL LIFE

WATER FRAMEWORK DIRECTIVE COMPLIANCE ASSESSMENT

FINAL REPORT

Prepared for:

TAURBEG LTD

Prepared by:

HYDRO-ENVIRONMENTAL SERVICES

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1. INTRODUCTION

1.1 BACKGROUND

Hydro-Environmental Services (HES) were requested by MKO Ireland (MKO), acting on behalf of Taurbeg Ltd, to complete a Water Framework Directive (WFD) Compliance Assessment for a planning application for the proposed extension of life for Taurbeg Wind Farm, Co. Cork (i.e. the Proposed Project).

The purpose of this WFD assessment is to determine if any specific components or activities associated with the proposed lifetime extension application 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 Site is in compliance with the objectives of the WFD.

This WFD Assessment is intended to supplement the Environmental Impact Assessment Report (EIAR) submitted as part of the Proposed Lifetime Extension application.

As detailed in Section 1.1.1 of the EIAR, this FRA uses for the following terminology: 'Proposed Lifetime Extension', 'the Site', the 'Proposed Offsetting Measures', the 'Proposed Offsetting lands' and the 'Proposed Project'.

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 with over 22 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 WF, Cahermurphy (Phase I & II) WF, Carrownagowan WF, and Croagh WF and over 100 other wind farm related projects across the country.

Conor McGettigan (BSc, MSc) is an Environmental Scientist with over 4 years' experience in environmental consultancy in Ireland. Conor holds an M.Sc. in Applied Environmental Science (2020) and a B.Sc. in Geology (2016) from University College Dublin. Conor has prepared the Land, Soils and Geology and Hydrology and Hydrogeology Chapters for numerous wind farm EIAR projects. Conor routinely completes WFD Assessments for a wide variety of projects including wind farms, quarries and proposed residential developments.

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).

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. RBMPs include 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 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

Proposed Lifetime Extension

Regionally, the Site is located in 2 no. surface water catchments. The vast majority of the Site, including 10 of 11 no. turbines, is located in the Tralee Bay-Feale surface water catchment within Hydrometric Area No. 23 of the Shannon River Basin District. The very south of the Site, including 1 no. turbine, is mapped within the Blackwater (Munster) surface water catchment within Hydrometric Area No. 18 of the Shannon River Basin District.

Within the Tralee Bay-Feale regional surface water catchment, the Site is located within the Feale_SC_010 sub-catchment and 2 no. WFD river sub-basins. 8 no. turbines and the existing substation location are mapped in the Feale_010 WFD river sub-basin whilst 2 no. turbines are mapped in the Glenacarney_010 WFD river sub-basin to the west. Within the Feale_010 WFD river sub-basin, 2 no. 1st order streams emerge from within the Site. These watercourses are locally unnamed but are referred to by the EPA as the Knockahorrea East and the Glennaknockane streams. These streams form part of the Feale_010 SWB and flow to the east and merge together to the east of a local road. This watercourse then flows to the north and discharges into the Feale River at Rockchapel, ~3.2km to the north. Meanwhile, within the Glenacarney_010 WFD river sub-basin, the EPA map a 1st order stream, referred to as the Glasheenanargid stream, to flow to the west and discharge into the Glenacarney River ~600m west of the Site. These watercourses form part of the Glenacarney_010 SWB. The Glenacarney River flows to the north and discharges into the Feale River (Feale_020 SWB) ~3.8km to the northwest. The Feale River continues to flow to the northwest before the Feala_090 SWB discharges into the Upper Feale Estuary to the west of Listowel. Further downstream this joins to the Cashen River Estuary and the Mouth of the Shannon coastal SWB.

Within the Blackwater (Munster) surface water catchment, the Site lies within the Dalua_SC_010 sub-catchment and 2 no. WFD river sub-basins. No infrastructure associated with the existing Taurbeg Wind Farm is located in the Owenkeal_010 WFD river sub-basin, while 1 no. turbine is located in the Glenlara_010 WFD river sub-basin. 2 no. 1st order streams are mapped by the EPA to flow to the southeast from the Site. These streams merge and discharge into the Glenlara River ~2.5km to the southeast. The Glenlara River continues to flow to the southeast and discharges into the Dalua River (Dalua_020 SWB) to the west of Newmarket Town. The Dalua River (Dalua_040 SWB) discharges into the Allow River (Allow_060 SWB) at Kanturk, ~16km to the southeast. Further downstream the Allow_070 SWB discharges into the Blackwater River (Blackwater (Munster)_090 SWB).

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

Table A presents the catchment area of each SWB downstream of the Site as far as the Feale Estuary in the Tralee Bay-Feale catchment and the River Blackwater in the Blackwater (Munster) catchment. The catchment area for these SWBs increases progressively downstream as more tributaries discharge into the Feale and Dalua Rivers. Therefore, those waterbodies which are located in close proximity to the Site are more susceptible to water quality impacts as a result of activities associated with the Site. The potential for the Site to impact a waterbody decreases further downstream due to the increasing catchment area to the surface waterbody and resulting increase in flow volumes (Note that the Proposed Project does not in any way rely on dilution or the assimilative capacity of any downstream

waterbody for the protection of surface water quality or quantity – the mitigation measures detailed in Section 4.3 are prescribed to ensure that the Proposed Project does not impact any downstream SWB).

Table A: Catchment Area Downstream of the Site

WFD River Sub-Basin	Total Upstream Catchment Area (km²)
Tralee Bay Feale Catchment	
Glenacarney_010	20
Feale_010	28
Feale_020	60
Feale_030	120
Feale_040	208
Feale_050	318
Feale_060	492
Feale_070	515
Feale_080	661
Feale_090	673
Blackwater (Munster) Catchment	
Owenkeal_010	14
Owenkeal_020	25
Glenlara_010	25
Dalua_020	56
Dalua_030	87
Dalua_040	134
Allow_060	266
Allow_070	311
Blackwater (Munster)_090	>900

Proposed Offsetting Measures

The Proposed Offsetting lands are located in 2 no. regional surface water catchments. In the west, the Proposed Offsetting lands are located in the Laune-Maine-Dingle Bay regional surface water catchment (Hydrometric Area 22) while the southeast is mapped in the Tralee Bay Feale regional surface water catchment (Hydrometric Area 23).

Within the Tralee Bay Feale regional surface water catchment, the Proposed Offsetting lands are mapped in the Feal_SC_030 WFD river sub-catchment and the Clydagh (Feale)_010 WFD river sub-basin. Within this river sub-basin, the Proposed Offsetting lands are drained by the Glengarriff River which forms part of the Clydagh (Feale)_010 SWB. This river flows to the northeast, before the Clydagh (Feale)_020 SWB discharges into the Feale River (Feale_040 SWB) near Clydagh Bridge, ~10.5km northeast of the Proposed Offsetting lands.

Within the Laune-Maine-Dingle Bay regional surface water catchment, the Proposed Offsetting lands are mapped in the Maine_SC_010 WFD river sub-catchment and the Shanowen (Maine)_010 WFD river sub-basin. Within this river sub-basin, the Proposed Offsetting lands are drained by the Knockatee and Croaghane streams and the Cloon (Shanowen) River which form part of the Shanowen (Maine)_010 SWB. The Shanowen River discharges into the Maine River (Maine_020 SWB) near Castleisland. Further downstream, the Maine River discharges into the Castlemaine Harbour transitional waterbody.

The catchment area of the river waterbodies downstream of the Proposed Offsetting lands are detailed in **Table B**.

Table B: Catchment Area Downstream of the Proposed Offsetting lands

WFD River Sub-Basin	Total Upstream Catchment Area (km²)
Tralee Bay Feale Catchment	
Clydagh (Feale)_010	23
Clydagh (Feale)_020	41
Feale_040	208
Laune-Maine-Dingle Bay Catchment	
Shanowen (Maine)_010	11
Maine_010	45
Maine_020	92
Maine_030	155
Maine_040	~300

