Derrycolumb Bog

Cutaway Bog Decommissioning and Rehabilitation Plan 2021

This document seeks to address the requirements of Condition 10.2 of IPC License Ref. P0504-01:

> "*The licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for permanent rehabilitation of the cutaway boglands within the licensed area.*"

This licence condition requires Bord na Móna agree with the EPA the measures that will provide for rehabilitation, i.e. stabilisation of Derrycolumb Bog upon cessation of peat production and compliments the licence requirement to decommission the site.

***Rehabilitation** generally comprises site stabilisation with natural colonisation with or without targeted management.*

Industrial peat production has now fully ceased at Derrycolumb Bog. Bord na Móna have now announced the complete cessation of industrial peat production.

In addition, to preparing this document to comply with Condition 10 of IPC Licence Ref. PO504-01, due regard was also given to the proposed 'Peatlands Climate Action Scheme' (PCAS) announced by the Minster. This Scheme will see the Minister support, via the Climate Action Fund, Bord na Móna in developing a package of measures, 'the proposed Scheme', for enhanced decommissioning, rehabilitation and restoration of cutaway peatlands referred to as, the Peatlands Climate Action Scheme'. However, only the additional costs associated with the additional and enhanced rehabilitation, i.e., measures which go beyond the existing standard mandatory decommissioning and rehabilitation requirements arising from Condition 10 will be eligible for support. The additional costs of the proposed Scheme will be supported by Government through the Climate Action Fund, administered by the Department of Environment, Climate and Communications (DECC), while the National Parks and Wildlife Service (NPWS) will act as the Scheme regulator.

While this document outlines the enhanced rehabilitation measures planned for the Derrycolumb bog, activities which goes beyond that required by Condition 10 in the Licence, rehabilitation necessary to comply with the 'standard' requirement of Condition 10 (in the absence of the proposed Scheme) is also included, to estimate costs. The inclusion of the 'standard' rehabilitation together with the enhanced rehabilitation in this document allows the Scheme Regulator to distinguish and objectively determine the specific activities (and their associated costs) eligible for support under the proposed Scheme.

Bord na Móna have defined the key rehabilitation outcome at Derrycolumb Bog as environmental stabilisation, re-wetting and setting the bog on a trajectory towards development of naturally functioning peatland and wetland habitats.

Any consideration of any other future after-uses for Derrycolumb Bog, such as amenity, will be conducted in adherence to the relevant planning guidelines and consultation with relevant authorities and will be considered within the framework of this rehabilitation plan.

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SUMMARY

Name of bog: Derrycolumb Bog **Area:** 455.8 ha

Site description:

- Derrycolumb Bog is located close to Lough Ree in Co. Longford.
- Derrycolumb Bog was in industrial peat production from the mid-1980s until 2019. The peat was formerly used as fuel peat in Lough Ree Power in Lanesborough.The bog comprises three main sections that are divided by minor public roads.
- Derrycoloumb Bog has a partially pumped drainage regime.
- The majority of the former peat production footprint is bare peat and contains active drainage channels.
- The south/eastern section of the bog contains the deepest residual peat of between 1.1m and 2.6m of peat.
- The Bilberry River flows along the north-eastern boundary of part of Derrycolumb.
- One area of remnant marginal raised bog present includes a small number of 'active' raised bog habitat.
- The site is located adjacent to Lough Ree and several designated conservation sites. Part of Derrycolumb Bog overlaps an adjacent proposed NHA.

Rehabilitation goals and outcomes

Bord na Móna is committed to discharging the obligations arising from Condition 10 of the IPC licence. The primary goals and outcomes of this plan are:

- Meeting conditions of the IPC License.
- Stabilisation or improvement in water quality parameters (e.g. suspended solids).
- Optimising hydrological conditions for **climate action benefits as part of PCAS.** This will be achieved via **deep peat re-wetting and optimising re-wetting on shallower cutaway areas** and eventually naturally functioning wetland/peatland habitats.
- Environmental stabilisation.
- Rehabilitation will support the National Policies on Climate Action and GHG mitigation by maintaining and enhancing the current peat storage capacity of the bog (locking the carbon into the ground). It is expected that the bog will have reduced emissions (reduced source) and in time develop its carbon sink function, in part, as some peat-forming habitats develop on site. It will also support Ireland's commitments towards Water Framework Directive and the National River Basin Management Plan 2018-2021.
- Optimising hydrological conditions for the protection of exposed archaeological structures, their retention in situ and preservation into the future.

Scope of rehabilitation

The principal scope of this rehabilitation plan is defined by:

- The area of Derrycolumb Bog.
- EPA IPC Licence - Ref. P0504-01. As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. The key objective of 'rehabilitation', as required by this licence, is achieved by the **environmental stabilisation** of the bog.
- **The proposed Scheme (PCAS)** includes enhanced measures which are designed to exceed/meet the standard stabilisation requirements as defined by the IPC Licence and to enhance the ecosystem services of Derrycolumb Bog, in particular, optimising **climate action benefits**.

- The local environmental conditions of this bog. Derrycolumb Bog has variable environmental characteristics with a range of residual peat depths, hydrology and topography. Part of the site is dependent on pumped drainage and is suited to wetland development.
- The key goals and outcomes of rehabilitation at this bog outlined above.
- To minimise potential impacts on neighbouring land, some boundary drains around Derrycolumb Bog will be left unblocked, as blocking boundary drains could affect adjacent land.
- Other constraints including archaeology and rights of way.

Criteria for successful rehabilitation:

The Criteria for successful rehabilitation to meet Condition 10 of the IPC Licence have been defined as:

- Rewetting of residual deep peat in the former area of industrial peat production to slow water movement across the site to retain silt, encouraging development of vegetation cover via natural colonisation, and reducing the area of bare exposed peat (IPC Licence validation). The target will be the delivery of measures and this will be measured by an aerial survey after rehabilitation is completed. (IPC Licence validation).
- Stabilising/improving key emissions to water (e.g. potential silt-run-off). This will be measured via water quality monitoring (suspended solids and ammonia) for at least 2 years after the rehabilitation has been completed. (IPC Licence validation).
- Reducing pressure from peat production on the local catchment (WFD). This will be measured by the EPA WFD monitoring programme.
- Optimising the extent of suitable hydrological conditions for climate action and setting the site on a trajectory towards establishment of a mosaic of compatible peatland and wetland habitats, and eventually towards a reduced carbon source/carbon sink (Climate action verification). This will be measured by an aerial survey and a bog condition assessment after rehabilitation has been completed.
- Reduction in carbon emissions (Climate action verification). Baseline monitoring will be carried after rehabilitation is completed (during the scheme). It is proposed that sites can be monitored against this baseline in the future.
- Improvement in biodiversity and ecosystem services. (Climate action verification).

