

# TOBIN

Derryhinch, Drumman, Derryarkin,  
Ballybeg and Toar Bogs – Application for  
Substitute Consent

Water Framework Directive

Compliance Assessment

September 2026

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| Client:                | Bord na Móna Biomass Limited                                                                           |
| Project Reference      | 12334- Derrygreenagh Substitute Consent                                                                |

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## 1. INTRODUCTION

TOBIN was requested by Bord na Móna to complete a Water Framework Directive (WFD) Compliance Assessment as part of the remedial Environmental Impact Assessment report (remedial EIAR) for a planning application for Substitute Consent, for peat extraction and ancillary activities undertaken at the Derryhinch, Drumman, Derryarkin, Ballybeg and Toar Bogs (herein known as ‘the Application Site’).

The Application Site comprises mainly of cutover and cutaway bog. Bord na Móna has been involved in peat extraction operations at the site since the 1950s. Milled peat extraction ceased on the site in June 2020.

Peat extraction operated under an Integrated Pollution Control Licence (IPC Reg. No. P0501-01) issued by the Environmental Protection Agency (EPA) in 2000. In accordance with this licence, Draft Cutaway Decommissioning and Rehabilitation Plans have been developed. The Cutaway Bog Decommissioning and Rehabilitation Plans provide a description of the five bogs and the ecological conditions. They also provide a framework and outline the typical works that will be undertaken to achieve the aims of successful rehabilitation (the criteria for which are defined in the plan) and a timescale for when the various elements of the plan will likely be implemented.

Extraction activities commenced on the Application Site (1950s) prior to the introduction of the WFD, which was transposed into Irish law in 2003. The purpose of this WFD Compliance Assessment is to determine if any specific components or activities, associated with the Application Site, will compromise the objectives of the WFD, 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/potential. This assessment will determine the water bodies with the potential to be impacted, describe the mitigation measures and determine if the Application Site is in compliance with the objectives of the WFD.

### 1.1 PROJECT PHASES

The remedial EIAR has been structured into three distinct timeframes: Peat Extraction Phase, Current Phase and Remedial Phase. A summary of each phase is provided below.

#### 1.1.1 Peat Extraction Phase (1988 – June 2020)

Clearance and drainage activities across the Application Site commenced in 1950, with milled peat extraction beginning in 1958. As described in the remedial EIAR, historical impacts associated with the Peat Extraction Phase have been assessed from 1988 (representing the latest date by which the EIA Directive was transposed into Irish law).

Peat extraction ceased at different times across the five bog units, with Ballybeg Bog being the final unit to cease operations in June 2020. Accordingly, for the purposes of the remedial EIAR, the Peat Extraction Phase is defined as extending from 1988 to June 2020.

During the Peat Extraction Phase, the deepening and maintenance of drainage channels continued beyond 1988 and remained ongoing at each bog until peat extraction ceased. As the areas subject to peat extraction gradually decreased in extent over time, and as the available

peat depth correspondingly reduced, the number and extent of drains requiring deepening and maintenance also reduced over time.

The machinery and construction methodologies used for drainage works is described in section 4.4 of chapter 4 of the remedial EIAR.

### 1.1.2 Current Phase (June 2020 to present day)

In January 2021, Bord na Móna formally announced that industrial peat extraction across all bogs within its landholding had ceased. However, peat extraction at the Application Site had already ended prior to this announcement, with peat extraction ceasing in 2020.

The Application Site still operates under the requirements of IPC Licence P0501-01, and any decommissioning works undertaken with respect to peat extraction and ancillary activities are in accordance with Condition 10 of the IPC Licence, which states that that:

*“10.1: Following termination of use or involvement of all or part of the site in the licensed activity, the licensee shall:*

*10.1.1: Decommission, render safe or remove for disposal/recovery, any soil, subsoils, buildings, plant or equipment, or any waste, materials or substances or other matter contained therein or thereon, that may result in environmental pollution.”*

In compliance with Condition 10.1 of the IPC Licence, the license requires the decommissioning of the Application Site by removing, disposing of, or recovering buildings, equipment, waste materials, and other ancillary infrastructure. A key objective of Condition 10 is to ensure that the Application Site is not causing, and is not likely to cause, environmental pollution, and that the site is left in a satisfactory condition such that the licensed lands can be deemed suitable for surrender of the IPC License under Section 95 of the EPA Acts.

To meet these requirements, Bord na Móna identifies all mechanical and infrastructural resources that were installed within the bogs to facilitate the development and extraction operations. This inventory is then reviewed to identify any items that could potentially result in environmental pollution if left in situ and therefore require removal.

The remaining bog and ancillary infrastructure including any unconsolidated plant, equipment and attachments, waste materials, unused raw materials (e.g. land drainage pipes), remaining peat stockpiles, stockpile coverings and pumps. Following the cessation of peat extraction, any remaining stockpiled peat at the Application Site was systematically transferred to Ballivor Horticultural Works, Derrinlough Briquette Factory, Lough Ree Power Station, West Offaly Power Station, Cúil na Móna Horticultural Works, Edenderry Power Station, and other third-party horticultural peat customers. Stockpile removal was completed in 2021. Ongoing decommissioning measures at the Application Site, including the removal of industrial railways, are outlined in Table 4-6 of Chapter 4 of the remedial EIAR.

### 1.1.3 Remedial Phase

Following the conclusion of the decommissioning activities, Bord na Móna are required under Condition 10.2 of the IPC Licence to prepare (to the satisfaction of the EPA) and implement, a Cutaway Bog Rehabilitation Plan.

Bord na Móna have produced a Draft Cutaway Bog Decommissioning and Rehabilitation Plan for each of the five bogs within the Application Site (i.e., Derryhinch, Drumman, Derryarkin Ballybeg and Toar Bogs), refer to Appendix 4-3 of the remedial EIAR for details. It is the intention of Bord na Móna to rehabilitate the bogs in a phased approach under the requirements of the IPC Licence.

The key objective of Bord na Mona's peatland rehabilitation is environmental stabilisation. The plans use bespoke interventions designed to firstly stabilise the environment and secondly to rehabilitate the site as much as possible by placing the existing peatland environments on a path towards naturally functioning peatlands.

The rehabilitation of the bogs will support biodiversity e.g., plants, insects, bird and mammals, and the formation of wetland habitats. In addition, peatland rehabilitation will bring a range of benefits to the local community via improvements in the local landscape, and it is also complying with national policies and strategies regarding the reduction of carbon emissions, supporting biodiversity and enhancing water quality. It is anticipated it will take up to 30 years for naturally functioning wetland and peatland ecosystems to fully re-establish.

Each individual bog comprising the Application Site has its own unique history of peat extraction activities and all ancillary works operations; therefore, the most appropriate rehabilitation approach is bog-specific reflecting local ecological and hydrological factors. Consequently, each bog has its own exclusive Cutaway Bog Decommissioning and Rehabilitation Plan.

The intervention measures include drain blocking. This will encourage natural colonisation of cutaway areas and will establish a more suitable hydrological/hydrogeological regime for the development of bog habitats. The details necessary to achieve the aims set out in the Cutaway Bog Decommissioning and Rehabilitation Plans will include the exact locations of the drains to be blocked and any bunds to be constructed. These details are based on the existing habitats present and the topography of the Application Site. This level of detail will only be available once the rehabilitation plan is finalised.

### 1.1.4 Potential Future Land Use

BnM (formerly Bord na Móna) intends to develop a wind and solar energy project across Derryarkin, Drumman, Derryhinch and Ballybeg Bog, currently known as Derrygreenagh Wind and Solar project. The proposed development is currently at the design phase and is likely to consist of wind turbines, solar photovoltaics and a battery energy storage system. The design of the development will align and integrate with the peatland rehabilitation measures as required under the IPC Licence P0501-01.

A third party intends to develop infrastructure at lands within the Application Site, consistent with the Government's Large Energy User Action Plan (LEAP), and which will be subject to separate planning and regulatory consent as appropriate.



Any future development within the Application Site, will be the subject of separate planning applications. Where required, such applications will be accompanied by an Environmental Impact Assessment Report (EIAR), which will assess the likely significant environmental effects associated with the construction, operation and decommissioning of the respective developments, including consideration of the rehabilitation measures being implemented at the Application Site.

## 1.2 BACKGROUND

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

The Directive was transposed in Ireland by the European Communities (Water Policy) Regulations 2003 (S.I. No. 722 of 2003). 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, undertaking 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. The third cycle of the River Basin Management Plan 2022-2027<sup>1</sup> was published in 2024. Extraction activities commenced on the Application Site (1950s) prior to the introduction of the WFD and the assessment addresses the compliance of the site since the transposition of the directive.

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

Member States must provide information on anthropogenic pressures. The magnitude of pressure and associated impact affects the status classification.

This report provides a WFD Compliance Assessment for the Application Site. This report forms part of the remedial Environmental Impact Assessment (remedial EIAR) submitted with the substitute consent application and should be read in conjunction with Chapter 9 Hydrology Hydrogeology and Water Quality of the remedial EIAR. For avoidance of doubt, any reference hereafter to 'the remedial EIAR' relates to the remedial EIAR prepared and submitted with the application for substitute consent for peat extraction and ancillary activities at the Application site. Consideration of the WFD is required for any development application which has the potential to cause deterioration in the ecological and chemical status of a waterbody or to compromise improvements which might otherwise lead to a waterbody meeting its WFD objectives.

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

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<sup>1</sup> Water Action Plan (WAP) 2024 – A River Basin Management Plan for Ireland



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

### 1.1.1 Assessment Methods

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

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

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

A 2 km buffer zone was applied for assessing protected areas along with downstream connectivity. The Application Site comprises a series of drained peatlands which discharge to a network of small headwater streams and drainage channels. The 2 km buffer encompasses all directly connected surface water features, WFD river waterbodies, groundwater receptors and protected areas with a plausible pathway for interaction during the screening stage of the assessment. Where hydrological connectivity extended beyond the 2 km screening area, downstream waterbodies were also assessed. This is demonstrated by the inclusion of downstream EPA monitoring stations and receiving WFD waterbodies including waterbodies within the Yellow (Castlejordan), Castlejordan, Kinnegad, Brosna, Silver (Tullamore) and Esker catchments.

### 1.2.1 Assessment Criteria

This assessment needs to evaluate where activities may influence WFD waterbodies. Evaluation was made against those quality elements that make up the classification of ecological status. For the freshwater waterbodies that intersect the Application Site, these are shown in Figure 2-1. Ecological Status is defined as alteration from 'natural' conditions; see the official WFD normative definitions in the box below.

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

| WFD Element       | Description of elements for the classification of Ecological Status                                                                                                                                      |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Biological Status | Composition and abundance of aquatic flora (including macrophytes and phytobenthos)<br>Composition and abundance of benthic invertebrate fauna<br>Composition, abundance and age structure of fish fauna |
| Chemical Status   | Elements that support the biological elements including: <ul style="list-style-type: none"> <li>• Temperature</li> <li>• pH</li> <li>• Ammonia</li> <li>• Phosphate</li> </ul>                           |
| Hydrology Status  | Quantity of water flow<br>Connection to groundwater bodies                                                                                                                                               |
| Morphology Status | River depth and width variation<br>Structure and substrate of the river bed<br>Structure of the riparian zone                                                                                            |

Source: WFD Directive 2000/60/EC

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

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

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

## 1.3 STATEMENT OF AUTHORITY

This assessment has been completed by Mr. John Dillon (BSc, MSc, MCIWM, PGeo). John has over 20 years of experience in hydrogeological/hydrological assessment for EIS/EIA. John has an active involvement in the compilation of environmental impact assessment reports, planning applications and wind farm applications. John has experience with EPA WFD groundwater/surface water monitoring, WFD groundwater assessment and characterisation

and in the completion of WFD compliance assessments for renewable energy projects, water pipelines and substitute consent applications.

## 2. STAGE 2 SCREENING AND SCOPING

On a national stage, the Environmental Protection Agency (EPA, 2022) has published the Water Quality in Ireland Report 2019-2024 which provides the latest assessment of the quality of Ireland's rivers, lakes, estuaries, coastal and groundwaters. An EPA indicators report for 2025 was also issued in June 2026. Water quality nationally has declined. The data within the Application Site has shown slight improvements since 2013. The overall status of surface water/rivers in the vicinity of the Application Site is 'Poor' Status. However, the WFD describes the groundwater at the Application Site as 'Good'.