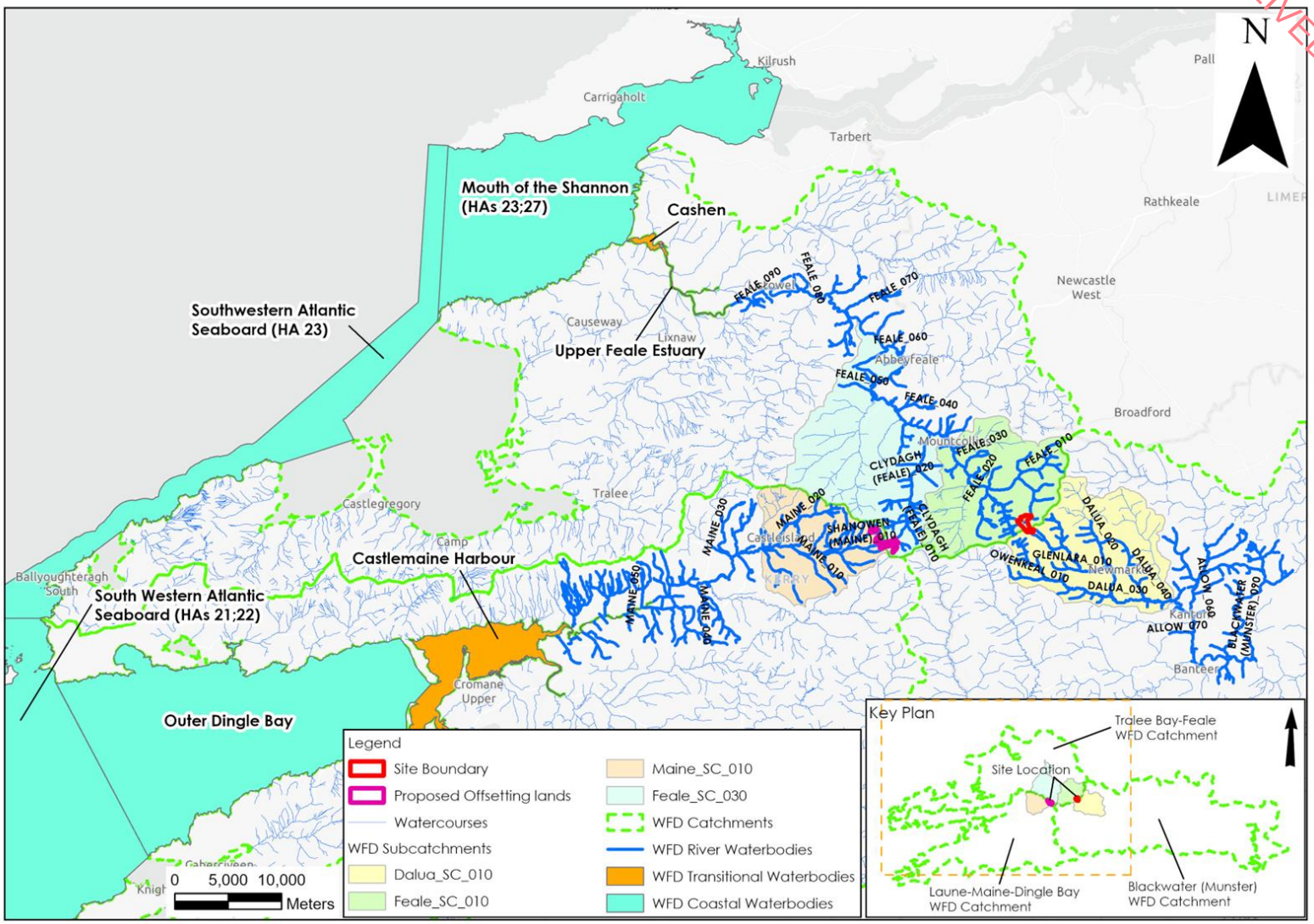

Figure A: Local Hydrology Map

2.3 SURFACE WATER BODY CLASSIFICATION

A summary of the WFD status and risk result for SWBs downstream of the Site and the Proposed Offsetting lands are shown in **Table C**. The overall status is based on the ecological, chemical and quantitative status of each SWB.

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

As described in **Section 2.2** above, the majority of the Site drains to the River Feale. The Feale_010 SWB achieved "High" status in the latest WFD cycle (2016-2021). This was an improvement on the "Good" status which was achieved by this SWB in the previous cycles. Meanwhile, the Glenacarney_010 SWB achieved "Good" status in all 3 no. WFD cycles. Further downstream the WFD status of the River Feale ranges from "Moderate" to "Good". Meanwhile, the Feale_070 SWB achieved "High" status.

In terms of risk status, only the very lower reaches of the River Feale (Feale_090 SWB) have been deemed to be "at risk" of failing to meet its future WFD objectives. All other river SWBs downstream of the Site are classified as being "not at risk". Hydromorphology, urban run-off and agricultural activities have been identified as significant pressures impacting negatively on the Feale_090 SWB.

Within the Blackwater (Munster) catchment, the Owenkeal_010 SWB in the vicinity of the Site achieved "Good" status in the latest WFD cycle. However, as stated previously no infrastructure associated with the existing Wind Farm is located within this WFD river sub-basin. Meanwhile, the Glenara_010 SWB achieved "Moderate" status in all 3 no. WFD cycles. Further downstream, the Dalua_020 and _030 SWBs are of "Good" status whilst the Dalau_040 SWB is of "High" status. The status of the Allow River downstream of the Site ranges from "Moderate" to "Good" status. The status of the Blackwater River downstream of the confluence with the Allow River is "Good" (Blackwater (Munster)_090 SWB).

In terms of risk status, the Glenara_010 SWB has been classified as being "at risk" with hydromorphology and forestry activities listed as significant pressures on the waterbody. Both the Dalua_020 and the Dalua_040 SWBs are "not at risk" whilst the Dalua_030 SWB is "at risk". The Allow_060 SWB is "at risk" with agriculture, hydromorphology, industry, urban wastewater and other activities noted as significant pressures. The Allow_070 SWB is "not at risk". The risk status of the Blackwater (Munster)_090 SWB is "at risk".

In terms of the Proposed Offsetting lands, the Shanowen (Maine)_010 SWB in the vicinity achieved "Good" status in all 3 no. WFD cycles. Further downstream, the Maine_010 SWB achieved 'Moderate' status in the latest WFD cycle (2016-2021). This was a deterioration from the 'Good' status which this SWB achieved previous WFD cycles. The Maine_010 SWB is deemed to be at risk of failing to meet its WFD objectives and is listed as being under significant pressure from hydromorphological impacts. Within the Tralee Bay-Feale regional surface water catchment, the Clydagh (Feale)_010 and _020 SWBs downstream of the Proposed Offsetting lands achieved 'High' status in the latest WFD cycle (2016-2021). This was an improvement in status from the 'Good' status which these SWBs achieved in the 2013-2018 cycle. These SWBs are not at risk of failing to meet their WFD objectives.

With regards the transitional waterbodies, the Feale River downstream of the Site discharges into the Upper Feale Estuary, which in turn leads into the Cashen transitional waterbody. These transitional SWBs achieved "Moderate" and "Poor" status respectively and both are "at risk. Within the Laune-Maine-Dingle Bay Catchment, Castlemaine Harbour transitional SWB achieved "Poor" status and is "at risk" of failing to meet its WFD objectives.

With regards to downstream coastal waterbodies, the Mouth of the Shannon (HAs 23;27) and Southwestern Atlantic Seaboard (HA 23) coastal waterbodies within the Tralee Bay-Feale Catchment achieved "Good" and "High" status respectively and are "not at risk". Within the

Laune-Maine-Dingle Bay Catchment, the Outer Dingle Bay coastal SWB achieved "High" status in the latest WFD cycle.

The SWB status for the 2016-2021 WFD cycle are shown on **Figure B.**

Table C: Summary WFD Information for River Water Bodies

SWB	Overall Status 2010-2015	Overall Status 2013-2018	Overall Status 2016-2021	Risk Status 3rd Cycle	Pressures
	Tralee Bay-Feale Catchment				
Glenacarney_010	Good	Good	Good	Not at risk	None
Feale_010	Good	Good	High	Not at risk	None
Feale_020	Good	Good	Good	Not at risk	None
Feale_030	Good	Good	Good	Not at risk	None
Feale_040	Good	Good	Good	Not at risk	None
Feale_050	Good	Good	Good	Not at risk	None
Feale_060	Good	Moderate	Good	Not at risk	None
Feale_070	Good	Good	High	Not at risk	None
Feale_080	Moderate	Good	Good	Not at risk	None
Feale_090	Moderate	Moderate	Moderate	At risk	Agriculture, hydromorphology & urban run-off
Upper Feale Estuary	Poor	Poor	Moderate	At risk	Agriculture, hydromorphology & urban wastewater
Cashen	Poor	Poor	Poor	At risk	Agriculture & urban wastewater
Mouth of the Shannon (HAs 23;27)	Moderate	Good	Good	Not at risk	None
Southwestern Atlantic Seaboard (HA 23)	Unassigned	High	High	Not at risk	None
Clydagh (Feale)_010	Good	Good	High	Not at risk	None
Clydagh (Feale)_020	Moderate	Good	High	Not at risk	None
	Laune-Maine-Dingle Bay Catchment				
Shanowen (Maine)_010	Good	Good	Good	Not at risk	None
Maine_010	Good	Good	Moderate	At risk	Hydromorphology
Maine_020	Moderate	Moderate	Good	Under review	None
Maine_030	Good	Poor	Good	Not at risk	None
Maine_040	Moderate	Moderate	Good	Not at risk	None

Maine_050	Unassigned	Unassigned	Moderate	Under Review	None
Castlemaine Harbour	Good	Good	Poor	At risk	Agriculture
Outer Dingle Bay	Unassigned	High	High	Under Review	None
	Blackwater (Munster) River Catchment				
Owenkeal_010	High	Good	Good	Not at risk	None
Owenkeal_020	Good	Good	High	Not at risk	None
Glenlara_010	Moderate	Moderate	Moderate	At risk	Forestry & hydromorphology
Dalua_020	Good	Good	Good	Not at risk	None
Dalua_030	Good	Good	Good	At risk	Other
Dalua_040	Good	High	High	Not at risk	None
Allow_060	Poor	Poor	Moderate	At risk	Agriculture, hydromorphology, industry, other & urban wastewater
Allow_070	Good	Good	Good	Not at risk	None
Blackwater (Munster)_090	Good	Good	Good	At risk	Agriculture & hydromorphology

2.4 GROUNDWATER BODY IDENTIFICATION

The bedrock geology underlying the Site is mapped by the GSI as comprising of Namurian shales in the north and Namurian sandstones in the south. The bedrock is classified by the GSI as being a Locally Important Aquifer – Bedrock which is Moderately Productive only in Local Zones.

The majority of the Site, including 10 no. existing turbines, is underlain by the Abbeyfeale Groundwater Body (GWB) which is characterized by poorly productive bedrock. Meanwhile, the south of the Site is underlain by the Rathmore West GWB which is also characterised by poorly productive bedrock.