Summary of measures:

The below section is a summary of measures proposed for rehabilitation.

- Planning actions, including developing a detailed site plan and carrying out a hydrology and drainage assessment.
- Carry out an ecological appraisal of the potential impacts of the planned rehabilitation.
- Carry out proposed measures, which will be a combination of pump management, drain blocking, peat field re-profiling, cell-bunding, wetland creation and fertiliser applications targeting headlands, high fields and other areas.
- Phase 2 measures may include seeding of targeted vegetation and inoculation of *Sphagnum*.
- Silt ponds will continue to be maintained during the rehabilitation and decommissioning phase.
- Evaluate success of short-term rehabilitation measures outlined above and remediate, where necessary.
- Decommissioning of silt-ponds will be assessed and carried out, where required.

Timeframe:

- 2020-2021: Short-term planning actions.
- 2021: Short-term practical actions.
- 2021-2024: Any Long term practical actions; Evaluate success of short-term rehabilitation measures outlined above and remediate, where necessary.
- 2024: Decommission silt-ponds, if necessary.

Budget and Costing

- The rehabilitation plan outlined in this document is predicated on the understanding that it is the Minister's intention to support, via the Climate Action Fund, Bord na Móna in developing a package of measures, 'the proposed Scheme', for enhanced decommissioning, rehabilitation and restoration of cutaway peatlands referred to as, the Peatlands Climate Action Scheme'. However, only the additional costs associated with the additional and enhanced rehabilitation, i.e., measures which go beyond the existing standard mandatory decommissioning and rehabilitation requirements arising from Condition 10 will be eligible for support.
- In relation to the pre-existing Condition 10 IPC Licence requirement to carry out what can be termed the 'standard' decommissioning and rehabilitation, Bord na Móna maintains a Provision on its balance sheet to pay for these future costs when industrial peat extraction ceases. This is updated every year. For more information see the Bord na Móna Annual Report (Bord na Móna 2020). Bord na Móna is fully committed to meeting its obligations relating to rehabilitation and decommissioning under the Integrated Pollution Control Licence.

Monitoring, after-care and maintenance

The monitoring, after-care and maintenance programme for Derrycolumb Bog, as required to meet Condition 10 of the IPC Licence, is defined as:

- Quarterly monitoring assessments of the site to determine the general status of the site, assess the condition of the rehabilitation work, asses the progress of natural colonisation, monitoring of any potential impacts on neighbouring land and general land security. The number of site visits will reduce after 2 years to bi-annually. These site visits will assess the need to additional rehabilitation, if needed.
- **Water quality monitoring** will be established. Monitoring of key water quality parameters for 2 years after rehabilitation will include: Ammonia, Phosphorous, Suspended solids, pH and conductivity.
- Where other uses are proposed for the site, these will be assessed by Bord na Móna in consultation with interested parties. Other after-uses can be proposed for licensed areas and must go through the appropriate assessment and planning procedures.

Additional Monitoring:

- The monitoring and validation of re-vegetation via natural colonisation and changes in bog condition will be carried out using an aerial remote sensing survey, after rehabilitation measures are implemented. It is proposed that sites can be monitored against this baseline in the future.
- Biodiversity Ecosystem services will be monitored using specific indicators during PCAS.
- Carbon emissions monitoring only be carried out on a small proportion of BnM sites to develop better understanding of carbon emissions and GHG emission factors from different types of BnM sites and will be developed on association with other established research programmes. Reduction in carbon emissions will be modelled by a combination of habitat condition assessment and application of appropriate carbon emission factors derived from other sites. Baseline monitoring (habitat condition) will be carried after rehabilitation is completed (during the Scheme). It is proposed that sites can be monitored against this baseline in the future.

Validation and IPC Licence surrender

Reporting to the EPA will continue until the IPC License is surrendered. The bog will be included in the full licence surrender process as per the Guidance to Licensees on Surrender, Cessation and Closure of Licensed Sites EPA, 2012, when:

- The planned rehabilitation has been completed.

- Water quality monitoring demonstrates that water quality indicators are stabilising/improving.
- The site has been environmentally stabilised.

1. INTRODUCTION

Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Mount Dillon bog group (Ref. P0504-01). As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. The bog is part of the Mount Dillon bog group (see Appendix II for details of the bog areas within the Mount Dillon Bog Group). Derrycolumb Bog is located in Co. Longford.

This document seeks to address the requirements of Condition 10.2 of IPC License Ref. P0504-01:

> "*The licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for permanent rehabilitation of the cutaway boglands within the licensed area.*"

This plan is a specific rehabilitation plan for the bog and outlines:

- Description of site management and status;
- Main issues and approaches to rehabilitation;
- Consultation to date with interested parties;
- Interaction with other policy and legislative frameworks (Appendix VI);
- The planned rehabilitation goals and outcomes:
- The scope of the rehabilitation plan;
- Criteria which define the successful rehabilitation and critical success factors required for successful rehabilitation;
- Proposed rehabilitation actions;
- Proposed timeframe to implement these actions;
- Budget and Costings; and
- Associated aftercare, maintenance and monitoring.

It is proposed by Government that Bord na Móna carry out a Peatlands Enhanced Decommissioning, Rehabilitation and Restoration Scheme (PCAS) on peatlands previously used for energy production. Note this proposal is also known colloquially as the 'Peatlands Climate Action Scheme'. The additional costs of the proposed Scheme will be supported by Government through the Climate Action Fund, administered by the Department of Environment, Climate and Communications (DECC), while the National Parks and Wildlife Service (NPWS) will act as the Scheme regulator.