The regional natural surface water drainage pattern, in the environs of the Application Site is shown in Figure 2-1 below.

The Mongagh River (EPA code: 07/C/04, EPA Name Castlejordan\_07 River), is a tributary of the Yellow River, which ultimately flows into the River Boyne (HA 7). The Mongagh River rises to the west of Tyrrellspass, Co. Westmeath, flowing in an easterly direction before joining with the Yellow River and entering the River Boyne.

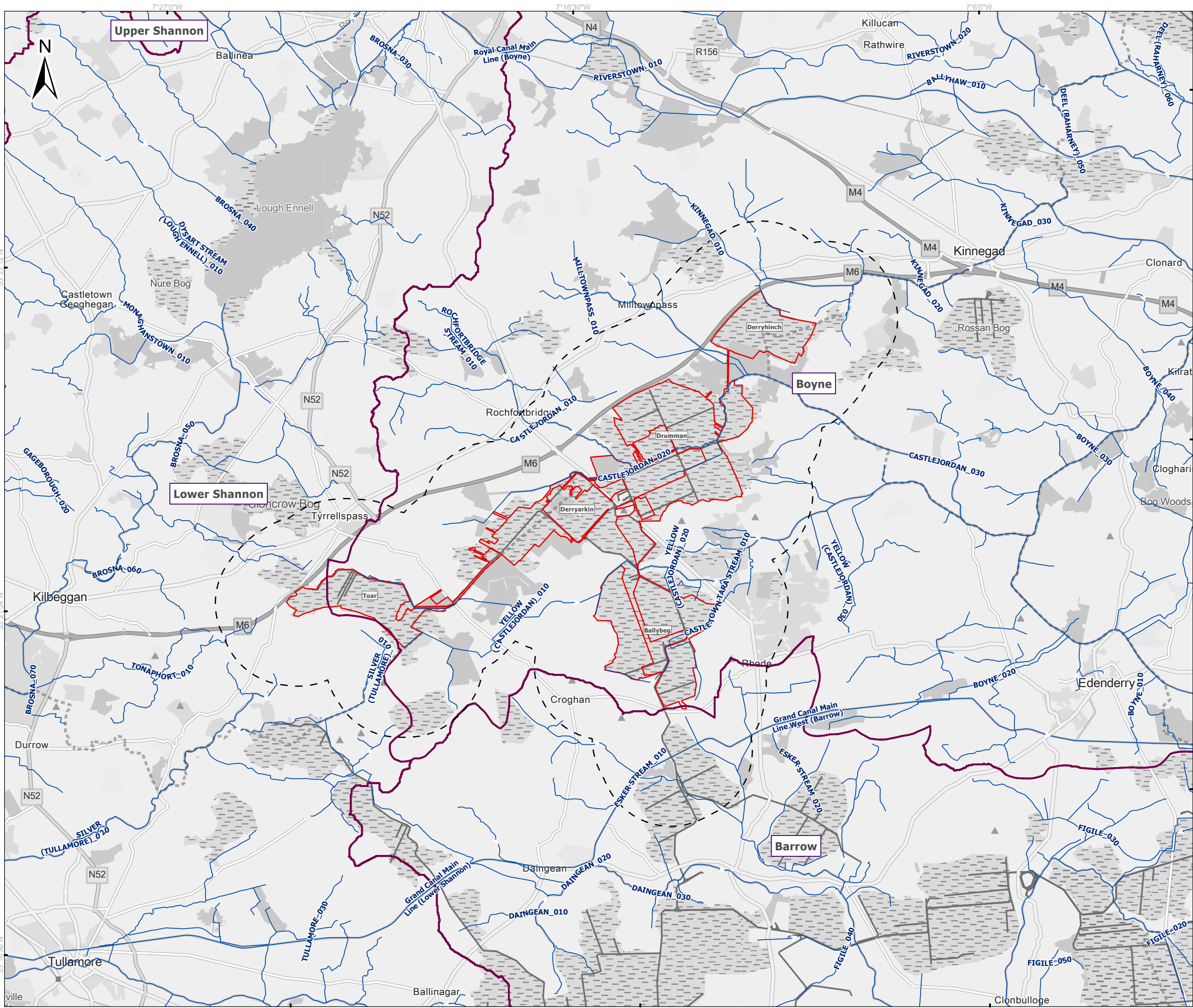
The Mongagh River flows through the centre of Drumman Bog. The Rochfortbridge Stream converges with the Mongagh River approximately 1 km east of the R400 in Drumman Bog. The Mongagh River converges with the Milltownpass River between Drumman and Derryhinch Bog. Downstream of Derryhinch Bog. The Castlejordan River joins with the Yellow River approx. 1 km south of Castlejordan Village.

The Yellow River (EPA code: 07/Y/02) is a tributary of the River Boyne (HA 7) rises to the north of Croghan Village, Co. Offaly; flowing in an easterly direction for approximately 22 km before entering the River Boyne. The Coolcor (Tara) Stream rises on the lower slopes of Croghan and flows through the site before discharging to the Yellow River to the east of the R400.

The Mongagh and Yellow River drains the central part of the site. The Mongagh and Yellow flows eastwards, externally to the site and effectively dividing the site. The Yellow [Castlejordan]\_SC\_010 drains a subcatchment of approximately 184 km<sup>2</sup> before entering the River Boyne downgradient of Clongall Bridge.

The western and northwestern section of Toar bog are within the River Brosna catchment (HA 25A).

For this assessment to inform Cycle 3, there is one waterbody in The Boyne catchment achieving High Status, 64 achieving Good Status, 50 achieving Moderate Status and 29 at Poor Status. With reference to the Barrow Catchment 3, there are three waterbodies achieving High Status, 91 achieving Good Status, 51 achieving Moderate Status and 24 achieving Poor Status. With reference to the Shannon 25A Catchment 3, there are one waterbody achieving High Status, 15 achieving Good Status, 22 achieving Moderate Status and 10 at Poor Status.



**Legend**

- Application Site Boundaries
- 2km Buffer
- WFD - Rivers
- WFD - Catchments

0 1.5 3 Kilometers

|                                                           |            |                                                                                                                                         |           |
|-----------------------------------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------|-----------|
| <b>Spatial Reference</b><br>Datum: IRENET95<br>EPSG: 2157 |            | <b>Copyrights:</b><br>Sources: Map data © OpenStreetMap contributors, Microsoft, Esri Community Maps contributors, Map layer by Esri, © |           |
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| A                                                         | 21/08/2026 | First issue                                                                                                                             | K.K. B.K. |
| Rev                                                       | Date       | Description                                                                                                                             | By Chkd.  |

Client:

Project: Derrygreenagh Substitute Consent

Title: Figure 2-1: Regional Catchment Delineation

Scale @ A3: 1:100,000

|              |             |             |
|--------------|-------------|-------------|
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| Map Ref:                | Draft: |
| 12334-011-CA-S.BO-TOB-A | A      |

## 2.1.1 Surface Water Bodies

The river waterbody types located within the Application Site are primarily small, low-lying streams/drainage channels which flow to into The River Boyne. The Application Site is located in a number of river sub basins and detailed in Table 2-1. Eight sub basins are present at the Application Site. The Application site lies within the Kinnegad\_010, Kinnegad\_020, Castlejordan\_020, Yellow Castlejordan\_010, Yellow (Castlejordan)\_020, Yellow (Castlejordan)\_030, Castletown Tara Stream\_010, and the Esker Stream\_010.

The majority of the Application Site lies within the catchment of the Boyne River Basin, with a small portion to the south located within the Barrow River basin. No peat extraction was undertaken on Ballybeg South however, turbary rights exist on the bog.

**Table 2-1: Water Body Status (<https://www.catchment.ie>) within 2 km of the Application Site**

| Waterbody Code  | Name                       | Status 2018 | 2013- Current Status 2019-2024 | Application Site within WFD Subbasin |
|-----------------|----------------------------|-------------|--------------------------------|--------------------------------------|
| IE_EA_07C040100 | Castlejordan_020           | Moderate    | Moderate                       | Yes                                  |
| IE_EA_07Y020100 | Yellow (Castlejordan)_020  | Moderate    | Moderate                       | Yes                                  |
| IE_EA_07K010060 | Kinnegad_010_              | Moderate    | Moderate                       | Yes                                  |
| IE_EA_07Y020070 | Yellow (Castlejordan)_010  | Moderate    | Poor                           | Yes                                  |
| IE_EA_07C080190 | Castletown Tara Stream_010 | Poor        | Poor                           | Yes                                  |
| IE_SH_25B090400 | BROSNA_060                 | Good        | Good                           | Yes                                  |
| IE_SH_25S030010 | SILVER (TULLAMORE)_010     | Good        | Good                           | Yes                                  |
| IE_SH_25Y080860 | Cornaheer_010              | Moderate    | Moderate                       | Yes                                  |
| IE_EA_07Y02070  | Rochfortbridge Stream_010  | Moderate    | Moderate                       | Upgradient                           |
| IE_EA_07K010100 | Kinnegad_020               | Moderate    | Poor                           | Upgradient                           |
| IE_EA_07C040050 | Castlejordan_010           | Poor        | Poor                           | Upgradient                           |
| IE_EA_07C040190 | CASTLEJORDAN_030           | Good        | Good                           | Downgradient                         |
| IE_EA_07Y020300 | Yellow (Castlejordan)_030  | Good        | Good                           | Downgradient                         |
| IE_EA_07M040400 | Milltownpass               | Poor        | Moderate                       | Upgradient                           |

|                 |                                     |      |          |                                |
|-----------------|-------------------------------------|------|----------|--------------------------------|
| IE_14_AWB_GCMLW | Grand Canal Main Line West (Barrow) | Good | Good     | Not connected to the peatlands |
| IE_SE_14E010100 | Esker Stream_010                    | Good | Moderate | Downgradient                   |

### Surface Water Quality

The Environmental Protection Agency (EPA) has carried out biological water quality monitoring on selected watercourses all over the Republic of Ireland since the early 1970's. In order to gain an understanding of historical water quality in the watercourses hydrologically connected to Bord na Móna's application site operations a review of the EPA's historical water quality monitoring was carried out.

In order to determine the biological quality of the river, the Q-scheme index is used whereby the analyst assigns a Biotic Index value (Q-Value) based on macro invertebrate results. The Biotic Index is a quality measurement for freshwater bodies that range from Q1 - Q5 with Q1 being of poorest quality and Q5 being pristine/unpolluted. The criteria used in the assessment of ecological water quality is shown in Table 2-2 below. Subsequently, the Q-values for the rivers relevant to the application site based on the criteria listed above are listed in Table 2-3 to 2-9.

**Table 2-2: Biotic Index of Water Quality**

| Biotic Index | EPA Water Quality | Water Framework Directive (WFD) Ecological Status | Quality Status      |
|--------------|-------------------|---------------------------------------------------|---------------------|
| Q5           | Good              | High                                              | Unpolluted          |
| Q4-5         | Fair-Good         | High                                              | Unpolluted          |
| Q4           | Fair              | Good                                              | Unpolluted          |
| Q3-4         | Doubtful-Fair     | Moderate                                          | Slightly Polluted   |
| Q3           | Doubtful          | Poor                                              | Moderately Polluted |
| Q2-3         | Poor-Doubtful     | Poor                                              | Moderately Polluted |
| Q2           | Poor              | Bad                                               | Seriously Polluted  |
| Q1-2         | Bad-Poor          | Bad                                               | Seriously Polluted  |
| Q1           | <i>Bad</i>        | <i>Bad</i>                                        | Seriously polluted  |

Based on the results recorded at the EPA water monitoring stations, the overall water quality in the watercourses around the Application Site have been generally good over the past 30 years, since regular monitoring commenced. Results upgradient are in general lower due to a combination of pressures including wastewater treatment plants (WWTPs), agriculture and hydromorphological pressures.

Recorded Q-values have been consistently between 3-4 and 4 in the majority of monitoring stations. Stations that were in operation around the time the Environmental Impact Directive (EIA) Directive was brought in were also recording Q values of between 3 to 4 (between 1980 to 1990).