The eastern section of the Proposed Offsetting lands is underlain by the Abbeyfeale GWB and the western areas are underlain by the Scartaglin GWB which is also characterised by poorly productive bedrock.

Each of the GWB's are composed primarily of low permeability rocks, although localized zones of enhanced permeability do occur along faults. Groundwater flows along fractures, joints and major faults. Recharge occurs diffusely through the subsoils and via outcrops. Groundwater discharges to the numerous small streams crossing the aquifer, and to the springs and seeps. Local flow directions tend to follow the local topography.

2.5 GROUNDWATER BODY CLASSIFICATION

The GWBs are assigned a status based on the assessment of groundwater chemical and quantitative figures. Summary WFD information for GWBs underlying the Site is presented in **Table D**. The GWB status for the 2016-2021 WFD cycle are shown on **Figure B**.

The Abbeyfeale GWB (IE_SH_G_001) and the Rathmore West GWB (IE_SW_G_070) achieved "Good" status in all 3 no. WFD cycles. These GWBs have been deemed to be 'Not at Risk'. No significant pressures have been identified on these GWBs.

Furthermore, the Scartaglin GWB underlying the western section of the Proposed Offsetting lands achieved "Good" status in all 3 no. WFD cycles. This GWB is also "not at risk" and no significant pressures have been identified.

Table D: Summary WFD Information for Groundwater Bodies

GWB	Overall Status 2010-2015	Overall Status 2013-2018	Overall Status 2016-2021	Risk Status 3rd Cycle	Pressures
Abbeyfeale	Good	Good	Good	Not at risk	None
Rathmore West	Good	Good	Good	Not at risk	None
Scartaglin	Good	Good	Good	Not at risk	None

2.6 ZONE OF INFLUENCE

The potential Zone of Influence (ZOI) for the Site extends to the following SWBs, GBs, and transitional and coastal waterbodies.

- River waterbodies: Glenacarney_010, Feale_010 to Feale_090, Owenkeal_010, Owenkeal_020, Glenlara_010, Dalua_020 to Dalua_040, Allow_060, Allow_070 and Blackwater (Munster)_090 river waterbody.
- Transitional waterbodies: Upper Feale Estuary and Cashen estuaries.

- Coastal waterbodies: Mouth of the Shannon (HAs 23;27) and Southwestern Atlantic Seaboard (HA 23) SWBs.
- GWBs: Abbeyfeale and Rathmore West GWBs.

Furthermore, the ZoI for the Proposed Offsetting Measures extends to the following waterbodies:

- River waterbodies: Clydagh (Feale)_010 to Feale_090 and the Shanowen (Maine)_010 to the Maine_050.
- Transitional waterbodies: Upper Feale Estuary, Cashen Estuary and Casltemaine Harbour.
- Coastal Waterbodies: Outer Dingle Bay and Mouth of the Shannon.
- GWBs: Abbeyfeale and Scartaglin GWBs.

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), shellfish areas and drinking water protected area's (DWPA) are looked at 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.

The Site is mapped within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (Site Code: 004161). The site consists of a variety of upland habitats, though almost half is afforested.

Furthermore, the Site has downstream hydrological connections with designated conservation sites in the region as described below:

- The Lower River Shannon SAC (Site Code: 002165) is located downstream of the Site via the Knockaahorrea East Stream. The length of the hydrological pathway between the Site and the SAC is ~2.2km.

- The Blackwater River (Cork/Waterford) SAC (Site Code: 002170) is located downstream of the Site via the Glenlara River. The length of the hydrological flowpath between the Site and the SAC is ~6.5km.

Several designated sites are located even further downstream and distant from the Site (>40km straight line distance) in the Blackwater (Munster) surface water catchment. These designated sites (listed below for completeness) are located downstream of the Blackwater (Munster)_090 SWB and due to their distant location from the Site have no potential to be impacted by the Proposed Project. These distant designated sites include:

- The Blackwater Valley (Killavullen) pNHA (Site Code: 001080);
- The Blackwater Valley (Ballincurrig Wood) pNHA (Site Code: 001793);
- The Blackwater Valley (Killathy Wood) pNHA (Site Code: 001795);
- The Blackwater Valley (Cregg) pNHA (Site Code: 001796);
- The Blackwater Valley (The Beech Wood) pNHA (Site Code: 001797);

- Blackwater River Callows pNHA (Site Code: 000073);
- Blackwater Callows SPA (Site Code: 004094);
- Blackwater River And Estuary pNHA (Site Code: 000072); and,
- Blackwater Estuary SPA (Site Code: 004028).

The Cashen River Estuary pNHA (Site Code: 001340) is also located downstream (>35km straight line distance) of the Site in the Tralee Bay-Feale Catchment.

Other designated sites within 10km of the Site include:

- Mount Eagle Bogs NHA (Site Code: 002449) is situated ~7.5km to the west; and,
- Lough Gay Bog NHA (Site Code: 002454) is located ~9.3km to the north.

The Proposed Offsetting lands are also mapped within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. The Proposed Offsetting lands are also located immediately adjacent to the Mount Eagle Bogs NHA (Site Code: 002449). Within the Tralee Bay-Feale regional surface water catchment, the Proposed Offsetting lands are also located immediately upstream of the Lower River Shannon SAC (Site Code: 002165), the length of the hydrological flowpath between the Proposed Offsetting lands and the SAC is ~2km along the Glengarriff River. Within the Laune-Maine-Dingle Bay regional surface water catchment, the Proposed Offsetting lands are located ~28km northeast (straight line distance) of the Castlemaine Harbour SAC (Site Code: 000343).

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).

The closest downstream designated bathing waters are located at Ballybunion (>40km northwest of the Site). Meanwhile, the bathing waters at Inch Strand are downstream of the Proposed Offsetting lands associated with the Outer Dingle Bay coastal waterbody.

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).

Within the Tralee Bay-Feale catchment, there is 1 no. NSA downstream of the Site and the Proposed Offsetting lands. This is the Upper Feale Estuary and Cashen Estuary NSA downstream of the Listowel urban wastewater agglomeration.

There are no NSA downstream of the Site are far as the Blackwater (Munster)_090 SWB in the Blackwater (Munster) catchment. Furthermore, there are no NSA downstream of the Proposed Offsetting lands in the Laune-Maine-Dingle Bay catchment.

2.7.4 Shellfish Areas

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

There are 2 no. designated shellfish area in the Tralee Bay-Feale catchment. However, the Site is situated inland, and the nearest shellfish waters are ~40km to the west at Tralee Bay (IEPA2_0020).

Cromane designated shellfish waters are located downstream of the Proposed Offsetting lands in the Laune-Maine-Dingle Bay catchment and are associated with the Castlemaine Harbour transitional waterbody.

2.7.5 Salmonid Waters

The Salmonid Regulations (S.I. 293 / 1988) identifies the protected river that are designated as Designated Salmonid Waters under S.I. No. 293/1988 - European Communities (Quality of Salmonid Waters) Regulations 1988, 14th August 1988. The Council Directive 78/659/EEC of 18th July 1978 on the quality of fresh waters needing protection or improvement in order to support fish life and the Council Directive 92/42/EEC of 21st May 1992 on the conservation of natural habitats and of wild fauna and flora was transposed into Irish law under the Fish Directive S.I. 293/1988 and Habitats Directive S.I. 477/2011.

The Feale River (Feale_020 to Feale_090) are identified as designated Salmonid Waters and are located downstream of the Site and the Proposed Offsetting lands in the Tralee Bay-Feale catchment.

Within the Blackwater (Munster) catchment, the Blackwater River (including the Blackwater (Munster)_090 SWB) downstream of the Allow River is also designated as a salmonid protected watercourse.

Meanwhile, the Maine_040 downstream of the Proposed Offsetting lands in the Laune-Maine-Dingle Bay catchment forms part of the Brown Flesk salmonid protected waters.

2.7.6 Drinking Water Protected Areas

Closest designated surface water Drinking Water Protected Area (DWPA) downstream of the Site is the Feale_050 DWPA, located ~16km (straight line distance) to the northwest. This Uisce Éireann abstraction is for the Abbeyfeale Public Water Supply with the estimated maximum abstraction volume being 3,010m^3/day.

Further downstream the Feale_090 SWB is also listed as a DWPA and is the source for the Listowel Regional Public Water Supply (1300PUB1204). The Feale_090 DWPA did not meet its DWPA objective in 2019 as it had MCPA and Glyphosate pesticide exceedances.

Within the Blackwater (Munster) Catchment there are no DWPAs identified downstream of the Site as far as the Blackwater (Munster)_090 SWB. The closest downstream DWPA is the Blackwater (Munster)_150 SWB located ~35km to the southeast and this has no potential to be impacted due to its distant location.

There are no surface water DWPAs downstream of the Proposed Offsetting lands in the Laune-Maine-Dingle Bay catchment.