Bord na Móna have identified a footprint of 33,000 ha as peatlands suitable for enhanced rehabilitation. This proposed Scheme will significantly go beyond what is required to meet rehabilitation and decommissioning obligations (Appendix VII & IX) under existing EPA IPC licence conditions. Interventions supported by the Scheme will ensure that environmental stabilisation is achieved (meaning IPC obligations are met), and importantly, significant additional benefits, particularly relating to climate action and other ecosystem services, will also be delivered. However, it is important for all stakeholders to understand that only the costs associated with the additional, enhanced and accelerated rehabilitation, i.e. those measures which go beyond the existing decommissioning and rehabilitation requirements arising from Condition 10, will be eligible for support under the proposed Scheme. Bord na Móna have now announced the complete cessation of industrial peat production across its estate (January 2021).

It is expected that the proposed Scheme (PCAS) will have benefits accruing from biodiversity provision, water quality and storage attenuation as well as increased carbon storage, reduced carbon emissions and acceleration

towards carbon sequestration. The Scheme will also facilitate monitoring of carbon fluxes (Greenhouse Gases and fluvial carbon) in selected areas (in addition to other established Research programmes), to monitor changes in where the interventions will accelerate the trajectory towards a naturally functioning peatland ecosystem.

It is envisaged that the PCAS will support activities, interventions, or measures across the Bord na Móna cutaway peatlands which accelerate the original timelines. Selected rehabilitation measures will take account of site environmental conditions, which can vary significantly. These measures potentially include:

- more intensive management of water levels through pump management, drain-blocking and cell bunding;
- re-profiling that will deliver suitable conditions for development of wetlands, fens and bog habitats;
- targeted fertiliser applications,
- seeding of targeted vegetation; and
- proactive inoculation of suitable peatland areas with *Sphagnum.*

These are collectively designed to optimise hydrological conditions (ideally and where possible water-levels <10 cm) for climate action benefits and to accelerate the trajectory of the site towards a naturally functioning ecosystem, and eventually a reduced carbon source/carbon sink again. In some areas of dry cutaway this trajectory will be significantly longer and it is not feasible in the short-term to re-wet some areas, which will develop other habitats. Other areas will naturally have deeper water). The key to optimising climate action benefits is the restoration of suitable hydrological conditions and more intensive intervention means that the extent of suitable hydrological conditions can be optimised.

These measures are designed to encourage the development of peat-forming habitats, where possible. They are also designed to further slow the movement of water across the site (with the site acting similarly to a constructed wetland), slowing the release of water (improving local water attenuation) and water quality is also expected to improve as the site returns to a naturally functioning peatland ecosystem.

Derrycolumb Bog is proposed to be part of this this proposed Scheme (PCAS) and this rehabilitation plan outlines the approach taken.

1.1 Constraints and Limitations

This document covers the area of **Derrycolumb**.

Future land-use at Derrycolumb has not been defined by Bord na Móna. Biodiversity and ecosystem services have been identified as the current primary land use. Bord na Móna will continue to review the future after-use of its land-bank. Any consideration of any other future after-uses for Derrycolumb Bog, will be conducted in adherence to the relevant planning legislation and consultation with relevant authorities and will be considered within the framework of this rehabilitation plan.

Industrial peat extraction at Derrycolumb Bog permanently ceased in 2019. Currently the former peat production area is bare peat. It is anticipated that the combination of active enhanced rehabilitation measures and natural colonisation will quickly support the development of pioneer vegetation. Nevertheless, it will take some time (30-50 years) for naturally functioning peatland ecosystems to fully re-establish.

Parts of Derrycolumb Bog (outside the areas owned and under the control of Bord na Móna) are currently used by domestic turf cutters to harvest peat. These areas are ecologically and hydrologically linked to the area owned by Bord na Móna where rehabilitation is planned. It is beyond the scope of this rehabilitation plan to address turf cutting issues on Derrycolumb Bog that are outside of the control of Bord na Móna. Nevertheless, Bord na Móna

are aware of such issues which may constrain the proposed rehabilitation actions, and this rehabilitation plan considered potential impacts of these on the delivery of the stated objectives.

Rehabilitation in other areas of the bog may also be constrained due to other property issues or issues such as rights of way. In addition, there is substantial Archaeology evidence present at Derrycolumb; this is similarly treated as a constraint.

2. METHODOLOGY

This rehabilitation plan was developed with a combination of desktop and field surveys, consultations with internal and external stakeholders and cognisance of the proposed Scheme (PCAS). The development of this enhanced rehabilitation plan also considered **recently published** guidance issued by the EPA in 2020 – **Guidance on the process of preparing and implementing a bog rehabilitation plan**.

The ecological information and site information collected during the Bord na Móna ecological baseline survey, additional confirmatory site visits and monitoring and desktop analysis forms the basis for the development of the rehabilitation plan for the bog, along with:

- Experience of 40 years of research on the after-use development and rehabilitation of the Bord na Móna cutaway bogs (Clarke, 2010; Bord na Móna, 2016);
- Significant international engagement during this period with other counties in relation to best-practise regarding peatland rehabilitation and after-use through the International Peat Society and the Society for Ecological Restoration (Joosten & Clarke, 2002; Clarke & Rieley, 2010; Gann *et al*., 2019);
- Consultation and engagement with internal and external stakeholders;
- GIS Mapping;
- BNM drainage surveys;
- Bog topography and LIDAR data:
- Hydrological modelling; and
- The development of a **Methodology Paper (draft) outlining the proposed Scheme (PCAS)**. This rehabilitation includes enhanced measures defined in the Methodology Paper which are designed to exceed the standard stabilisation requirements as defined by the IPC Licence and to enhance the ecosystem services of Derrycolumb Bog, in particular, optimising **climate action benefits**.