Table 2-3: Q-Values – Yellow River

| Station Name /Location | Yellow River           |                    |              |                                  |             |
|------------------------|------------------------|--------------------|--------------|----------------------------------|-------------|
|                        | Upgradient             |                    | Downgradient |                                  |             |
|                        | Site boundary          | Site Boundary      | 2 km         | 7 km                             | 8 km        |
|                        | RS07Y020060            | RS07Y020070        | RS07Y020100  | RS07Y020200                      | RS07Y020300 |
| Location               | Yellow - Nr Derryarkin | Br d/s Big R confl | Garr Br      | YELLOW (CASTLEJORDAN) - Sheep Br | Clongall Br |
| 1981                   | - <sup>2</sup>         | -                  | 3-4          | 4-5                              | 4-5         |
| 1985                   | -                      | -                  | 4            | 4-5                              | 4-5         |
| 1990                   | -                      | -                  | 3-4          | 4                                | 4           |
| 1994                   | 4                      | -                  | 4            | 3-4                              | 4           |
| 1997                   | 4                      | -                  | 3-4          | -                                | 4           |
| 2000                   | 4                      | -                  | 3            | -                                | 4           |
| 2003                   | 3                      | 3                  | 3-4          | -                                | 4           |
| 2006                   | -                      | 4                  | 3-4          | -                                | 4           |
| 2009                   | -                      | 4                  | 3-4          | -                                | 4           |
| 2012                   | -                      | 4                  | 3-4          | -                                | 4           |
| 2014                   | -                      |                    | 3-4          | -                                |             |
| 2015                   | -                      | 3-4                | 4            | -                                |             |
| 2018                   | -                      | 3-4                | 4            | -                                | 4           |
| 2020                   | -                      | 3                  | 4            | -                                | 4           |
| 2024                   | -                      | 3                  | 3-4          | -                                | 4           |

Note: No Data = -

Biological sampling of the Yellow River has conducted by the EPA, as well as the Environmental Research Unit (ERU) and An Foras Forbartha prior to the establishment of the EPA. The Mongagh River was partially straightened and deepened as part of the Boyne Arterial Drainage Scheme.

<sup>2</sup> No data



Results upgradient of the site are generally unpolluted with deterioration at Br d/s Big R confluence since 2015. This was attributed to river widening works at this location. This monitoring has indicated that the water quality at the closest monitoring location downgradient (Garr Bridge: Site Code 07Y020100), has a majority of monitoring events recording “slight pollution to unpolluted” at the monitoring location. Monitoring undertaken at the location in 1985 and 1994 showed temporary improvements in the water quality with the monitoring location recording an “unpolluted status”.

Further downstream at Clongall Bridge (Site Code 07Y020300) water quality has been consistently good, with a water quality status of “unpolluted” recorded for all monitoring events. Upstream of Garr Bridge, (Site code 07Y020060), near Derryarkin the water quality has been classified as “unpolluted” since monitoring began in 1994, with the exception of 2003, where there was a significant deterioration in water quality, as the location was classified as “moderately polluted”.

**Table 2-4: Castletown Stream - Yellow River**

| Station Name/Location | Coolcor- Yellow River trib |                       |
|-----------------------|----------------------------|-----------------------|
|                       | Downgradient               | Downgradient          |
| Distance to bog in km | 0 km                       | 0.2 km                |
| Station Code          | RS07C080020                | RS07C080190           |
| Location              | Rhode WWTW upstream        | Rhode WWTW downstream |
| 2020                  | 3-4                        | 3-4                   |
| 2024                  | 3                          | 3                     |

Monitoring of the Coolcor Stream was undertaken for the first time in 2020. The monitoring stations are located downgradient of Ballybeg bog. Results in 2020 indicate the stream is slightly polluted both upgradient and downgradient of the Rhode WWTW. The stream was straightened and deepened as part of the Boyne Arterial Drainage Scheme. Results in 2024 are at poor status.

**Table 2-5: Mongagh River – Yellow River Tributary**

| Station Name/Location | Rochfordbridge Stream |             |             | Mongagh River |              |
|-----------------------|-----------------------|-------------|-------------|---------------|--------------|
|                       | Upgradient            | Upgradient  | Upgradient  | Downgradient  | Downgradient |
| Distance to bog in km | 2 km                  | 1.8 km      | 1.6 km      | 1.5 km        | 5.5 km       |
| Station Code          | RS07C040040           | RS07C040050 | RS07C040060 | RS07C040100   | RS07C040200  |

| Station Name/Location | Rochfordbridge Stream |                                          |                | Mongagh River |                           |
|-----------------------|-----------------------|------------------------------------------|----------------|---------------|---------------------------|
|                       | Upgradient            | Upgradient                               | Upgradient     | Downgradient  | Downgradient              |
| Location              | Mongagh Br            | SE of Rahinine d/s Rochfordbridge Stream | SE of Rahinine | Baltinoran Br | 0.5km d/s Castlejordan Br |
| 1981                  | -                     | -                                        | -              | 4-5           | -                         |
| 1985                  | -                     | -                                        | -              | 3-4           | -                         |
| 1990                  | -                     | -                                        | 3-4            | 4             | 4                         |
| 1994                  | -                     | -                                        | 2-3            | 3-4           | 3-4                       |
| 1997                  | -                     | -                                        | 2-3            | 3-4           | 3-4                       |
| 2000                  | -                     | -                                        | 3              | 4             | 4                         |
| 2003                  | -                     | -                                        | -              | 3             | 3                         |
| 2006                  | -                     | 2-3                                      | -              | 3-4           | 4                         |
| 2009                  | -                     | 3                                        | -              | 3-4           | 4                         |
| 2012                  | 3                     | -                                        | -              | 3-4           | 4                         |
| 2015                  | 3                     | -                                        | -              | 3-4           | 4                         |
| 2018                  | 3                     | -                                        | -              | 4             | 4                         |
| 2020                  | 3                     | -                                        | -              | 4             | 4                         |
| 2024                  | 3                     | -                                        | -              | 3-4           | 4                         |

The Mongagh River that bisects the Drumman bog has two monitoring stations adjacent to the bog boundary. Upgradient of the site, a lack of sensitive macroinvertebrate fauna, dominance of pollution tolerant species, abundant instream macrophyte growth and excessive siltation indicated unsatisfactory poor ecological conditions in the upper reaches (0040) of the Mongagh River. Conditions downgradient of the site at Baltinoran Bridge (0100) improved to good in 2018 and good ecological conditions persist in the lower reaches (0190). However, calcification and compaction of the substratum are still evident. Between 1988 and 2020, results at Baltinoran Br varied between Q3-4 and Q4.

The monitoring location along the Mongagh River is at Baltinoran Bridge (07/Y/02/0100), where a Q value of 3 was assigned in 2003. There was an improvement water quality at this monitoring station since 2003. The monitoring point for the Castlejordan River is located in the village of Castlejordan and Q3 was assigned in 2003.

Table 2-6: Kinnegad River

| Station Name/Location |                               |                      |                            |
|-----------------------|-------------------------------|----------------------|----------------------------|
|                       | Upgradient                    | Downgradient         | Downgradient               |
| Distance to bog       | 2 km                          | 2.5 km               | 5 km                       |
| Station Code          | RS07K010040                   | RS07K010060          | RS07Y020100                |
| Location              | Kinnegad - Br NE of Eskertown | Br SE of Cloonfad Ho | Br on L8021 (u/s Kinnegad) |
| 1981                  |                               | 3-4                  |                            |
| 1985                  |                               | 4                    |                            |
| 1990                  | 4                             | 3-4                  |                            |
| 1994                  |                               | 2-3                  |                            |
| 1997                  |                               | 3                    |                            |
| 2000                  |                               | 3-4                  |                            |
| 2003                  |                               | 3-4                  |                            |
| 2006                  |                               | 3-4                  |                            |
| 2009                  |                               | 3-4                  |                            |
| 2012                  |                               | 3-4                  |                            |
| 2014                  |                               | 3-4                  |                            |
| 2015                  |                               | 3-4                  |                            |
| 2018                  |                               | 3-4                  |                            |
| 2020                  |                               | 3                    | 3                          |
| 2024                  |                               | 3-4                  | 3                          |

The Kinnegad River was straightened and deepened as part of the Boyne Arterial Drainage Scheme. The river predominantly drains agricultural lands along with a small section of Derryhinch Bog. Two monitoring stations downgradient of the bog. In 2020, the dominance of pollution tolerant macroinvertebrate fauna and paucity of sensitive species indicated unsatisfactory ecological conditions at the four stations surveyed on the Kinnegad River in 2024. The loss of sensitive taxa from the site at the Bridge SE of Cloonfad House (0060) indicated a decline to poor ecological status. These conditions persisted downstream.

Table 2-7: Esker River

| Station Name/Location ESKER |              |              |
|-----------------------------|--------------|--------------|
|                             | Downgradient |              |
|                             | 5km          | 8km          |
|                             | Station Code | Station Code |
|                             | Location     | Location     |
| 1989                        | 3            | 3            |
| 1993                        | 3-4          | 4            |

| Station Name/Location | ESKER        |             |
|-----------------------|--------------|-------------|
| Station Code          | Downgradient |             |
|                       | 5km          | 8km         |
|                       | RS14E010100  | RS14E010200 |
|                       | Newtown Br   | Esker Br    |
| 1997                  | 4            | 4-5         |
| 2000                  | 4-5          | 4           |
| 2003                  | 3-4          | 3-4         |
| 2006                  |              | 3           |
| 2009                  |              | 3-4         |
| 2011                  |              | 3-4         |
| 2015                  |              | 3-4         |
| 2017                  |              | 4           |
| 2020                  |              | 3-4         |
| 2023                  |              | 3-4         |

The Esker Stream rises to the west of Croghan Hill and flows underneath the Grand Canal, discharging to the Figile River near Esker Bridge. Overall, the EPA water quality monitoring in the Esker Stream between 1989 and 2023 varied between poor and high status water quality at their stations, see Table 2-7. No peat extraction was undertaken by Bord na Móna on Ballybeg south catchment which flows to the Esker stream. The rail line which is located to the west of Ballybeg south was constructed in the 1960s.

Table 2-8: Brosna River

| Station Name/Location |                                            |                                |
|-----------------------|--------------------------------------------|--------------------------------|
| Station Code          | Upgradient                                 | Downgradient 4 km              |
|                       | RS25B090100                                | RS25B090400                    |
|                       | Butler's Br – downgradient of Lough Ennell | BROSNA - Just d/s Kilbeggan Br |
|                       |                                            |                                |
| 1978                  | 3-4                                        | 4-5                            |
| 1982                  | 4                                          | 4                              |
| 1984                  | 4                                          | 4-5                            |
| 1987                  | 4                                          | 4                              |
| 1993                  | 3-4                                        | 3-4                            |
| 1996                  | 3-4                                        | 3-4                            |
| 1999                  | 3                                          | 4                              |
| 2002                  | 3-4                                        | 3                              |

| Station Name/Location |                                            |                                |
|-----------------------|--------------------------------------------|--------------------------------|
| Station Code          | Upgradient                                 | Downgradient 4 km              |
|                       | RS25B090100                                | RS25B090400                    |
|                       | Butler's Br – downgradient of Lough Ennell | BROSNA - Just d/s Kilbeggan Br |
| 2005                  | 3-4                                        | 3                              |
| 2011                  | 3                                          | 4                              |
| 2014                  | 3-4                                        | 4                              |
| 2017                  | 3-4                                        | 4                              |
| 2021                  | 3-4                                        | 4                              |

The Brosna River rises to the west of Mullingar and flows to Lough Ennell and Kilbeggan, before finally discharging to the Shannon near Shannon Harbour. Overall, the EPA water quality monitoring in the Brosna Stream between 1978 and 2021 varied between poor and high status water quality at their stations. No obvious increase/decrease in water quality is seen with some decrease seen on the main channel downgradient of Lough Ennell in the 1990s. The Main pressures on the River Brosna is wastewater treatment plants (particularly in the upper reaches) and agriculture.