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

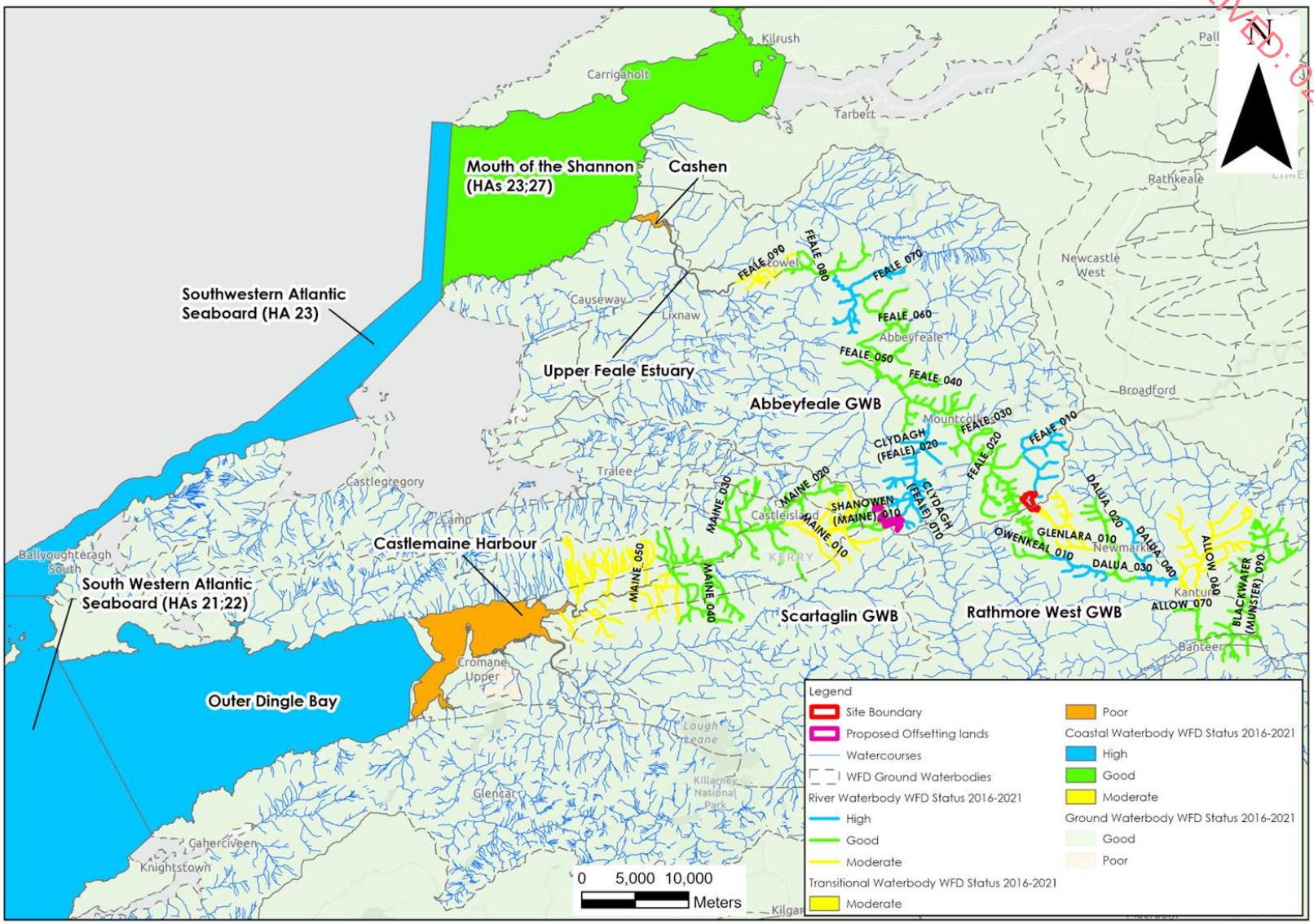

Figure B: WFD Groundwater and Surface Waterbody Status (2016-2021)

3. WFD SCREENING

3.1 SURFACE WATER BODIES

The river waterbodies in the immediate vicinity and downstream of the Site and the Proposed Offsetting lands are shown in **Figure A** and described in **Section 2.2** above.

With consideration for the Proposed Lifetime Extension and the Tralee-Bay Feale Catchment, it is considered that the upper reaches of the Feale River (Feale_010, Feale_020 and Feale_030 SWBs) and the Glenacarney River (Glenacarney_010 SWB) in the vicinity and downstream of the Site are carried through into the WFD Compliance Assessment. These SWBs have been included for further assessment due to their proximal location to the Site. The Feale_040 SWB is also included for the purposes of a conservative assessment. The Proposed Lifetime Extension 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.

Within the Blackwater (Munster) catchment, the Glenlara_010 SWB has been screened in due to the presence of existing wind farm infrastructure within this WFD river sub-basin. The Dalua River (Dalua_020 and Dalua_030 SWB) in the vicinity and downstream of the Site has also been carried through into the WFD Compliance Assessment. The Site works 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.

Further downstream, the River Feale (Feale_050 to Feale_090 SWBs) have been screened out due their distant location (hydrological flow path of ~19.5km) from the Site. Furthermore, and as outlined in **Table A** the catchment area for the River Feale increases dramatically downstream and thus the potential for the Site to impact the status of these SWBs decreases further downstream due to the increasing catchment area to the surface waterbody and resulting increase in flow volumes.

Within the Blackwater (Munster) catchment, the Allow and Blackwater rivers have been screened out due to their distant location from the Site. As outlined in **Table A** the catchment area for the Allow_060 SWB downstream of the Dalua_040 increases dramatically. The potential for the Site to impact a waterbody decreases further downstream due to the increasing catchment area to the surface waterbody and resulting increase in flow volumes. Furthermore, the Owenkeal_010 SWB has been screened out due to the lack of any existing wind farm infrastructure within this river sub-basin.

With respect to the Proposed Offsetting Measures, the Clydagh (Feale) _010 and _020 SWBs in the Tralee-Bay Feale catchment and the Shanowen (Maine)_010 and Maine_010 SWBs in the Laune-Maine-Dingle Bay catchment are included in the impact assessment. All other downstream SWBs are screened out of the impact assessment.

The Upper Feale Estuary, the Cashen estuary and the Castlemaine Harbour transitional waterbodies have been screened out due to the large volumes of water within these transitional waterbodies and the saline nature of these waters. The Proposed Lifetime Extension and the Proposed Offsetting Measures have no potential to cause a deterioration in status of these transitional SWBs and/or jeopardise the attainment of good surface water status in the future.

The Mouth of the Shannon (HAs 23;27), the Southwestern Atlantic Seaboard (HA 23) and the Outer Dingle Bay coastal SWBs have also been screened out due to the large volumes of water within these coastal waterbodies and the saline nature of these waters. The Proposed Lifetime Extension and the Proposed Offsetting Measures have no potential to cause a deterioration in status of these coastal waterbodies and/or jeopardise the attainment of good surface water status in the future.

3.2 GROUNDWATER BODIES

With respect to GWBs, the Abbeyfeale, Rathmore West and Scartaglin GWBs are carried through to the WFD Compliance Assessment due to their location directly underlying the Site and/or the Proposed Offsetting lands.

3.3 PROTECTED AREAS

The Site and the Proposed Offsetting lands are mapped within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. This SPA will therefore be included in the WFD Compliance Assessment.

The Lower River Shannon SAC and the Blackwater River (Cork/Waterford) SAC are hydrologically connected with the Site. The surface water connections from the Site could transfer poor quality surface water that may affect the conservation objectives of these designated sites. Both SAC's will be included in the Compliance Assessment given the hydrological pathways between them and the Site. The Lower River Shannon SEAC is also hydrologically connected with the Proposed Offsetting lands.

The Mount Eagle Bogs NHA is located immediately adjacent to the Proposed Offsetting lands. Therefore, this NHA will be included in the WFD Compliance Assessment.

The Lough Gay Bog NHA has been screened out of the WFD Compliance Assessment due to its distant location from the Site and lack of hydrological connectivity. Hydrogeologically, groundwater flow paths are expected to be short due to the low storage in the bedrock aquifer. This results in groundwater discharging to streams and springs in the area, and therefore there is no hydrogeological connectivity between the Site and the NHA.

All other downstream designated sites have been screened out of the WFD Compliance Assessment due to their distant location from the Site and the increasing volumes of water within these downstream waterbodies which will dilute any potential effects associated with the Site.

The downstream designated bathing waters has been screened out due to their distant location from the Site and the large volumes of water within the associated SWBs. The Proposed Project has no potential to cause a deterioration in the status of any downstream designated bathing areas.

The NSA's downstream of the Site have been screened out of the WFD Compliance Assessment due to their locations within the Blackwater River and transitional waterbodies downstream of the Site. The NSA's distant locations from the Site and the large volumes of water within these rivers and estuaries means that the Site has no potential to cause a deterioration in the status of these NSA's.

The Tralee Bay shellfish area and the Cromane shellfish area has been screened out due to their distant location from the Site and Proposed Offsetting lands. The Site has no potential to cause a deterioration in the status of these shellfish protected areas.

The Feale Salmonid Waters have also been screened into the WFD Compliance Assessment as they include the feale_030 to Feale_040 SWBs which have been screened in.

The designated salmonid water of the Blackwater River however will be screened out due to their distant location from the Site.

The surface water DWPA's downstream of the Site have been screened out of the WFD Compliance Assessment due to their distant downstream locations and the large volumes of

water within these rivers. This means that the Proposed Project has no potential to cause a deterioration in the status of these DWPA's.

3.4 WFD SCREENING SUMMARY

A summary of WFD Screening for SWBs and GWBs discussed above is shown in **Table E** below.