2.1 Desk Study

The desk study involved collecting all relevant environmental and ecological data for the study area. The development of the rehabilitation plan also takes account of research, experience and engagement with other peatland restoration and rehabilitation projects and peatland research including Irish, UK, European and International best-practise guidance (full citations are in the References Section):

- Anderson *et al*. (2017). An overview of the progress and challenges of peatland restoration in Western Europe.
- Bonn *et al*. (2017). Peatland restoration and ecosystem services- science, policy and practice.
- Carroll *et al*. (2009). *Sphagnum* in the Peak District. Current Status and Potential for Restoration. Moors for the Future Report No 16.
- Clark & Rieley (2010). Strategy for responsible peatland management.
- Eades *et al*. (2003). The Wetland Restoration Manual.
- Farrell & Doyle (2003). Rehabilitation of Industrial Cutaway Atlantic Blanket Bog, NW Mayo, Ireland.
- Gann *et al*. (2019). International Principles and Standards for the practice of Ecological Restoration.
- Hinde *et al*. (2010). *Sphagnum* re-introduction project: A report on research into the re-introduction of *Sphagnum* mosses to degraded moorland. Moors for the Future Research Report 18.
- Joosten & Clarke (2002). Wise Use of mires and peatlands – Background and Principles including a framework for Decision-making.

- Lindsay (2010). Peatbogs and Carbon: a Critical Synthesis to Inform Policy Development in Oceanic Peat Bog Conservation and Restoration in the Context of Climate Change.
- Mackin *et al*. (2017). Best practice in raised bog restoration in Ireland. Irish Wildlife Manuals, No. 99. National Parks and Wildlife Service,
- McBride *et al*. (2011). The Fen Management Handbook (2011), Scottish Natural Heritage.
- McDonagh (1996). Drain blocking by machines on Raised Bogs. Unpublished report for National Parks and Wildlife Service.
- NPWS (2017a). National Raised Bog Special Areas of Conservation management plan. Department of Arts, Heritage and the Gaeltacht.
- Quinty & Rochefort (2003). Peatland Restoration Guide, second edition. Canadian *Sphagnum* Peat Moss Association and New Brunswick Department of Natural Resources and Energy.
- Regan *et al*. (2020). Ecohydrology, Greenhouse Gas Dynamics and Restoration Guidelines for Degraded Raised Bogs. EPA Research Report. Prepared for the Environmental Protection Agency by Trinity College Dublin.
- Renou-Wilson *et al*. (2011). BOGLAND - Sustainable Management of Peatlands in Ireland. STRIVE Report No 75 prepared for the Environmental Protection Agency.
- Schouten (2002). Conservation and Restoration of Raised Bogs: Geological, Hydrological and Ecological Studies. Dúchas - The Heritage Service of the Department of the Environment and Local Government, Ireland;
- Thom (2019). Conserving Bogs – Management Handbook.
- Wheeler & Shaw (1995). Restoration of Damaged Peatlands – with Particular Reference to Lowland Raised Bogs Affected by Peat Extraction.
- Wittram *et al*. (2015). A Practitioners Guide to Sphagnum Reintroduction. Moors for the Future Partnership.

Additional on-line resources were also incorporated into the desk study, including:

- Moundillion Integrated Pollution Control Licence;
- Mountdillion Annual Environmental Reports;
- Review of the National Biodiversity Data Centre (NBDC) webmapper;
- Inland Fisheries Ireland (IFI) Reports;
- Environmental Protection Agency database (www.epa.ie);
- EPA Guidance on Requests for Alterations to a Licensed Industrial or Waste Activity;
- BirdWatch Ireland online data (including I-WeBS and CBS datasets; www.birdwatchireland.ie);
- Geological Survey of Ireland - National Draft Bedrock Aquifer map;
- Geological Survey of Ireland - Groundwater Database (www.gsi.ie);
- Historic Environment Viewer at https://webgis.archaeology.ie/historicenvironment/
- National Parks & Wildlife Services Public Map Viewer (www.npws.ie);
- Water Framework Directive catchments.ie/maps/ Map Viewer (www.catchments.ie);
- OPW Indicative Flood Maps (www.floodmaps.ie);
- CFRAM Preliminary Flood Risk Assessment (PFRA) maps (www.cfram.ie);
- River Basin Management Plan for Ireland 2018 – 2021;
- Bord na Móna Annual Report 2020.
- Spatial data in respect of Article 17 reporting, available online at https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17.

2.2 Consultation

A number of stakeholders have been identified during the course of Bord na Móna's rehabilitation and Biodiversity Action Plan activities and are contacted during the rehabilitation planning process for their views. See Section 4.

2.3 Field Surveys

Bord na Móna carried out a baseline ecological survey of all of its properties in 2009-2012 and developed habitat maps. As part of this exercise, Derrycolumb Bog was surveyed in July 2012 and surveyed again during 2018. Additional ecological walk-over surveys and visits have taken place at Derrycolumb Bog between 2012-2020 to inform rehabilitation planning and habitat maps have been updated, where required- the latest site visit took place in October of 2020. This rehabilitation plan is informed by the original baseline survey as well as subsequent confirmatory site walk-over surveys and visits, and updates to baseline data.

Habitat mapping followed best-practise guidance from Smith *et al.* (2011). Map outputs including all habitat maps and target notes were produced using GIS software application packages (ArcGIS). General marginal habitats and other habitats that had not been modified significantly by industrial peat extraction were classified using Fossitt *et al*. (2000). Plant nomenclature for vascular plants follows Stace (2010), while mosses and liverworts nomenclature follows identification keys published by the British Bryological Society (2010). A more detailed Bord na Móna classification system was developed for classifying pioneer cutaway habitats as Fossitt categories were deemed not to be detailed enough for cutaway bog (much of cutaway bog could be classified as Cutover Bog - PB4). Much of the pioneer cutaway vegetation is still at an early stage of its development and cannot be assigned to Fossitt Level 3 categories yet.

A detailed ecological survey report for Derrycolumb Bog is contained in Appendix II.

3. SITE DESCRIPTION

Derrycolumb Bog (hereafter Derrycolumb) is located approximately 9.5km to the west of Ballymahon in County Longford. This bog comprises three main sections that are divided by minor public roads. Derraghan Bog is located immediately adjacent to two sections of Derrycolumb and is connected via a rail link to Derrycolumb. To the south east, the next adjacent Bord na Móna Bog (Edera Bog) is also connected to Derrycolumb via a rail line. There are travel paths and drainage channels maintained around the bog formerly used for access and drainage of industrial peat production areas (Figure 3.1).