Table 2-9: Silver - Tullamore River

| Station Name/Location |                                  |              |
|-----------------------|----------------------------------|--------------|
| Distance              | Downgradient                     | Downgradient |
|                       | 6 km                             | 8 km         |
|                       | RS25S030100                      | RS25S030300  |
| Location              | Silver - Derrygolan Br (LH Chan) | Gormagh Br   |
| 1984                  | 4-5                              | 4-5          |
| 1987                  | 3-4                              | 4            |
| 1993                  | 4                                | 4            |
| 1996                  | 3                                | 4            |
| 1999                  | 3                                | 4            |
| 2002                  | 3*                               | 3            |
| 2005                  | 3-4                              | 3-4          |
| 2011                  | 3-4                              | 4            |
| 2014                  | 4                                | 4            |
| 2017                  | 4                                | 4            |
| 2021                  | 4                                | 4            |
| 2023                  | 4                                | 3-4          |
| 2025                  | 4                                | 3            |

Based on the results recorded at the EPA water monitoring stations, the overall water quality in Silver River is Q4 'unpolluted' to Q3 'polluted', further downstream. The overall status of surface water/rivers in the vicinity of the Application Site is between 'Good' Status. This classification is based on a low macroinvertebrate value (Q-Value) according to [www.wfdireland.ie](http://www.wfdireland.ie)

The WFD classified several of the surface waters within each sub catchment as 'at risk' of not achieving good status by 2027 ([www.epa.ie](http://www.epa.ie)). Where waterbodies have been classed as 'At Risk', significant pressures have been identified. The significant pressure affecting the greatest number of waterbodies in the Yellow [CAstlejordan;\_SC\_010] subcatchment is peat extraction, followed by urban wastewater treatment and urban diffuse, while septic tanks, misconnections and a licensed facility may be also impacting Milltownpass\_010. Yellow (Castlejordan)\_010 and Yellow (Castlejordan)\_020 are also impacted by diffuse agriculture (particularly as they are located on peaty soils).

Peat extraction and agriculture on peaty soils present in the Boyne SC\_030 subcatchment and is likely to be the significant pressures on Kinnegad\_010.

The regional natural surface water drainage pattern, in the environs of the Application Site, is presented in Figure 2-1 and summarised in table 2-10 below. The Application Site is located on a catchment boundary between the sub catchments of Yellow [Castlejordan]\_SC\_010 which covers the majority of the site and the Boyne\_SC\_030 forming a small segment to the north and the Figile\_SC\_020 subcatchment to the south.

Table 2-10: River Subbasin Summary

| Catchment (Catchment ID) | WFD Sub-catchment (Sub catchment ID) | River Network EPA Name (Segment Code) | River Waterbody WFD Risk 2019-2024 |
|--------------------------|--------------------------------------|---------------------------------------|------------------------------------|
| Shannon 25A              | BROSNA_SC_020                        | Tyrrellspass 25_3794                  | Not at risk                        |
| Shannon 25A              | Silver [Tullamore]_SC_010            | Silver [Tullamore] 25_1066            | Review                             |
| Barrow (14)              | Figile_SC_020                        | ESKER STREAM_010                      | At Risk                            |
| Boyne (07)               | Yellow [Castlejordan]_SC_010         | Castlejordan 07 (07_334)              | Review                             |
|                          |                                      | Castlejordan 07 (07_1885)             |                                    |
|                          |                                      | Castlejordan 07 (07_582)              |                                    |
|                          |                                      | Milltownpass (07_1009)                |                                    |
|                          |                                      | Kiltotan_and_Collinstown (07_564)     |                                    |
| Boyne (07)               | Yellow [Castlejordan]_SC_010         | Unnamed (07_1859)                     | At risk                            |
|                          |                                      | Unnamed (07_507)                      |                                    |

| Catchment (Catchment ID) | WFD Sub-catchment (Sub catchment ID) | River Network EPA Name (Segment Code) | River Waterbody WFD Risk 2019-2024 |
|--------------------------|--------------------------------------|---------------------------------------|------------------------------------|
| Boyne (07)               | Yellow [Castlejordan]_SC_010         | Rathgarrett 07_508                    |                                    |
|                          |                                      | Yellow (Castlejordan) (07_2221)       | At risk                            |
|                          |                                      | Unnamed (07_330)                      |                                    |
|                          |                                      | Unnamed (07_1819)                     |                                    |
|                          |                                      | Coolcor stream (07_1818)              | At risk                            |
|                          |                                      | Coolcor Stream (07_2199)              |                                    |
|                          |                                      | Unnamed (07_2132)                     |                                    |
|                          |                                      | Yellow (Castlejordan) (07_293)        |                                    |
|                          |                                      | Yellow (Castlejordan) (07_331)        |                                    |
|                          |                                      | Unnamed (07_1032)                     | At risk                            |
|                          | Boyne_SC_030                         | Clonfad 07 - 07_2                     | At risk                            |

Figure 2-1 depicts Surface Water Features/Local Catchment Delineation in relation to site area which includes a significant number of unnamed streams although EPA reference names have been applied for identification purposes. The Application Site is not located in a delineated area for action as set out in the National River Basin Management Plan.

Each of the streams flowing through or adjacent to the site has its own sub-catchment area. The delineation of these catchment boundaries is shown on Figure 2-1.

## 2.1.2 Groundwater Bodies

The groundwater body (GWB) is the groundwater management unit under the WFD. Groundwater bodies are subdivisions of large geographical areas of aquifers so that they can be effectively managed in order to protect the groundwater and linked surface waters. The GWB is defined as a distinct volume of groundwater, including recharge and discharge areas with little flow across the boundaries. The Application Site is on the boundary of four ground water bodies (GWB), namely the Clara GWB, Athboy GWB, The Trim GWB and The Daingean GWB. The groundwater body descriptions are available from the GSI website and the 'status' is obtained from the WFD website and the EPA website. The GWBs underlying the Application Site are classified as being at 'Good' status as shown Table 2-11. The Trim WFD GWB is comprised of primarily of high transmissivity karstified limestone. The Clara GWB, Athboy GWB and Daingean GWB are comprised of low transmissivity and storativity rocks, described as Poorly Productive bedrock.

**Table 2-11 Summary of groundwater bodies**

| EU_CD Code  | Name     | Description                 | GWB status (2010-2015) | GWB status (2013-2018) | GWB status (2019-2024) |
|-------------|----------|-----------------------------|------------------------|------------------------|------------------------|
| IE_EA_G_240 | Clara    | Poorly Productive Bedrock   | Good                   | Good                   | Good                   |
| IE_EA_G_001 | Athboy   | Poorly Productive Bedrock   | Good                   | Good                   | Good                   |
| IE_EA_G_002 | Trim     | Productive fissured bedrock | Good                   | Good                   | Good                   |
| IE_SE_G_049 | Daingean | Poorly Productive Bedrock   | Good                   | Good                   | Good                   |

Groundwater is often used as a source of drinking water supply. According to Offaly County Council a one large spring located to the southeast of the site is utilised as a Toberdaly public water supply (PWS).

The GSI has mapped groundwater wells and springs throughout the country. There were three springs utilised since the 1950s/1960s at Toberdaly. They are classified as having good yield, with the boreholes yielding >400m<sup>3</sup>/day. At Derrygreenagh Work a borehole was utilised as part of the works but is currently supplied by Toberdaly.

Zones of Contribution (ZOCs) were delineated for the EPA in 2011. The ZOC of a groundwater source is effectively a groundwater catchment. They are influenced by the hydrogeology of a given area, and are determined from the consideration of:

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

According to the GSI/EPA Source Protection Zone Map ([www.gsi.ie](http://www.gsi.ie)), there are no Source Protection Zones within the application area. The Toberdaly SPZ is located to the east of Ballybeg bog.

The groundwater in the Application Site is assessed as being of Good quantitative and chemical status. This is expected to continue. The bedrock is generally overlain by deep soil and peat deposits. No significant dissolution features (i.e., karst) were observed from visual appraisal of the Application Site and no karst features such as swallow holes are mapped within the GSI Karst Database of Ireland within the remedial EIAR Application Site boundary. No bedrock exposures were encountered in the Application Site.

### 2.1.3 Lake water Bodies

There are no Lake waterbodies present within the Application Site boundary. The nearest lake, Lough Ennell is at Good Status.

There are no Register of Protected Areas (RPA) nutrient sensitive lakes and estuaries in hydrological/hydrogeological connection with the Application Site and there are no RPA shellfish/pearl mussel areas within the Application Site.

### 2.1.4 Transitional and coastal waters

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

The scoping exercise has identified those river waterbodies that are present within a 2km buffer zone of the Application Site.

## 2.2 SCOPING AND ASSESSMENT RESULTS

The WFD requires that activities are also in compliance with other relevant legislation, as considered below. The following are looked at as part of the assessment (as mentioned above, in line with guidance a 2 km buffer zone was applied in this assessment):

### 2.2.1 Protected area

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

- There are no shellfish waters within 2 km of the Application Site;
- There are no bathing water sites within 2 km of the Application Site;
- There are no nutrient sensitive sites within 2 km of the Application Site; and
- There are no of SPAs or SACs within 2 km of the Application Site.

## 2.2.2 Nature Designations

These are areas designated for the protection of habitats or species were maintaining or improving the status of water is important for their protection. They comprise the aquatic part of European designated sites – Special Protection Areas (SPAs) designated under the Birds Directive (79/409/EEC) and Special Areas of Conservation (SACs) designated under the Habitats Directive (92/43/EEC). A list of pNHAs, NHAs, SACs and SPAs is included in Table 2-12.

**Table 2-12: National Sites within the 5 km Zol from Application Site**

| Site Name [Code]                               | Distance from Application Site and Relative Position |
|------------------------------------------------|------------------------------------------------------|
| Grand Canal pNHA [0002104]                     | 0.7 km S                                             |
| Milltownpass Bog NHA [0002323]                 | 1.6 km N                                             |
| Raheenmore Bog pNHA [0000582]                  | 0.8 km SW                                            |
| Cloncrow Bog (New Forest) NHA [0000677]        | 1.3km NW                                             |
| Rahugh Ridge (Kiltobier Esker) pNHA [0000918]  | 1.5 km SW                                            |
| Royal Canal pNHA [0002103]                     | 4.5km N                                              |
| Split Hills And Long Hill Esker pNHA [0001831] | 1.4km NW                                             |
| Ardan Wood pNHA [0001711]                      | 2.3 km W                                             |
| Murphy's Bridge Esker pNHA [0001775]           | 3.8 km SW                                            |
| Grand Canal pNHA [0002104]                     | 0.7 km S                                             |
| Milltownpass Bog NHA [0002323]                 | 1.6 km N                                             |
| Raheenmore Bog pNHA [0000582]                  | 0.8 km SW                                            |
| Cloncrow Bog (New Forest) NHA [0000677]        | 1.3km NW                                             |
| Rahugh Ridge (Kiltobier Esker) pNHA [0000918]  | 1.5 km SW                                            |
| Royal Canal pNHA [0002103]                     | 4.5km N                                              |
| Split Hills And Long Hill Esker pNHA [0001831] | 1.4km NW                                             |
| Ardan Wood pNHA [0001711]                      | 2.3 km W                                             |
| Murphy's Bridge Esker pNHA [0001775]           | 3.8 km SW                                            |

### 2.2.3 Hydromorphology

This section provides a summary of the known existing hydromorphology risk issues for the fluvial water bodies as presented in Table 2-13 below.

**Table 2-13: Hydromorphological Assessment**

| Assessment Questions                                                                                                    | Response                                                                                                   |
|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Consider if your activity could impact on the hydromorphology (morphology or water flow of a water body at high status? | No. river water bodies is not at High Status.                                                              |
| Consider if your activity could significantly impact the hydromorphology of any water body?                             | No. Surface water drainage flow and volume will not significantly change.                                  |
| Consider if your activity is in a water body that is heavily modified for the same use as your activity?                | Partial. Rochfordbridge, Kinnegad 020 and 030 are classified as heavily modified water body under cycle 3. |

### 3. STAGE 3: COMPLIANCE ASSESSMENT

The Application Site has been assessed for its potential to impact each of the WFD quality elements, to achieve its objectives in relation to those elements or impact upon Protected Areas.

The WFD Compliance Assessment primarily considers the extraction phase, the current phase and remedial phase of the Application Site. The Application Site has not been operational since 2020 and is in the process of decommissioning. However, effects are also considered if they have the potential for significant long-term change.