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	Tralee Bay-Feale Catchment			
	River	Glenacarney_010	**Yes**	The northwestern section of the Site, including 2 no. turbines are mapped within the Glenacarney_010 WFD river sub-basin. An assessment is required to consider the potential impacts of the Proposed Lifetime Extension on this SWB.
	River	Feale_010	**Yes**	The northeastern section of the Site, including 8 no. turbines are mapped within the Feale_010 WFD river sub-basin. An assessment is required to consider the potential impacts of the Proposed Lifetime Extension on this SWB.
	River	Feale_020	**Yes**	The Feale_020 is located directly downstream of the Feale_010 and in close proximity to the Site. An assessment is required to consider the potential impacts of the Proposed Lifetime Extension on this SWB.
	River	Feale_030	**Yes**	The Feale_030 is located proximally to the Site and directly downstream of the Feale_020 SWB. An assessment is required to consider the potential impacts of the Site on this SWB.
	River	Clydagh (Feale)_010	**Yes**	The Proposed Offsetting lands are located in this river sub-basin. Therefore, an assessment is required to consider the potential impacts of the Proposed Offsetting Measures on this SWB.
	River	Clydagh (Feale)_020	**Yes**	The Clydagh (Feale)_020 is located directly downstream of the Clydagh (Feale)_010 SWB and in close proximity to the Proposed Offsetting lands. An assessment is required to consider the potential impacts of the Proposed Offsetting Measures on this SWB.
	River	Feale_040	**Yes**	The Feale_040 SWB has been included in the impact assessment due to its location downstream of the Clydagh (Feale) River. An assessment is required to consider the potential impacts of the Proposed Project on this SWB.
	River	Feale_050	No	The Feale_050 SWB has been screened out due to its distant location from the Site (~19.5km) and the Proposed Offsetting lands and the increasing volumes of water within the Feale River. Therefore, the Proposed Project has no potential to affect the status of this SWB.
	River	Feale_060	No	The Feale_060 SWB has been screened out due to its distant location from the Site (>20km) and Proposed Offsetting lands and the increasing volumes of water within the Feale River. Therefore, the Proposed Project has no potential to affect the status of this SWB.
	River	Feale_070	No	The Feale_070 SWB has been screened out due to its distant location from the Site and the Proposed Offsetting lands and increasing volumes of water within the Feale River. Therefore, the Proposed Project has no potential to affect the status of this SWB.
	River	Feale_080	No	The Feale_080 SWB has been screened out due to its distant location from the Site and the Proposed Offsetting lands and the increasing volumes of water within the Feale River. Therefore, the Proposed Project has no potential to affect the status of this SWB.
	River	Feale_090	No	The Feale_090 SWB has been screened out due to its distant location from the Site and the Proposed Offsetting lands and the increasing volumes of water within the Feale River. Therefore, the Proposed Project has no potential to affect the status of this SWB.
	Transitional	Upper Feale	No	The Upper Feale Estuary SWB has been screened out due to the saline nature of its waters and

		Estuary		the large volumes of water within the estuary. The Proposed Project has no potential to impact the status of this SWB.
	Transitional	Cashen	No	The Cashen SWB has been screened out due to the saline nature of its waters and the large volumes of water within the estuary. The Proposed Project has no potential to impact the status of this SWB.
	Coastal	Mouth of the Shannon (HAs 23;27)	No	The Mouth of the Shannon (HAs 23;27) has been screened out due to the saline nature of its waters and the large volumes of water within the SWB. The Proposed Project has no potential to impact the status of this SWB.
	Coastal	Southwestern Atlantic Seaboard (HA 23)	No	The Southwestern Atlantic Seaboard (HA 23) has been screened out due to the saline nature of its waters and the large volumes of water within the SWB. The Proposed Project has no potential to impact the status of this SWB.
	Blackwater (Munster) Catchment			
	River	Owenkeal_010	**Yes**	The southwestern section of the Site is mapped within the Owenkeal_010 river sub-basin. However, no infrastructure associated with the existing Wind Farm is located within this river sub-basin. The Proposed Project has no potential to impact the status of this SWB.
	River	Owenkeal_020	No	The Owenkeal_020 is located downstream of the Owenkeal_010 SWB. However, given the lack of infrastructure within the Owenkeale_010 river sub-basin, the Site has no potential to effect this SWB. The Owenkeale_020 SWB has been screened out.
	River	Glenlara_010	**Yes**	The southeastern section of the Site, including 1 no. turbine is mapped within the Glenlara_010 river sub-basin. An assessment is required to consider the potential impacts of the Proposed Lifetime Extension on this SWB.
	River	Dalua_020	**Yes**	The Dalua_020 SWB is located in close proximity to the Site and directly downstream of the Glenlara_010 SWB. An assessment is required to consider the potential impacts of the Proposed Lifetime Extension on this SWB.
	River	Dalua_030	**Yes**	The Dalua_030 SWB is located in close proximity to the Site and directly downstream of the Dalua_020 SWB. An assessment is required to consider the potential impacts of the Proposed Lifetime Extension on this SWB.
	River	Dalua_040	No	The Dalua_040 SWB has been screened out due to its distant location from the Site and the increasing flow volumes within the river. Therefore, the Proposed Lifetime Extension has no potential to affect the status of this SWB.
	River	Allow_060	No	The Allow_060 SWB has been screened out due to its distant location from the Site and the large flow volumes of water within the Allow River. Therefore, the Proposed Lifetime Extension has no potential to affect the status of this SWB.
	River	Allow_070	No	The Allow_070 SWB has been screened out due to its distant location from the Site and the large flow volumes of water within the Allow River. Therefore, the Proposed Lifetime Extension has no potential to affect the status of this SWB.
	River	Blackwater (Munster)_090	No	The Blackwater (Munster)_090 SWB has been screened out due to its distant location from the Site and the large flow volumes of water within the Blackwater River. Therefore, the Proposed Lifetime Extension has no potential to affect the status of this SWB.

	Laune-Maine-Dingle Bay Catchment			
	River	Shanowen (Maine)_010	**Yes**	The Proposed Offsetting lands are located in this river sub-basin. Therefore, an assessment is required to consider the potential impacts of the Proposed Offsetting Measures on this SWB.
	River	Maine_010	**Yes**	The Maine_010 SWB is located directly downstream of the Shanowen (Maine)_010 SWB and in close proximity to the Proposed Offsetting lands. An assessment is required to consider the potential impacts of the Proposed Offsetting Measures on this SWB.
	River	Maine_020	No	The Maine_020 SWB has been screened out due to its distant location from the Proposed Offsetting lands and the increasing volumes of water within the Maine River. Therefore, the Proposed Offsetting Measures have no potential to affect the status of this SWB.
	River	Maine_030	No	The Maine_030 SWB has been screened out due to its distant location from the Proposed Offsetting lands and the increasing volumes of water within the Maine River. Therefore, the Proposed Offsetting Measures have no potential to affect the status of this SWB.
	River	Maine_040	No	The Maine_030 SWB has been screened out due to its distant location from the Proposed Offsetting lands and the increasing volumes of water within the Maine River. Therefore, the Proposed Offsetting Measures have no potential to affect the status of this SWB.
	River	Maine_050	No	The Maine_040 SWB has been screened out due to its distant location from the Proposed Offsetting lands and the increasing volumes of water within the Maine River. Therefore, the Proposed Offsetting Measures have no potential to affect the status of this SWB.
	Transitional	Castlemaine Harbour	No	The Castlemaine Harbour SWB has been screened out due to the saline nature of its waters and the large volumes of water within the estuary. The Proposed Offsetting Measures have no potential to impact the status of this SWB.
	Coastal	Outer Dingle Bay	No	The Outer Dingle Bay SWB has been screened out due to the saline nature of its waters and the large volumes of water within the SWB. The Proposed Offsetting Measures have no potential to impact the status of this SWB.
Groundwater Bodies				
Groundwater Body	Groundwater	Abbeyfeale	**Yes**	The Site, including 10 no. turbines, and the Proposed Offsetting lands are mapped to overlie the Abbeyfeale GWB. An assessment is required to consider the potential impacts of the Proposed Project on this GWB.
	Groundwater	Rathmore West	**Yes**	The Site, including 1 no. turbine, is mapped to overlie the Rathmore West GWB. An assessment is required to consider the potential impacts of the Proposed Lifetime Extension on this GWB.
	Groundwater	Scartaglin	**Yes**	The Proposed Offsetting lands are mapped to overlie the Scartaglin GWB. An assessment is required to consider the potential impacts of the Proposed Offsetting Measures on this GWB.
Protected Areas				
Protected Areas	Nature Conservation Designations	Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA	**Yes**	The Site and the Proposed Offsetting lands are mapped within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. The SPA will therefore be included in the assessment.
		Lower River Shannon SAC	**Yes**	The Lower River Shannon SAC is located ~2.2km downstream of the Site and ~2km downstream of the Proposed Offsetting Measures. The SAC is hydrologically linked to the Site and the Proposed Offsetting lands. An assessment is required to consider the potential impacts of the

				Proposed Project on this protected area.
		Blackwater River (Cork/Waterford) SAC	**Yes**	The Blackwater River (Cork/Waterford) SAC is located ~6.5km downstream of the Site and hydrologically linked to the Site chiefly via the Glenlara_010 SWB. An assessment is required to consider the potential impacts of the Proposed Lifetime Extension on this protected area.
		Castlemaine Harbour SAC	No	The Proposed Offsetting lands are distant from the SAC (~28km). The Proposed Offsetting Measures have no potential to impact the status of this SAC.
		Mount Eagle Bogs NHA	**Yes**	The Mount Eagle Bogs NHA is located immediately adjacent to the Proposed Offsetting lands. An assessment is required to consider the potential impacts of the Proposed Offsetting Measures on this NHA.
		Lough Gay Bog NHA	No	The Lough Gay Bog NHA has been screened out due to its distant location (~9.3km) from the Site and lack of hydrological connectivity. Hydrogeologically, groundwater flow paths are expected to be short due to the low storage in the bedrock aquifer. This results in groundwater discharging to streams and springs in the area, and therefore there is no hydrogeological connectivity between the Site and the NHA.
	Nutrient Sensitive Areas	Upper Feale Estuary & Cashen Estuary NSA	No	The Upper Feale Estuary & Cashen Estuary NSA has been screened out due to its distant location from the Site and the Proposed Offsetting lands. The Proposed Project has no potential to impact the status of this NSA.
	Shellfish Area	Tralee Bay	No	Tralee Bay Shellfish area has been screened out due to its distant location from the Site and the Proposed Offsetting lands. Therefore, the Proposed Project has no potential to impact on this protected area.
		Cromane	No	The Cromane designated shellfish area has been screened out due to its distant location from the Proposed Offsetting lands. Therefore, the Proposed Project has no potential to impact these designated shellfish waters.
	Salmonid Waters	Feale	**Yes**	The Feale designated salmonid waters are located downstream and in close proximity to the Site. An assessment is required to consider the potential impacts of the Proposed Project on these Salmonid Waters.
	Drinking Water Protected Areas	Feale_050	No	The Feale_050 DWPA has been screened out due to its distant location from the Site (~19.5km) and the increasing volumes of water within the Feale River. Therefore, the Proposed Project has not potential to affect the status of this DWPA.
		Feale_090	No	The Feale_090 DWPA has been screened out due to its distant location from the Site and the increasing volumes of water within the Feale River. The Proposed Project has no potential to impact the status of this DWPA.