Derrycolumb is one of a cluster of bogs that has developed along the floodplains of the River Shannon. It is one of a group with the Mount Dillon bog group that frequently is inundated with surface water during winter periods. In each of these bogs, a significant portion of the industrial peat production areas lie below the winter flood level of the Shannon. Derrycolumb had a partially pumped drainage regime to facilitate peat extraction.

3.1 Status and Situation

3.1.1 Site history

Derrycolumb Bog was in industrial peat production from the mid-1980s until 2019. The peat was formerly used as fuel peat in Lough Ree Power in Lanesborough.

3.1.2 Current land-use

Industrial peat production has now completely ceased at Derrycolumb Bog. Several small stock-piles are still present on the site and these will be removed before rehabilitation and decommissioning is complete. There are licensed turbary plots overlapping the bog boundary.

Longford County Council also proposes to undertake a project comprising the construction of amenity trackway through part of Derrycolumb Bog[1].

3.1.3 Socio-Economic conditions

Bord na Móna has historically been a vital employer for the rural community of the Midlands of Ireland. Bord na Móna compiled a report on the role of peat extraction in the midlands historically in which they report that in 1986, by the end of Bord na Móna's Third Development Programme, a total of twenty-three work locations had been established around the country. The company had an average employment of approximately 4,688 in the mid 1980's, with a peak employment of 6,100 during the production season, which placed it among the country's largest commercial employers. The importance of such levels of employment were largely due to its regional concentration in the Midlands and the lack of alternative employment opportunities at the time.

[1] See: https://www.longfordcoco.ie/longfordcoco/services/planning/part-viii/no-81-amenity-trackway-through-derrycolumb-bog/

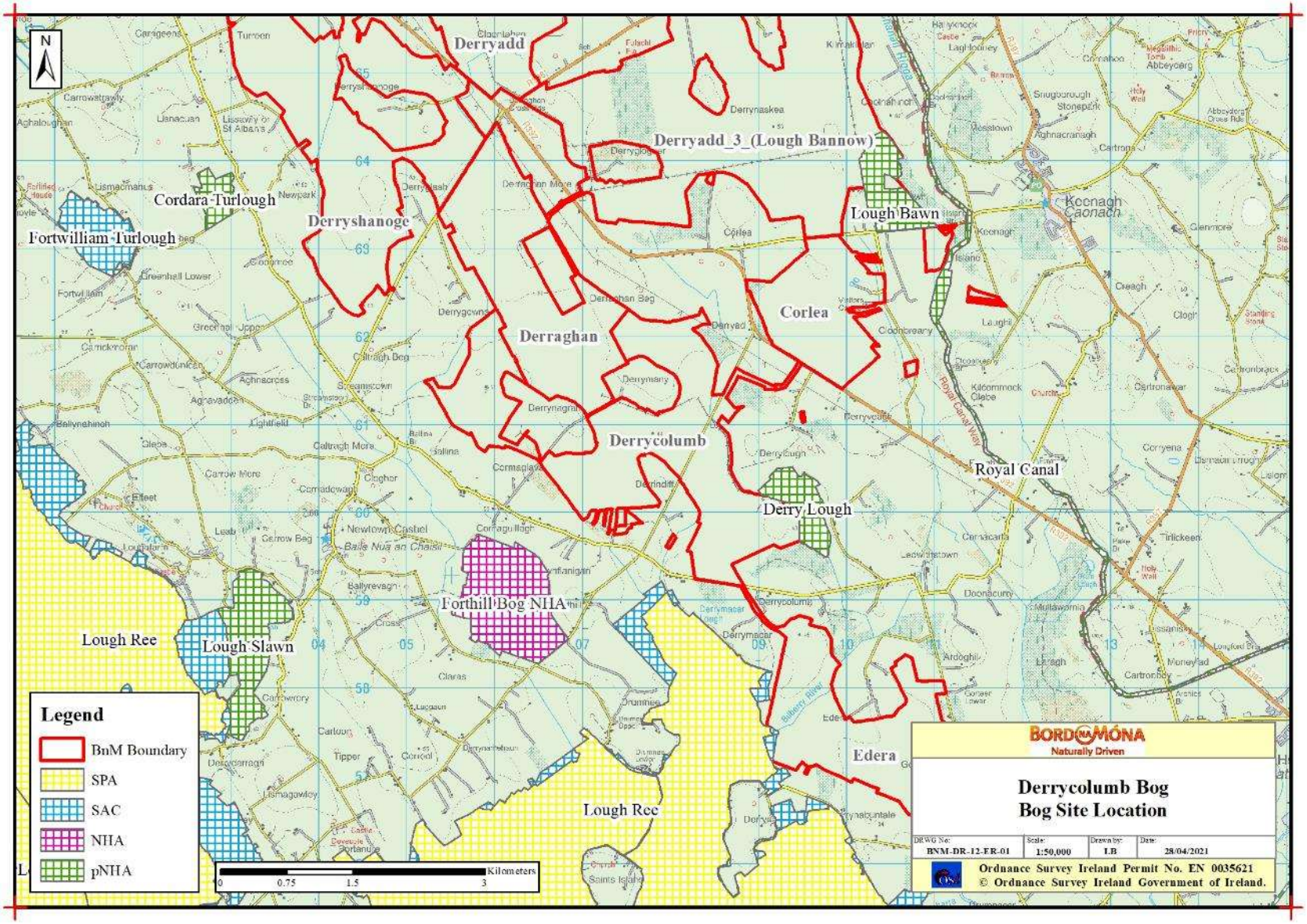

Figure 3.1 Location of Derrycolumb in context to other Bord na Móna bogs, surrounding area and Conservation sites.

According to the Energy Crop Socio-Economic Study undertaken by Fitzpatrick Associates in 2011, there were an estimated 1,443 jobs supported by the peat-to-power industry in Ireland at the time, some 81% of which were located in the catchment areas of the three peat-fired generating stations (Lough Ree, West Offaly, and Edenderry Power Stations). These constituted jobs in the plants and in peat extraction, jobs indirectly supported in upstream supply industries and jobs induced through the trickle-down effects of the wages and salaries of those supported directly or indirectly.