The WFD Compliance Assessment follows the structure of Chapter 9 (Hydrology, Hydrogeology and Water Quality) of the remedial EIAR for the Application Site considered separately in the first instance. The potential for cumulative impacts on a water body as a result of multiple elements of the Application Site potentially impacting upon them is considered in Step 3 of the assessment.

#### 3.1 PEAT EXTRACTION PHASE

This phase includes all peat extraction activities from the date of the required transposition of the WFD into Irish Law in 2003 to the formal cessation of peat extraction activities. During this time period the peat extraction activities at the Application Site were completed under the conditions set out in IPC Licence (Reg. no. P0501-01). This IPC Licence came into effect in 2000 and upgraded and enhanced several pre-existing environmental monitoring and control measures which had been implemented at the Application Site since and pre-1988 (refer to rEIAR Chapter 4 for a complete description of the measures). These pre-IPC measures largely included the incorporation of silt ponds into the bog drainage system to minimise the concentrations of suspended solids entering local watercourses.

The EPA has undertaken Technical Amendments of the IPC Licence for the purpose of aligning the conditions of the IPC Licence to the objectives of national and European environmental protection legislation enacted over the lifetime of the IPC Licence. The IPC Licence was subject to a Technical Amendment for the purpose of the European Communities Environmental Objectives (Surface Water) Regulations, 2009 and it now contains an objective to 'maintain' or 'restore' the water surface water quality to the defined 'Good Status'. With the implementation of conditions listed in the IPC Licence, the potential environmental effects of peat extraction activities and all ancillary works on water quality (such as the release of elevated concentrations of suspended sediments, and by association on aquatic ecosystems and protected species), have and continue to reduce through the implementation of IPC Licence conditions. Therefore, throughout this phase peat extraction activities have been operating under strict conditions designed to protect downstream water quality and quantity.

##### 3.1.1 Biological Quality elements

The first WFD cycle was completed in 2010-2015. Not all WFD status for surface waters exists for the first half of this period. However, EPA Q-values are available from 2000 to 2020 on the River Shannon 1km downgradient of site as shown in Tables XX. The data show relatively stable

Q-values during this period with the majority of watercourses fluctuating between Q3-Q4 – ‘Moderate’ status and Q4 ‘Good’ status.

These Q-values indicate a similar trend in Q-values to those in the pre-2003 period, therefore variation in Q-values is likely indicative of land use changes and the prevailing climatic conditions rather than any specific peat extraction related activities within the Application Site. The overall peat extraction area would have gradually decreased during the 2003-2020 period. Consequently, changes in water quality during this period cannot be attributed solely to peat extraction activities, which were being scaled back during this period.

The Application Site was operating in accordance with IPC Licence requirements during this period. It is likely that the changes in WFD status mainly relate to changes in EPA modelling and assessment.

The Peat Extraction Phase would have had a negligible effect to the distribution and abundance of suitable aquatic habitats since 2003. No significant effects on habitats or protected species are likely as a result of peat extraction and ancillary activities at the Application Site.

### 3.1.2 Chemical and Physico-chemical Quality

Potential impacts on water quality are assessed in Chapter 9 (Hydrology, Hydrogeology and Water Quality) of the rEIAR.

Peat extraction activities could potentially have resulted in an increase in the suspended sediment load and affected the water quality in adjacent streams. No significant impacts on water bodies are evident in the monitoring records during the extraction period. The Application Site operated in accordance with IPC licence conditions which put in place a series of control measures designed for the protection of surface water quality in the vicinity and downstream of the Application Site.

The impact has been classed as slight differences in water quality concentrations and within the normal bounds of variation of laboratory analysis results from coincident physical samples. No significant changes were identified between 2008 and present (See Chapter 9).

The impacts predicted for in terms of levels and water quality mean that any impacts on inputting water bodies would also be slight in terms of ammonium and silt and negligible or slight.

Due to the local hydrogeological regime and limited connectivity with the bedrock aquifer, it is considered that there will be no change in the status of the three GWB during the Remedial Phase.

### 3.1.3 Hydromorphological Quality

Potential impacts on hydromorphology are assessed in Chapter 9 (Hydrology, Hydrogeology and Water Quality) of the rEIAR. There were no significant alterations to hydromorphology since 2003.

Activities at the Application Site are not considered likely to have any significant detrimental impact on hydromorphological quality elements.

### 3.1.4 Protected Areas

The impacts on surface water levels and flows would be indistinguishable from 2003 baseline conditions, and would meet the WFD requirements under existing and future climate conditions. As a result, it is not considered likely that the Application Site would have resulted in any deleterious impacts on the qualifying features of these protected areas such as the River Boyne and Blackwater SAC

## 3.2 OPERATIONAL PHASE

### 3.2.1 Biological Quality Elements

Effects on biological quality elements are assessed in Chapter 7 (Biodiversity) of the remedial EIAR. A summary is provided here and includes the likely residual effects following implementation of mitigation and control measures. Extraction had ceased in 2020 however the areas of peat production were gradually reduced since the 1980s.

The Application Site would have had a negligible effect to the distribution and abundance of suitable foraging habitat since 1988. No significant indirect impacts on habitats or protected species are likely as a result of the Application Site.

### 3.2.2 Chemical and Physico-chemical Quality Elements

Effects on water quality are assessed in Chapter 9 (Hydrology, Hydrogeology and Water Quality) of the remedial EIAR. A summary is provided here and includes the likely residual effects following implementation of mitigation and control measures.

No significant impacts on water bodies are considered likely or evident in the monitoring records. The impact has been classed as imperceptible differences in water quality concentrations and within the normal bounds of variation of laboratory analysis results from coincident physical samples. No significant changes were identified in the EPA monitoring between 2008 and present.

The impacts predicted for in terms of levels and water quality mean that any impacts on inputting water bodies would also be slight in terms of ammonium and silt and negligible or slight positive in terms of ortho-phosphate.

Due to the local hydrogeological regime and limited connectivity with the bedrock aquifer, it is considered that there will be no change in the status of the three GWB during the Remedial Phase.

### 3.2.3 Hydromorphological Quality elements

Effects on hydromorphology are assessed in Chapter 9 (Hydrology, Hydrogeology and Water Quality) of the remedial EIAR. A summary is provided here and includes the likely residual effects following implementation of mitigation and control measures.

The operation of the Application Site is not considered likely to have any significant detrimental impact on hydromorphological quality elements.

### 3.2.4 Protected Areas

As outlined in the NIS, the River Boyne and River Blackwater SAC [0002299], River Barrow and River Nore SAC [0002162], and River Boyne and River Blackwater SPA [0004232], which were designated in 2003, 1998 and 2010 respectively. The River Boyne and Blackwater SAC/SPA is located 9.34 km north east of the Application Site. The River Barrow and Nore SAC is located 19.56 km south of the Application Site. At the time of designation, peat extraction and associated activities were well established at the Application Site, resulting in a landscape dominated by cutover bog and bare peat.

The impacts on water levels and flows at protected areas (i.e. SACs/SPAs/NHAs); are indistinguishable from baseline conditions due to the separation distances and would meet the WFD requirements under existing and future climate conditions. As a result, it is not considered likely that the Application Site would have resulted in any deleterious impacts on the qualifying features of these protected areas.

## 3.3 REMEDIAL PHASE

This phase includes the future rehabilitation. During this phase, the Application Site will continue to operate under the conditions set out in IPC Licence (Reg. No. P0501-01). Therefore, throughout this phase activities will operate under strict conditions designed to protect downstream water quality and quantity.

Environmental monitoring, drainage and silt maintenance will continue during this phase in accordance with IPC licence conditions.

During the Remedial Phase, silt ponds will be maintained and silt removed on a regular basis as required. The measures outlined in the draft Cutaway Bog Decommissioning and Rehabilitation Plans will be agreed with the EPA. The key objective of Bord na Móna peatland rehabilitation is environmental stabilisation. The Bord na Móna bogs cannot be restored back to raised bog, as the majority of peat has been removed and the environmental conditions have been modified. However other natural habitats have started to develop, such as heath, wetlands/reedbeds and birch woodland on shallower peat. In time, areas of *Sphagnum* rich embryonic bog communities (on deeper peat) and areas of naturalised peatland can be developed.

The site rehabilitation plans and the delivery of peatland rehabilitation by Bord na Móna is expected to have a positive impact on water quality and will help the Water Action Plan (2024) deliver its objectives in relation to the Water Framework Directive and is one of the five key actions. Rehabilitation works will result in improvements in water quality, depending on site-specific factors. While research is limited on the long-term restoration of peatlands, ammonium and DOC concentrations are likely to be reduced over time. Based on a number of international studies, ammonium concentrations at rehabilitated peatlands are typically higher than intact raised bogs. The majority of measures will be implemented during the initial stages of the decommissioning and rehabilitation work. Once drain blocking and other measures have been implemented the operational activities will comprise maintenance and repair works if/as those works are deemed necessary to comply with the EPA conditions and implement the plan. In addition, ecological surveys and hydrological/hydrogeological monitoring will be undertaken.

### 3.3.1 Biological Quality Elements

No significant direct or indirect impacts on habitats or protected species are likely as a result of the Remedial Phase. Potential impacts on biological quality elements are assessed in Chapter 7 (Biodiversity) of the rEIAR.

No future peat extraction is proposed. Formal silt control measures will remain in place in accordance with the IPC Licence until such a time as the IPC Licence is surrendered.

During this period the site drainage will operate under the same drainage systems as during the Peat Extraction Phase i.e. a hierarchy of field drains, main drains, silt ponds and discharge outlets. The continued expansion of wetland habitats on the site will further improve and filter surface water on the Application Site. The discharge volumes from the Application Site to nearby surface watercourses will be comparable to surface water discharges during the Peat Extraction Phase.

The Remedial Phase would have had a slight positive impact on water quality.

### 3.3.2 Chemical and Physico-chemical Quality Elements

No additional control measures are deemed necessary as the conditions and emission limits set out in the IPC Licence are designed in accordance with the relevant legislation to ensure ongoing protection of groundwaters and surface waters.

Potential impacts on water quality are assessed in Chapter 9 (Hydrology, Hydrogeology and Water Quality) of the rEIAR.

The impacts predicted for in terms of levels and water quality mean that any impacts on inputting water bodies will be slight in terms of ammonium and silt and negligible or slight positive in terms of ortho-phosphate. Flow rates in internal drains will decrease when the sides of the drain are changed from bare peat to vegetation due to increased surface friction. The vegetated area also increase filtration of water, oxygenates the water and absorbs nutrients such as nitrogen and phosphorus. The exact impact will vary locally and depend on factors like the vegetation type, the density of the vegetation.

Discharge volumes from the Application Site to nearby surface watercourses will be comparable to, if slightly lower than the surface water discharges during the peat extraction phase. No additional control measures are deemed necessary as the conditions and emission limit values associated with the IPC Licence are in accordance with the relevant legislation to ensure ongoing protection of groundwaters and surface waters.

Overall, studies show long-term decreases in inorganic nitrogen, phosphorus, base cations, suspended solids and DOC, as well as increasing biodiversity and carbon sequestration potential (Holden et al, 2004, Klove et al 2010 and Renou-Wilson et al., 2018). Studies show that peatland rehabilitation, particularly through rewetting and drain blocking, leads to a decrease in ammonium concentrations. This is primarily due to the suppression of aerobic decomposition, reduced mineralization, and increased denitrification and vegetation uptake.

International studies have shown a reduction of pollutants, including nitrate and ammonia, following rewetting compared to drained and degraded peatlands, albeit some rewetted bogs may still have higher concentrations of ammonium compared to intact natural bogs.

Due to the local hydrogeological regime and limited connectivity with the bedrock aquifer, it is considered that there will be no change in the status of the three GWB during the Remedial Phase.

### 3.3.3 Hydromorphological Quality Elements

Potential impacts on hydromorphology are assessed in Chapter 9 (Hydrology, Hydrogeology and Water Quality) of the rEIAR. There are no significant proposed alterations to the hydromorphology. Any works undertaken as part of the Cutaway Bog Decommissioning and Rehabilitation Plans will be completed under licence from the EPA with Bord na Mona reporting to the EPA until such a time as the IPC Licence is surrendered. The existing drainage systems which have proven effective will continue to operate during this period. The operation, monitoring, and maintenance of silt ponds will continue in line with IPC Licence requirements to prevent silt run-off from the Application Site.