4. WFD COMPLIANCE ASSESSMENT

4.1 DEVELOPMENT PROPOSALS

Planning permission is being sought for the Proposed Lifetime Extension of Taurbeg Wind Farm as permitted by Cork County Council under planning regulation ref N/2002/3608, for a further period of 10 years from the date of expiry (2026) per Condition no. 7 of the original planning consent issued, with decommissioning of the wind farm at the end of the proposed extension period.

The Proposed Project is described in full in Chapter 4 of the EIAR and related to the extended operation of all elements of the existing wind farm and the enhancement and management of lands for the purposes of hen harrier mitigation.

There are no alterations proposed to the existing wind farm infrastructure, therefore, there are no requirements for construction works or reinstatement works for the Proposed Lifetime Extension.

Typically, daily operational phase maintenance traffic will consist of four-wheel drive vehicles or vans with no off-road requirements.

During the Proposed Lifetime Extension, occasionally vehicles or plant may be necessary for maintenance of access roads, drainage networks and hardstands along with some minor landscaping works.

Small amounts of granular material may be imported to maintain access tracks and hardstands during the Proposed Lifetime Extension which will place intermittent minor demand on local quarries.

Meanwhile, as part of the Proposed Offsetting Measures, it is proposed to permanently remove c. 105.5 hectares of plantation forestry which will create more biodiverse upland habitats suitable for foraging hen harrier. Approximately 10ha of this land will be permanently removed offsite, with the remaining 95.5 ha of felled material being stacked into windrows on site. Regarding the farmland area (c.17.7 ha), this land will be permanently restored for the benefit of hen harrier through restoration measures such as planting and restoring of hedgerow, implementation of a rotational grazing scheme, linear wildlife crop sowing, cease on fertiliser application and predator fencing. Full details of the Proposed Offsetting Measures are also outlined in Chapter 4.

4.2 POTENTIAL EFFECTS

4.2.1 Proposed Offsetting Measures

There are no proposed construction works associated with the Proposed Lifetime Extension.

The only works associated with the Proposed Project relate to the Proposed Offsetting Measures and are discussed below:

4.2.1.1 Potential Surface Water Quality/Quantity Effects

Deforestation is a component of the Proposed Offsetting Measures with ~105.5ha of coniferous forestry proposed for deforestation. Potential effects during deforestation occur mainly from:

- Exposure of soil and subsoils due to vehicle tracking, compaction and skidding or forwarding extraction methods resulting in a source of suspended sediment which can become entrained in surface water runoff and enter surface watercourses;

- Entrainment of suspended sediment in watercourses due to vehicle tracking through watercourses;
- Damage to forest roads resulting in a source of suspended sediment which can become entrained in surface water runoff and enter surface watercourses;
- Release of sediment attached to timber in stacking areas; and,
- Nutrient release.

These effects from deforestation have the potential to affect the water quality downstream SWBs.

Hydrocarbons will be used during the Proposed Offsetting Measures and any accidental spillage during refuelling of construction plant with petroleum hydrocarbons can cause significant pollution risk to surface water and associated aquatic ecosystems.

There is also a requirement for temporary crossing over a stream between Proposed Offsetting lands Areas 1 and 4. Construction of structures over water courses has the potential to significantly interfere with water quality and flows during the works phase.

A summary of potential status change to SWBs arising from surface water quality effects within the project site during the Proposed Offsetting Measures works phase of the Proposed Project in the unmitigated scenario are outlined in **Table F**.

Table F: Potential Surface Water Quantity Effects Downstream During the Proposed Offsetting Measures (Unmitigated)

SWB	WFD Code	Current Status	Assessed Potential Status Change
Shanowen (Maine)_010	IE_SW_22S010020	Good	Moderate
Maine_010	IE_SW_22M010300	Moderate	Moderate
Clydagh (Feale)_010	IE_SH_23C030200	High	Good
Clydagh (Feale)_020	IE_SH_23C030500	High	High

4.2.1.2 Potential Groundwater Quality/Quantity Effects

The accidental spillage of hydrocarbons and the release of effluent from wastewater treatment systems have the potential to negatively impact on groundwater water quality at the Proposed Offsetting lands.

However, due to the low permeability of the bedrock aquifer and the shallow nature of the proposed works, there is limited potential for the Proposed Offsetting Measures to alter the overall status of the underlying GWBs. The potential to affect the status of the overall GWB is further limited given the scale of the Proposed Offsetting lands in comparison to the overall size of the Abbeyfeale GWB (949km^2) and the Scartaglin GWB (472km^2).

A summary of potential status change to GWBs at arising from works at the Proposed Offsetting lands in the unmitigated scenario are outlined in **Table G**.

Table G: Potential Deterioration of Groundwater Bodies During the Proposed Offsetting Measures (Unmitigated)

GWB	WFD Code	Current Status	Assessed Potential Status Change
Abbeyfeale	IE_SH_G_001	Good	Good
Scartaglin	IE_SW_G_073	Good	Good

4.2.1.3 Potential Effects on Designated Sites

Any deterioration in water quality during the Proposed Offsetting Measures works could impact the overall environmental of the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA and water quality in the downstream designated sites including the Lower River Shannon SAC.

The Mount Eagle Bogs NHA is located upgradient of the Proposed Offsetting lands. Therefore, there are no surface water connections. Given the close proximity to the works areas, any disturbance of the bog hydrological/hydrogeological regime could impact the NHA. However, there are no deep excavations or earthworks proposed and there is no potential to change the hydrological regime in the adjacent lands.

4.2.2 Extended Operational Phase (Unmitigated)

Potential effects associated with the Extended Operational Phase will be much reduced in comparison to the construction of a wind farm development. Any effects at the Site and will be associated with minor maintenance works.

4.2.2.1 Potential Surface Water Quality/Quantity Effects Downstream of the Site

Impermeable surfaces such as site access roads and turbine hardstands can potentially result in an increase in the proportion of surface water runoff reaching the surface water drainage network in comparison to the pre-development condition. This could potentially increase runoff from the Site and increase flood risk downstream of the development. However, in reality the existing access roads and hardstand areas have a higher permeability than the underlying peat. No signs of erosion were identified at the Site.

During the Proposed Lifetime Extension, some minor maintenance works may be completed, such as maintenance of site entrance, internal roads and hardstand areas. These works would be of a very minor scale and would be very infrequent. These minor activities could, however, result in a brief release of suspended solids to surface water and could result in an increase in the suspended sediment load, resulting in increased turbidity which in turn could affect the water quality and fish stocks of downstream water bodies. Potential effects are not likely to be significant even if not mitigated against.

Accidental spillage during refuelling of plant and equipment with petroleum hydrocarbons is a significant pollution risk. However, due to the small volumes of oils and fuels that will be present on-site during the proposed extended operational phase, no significant effects will occur.

A summary of potential status change to SWBs during the Extended Operational Phase in the unmitigated scenario are outlined in **Table H**.

Table H: Potential Surface Water Quantity Effects Downstream of the Site During the Extended Operational Phase (Unmitigated)

SWB	WFD Code	Current Status	Assessed Potential Status Change
Glenacarney_010	IE_SH_23G060300	Good	Good
Feale_010	IE_SH_23F010020	High	High
Feale_020	IE_SH_23F010040	Good	Good
Feale_030	IE_SH_23F010120	Good	Good
Glenlara_010	IE_SW_18G080500	Moderate	Moderate
Dalua_020	IE_SW_18D010200	Good	Good
Dalua_030	IE_SW_18D010300	Good	Good

4.2.2.2 Potential Groundwater Quality/Quantity Effects

There is very limited potential for effects on the status of the underlying GWBs. Any accidental spillage of hydrocarbons during maintenance works could result in a local deterioration in groundwater quality. However, given the scale of the underlying GWBs this would not result in a change in the overall status of the GWBs.

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 Surface Water Quality Effects Downstream of Site during the Proposed Extended Operational Phase (Unmitigated)

SWB	WFD Code	Current Status	Assessed Potential Status Change
Abbeyfeale	IE_SH_G_001	Good	Good
Rathmore West	IE_SW_G_070	Good	Good

4.2.2.3 Potential Effects on Protected Areas

The Site is located within the Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA. This designated site does not contain any water-dependent qualifying interests or water related conservation objectives.

The Site is also hydrologically connected to the Lower River Shannon SAC and the Blackwater River (Cork/Waterford) SAC.