As the primary employer in many Midland counties, Bord na Móna played a central role in building communities through several initiatives, including Education bursaries, support of local sporting clubs, the provision of community gain funds, charity programmes and the provision and building of amenity areas."

It is anticipated that the proposed scheme (PCAS) will provide some employment for a team of workers at this site for a period of time (> 1 year).

3.2 Geology and Peat Depths

3.2.1 Sub-soil geology

The underlying geology at Derrycolumb Bog comprises Visean Limestones (undifferentiated)[2]. Subsoils at Derrycolumb comprise Silty clays, silty clay loams overlain by deposits of organic mud or marl deposits. The peat is underlain by glacial deposits interbedded with glacio-fluvial deposits made up of mixed gravels and till.

Lacustrine deposits (lake deposits) are also present under the peat (lacustrine shell marl) in parts of the site.

3.2.2 Peat type and depths

Commercial peat extraction has only been undertaken at Derrycolumb Bog relatively recently (i.e. since the mid 1980's). A substantial portion of the residual peat on site is "red" or "*Sphagnum* peat". The south/eastern section of the bog contains the deepest peat reserves of between 1.1m and 2.6m of peat. Some sections, particularly in the north-east part of the site and through the remainder of the site, have been cutaway and have shallow or no residual peat and exposed marl and gravel (Figure 8.2).

3.3 Key Biodiversity Features of Interest

The majority of Derrycolumb Bog within the Bord na Móna boundary is bare peat as this bog was in production until 2019 (Figure 8.1).

3.3.1 Current habitats

A small area in the south-eastern corner of the site is within the area that is designated as the Derry Lough proposed NHA (Site Code 001444, hereafter pNHA). The pNHA where it overlaps consists of Wet Grassland (Fossitt Code GS4), Poor Fen (PF1), Bog Woodland (WN7) and open water/wetland habitats. There is no production bog within the pNHA. The Bilberry River flows along the north-eastern boundary of this part of Derrycolumb and a berm was constructed along a section of the river in 2010 in order to prevent flooding to the former production bog area.

[2] https://www.gsi.ie/en-ie/data-and-maps/Pages/Bedrock.aspx

South of the Bilberry River, the boundary of this section of Derrycolumb encloses some Raised or high bog (PB1) that includes a small number of 'active' raised bog. This habitat contains Heather (*Calluna vulgaris*), Purple Moor Grass (*Molinia caerulea*), Bog Asphodel (*Narthecium ossifragum*), Bog Cotton (*Eriophorum spp*.), Sundew species and Deer Grass (*Trichophorum cespitosum*) along with Sphagnum mosses (*Sphagnum magnellanicum, S. subnitens* and *S. papillosum*). A silt pond and a section of Birch (*Betula spp.)* woodland (WN7) is also located in this area. The southern boundary of this section has a small area of remnant raised bog (PB1) that is used for domestic turf cutting and some scrub (WS1) and Wet Grassland (GS4) is further present.

The mid-section of Derrycolumb is the largest portion of the bog and this area curves around farmland (primarily improved agricultural grassland GA1) that is located to the north. The majority of the mid-section was until recently in active industrial peat production however some cutaway bog (PB4) has emerged in recent years. These areas of cutaway are becoming vegetated by a mix of emergent Soft Rush (*Juncus effusus*) along with Birch and Willow (*Salix spp.)* This area is bounded to the south west by the Newtownflanagan Stream.

The north/western section of Derrycolumb was in industrial peat production for a number of years and the centre of this section has been cutaway and is becoming vegetated with Soft Rush and Marsh Arrow Grass (*Triglochin palustris*) (pioneering Poor Fen PF1 habitat). A relatively large section of Birch woodland (WN7) is located in the southern section of this part of Derrycolumb and is made up of Birch and Willow.

Other habitats along the margins of Derrycolumb overall include further Birch woodland, wet grassland, dry heath (HH1) and cutover bog (PB4) or mosaics of same.

Figure 3.2 Raised Bog remnant at Derrycolumb (October 2020)

Figure 3.3 Flood defence berm and adjacent cutaway at Derrycolumb Bog (October 2020)

Figure 3.4 Cutaway Bog at Derrycolumb Bog (October 2020)

A habitat map of Derrycolumb Bog is shown in Figure 3.5.

3.3.2 Species of conservation interest

A review of available Biodiversity records from the National Biodiversity Data Centre (hereafter NBDC) of bird records from the recent 2007-2011 Bird Atlas, found 92 species of birds have been recorded at or near Derrycolumb Bog.

Common species observed at Derrycolumb by Bord na Móna ecologists include Grey Heron (*Ardea cinerea*), Hooded Crow (*Corvus cornix*), European Robin (*Erithacus rubecula*), Common Blackbird (*Turdus merula*) and Raven (*Corvus corax*).

Studies to inform the nearby Derryadd Wind Farm planning application[3] recorded flight activity proximal to Derrycolumb of (Amber listed- Colhoun & Cummins 2013[4]) Lesser Black-backed Gull (*Larus fuscus*) during Spring passage; and evidence of breeding (Amber listed) Common Snipe (*Gallinago gallinago*) in suitable habitat. A Common Buzzard (*Buteo buteo*) breeding territory was confirmed at Derrygowna, immediately northwest of Derrycolumb.

Wintering (Amber listed) Whooper Swan (*Cygnus cygnus*) are known to occur at a number of wetlands in the hinterland of Derrycolumb, such as Fort William Turlough, Cordora Turlough and at Carrowmore[5].

Signs of several mammal species have been noted by Bord na Móna ecologists during surveys of Derrycolumb including Red Fox (*Vulpes vulpes*), Badger (Meles meles), Pine Marten (*Martes martes*) and Otter (*Lutra lutra*). Irish Hare (*Lepus timidus subsp. hibernicus*), West European Hedgehog (*Erinaceus europaeus*) and American Mink (*Mustela vison*) are likely to occur in suitable habitat based on records from the NBDC website.