With the cessation of peat extraction, there is less potential for disturbance of peat and therefore a lower likelihood of elevated concentrations of suspended sediments entering surface watercourses. During this period the site drainage still operates under the same drainage systems as during the Peat Extraction Phase i.e. field drains, main drains, silt ponds and discharge outlets etc. Therefore, discharge volumes from the Application Site to nearby surface watercourses will be comparable to surface water discharges during the Peat Extraction Phase.

The Remedial Phase at the Application Site is not considered likely to have any significant impact on hydromorphological quality elements.

### 3.3.4 Protected Areas

The impacts on levels and flows would be indistinguishable from the Peat Extraction Phase conditions; and would meet the WFD requirements under existing and future climate conditions. As a result, it is not considered likely that the Application Site would have resulted in any significant impacts on the qualifying features of these protected areas.

The Application Site cannot be restored back to raised bog, as the majority of peat has been removed and the environmental conditions have been modified. However other natural habitats have started to develop, such as heath, wetlands/reedbeds and woodland. In time areas of *Sphagnum* rich embryonic bog communities (on deeper peat) and areas or naturalised peatland can be developed.

With the implementation of the measures and requirements of the IPC Licence at the Application Site during this period, the decommissioning and rehabilitation works will have no potential to cause a deterioration in the status of downstream surface water bodies and/or jeopardise their attainment of good surface water or lake status. The long-term impacts of the rehabilitation plans may lead to an improvement in the status of those waterbodies directly downstream of the Application Site, however this is dependent on several site-specific factors.

Further measures outlined in the WAP (2024) will be implemented outside of the Application Site to reduce diffuse agricultural pollution and continue to improve water quality over the water action plan period. Measures included in WAP 2024 include Improved nutrient management, increase inspections in relation to the Nitrates Directive and Good Agricultural Practices (GAP) regulations and Low Emission slurry spreading,

### 3.3.5 Compliance Assessment Summary

The site-specific impacts of the Application Site on the biological, physico-chemical and hydromorphological quality elements of the water bodies are shown in the assessment above and summarised in Table 3-1.

Table 3-1: WFD: Assessment Summary

| Receptor               | Potential risk to receptor? | <i>Note the risk issue(s) for impact assessment</i>                                                                                                                                                                                                                                                                                |
|------------------------|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Hydromorphology        | No                          | Surface water drainage flow and volume was not significantly changed at the Application Site. The boundary streams in all cases are channelised since the 1960s.                                                                                                                                                                   |
| Biology: habitats      | No                          | The footprint of the Application Site was contained primarily within the cutover bog. There are no significant direct or indirect impacts on SACs/SPAs or Annex Habitats.                                                                                                                                                          |
| Biology: fish          | No                          | The risks to the receptor are from increased sediment to adjacent streams. Surface water drainage flow was maintained as a result of the Application Site operations.                                                                                                                                                              |
| Water quality          | Yes                         | Medium term, the Application Site would have increased sediment and ammonium. Bogs not in agricultural use have very low ortho-Phosphate. Mitigation measures are detailed in the EPA Licence.                                                                                                                                     |
| <i>Protected areas</i> | <i>No</i>                   | The Application Site is adjacent to a number of protected habitats. An EPA Licence was implemented in accordance with the EPA 1992 act as amended. No extraction works occurred in SACs/SPAs. The operation of the Application Site did not significantly change the current level of surface water or groundwater volume or flow. |

## 3.4 ASSESSMENT OF APPLICATION SITE AGAINST PROGRAMME OF MEASURES

Within each RBMP, there is a list of measures, or environmental improvements, which have been identified by the RBMP, to meet the target date set by the Water Framework Directive. Part of the WFD Compliance Assessment is to consider measures and assess whether an Application Site can contribute to them or might obstruct any of them from being delivered. No peat extraction has occurred at the Application Site since 2020.

## 4. MITIGATION MEASURES

Post-1988, but prior to the implementation of the IPC Licence at the Application Site in 2000, the environmental management measures, remained in place across the Application Site. In addition, as evidenced in the 1991 Harkins Report (see Appendix 4.7), silt control measures in the form of silt ponds were in place prior to 1988, with Bord na Móna carrying out further studies and surveys throughout the 1980s and 1990s to improve silt pond design and use such that suspended solids emissions in surface run-off were reduced.

Bord na Móna was granted an IPC Licence (Reg. No. P0501-01) for the Derrygreenagh Bog Group (within which the Application Site is located) in the year 2000. Following the grant of the IPC Licence, the control measures were updated and expanded. A copy of the IPC Licence is provided in Appendix 4-1 of the rEIAR. Bord na Móna staff underwent an EPA IPC Licence Compliance training programme, which resulted in the development of an environmental management system. This system addresses emissions to water and air, noise, vibration and odour emissions, waste management, use of natural resources, visual effects and the natural environment and ecosystem. The conditions of the IPC Licence are intended for the protection of the environment and apply from the time of grant of the IPC Licence. The EPA has undertaken Technical Amendments of the IPC Licence for the purpose of aligning the conditions of the IPC Licence to the objectives of national and European environmental protection legislation enacted over the lifetime of the IPC Licence.

A rehabilitation plan will be implemented in compliance with Condition 10 of the IPC licence. The draft Cutaway Bog Decommissioning and Rehabilitation plans are included in Appendix 4-3 of the remedial EIAR, and the details and scope of the plan are briefly described in Section 9.1 and Chapter 4 (Project Description) of the remedial EIAR.

### 4.1 PEAT EXTRACTION PHASE (1988 – JUNE 2020)

Prior to the IPC licence, measures were already in place and are listed below:

- All tank and drum storage areas were bunded.
- Refuelling of production machines took place in designated areas away from drains or rivers.
- Refuelling of peat production plant took place on the bog using fixed bunded tanks or bunded service trains.
- The loading of tanks from the fuel supplier took place either directly into these fixed bunded tanks on the bogs or the fixed bunded main tanks at the workshop in the vicinity of the bog. At the workshops, concrete bunds and oil interceptors were provided and the service train was filled and travelled by rail to refill the plant machinery on the bog.

Toar, Derryhinch, Drumman, Derryarkin and Ballybeg bogs were regulated by the EPA under IPC Licence (Reg. No. P0501-01) since early 2000. No additional mitigation measures, other than compliance with the control measures, and closure, remediation and monitoring plan (CRAMP) regulated by the EPA, are considered necessary in terms of protecting groundwater quality. The list below outlines control measures conditioned under the IPC licencing regime, as regulated by the EPA:

- Effective spill/leak management of mobile fuelling units;
- Replacement (and remediation where necessary) of all underground fuel tanks;
- There shall be no other emissions to water of environmental significance;

- All tank and drum storage areas shall be rendered impervious to the materials stored therein. In addition, tank and drum storage areas shall, as a minimum be bunded;
- Drainage from bunded areas shall be diverted for collection and safe disposal;
- The integrity and water tightness of all the bunding structures and their resistance to penetration by water or other materials stored therein shall be tested and demonstrated by the licensee to the satisfaction of the Agency and shall be reported to the Agency within eighteen months from the date of grant of this licence and every two years thereafter;
- The loading and unloading of fuel oils shall be carried out in designated areas protected against spillage and leachate run-off;
- While awaiting disposal, all materials shall be collected and stored in designated areas protected against spillage and leachate run-off;
- With the exception of roof water, all surface water discharges from workshop areas shall, be fitted with oil interceptors;
- An inspection for leaks on all flanges and valves on over-ground pipes used to transport materials other than water shall be carried out weekly;
- The licensee shall undertake a programme of testing and inspection of underground fuel pipelines to ensure that all underground fuel lines are tested at least every three years; and
- The licensee shall have in storage an adequate supply of containment booms and/or suitable absorbent material to contain and absorb any spillage.

In terms of groundwater quantity and hydrology (surface water runoff), or volumetric flows to surface water impacted by groundwater drainage of the bogs, mitigation measures that were in place included:

- Field drains with low gradients;
- Silt ponds, as well as being a control measure for sediment from the bog, also acted as attenuation measures for higher flows during peak rainfall events. Each metre length of silt pond provides >12 m<sup>3</sup> of water storage, which aided in slowing down the discharge from the bog;
- Silt ponds were cleaned at least twice a year to maintain adequate storage and treatment (sedimentation/settlement) capacity; and
- Pump capacities at pumping stations were designed based on a runoff rate of 1 l/s/Ha, which is equivalent the greenfield runoff rates.

## 4.2 CURRENT PHASE (JUNE 2020 TO PRESENT DAY)

Measures implemented as part of the EPA Licence continue on the bog including the maintenance silt ponds and monitoring of water quality. Toar, Derryhinch, Drumman, Derryarkin and Ballybeg bogs were regulated by the EPA under IPC Licence (Reg. No. P0501-01) since early 2000. No additional mitigation measures, other than compliance with the control measures, and closure, remediation and monitoring plan (CRAMP) regulated by the EPA, are considered necessary in terms of protecting groundwater quality.

## 4.3 REMEDIAL PHASE (FUTURE)

The rehabilitation of the Application Site will be undertaken EPA under IPC Licence (Reg. No. P0501-01). Rehabilitation measures will include drain-blocking, reduced pumping and other measures to raise water levels to the surface of the bog, thus encouraging the development of naturally functioning cutaway peatland habitats.

These rehabilitation measures will be planned and managed by a team consisting of expert ecologists and engineers. It is a guiding principle of Bord na Móna rehabilitation planning that no actions or activities will be undertaken that would negatively impact on adjacent land. No boundary drains will be blocked. Water will still leave the bog via the existing outlets.

Peatland rehabilitation of this bog will bring a range of benefits to the local community via improvements and supporting national policies and strategies in relation to reduction of carbon emissions from peatlands, as well as supporting biodiversity and improvements to water quality.

Drain blocking at the five bogs will improve water quality through reducing ammonium and sediment levels. Drains on site are natural regenerating at present. Climate benefits include the reduction of carbon emissions and enhanced biodiversity when the residual peat is re-wetted.

Taking into consideration the anticipated impacts of the Application Site on the biological, physico-chemical and hydromorphological quality elements, following the implementation of design and mitigation measures, it is concluded that the development of the Application Site will not compromise progress towards achieving GES or GEP of any of the water bodies that are in scope.

**Table 4-1: Compliance of the Application Site with the environmental objectives of the WFD**

| Environmental Objective                                                                                                                                                    | Application Site                                                                                                                                                                                                                                   | Compliance with the WFD Directive |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| No changes affecting high status sites.                                                                                                                                    | There are no high status water bodies in the study area.                                                                                                                                                                                           | Yes                               |
| No changes that will cause failure to meet surface water good ecological status or potential or result in a deterioration of surface water ecological status or potential. | After consideration as part of the detailed compliance assessment, the Application Site will not cause deterioration in the status of the water bodies following the implementation of rehabilitation works, no significant effects are predicted. | Yes                               |
| No changes which will permanently prevent or compromise the Environmental Objectives being met in other water bodies.                                                      | The Application Site will not cause a permanent exclusion or compromise achieving the WFD objectives in any other bodies of water within the River Basin District.                                                                                 | Yes                               |
| No changes that will cause failure to meet good groundwater status or result in a deterioration groundwater status.                                                        | The Application Site will not cause deterioration in the status of the groundwater bodies.                                                                                                                                                         | Yes                               |

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

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

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

With the implementation of the mitigation measures it is concluded that in combination with other Application Sites the Application Site will not compromise the achievement of the objectives of the WFD for any water body. Therefore, the Application Site complies with Article 4.8.

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

The Habitats Directive (1992) promotes the maintenance of biodiversity by requiring Member States to take measures to maintain or restore natural habitats. European designated sites in the vicinity of the Application Site have been assessed and are presented in the remedial Natura Impact Statement (remedial NIS). The remedial NIS is a standalone document included in the planning application for the Application Site. It concludes that the Application Site will not lead to a deterioration in the features of any designated site. The Application Site is not considered to be a risk to designated habitats and therefore is compliant with the Habitats Directive.

The Bathing Water Directive (BWD) (2006/7/EC) was adopted in 2006, and is the process used to measure/monitor water quality at identified bathing waters. There are no bathing waters within 2 km of the Application Site.