Due to physical, hydrological and hydrogeological separation all other designated sites have no potential to be affected by the Site.

Due to the lack of any proposed construction works the potential for effects on these designated sites is very limited. However, during minor and infrequent maintenance works there is the potential for the release of suspended solids and hydrocarbons to the surface

water environment. These effects could have the potential to impact downstream designated sites.

4.3 MITIGATION MEASURES

4.3.1 Proposed Offsetting Measures

4.3.1.1 Mitigation Measures to Protect Surface Water Quality During Deforestation

Forestry 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 deforestation and other forestry operations result in minimal potential negative effects to the receiving environment. These mitigation measures are tried and tested, best practice mitigation measures which are implemented at forestry sites across the country. The guidance documents are listed in Section 9.5.2.1 of the EIAR.

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. Based on the Forest Service guidance, with moderate slopes existing across much of the project site, a minimum 10m setback would be required, however out of an abundance of caution 30m to 40m setbacks will be established along all aquatic zones. Furthermore, a 5m setback will be established along all relevant watercourses and water hotspots. Buffer zone widths will be increased at vulnerable hotspots, where deemed necessary. This will ensure water quality is protected during the deforestation operations.

The setback distance from sensitive hydrological features means 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 peat/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.

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 will be chosen which are most suitable for ground conditions at the time of deforestation, and which will minimise soils disturbance. The harvester and the forwarder are designed specifically for the forest environment and are low ground pressure machines;
- All machinery will be operated by suitably qualified personnel;
- Checking and maintenance of forest roads and culverts will be on-going through any deforestation operations. 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 deforestation works;
- These 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 peat and 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 deforestation areas. No direct discharge of such drains to watercourses will occur. Sediment traps and silt fences will be installed in advance of any deforestation 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 peat disposal 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 deforestation areas which are located in close proximity to streams and/or relevant watercourses;
- Drains and silt traps will be maintained throughout all deforestation 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. Straw bales and check dams to 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;
- Refuelling or maintenance of machinery will not occur within 50m of an aquatic zone or within 20m of any other hydrological feature. 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 of deforestation areas 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 deforestation 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.

Timing of Deforestation Works:
Deforestation 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.

Drain Inspection and Maintenance:
The following items shall be carried out during inspection pre-deforestation and after:

- Communication with deforestation 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-deforestation inspections, the main drainage ditches shall be identified. Ideally the pre-deforestation inspection shall be carried out during rainfall;
- Following tree deforestation all main drains shall be inspected to ensure that they are functioning;
- Extraction tracks near drains need to 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 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.

4.3.1.2 Mitigation Measures to Protect Against the Release of Hydrocarbons

There will be no fuels or herbicides stored within 50m of an aquatic zone or within 20m of all other water features.

- All road-going vehicles will be refuelled off-site;
- On-site re-fuelling will be required for forestry and excavator machinery which will be based continuously at the project site;
- The on-site refuelling will be undertaken using a mobile double skinned bowser with spill kits kept on site for accidental leakages or spillages;
- The bowser will be refilled off-site and will be towed around the site by a 4x4 jeep;
- The 4x4 jeep will carry absorbent materials and pads in the event of accidental spillages;
- The fuel bowser will be parked on a level area on the construction compound when not in use;
- Only designated trained operatives will be authorised to refuel plant on-site;
- Taps, nozzles or valves associated with refuelling equipment will be fitted with a lock system;
- Fuels stored on-site will be minimised. All storage areas will be bunded appropriately for the duration of the construction phase. All bunded areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area;
- Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage;
- The plant used during construction will be regularly inspected for leaks and fitness for purpose; and,
- An emergency response plan for the construction phase to deal with accidental spillages will be contained within the Construction Environmental Management Plan.

4.3.2 Extended Operational Phase

4.3.2.1 Increased Site Runoff and Hydromorphology Effects

The footprint of the wind farm development (3.37ha) represents only ~3% of the Site area of 112ha. As detailed in Section 9.5.3.1 of the EIAR, when compared to greenfield pre-development conditions, and assuming that the hardstands and access roads are 100% impermeable, the development footprint results in an increase of approximately 0.1% in the average daily/monthly volume of runoff from the Site.

Therefore, any increase in runoff from the Site is therefore imperceptible and therefore no additional drainage mitigation is proposed above what is already present at the Site.

4.3.2.2 Mitigation Measures to Protect Surface Water Quality

The existing drainage measures have been effective in removing any silt generated during routine maintenance works. This has been reflected in any of the surface water sampling

conducted at the site. In addition to the above, temporary check dams and silt fencing arrangements will be placed along sections of access roads where maintenance works are being undertaken. Check dams will be constructed from a 4/40mm non-friable crushed rock. Temporary blocking of drains downstream of works area can also be undertaken if roadside swales are absent.

Any plant and equipment used during the operational phase will require refuelling during the works. Appropriate management of fuels will be required to ensure that incidents relating to refuelling are avoided. The following mitigation measures are proposed to avoid release of hydrocarbons at the site:

- Road-going vehicles will be refuelled off site wherever possible;
- On-site refuelling will be carried out at designated refuelling areas at various locations throughout the Site. Machinery will be refuelled directly by a fuel truck that will come to site as required;
- Only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations;
- Fuel volumes stored on site will be minimised. Any fuel storage areas will be bunded appropriately for the fuel storage volume;
- The plant used will be regularly inspected for leaks and fitness for purpose;
- An emergency plan for the operational phase to deal with accidental spillages will be developed Spill kits will be available to deal with and accidental spillage in and outside the refuelling area;
- A programme for the regular inspection of plant and equipment for leaks and fitness for purpose will be developed at the outset of the operational phase; and,
- Adherence to Operational and Environmental Management Plan.

4.3.2.3 Mitigation Measures to Protect Groundwater Quality

It is proposed to continue to manage wastewater from the staff welfare facilities in the control buildings by means of a sealed storage tank, with all wastewater being tankered off site by permitted waste collector to wastewater treatment plants.

Mitigation measures for hydrocarbons are described above in **Section 4.3.2.2**.

4.3.2.4 Mitigation Measures for Protected Areas

The mitigation measures to protect against poor quality runoff and hydrocarbons during the operational phase of the Site are the same as those outlined **Section 4.3.1.2** above.

It can be concluded that with best practice methods adhered to during the operation phase of the Site, the potential for the project to impact upon the qualifying interests of the local designated sites is not significant.

4.3.3 Decommissioning Phase

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

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.

The Site roadways will be kept and maintained following decommissioning of the wind farm infrastructure, as these will be utilised by ongoing forestry works and by other participating landowners.

The electrical cabling connecting the site infrastructure to the on-site substation will be removed, while the ducting itself will remain in-situ rather than excavating and removing it, as this is considered to have less of a potential environmental impact, in terms of soil exposure, and thus on the possibility of the generation of suspended sediment which could enter nearby watercourses.

The turbines will be removed by disassembling them in a reverse order to their erection. This will be completed using the same model cranes as used in their construction. They will then be transported off-site along their original delivery route. The turbine concrete bases will remain in the ground and backfilled.

The disassembly and removal of the turbines will not have an impact on the hydrological/hydrogeological environment at the wind farm site.

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.

As noted in the Scottish Natural Heritage report (SNH) Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms (SNH, 2013) reinstatement proposals for a wind farm are made ~30 years in advance, so within the lifespan of the wind farm, technological advances and preferred approaches to reinstatement are likely to change. According to the SNH guidance, it is, therefore:

"*Best practice not to limit options too far in advance of actual decommissioning but to maintain informed flexibility until close to the end-of-life of the wind farm*".

Mitigation measures to avoid contamination by accidental fuel leakage and compaction of soil by on-site plant will be implemented as per the operational phase mitigation measures.

No significant effects on the hydrological and hydrogeological environment will occur during the decommissioning phase of the Site.

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 J** below.

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

SWB	WFD Code	Current Status	Assessed Status - Unmitigated	Assessed Status with Mitigation Measures
Tralee Bay Feale Catchment				
Glenacarney_010	IE_SH_23G060300	Good	Good	Good
Feale_010	IE_SH_23F010020	High	High	High
Feale_020	IE_SH_23F010040	Good	Good	Good
Feale_030	IE_SH_23F010120	Good	Good	Good
Blackwater (Munster) Catchment				
Owenkeal_010	IE_SW_18O060500	Good	Good	Good
Glenlara_010	IE_SW_18G080500	Moderate	Moderate	Moderate
Dalua_020	IE_SW_18D010200	Good	Good	Good
Dalua_030	IE_SW_18D010300	Good	Good	Good
Groundwater Bodies				
Abbeyfeale	IE_SH_G_001	Good	Good	Good
Rathmore West	IE_SW_G_070	Good	Good	Good

4.4 CUMULATIVE ASSESSMENT

This section presents an assessment of the potential cumulative effects associated with the Proposed Project and other developments (existing and/or proposed) on the WFD status of downstream SWBs.

The primary potential for cumulative effects associated with a wind farm development would generally occur during the construction phase. However, no construction works are proposed and there will be no excavations or earthworks at the Site. The potential for cumulative effects during the proposed extended operational phase will be significantly reduced in comparison to a construction phase as there will be no exposed excavations, there will be no sources of sediment to reach watercourses, there will be no use of cementitious materials and fuels/oil will be kept to a minimum at the site. During the decommissioning phase, the potential cumulative effects are similar to the construction phase, but to a lesser degree with less ground disturbance.