Common Frog (*Rana temporaria*) and Smooth Newt (*Lissotriton vulgaris*) are likely to occur in suitable habitat based on records from the NBDC website.

Marsh Fritillary (*Euphydryas aurinia*) have been recorded to the south of Derrycolumb at Ledwithstown, Co. Longford, and to the east at Corlea, Co. Longford (NBDC data viewer) but there are no on-site records yet. Bord na Móna ecologists have recorded Green Veined White (Pieris napi), Small Heath (*Coenonympha pamphilus*), Painted Lady (*Vanessa cardui*), Wall Brown (*Lasiommata megera*), Small Copper (*Lycaena phlaeas*) and Meadow Brown (*Maniola jurtina*) Butterflies at Derrycolumb.

3.3.3 Invasive species

There are recorded invasive species known from Derrycolumb. A broad range of common garden escapes are occasionally present around the margins of Bord na Mona bogs, and although spatial overlap with the PCAS is expected to be limited, these are, where necessary, to be treated in line with Best Practice during PCAS activities (Appendix V).

[3]McCarthy Keville O'Sullivan Ltd. (2017). Bord na Móna Breeding Surveys 2017 Derryadd Co. Longford Survey Report.

[4] Colhoun, K. & Cummins, S. (2013). Birds of Conservation Concern in Ireland 2014-2019. Irish Birds 9: 523-544.

[5] MWP (2017). Ornithology Report. Bord na Móna Winter Bird Survey 2016/17.

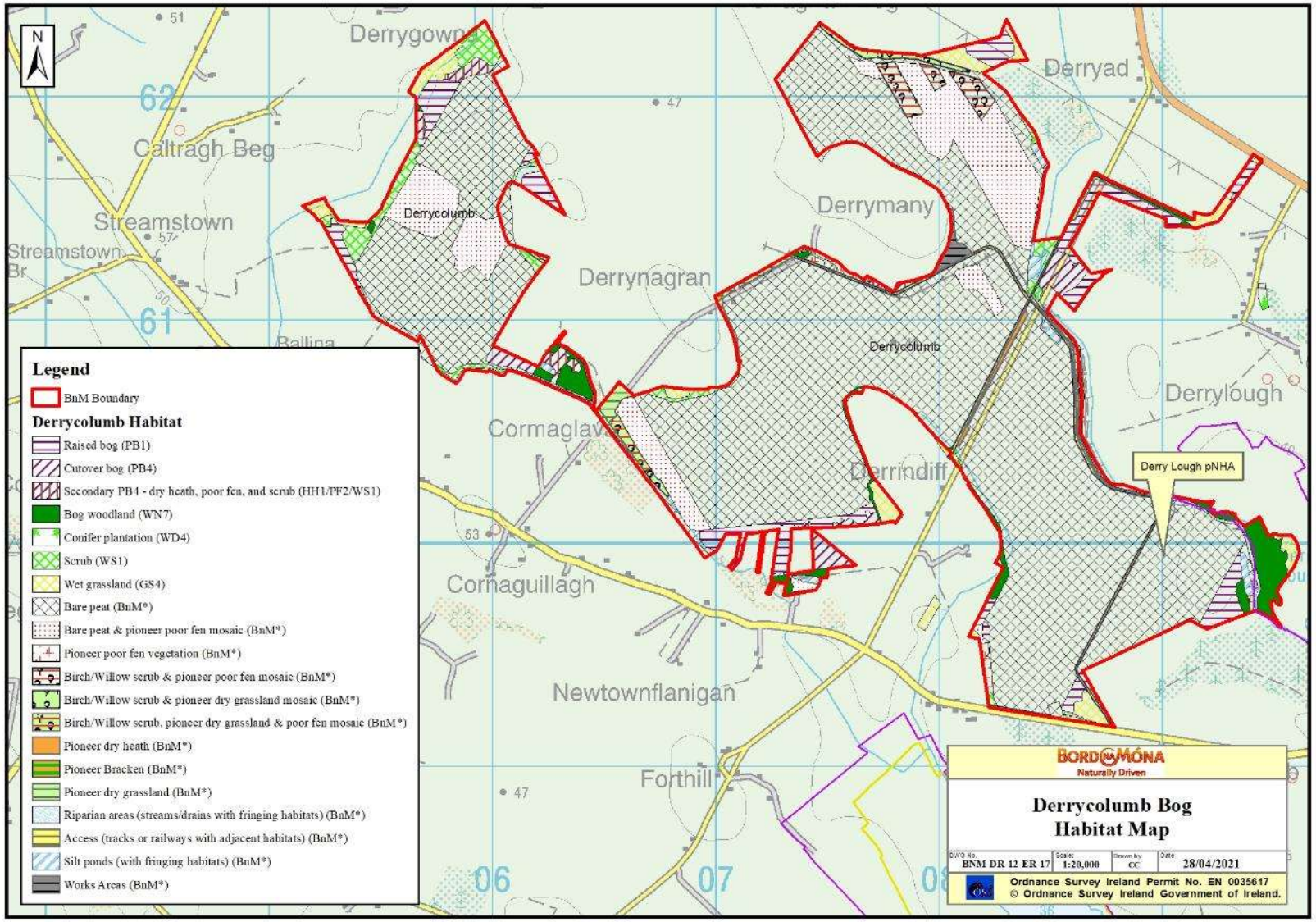

Figure 3.5 Habitat map of Derrycolumb Bog showing Bord na Móna habitat categorisation

3.4 Statutory Nature Conservation Designations

Derrycolumb Bog partially overlaps Derry Lough pNHA (NPWS Site Code: 001444) (Figure 3.1). In addition, Forthill Bog NHA (Site code 001448) is ca.1km to the south west of Derrycolumb. Lough Ree NHA (Site Code 00040) is less than 400m due west of Derrycolumb and shares a hydrological link via the Derrymanny Stream (EPA Code 26D90), and the Newtownflanigan Stream (EPA Code 26N06) both of which drain from the middle section of Derrycolumb southwards towards Lough Ree, in addition to the Bilberrry River and the Drumnee Stream.The Royal Canal pNHA (Site code 2103) lies within 2.5km of the eastern boundary of Derrycolumb.