## 4.4 CUMULATIVE ASSESSMENT

The potential cumulative effects of this project with other developments in the region, relate to the effects on surface water and groundwater. These developments include other existing or planned developments in the environs of the Application Site and/or developments with the potential to interface with the Application Site in terms of environmental effects.

A cumulative assessment of the peat extraction and ancillary activities, (including the Peat Extraction, Current and Remedial Phase) together with other relevant developments, was undertaken with the purpose of identifying what influence the subject development has had, or potentially could have, on the surrounding environment when considered cumulatively and in combination with relevant permitted, proposed and constructed projects and other land-uses in the vicinity of the site.

Information relating to relevant developments within the vicinity of the Application Site was compiled through a review of online planning registers including Offaly, Meath and Westmeath County Council’s and ACP’s online planning portals. A review of relevant EIAR and remedial EIAR documents, technical assessments, planning application details and planning drawings was undertaken to identify past projects, their associated activities, environmental effects and any potential impact on this Substitute Consent planning application. The developments considered within the cumulative assessment have been considered for each phase of the development, including the Peat Extraction, Current and Remedial Phase.

All water bodies within the study area have been assessed for direct effects. The Application Site will not compromise the achievement of the objectives of the WFD for any water body in the study area. In addition, the Application Site has been assessed for the potential for cumulative effects with other Application Sites within 1km of the study area was assessed.

Potential cumulative effects on hydrology were also considered. Areas outside of the application site will be rehabilitated in according to their planning conditions. Peat Extraction Phase

### **Other commercially extracted bogs operated by Bord na Móna and private operators**

Consideration has been given to other commercially extracted bogs located in close proximity to the Application Site. These primarily consist of other bogs owned and operated by Bord na Móna which are also part of the Derrygreenagh Bog Group, however it also includes privately owned and operated commercially extracted bogs. Commercial peat extraction on all Bord na Móna bogs ceased in January 2021, although many of the Bord na Móna bogs ceased extraction much earlier than this, similar to the Application Site which ceased in June 2020.

Third party peat cutting (turbary plots) is generally a much smaller area of bog compared to the Bord na Móna extraction areas. Bogs in the Derrygreenagh Bog group were in active extraction between 1988 and the cessation of peat extraction on all Bord na Móna bogs. As with the Application Site, areas within the peatlands were removed from extraction on a phased basis. The Rossan Bog (located to the east of Derryhinch Bog) is within the Boyne catchment while the Esker Bogs discharges to the River Esker. The Cavemount bog is fully out of operation since 2014/2015. The activities carried out on the other bogs would have been similar to those carried out at the Application Site. The principal risks associated with hydrology, hydrogeology and water quality at the site are the generation of silty waters due to runoff to water. These risks were mitigated through the adoption of existing Bord na Mona control measures and IPC licence measures. Potential effects were mitigated through the adoption of operational good practice and IPC licence procedures and hence, it is unlikely that the development give rise to any significant cumulative effects.

### **Extraction of Sand and Gravel at Derryarkin and Drumman (Planning reference 01/365, 01/444, 19/25 and associated planning consents including 02/172, 051113, 1925, 18209)**

A planning application and EIAR accompanied an Application by Derryarkin S&G to Westmeath County Council and Offaly County Council in respect of the development of a new sand and gravel extraction operation, as well as the ancillary facilities required to serve the development. The initial application was consented in 2001 by Offaly County Council (application reference 01/365 and 01/444 respectively). An extension to the Drumman extraction pit was granted planning permission in 2019 by Offaly County Council (19/25).

The gravel extraction area extends to c. 250 hectares and includes a restoration plan for the site. The site was on the former peat extraction area with gravel deposits above and below the water table. Flooded quarry ponds can improve water quality on floodplains. They primarily achieve this through two key mechanisms: capturing sediment and pollutants during flood events and actively removing excess nutrients from the water. These ponds can provide important ecosystem services such as water provisioning and nitrogen cycle regulation<sup>3</sup>. Given the proposed mitigation measures in place during the Peat Extraction, Current and Remedial Phase, and the mitigation measures as part of the sand and gravel extraction activities, there is no likely significant cumulative effects on the identified groundwater and surface water receptors.

<sup>3</sup> Ghirardi, N., Bresciani, M., Pinardi, M., Nizzoli, P., Viaroli, P., Pit lakes from gravel and sand quarrying in the Po River basin: An opportunity for riverscape rehabilitation and ecosystem services improvement, *Ecological Engineering*, Volume 196,



**Clonin Solar Farm, Rhode, Co. Offaly (Planning ref 16246)**

This solar farm was granted in 2017 for a 96.6 hectare solar farm with a proposed capacity of 40 MW. It is located to the east of Ballybeg bog. Based on a review of the submitted application, there is no risk of significant cumulative effects on hydrology and hydrogeology as a result of the development.

**Sand and Gravel Extraction - Kilmurray Precast Concrete Ltd. (Planning reference 051028, 12207, 178, 15141, 13122, 18324, 1849)**

A number of planning applications, accompanied by EIARs, were granted planning permission by Offaly County Council in respect of the development of a new sand and gravel extraction operation, as well as the ancillary facilities at the Kilmurray site. The original permission was granted in 2006, with subsequent permissions granted between 2012 and 2019. The development extends over approximately 150 ha and incorporates a restoration and rehabilitation plan. The site is located within a former extraction area and comprises gravel deposits both above and below the groundwater table.

The potential for cumulative effects with the Application Site was assessed in relation to surface water, groundwater, hydrology and Water Framework Directive (WFD) objectives. The Kilmurray development is subject to planning conditions and mitigation measures designed to protect the water environment during both operational and restoration phases. Having regard to the separation of the developments, the nature and scale of the permitted activities, and the implementation of approved mitigation and restoration measures, no significant cumulative adverse effects on surface water quality, groundwater resources, hydrological processes, or the status objectives of any WFD water body are anticipated. Furthermore, the Proposed Development, either alone or in combination with the Kilmurray development and other relevant projects within the catchment, will not result in deterioration of the status of any water body or compromise the achievement of WFD environmental objectives.

**4.4.1 Current Phase****Yellow River Wind Farm - Planning reference ACP PA0032**

The site is located within the townlands of Derryarkin, Derryiron, Coolcor, Coolville, Ballyburly, Greenhills, Bunsallagh, Derrygreenagh, Knockdrin, Wood, Killowen, Corbetstown, Carrick, Garr and Dunville, Rhode, Co. Offaly. The windfarm is located to the South of Derryarkin and to the south of Drumman and Derryhinch Bog. The wind farm was granted permission in 2014 however, the development was constructed in 2024/2025 and is now operational.

The area surrounding the Application Site is currently the site of the Yellow River Wind Farm development. Yellow River Wind Farm is currently in the operational phase where there no significant effects.

The surrounding area is relatively flat lying, with cutover peat overlying glacial till and gravels that in turn overly sedimentary bedrock of mixed lithology. The principal risks associated with hydrology and hydrogeology at the yellow river wind farm site are the generation of silty waters due to runoff from construction areas, and the loss of construction and operational materials (concrete, fuel and oil, etc) to water. These risks were mitigated through the implementation of the agreed mitigation measures. The effects from Yellow River Wind Farm are listed below.

- Pollution with suspended solids due to runoff of soil from construction areas;

- Pollution during construction phase with substances such as fuels, lubricants, waste concrete, wastewater from site toilet and wash facilities, etc;
- Pollution with surface drainage water during operation; and
- Permanent loss of habitat due to culverting or bank/stream alteration.

As mentioned, these risks are mitigated through the implementation of construction and operational mitigation measures, the development did not give rise to any significant cumulative effects with regards to hydrology, hydrogeology, and water quality.

#### **BNM Biomass Storage (Planning ref 20331 , 20/329)**

Biomass (timber) is stored on part of the Drumman Bog. The implementation of the proposed mitigation measures in the planning application ensured there is no cumulative significant adverse effects on the water environment in combination with other relevant developments within the catchment.

#### **Clonin Solar Farm, Rhode , Co. Offaly (Planning ref 21488)**

This solar farm was granted in 2017 for a 96.6 hectare solar farm with a proposed capacity of 40 MW. It is located to the east of Ballybeg bog. Based on a review of the submitted application, there is no risk of significant cumulative effects on hydrology and hydrogeology as a result of the development.

#### **Derryarkin Sand and Gravel DAC(Planning reference 01/365, 02/172, 051113, 1925, 18209)**

A planning application and EIAR accompanied an Application by Derryarkin S&G to Westmeath County Council and Offaly County Council in respect of the development of a new sand and gravel extraction operation, as well as the ancillary facilities required to serve the development. The initial application was in 2001 with another application in 2019. The gravel extraction area extends to c. 250 hectares and includes a restoration plan for the site. The site was on the former peat extraction area with gravel deposits above and below the water table. Flooded quarry ponds can improve water quality on floodplains. They primarily achieve this through two key mechanisms: capturing sediment and pollutants during flood events, and actively removing excess nutrients from the water. These ponds can provide important ecosystem services such as water provisioning and nitrogen cycle regulation<sup>4</sup>. Proposed mitigation measures in place there is no likely significant cumulative effects on the identified groundwater and surface water receptors.

#### **S&G Extraction - Kilmurray Precast Concrete Ltd. (Planning reference 051028, 12207, 178, 15141, 13122, 18324, 1849)**

A number of planning applications and EIAR by Derryarkin S&G to Offaly County Council in respect of the development of a new sand and gravel extraction operation, as well as the ancillary facilities required to serve the development. The initial application was in 2006 with additional applications in 2012-2019. The site extends to c. 150 hectares and includes a restoration plan. The site was on the former extraction area with gravel deposits above and below the water table. The implementation of the proposed mitigation measures ensured there is no cumulative significant adverse effects on the water environment in combination with other relevant developments within the catchment.

**S&GSand and Gravel Extraction - BD Flood (Offaly County Council Planning reference 2560511, ACP Reference 501316)**

A planning application and EIAR accompanied an application by BD Flood to Offaly County Council in respect of the development of a sand and gravel extraction operation, as well as the ancillary facilities required to serve the development. Planning permission was granted by Offaly County Council in April 2026. A first-party appeal was subsequently lodged with An Coimisiún Pleanála (ACP) in May 2026.

The application site extends to c. 19.5 hectares and includes a restoration plan. The proposed development comprises the extraction of sand and gravel deposits both above and below the groundwater table. The site is located approximately 0.2 km from the Application Site.

Based on a review of the application along with the implementation of the mitigation measures, there is no cumulative significant adverse effects on the hydrology and hydrogeology environment in combination with other relevant developments.

**Derrygreenagh Power Station (ACP reference 319023)**

The consented development comprises two generating units located on the site: a flexible combined cycle gas turbine unit (CCGT) with an output of approximately 430 megawatts (MW) and a reserve/peaking open cycle gas turbine unit (OCGT) of approximately 170 MW. The development is located within the townlands of Knockdrin, Derrygreenagh, Derryarkin, Derryiron, Ballybeg, Coolcor, Barrysbrook, Clonin, Togher And Coole, Co. Offaly. The primary fuel source for the CCGT unit will be natural gas with distillate stored onsite as a backup fuel.

The consented development will also consist of all necessary ancillary structures and equipment to allow for the efficient and safe running of the power plant. Further to this, it is proposed that Bord na Móna's Power Generation business unit headquarters will be located at the site.

Potential impacts identified for the development include groundwater abstraction and the potential to effect flow regimes which can have an effect on the ecology of the Yellow River. In relation to groundwater abstraction, this has the potential to result in hydrogeological disruption. Wastewater discharges to the Yellow River has the potential for direct effect to water quality.

The consented development has potential hydrological and hydrogeological connectivity at downstream sites and therefore there can give rise to potential cumulative effects or interactions with other developments. With the implementation of the proposed mitigation measures will ensure there will be no cumulative significant adverse effects on the hydrology and hydrogeology environment from the proposed power plant with the application site, as well as with the proposed grid and gas connection works associated with the project.

**Red Admiral Data Centre (DC) facility and a Decentralised Energy Resource (DER). Planning ref 2560344**

The consented Red Admiral Data Centre (DC) facility was granted planning permission in June 2026 by Westmeath County Council and is currently subject to third party appeal. The development comprises six two-storey data centre buildings, a solar farm extending to approximately 168 ha, car parking, landscaping, drainage infrastructure and associated ancillary works. The data centre facility will be constructed within a secured campus extending to

approximately 39 ha. The development is located within the townlands of Gneevebane, Farthingstown, Kiltotan and Collinstown, near Rochfortbridge, County Westmeath. Solar panel infrastructure is proposed on lands to the south of the M6 motorway.