Separate hydrological cumulative study areas have been delineated for the Site and for the Proposed Offsetting lands. These cumulative study areas are shown in Figure 9-10. There will be no potential for cumulative effects beyond these cumulative study areas due to increases in flow volumes (as the catchment area increases) and increasing distance from the Site and the Proposed Offsetting lands.

The cumulative hydrological study area for the Site has a total area of 234km^2 and has been delineated as follows:

- The north of the Site is located in the Tralee Bay Feale Catchment. A quantitative analysis using flow volumes derived from the EPA Hydrotool database shows that there is no potential for effects on the Feale River downstream of EPA Hydrotool Node: 23_1771 (Total Upstream Catchment Area of ~95km^2); and,
- The south of the Site is located in the Blackwater (Munster) Catchment. A quantitative analysis using flow volumes derived from the EPA Hydrotool database shows that there is no potential for effects downstream of EPA Hydrotool Node: 18_2469 on the Glenlara River. This Node is located ~2km upstream of the confluence of the Glenlara and Allow Rivers. In order to be conservative and for completeness, the cumulative study area extends downstream as far as Node 18_1756 which includes the entire catchment of the Glenlara River (Total Upstream Catchment Area of ~139km^2).

Given, the nature of the Proposed Lifetime Extension (i.e. extension of life of an existing wind farm) and the lack of any significant groundworks, the delineated cumulative hydrological study area associated with the Site is considered to be very conservative.

The cumulative hydrological study area for the Proposed Offsetting lands has a total area of 74km2 and has been delineated as follows:

- The Shanowen (Maine)_010 and Clydagh (Feale)_010 WFD river sub-basins are also included in the cumulative study area as these are the river sub-basin within which the Proposed Offsetting lands are located. For the purposes of a conservative assessment, the Maine_010 and Clydagh (Feale)_020 WFD river sub-basins are also included in the cumulative study area.

4.4.1 Cumulative Effects with Commercial Forestry

Taurbeg Wind Farm

The Site is situated in an upland area which contains peat bogs and forested areas.

The most common water quality problems arising from forestry relate to the release of sediment and nutrients to the aquatic environment, and impacts from acidification. Forestry may also give rise to modified stream flow regimes caused by associated land drainage.

Due to the close proximity of several forested areas to the Site and given that they drain to the same watercourses, the potential cumulative effects on downstream water quality and quantity need to be assessed.

However, given the nature of the Proposed Lifetime Extension, the lack of any significant groundworks and the prescribed mitigation measures for the proposed extended operational phase, there will be no effects on downstream surface water quality.

For these reasons we consider that there will not be a significant cumulative effect associated with commercial forestry activities.

Proposed Offsetting Measures

Forestry activities will continue in the lands adjacent to the Proposed Offsetting lands. Typical downstream water quality issues arising from forestry activities include elevated concentrations of suspended solids and nutrient enrichment. However, the Proposed Offsetting Measures involves the deforestation of ~105.5ha of coniferous forestry which will result in improved surface water quality and attenuation. This will improve local surface water quality in the vicinity of the Proposed Offsetting lands in comparison to the existing baseline condition where forestry operations are ongoing.

4.4.2 Cumulative Effects with Agriculture

Taurbeg Wind Farm

The cumulative study area associated with the Site includes agricultural areas surrounding Newmarket and Rockchapel.

Agriculture is the largest pressure on water quality in Ireland. Agricultural practices such as the movement of soil and the addition of fertilizers and pesticides can lead to nutrient losses and the entrainment of suspended solids in local surface watercourses. This can have a negative effect on local and downstream surface water quality.

Due to the close proximity of several forested areas to the Site and given that they drain to the same watercourses, the potential cumulative effects on downstream water quality and quantity need to be assessed.

However, given the nature of the Proposed Project, the lack of any significant groundworks and the prescribed mitigation measures for the Proposed Project, there will be no effects on downstream surface water quality.

For these reasons it is considered that there will not be a significant cumulative effect associated with agricultural activities.

Proposed Offsetting Measures

The cumulative study area associated with the Proposed Offsetting lands includes agricultural areas to the east of Castleisland. Agricultural practices can have negative effects on water quality associated with nutrient losses and the entrainment of suspended solids in surface waters.

However, the Proposed Offsetting Measures involves the deforestation of ~105.5ha of coniferous forestry which will result in improved surface water quality. This will improve local surface water quality in the vicinity of the Proposed Offsetting lands in comparison to the existing baseline condition where forestry operations are ongoing.

4.4.3 Cumulative Effects with Other Housing Developments

A detailed cumulative assessment has been carried out for all planning applications (granted and awaiting decisions) within the cumulative assessment areas described above for both Taurbeg Wind Farm and the Proposed Offsetting lands.

These applications are generally for new dwellings or renovations of existing dwellings, as well as for the erection of farm buildings. There is also a planning permission for the construction of 67 no. dwellings at Cahereen West, Killarney Road, Castleisland (Planning Ref Number: 201198). These developments are typically small scale and localised in nature and impacts on water quality or flows (surface water or groundwater) are not expected. Therefore, hydrological cumulative impacts with respect to the Proposed Project will not occur.

4.4.4 Cumulative Effects with Other Wind Farms

Taurbeg Wind Farm

A total of 3 no. existing wind farms have been identified within the hydrological cumulative study area for the wind farm. These include the Coolegrean, Glentane and Knockacummer Wind Farms. There is also a single existing wind turbine at Newmarket which also lies within the hydrological cumulative study area.

These existing wind farms identified within the cumulative study area have already been constructed and are currently in the operational phase of development and are generating electricity. Given that the wind farms have already been constructed, the potential for cumulative hydrological effects to occur is very limited.

The EIARs for the above wind farm developments detail potential hydrological and hydrogeological issues relating to the operation and decommissioning phases of these developments and propose a suite of best practice mitigation measures designed to ensure that the developments do not in any way have a negative effect on downstream surface water quality and quantity. Similarly, the mitigation and best practice measures proposed in this EIAR chapter will ensure that the Proposed Project does not have the potential to result in significant effects on the hydrological/hydrogeological environment.

The proposed Gooseberry Hill Wind Farm in Co. Cork is also located in the hydrological cumulative study area. This wind farm is currently in the design phase, with 18 no. turbines currently proposed. If this wind farm was to be granted planning permission, it would be accompanied by an EIAR which would prescribe strict mitigation measures for the protection of surface water quality and quantity during the construction, operation and decommissioning phases of this wind farm development.

Therefore, there will be no cumulative effects associated with the extended operational or decommissioning phases of the Proposed Project and other wind farms within the cumulative study area.

Proposed Offsetting Measures

The existing Mount Eagle Wind Farm, Coolegrean Wind Farm and Cordal Wind Farm are located within the cumulative study area associated with the Proposed Offsetting Measures. Mount Eagle Wind Farm is currently in operation. The EIARs for this wind farm development details potential hydrological and hydrogeological issues relating to the operation and decommissioning phases and propose a suite of best practice mitigation measures designed to ensure that the developments do not in any way have a negative effect on downstream surface water quality and quantity. Similarly, the mitigation and best practice measures proposed in this EIAR chapter will ensure that the Proposed Offsetting Measures do not have the potential to result in significant effects on the hydrological/hydrogeological environment.

Therefore, there will be no cumulative effects associated with the Proposed Offsetting Measures and other wind farms within the cumulative study area.

4.4.5 Cumulative Effects with Wastewater Treatment Plants

Taurbeg Wind Farm

A total of 3 no. urban Wastewater Treatment Plants (WwTPs) are located within the hydrological cumulative study area. These include the Meelin, Newmarket and Rockchapel urban WwTPs. In addition, the WwTP associated with Newmarket Co-operative Creameries Ltd (P0793) is located within the hydrological cumulative study area. The discharge of wastewater to local watercourses and could potentially result in cumulative effects with the Proposed Project. However, these WwTPs discharge treated wastewater and discharge limits have been assigned to the effluent to ensure that the treated wastewater does not have any significant effects on the receiving surface water quality. The available Annual Environmental Reports (AERs) have been reviewed and the WwTPs are largely compliant with respect to the discharge limits.

The mitigation and best practice measures proposed in this EIAR chapter will ensure that the Proposed Project does not have the potential to result in significant effects on the hydrological/hydrogeological environment.

Therefore, there will be no cumulative effects associated with the extended operational or decommissioning phases of the Proposed Project and the WwTPs within the cumulative study area.

Proposed Offsetting Measures

The Brosna WwTP is located in the cumulative study area with wastewater being discharged into the Clydagh River. This WwTP discharges treated wastewater and discharge limits have been assigned to the effluent to ensure that the treated wastewater does not have any significant effects on the receiving surface water quality. There is no potential for cumulative effects.

5. SUMMARY AND CONCLUSION

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

The Proposed Lifetime Extension does not involve any abstraction of groundwater or alteration of exiting surface water 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 Extended 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 Extended Operational Phase and the Decommissioning Phase will ensure the qualitative status of the receiving waters will not be altered by the Site.

There is also mitigation proposed to protect surface and groundwater quality within the Site and at the Proposed Offsetting lands during all phases of the Proposed Project. These mitigation measures will ensure the qualitative status of the underlying GWB will not be altered by the Site.

The operation of the Taurbeg Wind Farm to date has not resulted in the deterioration of the status of any SWB or GWB. Indeed, the status of the Feale_010 SWB which drains the majority of the Site has improved in status during the lifetime of the Taurbeg Wind Farm. Therefore, the existing drainage controls and mitigation measures being implemented are effective. These will continue to be implemented during the proposed extended operational phase.

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 all surface and groundwater bodies assessed;
- will not jeopardise the objectives to achieve 'Good' surface water/groundwater status;
- 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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