Having regard to the scale and nature of the consented development, the implementation of the embedded mitigation measures, and the proposed drainage and water management systems, no significant cumulative adverse effects on surface water quality, groundwater resources, hydrological processes or hydrogeological conditions are anticipated.

Furthermore, the assessment concluded that the Proposed Development, either alone or in combination with the Red Admiral Data Centre and other relevant developments within the catchment, would not result in deterioration in the status of any WFD water body and would not compromise the achievement of the relevant WFD environmental objectives. Accordingly, no significant cumulative effects are predicted in relation to hydrology, hydrogeology or WFD compliance.

#### **Rhode LDES Ltd Long Duration Energy Storage Facility (Offaly County Council Planning ref 2460289)**

A planning application was submitted by Rhode LDES Limited to Offaly County Council for the development of a long duration energy storage (LDES) facility on a site extending to approximately 22 ha in the townlands of Clonin and Coolcor, Rhode, Co. Offaly. The proposed development comprises two air dome structures for the storage of carbon dioxide at atmospheric pressure, associated cooling, compression, pumping and power generation equipment, a single-storey storage and control building, internal access roads, an underground electrical connection to the Derryiron 110 kV Substation, and all associated civil engineering, drainage, landscaping, lighting and security infrastructure.

Based on a review of the application along with the implementation of the mitigation measures, there is no cumulative significant adverse effects on the hydrology and hydrogeology environment in combination with other relevant developments.

#### **Biomass Store Planning Offaly County Council Ref: 2560104**

Planning permission was granted by Offaly County Council in July 2025 for a biomass storage facility located within the townlands of Derrygawney, Carrick and Castlejordan, Co. Offaly. The development comprises a Biomass Wood Pellet/Chip Store, an associated Intake Store, and ancillary infrastructure. The application relates to a development for the purposes of an activity requiring an Industrial Emissions (IE) Licence (formerly IPPC Licence).

There is no overlap with the Application site. Based on a review of the application along with the implementation of the mitigation measures, there is no cumulative significant adverse effects on the hydrology and hydrogeology environment in combination with other relevant developments.

#### 4.4.2 Remedial Phase

Potential benefits of peatland rehabilitation include carbon sequestration, restored biodiversity, and improved hydrological functions.

BnM intends to develop a wind and solar energy project across Derryarkin, Drumman, Derryhinch and Ballybeg Bog, currently known as Derrygreenagh Wind and Solar project. The proposed development is currently at the design phase and is likely to consist of wind turbines, solar photovoltaics and a battery energy storage system. The design of the development will align and integrate with the peatland rehabilitation measures as required under the IPC Licence P0501-01.

A third party intends to develop infrastructure at lands within the Application Site, consistent with the Government's Large Energy User Action Plan (LEAP), and which will be subject to separate planning and regulatory consent as appropriate.

Any future development within the Application Site, will be the subject of separate planning applications. Where required, such applications will be accompanied by an Environmental Impact Assessment Report (EIAR), which will assess the likely significant environmental effects associated with the construction, operation and decommissioning of the respective developments, including consideration of the rehabilitation measures being implemented at the Application Site.

The proposals for future land uses have been accounted for, to the extent that information is available, in the preparation of the draft Cutaway Decommissioning and Rehabilitation Plans for the bogs which are included in Appendix 4.3 of this remedial EIAR.

The draft Cutaway Bog Decommissioning and Rehabilitation plans were developed in compliance with Condition 10 of the IPC licence. The scope of the plans was to address issues of concern as identified by Bord na Móna and consultees.

The primary rehabilitation goal is environmental stabilisation of the site and optimising climate action benefits. This will be achieved via wetland creation/management and residual peat re-wetting. This is defined as:

- Stabilisation or improvement in water quality parameters (e.g., suspended solids).
- Environmental stabilisation;
- The main target will be to maintain water-levels close to the peat surface, and to avoid the creation of large-water bodies, where possible;
- Reducing pressures due to former peat extraction activities on receiving water bodies in general. Carrying out rehabilitation with the application rehabilitation measures to re-wet peat and slow water movement across the site;
- Where appropriate, optimising hydrological conditions for the further development of wetland, Reed swamp, wet woodland and fen habitats on shallow cutaway peats, along with management of existing wetlands;
- Rehabilitation will support the National Policies on Climate Action and Green House Gas mitigation by maintaining and enhancing the current residual peat storage capacity of the bog (locking the carbon into the ground).

It is expected that the Application Site will have reduced emissions (reduced source) as it further develops naturally functioning wetland, scrub, woodland and peatland/heath habitats. It will also support Ireland's commitments towards Water Framework Directive and the River Basin Management Plan 2022-2027.

Colonisation of the cutaway generally begins within the first year of the field being taken out of extraction. Vegetation quickly establishes in drains and slows water flow and improves water quality. Rehabilitation will allow for the stabilisation of the site in its entirety. In order to achieve this, the drainage channels in the peat extraction areas were blocked to reduce water level fluctuations in the peatlands. The rehabilitation plan slowed the movement of water through the peat extraction areas through blocking of field drains and developing replacement siltation areas for terminal silt ponds. Each of these aspects are undertaken on a phased basis.

The draft Cutaway Bog Decommissioning and Rehabilitation plan also entailed the aftercare management of a number of siltation ponds. A programme of works will be devised in consultation with the EPA. Soft rush and other pioneer vegetation quickly establish in drains and then spreads across the peat fields. Once the soft rush establishes, other species begin to colonise the peatlands. The vegetation in the drains, helps to retain suspended solids and reduce the velocity of runoff.

Monitoring of the areas taken out of operations showed a steady recovery of the site through natural colonisation and stabilisation of the soils and overall high quality of water draining the site and entering streams. The rehabilitation was successful in slowing the movement of water on site and containing any peat within the bog area. A number of pools and shallow waterbodies have been created and these help to mitigate against peat run-off by extending the area for peat settlement before entering existing silt ponds.

In conclusion, decommissioning and rehabilitation is and will have mostly positive effects on the water environment of the Application Site. Rehabilitation works will include the blocking of drainage channels may have had slight short-term negative effects, as the environment was altered but, in this case, this was done in order to assist and speed up the recovery process of the bog and result in long-term positive effects.

The bog rehabilitation by Bord na Móna will have restored the regime closer to that expected for a wetland on peat soils and is a beneficial impact of the rehabilitation following cessation of peat harvesting activities. Reduction in pumping will expand wetland habitats at Ballybeg, improving overall water quality. It is considered that there will be a long-term slight positive effect on water quality arising from the cumulative effects of the rehabilitation of the bogs and the future development of the subject lands. The future proposals are also expected to slight beneficial and long term on hydrology, hydrogeology and water quality.

## 5. CONCLUSIONS

Peat Extraction and ancillary activities commenced and were long established on the Application Site prior to the introduction of the Water Framework Directive in 2003 to Ireland. The Application Site has been subject to drainage and peat extraction activities since 1950. The primary hydrological and hydrogeological changes associated with the peat extraction process occurs during the initial drainage of the bog in advance of peat extraction. Therefore, the peat extraction activities and potential effect on the groundwater bodies and surface water bodies pre-date the transposition of the WFD into Irish law.

Peat extraction ceased at the Application Site in June 2020 and no significant changes to the hydrological and/or hydrogeological environments will have occurred since the cessation of peat extraction activities. The Cutaway Bog Decommissioning and Rehabilitation Plans for the Application Site will be implemented as part of the condition 10 of the EPA licence. All activities at the Application Site are required to operate in accordance with IPC Licence (P0501-01) until the licence is surrendered. Therefore, an unmitigated scenario is not applicable to the WFD assessment of the Remedial Phase. Measures outlined in IPC licence will be implemented on the Application Site. Rehabilitation measures will include drain-blocking and other measures to raise water levels to the surface of the bog, thus encouraging the development of naturally functioning cutaway peatland and wetland habitats. During the Remedial Phase the Application Site will continue to operate in accordance with IPC Licence requirements. The outlined measures will ensure the protection of groundwater bodies and downstream surface and lake waterbodies.

Taking into consideration the effects of the Application Site on the biological, physico-chemical and hydromorphological quality elements, it is concluded that, following the implementation mitigation and control measures during the Peat Extraction Phase, Current Phase and Remedial Phase, it will not compromise progress towards achieving GES/GEP or cause a deterioration of the overall status of the water bodies that are in scope; it will not compromise the qualifying features of protected areas and is compliant with other relevant Directives. Measures such as peatland rehabilitation have been incorporated into the RBMPs. It can therefore be concluded that the Application Site is compliant with WFD and therefore does not require assessment under Article 4.7 of the WFD.

## 6. REFERENCES

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

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

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

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

## 7. GLOSSARY

Table 7-1: Glossary

| Environmental Objective | Application Site                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Artificial waterbody    | A body of surface water created by human activity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Aquifer                 | A subsurface layer or layers of rock or other geological strata of sufficient porosity and permeability to allow either a significant flow of groundwater or the abstraction of significant quantities of groundwater.                                                                                                                                                                                                                                                                                                  |
| Coastal waterbody       | Surface water on the landward side of a line, every point of which is at a distance of one nautical mile on the seaward side from the nearest point of the baseline from which the breadth of territorial waters is measured, extending where appropriate up to the outer limit of transitional waters.                                                                                                                                                                                                                 |
| Confidence              | <p>Low - Non-expert opinion, unsubstantiated opinion with no supporting evidence.</p> <p>Medium - Expert view grounded in theory but based on limited information, e.g., anecdotal evidence, or historical data.</p> <p>High - Estimation of potential impacts or consequences, with strong theoretical basis, using accepted methods, reliable analysis and accepted within the sector as 'fit for purpose'. This typically includes analytical methods where the methods are strong, and the science is reliable.</p> |
| Groundwater             | All water which is below the surface of the ground in the saturation zone and in direct contact with the ground or subsoil.                                                                                                                                                                                                                                                                                                                                                                                             |
| Groundwater body        | A distinct volume of groundwater within an aquifer or aquifers.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Lake waterbody          | A body of standing inland surface water.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Non-Temporary/Temporary | <p>The requirement is to assess if the activities will have an effect that is non-temporary on the status of the waterbody. The terms are not currently defined within the guidance, however, for the purposes of this assessment 'temporary' is assumed to mean recovery should occur within the period of time the element in question is measured. For example, macro-invertebrates should be measured every 3 years.</p> <p>Therefore, temporary means less than three years for this element.</p>                  |
| River basin             | The area of land from which all surface run-off flows through a sequence of streams, rivers and, possibly, lakes into the sea at a single river mouth, estuary or delta.                                                                                                                                                                                                                                                                                                                                                |

| Environmental Objective     | Application Site                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| River Basin District        | The area of land and sea, made up of one or more neighbouring river basins together with their associated groundwaters and coastal waters, which is identified under Article 3(1) of the Water Framework Directive as the main unit for management of river basins.                                                                                                                                                                                              |
| River Basin Management Plan | River Basin Management Plans describe the river basin district, and the pressures that the water environment faces. It shows what this means for the current state of the water environment in the river basin district, and what actions will be taken to address the pressures. It sets out what improvements are possible by 2015 and how the actions will make a difference to the local environment - the catchments, estuaries, the coast and groundwater. |
| River waterbody             | A body of inland water flowing on the surface of the land, but which may flow underground for part of its course.                                                                                                                                                                                                                                                                                                                                                |
| Surface water               | Inland waters, except groundwater; transitional waters and coastal waters, except in respect of chemical status for which it shall also include territorial waters.                                                                                                                                                                                                                                                                                              |
| Transitional waterbody      | Bodies of surface water in the vicinity of river mouths which are partly saline in character as a result of their proximity to coastal waters but which are influenced by freshwater flows.                                                                                                                                                                                                                                                                      |

## Appendix A-I

### WFD normative definitions

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

#### *High status*

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

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

These are type-specific conditions and communities.

#### *Good status*

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

#### *Moderate status*

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

#### *Poor status*

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

#### *Bad status*

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