Lough Ree SAC (Site Code 000440) and Lough Ree SPA (Site Code 004064) are similarly connected to Derrycolumb via the Derrymany, Newtownflanagan and Drumnee streams and Bilberry River and both European Sites occur within 500m of the bog boundary.

Lough Ree SAC (and pNHA) is designated for the natural eutrophic lake as well as active raised bogs, degraded raised bogs capable of natural regeneration, bog woodland and Otter. Lough Ree SPA is designated for the assemblage of wintering wildfowl, many species of which occur in nationally important numbers, in addition to breeding Common Tern (*Sterna hirundo*) and Common Scoter (*Melanitta nigra*).

3.4.1 Other Nature Conservation Designations

The Ramsar Convention entered into force in Ireland on 15th March 1985. Ireland currently has 45 sites/wetlands designated as Wetlands of International Importance (Ramsar Sites). These cover a surface area of 66,994ha. There are no Ramsar Sites in the local vicinity of Derrycolumb Bog (i.e. within 3km) The closest Ramsar Sites to Derrycolumb Bog include Mongan Bog in Co. Offaly and Lough Glen on the border of Longford and Westmeath.

https://www.arcgis.com/apps/MapTour/index.html?appid=cd6e1a247bdc4179b9dfc0461e950f1e#

3.5 Hydrology and Hydrogeology

Derrycolumb Bog has a partially pumped drainage regime. Hydrological modelling (Figure 8.3 & 8.4) indicates that much of the bog is a natural basin with significant potential for re-wetting. Some of the modelled basins overlap with residual deeper peat. It is likely that some of these basins will re-wet with deeper water, creating a mosaic of wetland habitats, when pumping ceases. There are two pumps on Derrycolumb. The northern pump mainly controls discharge from the adjacent Derraghan. The south-east pump was important for the drainage of the south-east catchments. There are 12 different sub-catchments across Derrycolumb.

There is likely to be some alkaline influence on the water chemistry of the ground water of a portion of this bog due to exposed sub-soils that are limestone-based.

Derrycolumb Bog is located in the Upper River Shannon catchment. The majority of the bog is drained by the Bilberry River, Derrymany Stream and Newtownflanagan Streams. In addition, an unnamed tributary of the Drumnee Stream (EPA Code 26D08) occurs along the boundary of the north-westernmost section of Derrycolumb; this watercourse flows south into the Drumnee which drains to Lough Ree, west of Saints Island.

Silt pond systems are present around the margins of the bog to manage discharges into the various watercourses which drain the site.

Field drains run north-east to south west in both the southeast and northwest sections of Derrycolumb, whereas the middle section field drains are orientated northwest to southeast.

The bog is located in an area with a regionally important aquifer- Karstified (conduit)(Rkc) (EPA map-viewer). An aquifer is an underground body of water-bearing rock or unconsolidated materials (gravel or sand) from which groundwater can be extracted in useful amounts. GSIs Aquifer classes are divided into three main groups based on their resource potential, and further subdivided based on the type of openings through which groundwater flows. There are nine aquifer categories in total. Regionally important aquifers can supply regionally important abstractions (e.g. large public water supplies). The continuous aquifer unit generally has an area of >25 km^2. Groundwater flow predominantly occurs through fractures, fissures and joints.

Rkc aquifers are those aquifers in which the degree of karstification limits the potential to develop groundwater. They have a high 'flashy' groundwater throughput, but a large proportion of flow is concentrated in conduits, numerical modelling using conventional programs is not usually applicable, well yields are variable with a high proportion having low or minimal yields, large springs are present, storage is low, locating areas of high permeability is difficult and therefore groundwater development using bored wells can be problematical.

The bog is located in an area mapped by GSI as of low groundwater vulnerability (GSI Mapviewer). Groundwater Vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated by human activities. Groundwater vulnerability maps are based on the type and thicknesses of subsoils (sands, gravels, glacial tills (or boulder clays), peat, lake and alluvial silts and clays), and the presence of karst features. Groundwater is most at risk where the subsoils are absent or thin and, in areas of karstic limestone, where surface streams sink underground at swallow holes. These data indicate there is generally low risk of any groundwater contamination occurring at this site.

The peat is underlain by glacial deposits interbedded with glacio-fluvial deposits over limestone bedrock. The glacial deposits generally consist of grey gravelly clay/silt (present on an adjacent cutaway site). The bog water table across the site is expected to be high when bog drains are blocked, and perched above the underlying regional groundwater table.

3.6 Emissions to surface-water and water-courses

Drainage is an important feature of industrial peat production and there were extensive field drains maintained throughout bog areas to facilitate industrial peat production annually, each of which eventually drains into a terminal silt pond that allows for settlement of suspended solids before entering the main river systems. In accordance with the existing Integrated Pollution Control licence, all drainage water from boglands in a licensed area is discharged via an appropriately designed silt pond treatment arrangement as required in Condition 6.6. of the licence. The silt ponds are inspected and maintained in accordance with the licence. Industrial peat production has now permanently ceased at Derrycolumb Bog.

Silt ponds are the key silt control infrastructure to control potential emissions from industrial peat production sites. As required under licence, BNM have a number of procedures for how it manages and maintains its silt pond network. The silt that builds up in silt ponds is excavated on a regular basis by Bord na Móna to facilitate an efficient level of silt control. Silt ponds will continue to be maintained during the rehabilitation and decommissioning. Silt pond decommissioning will be considered when sites are deemed to be on a trajectory of environmental stability and peatland rehabilitation has been completed.

Derrycolumb bog has silt ponds that discharge surface water to the Ledwithstown IE_SH_26L840850 and Drumnee IE_SH_26D080850 rivers and eventually the Shannon Upper IE_SH_25SO21660. Peat extraction is identified as pressure in the second cycle of the river basin management plan it is not indicated as remaining so in the third cycle, currently under preparation.

Details of silt ponds, associated surface water emission points and those being monitored and sampled as part of the PCAS scheme are detailed on the attached water quality map as Figure 3.7.

There is a robust monitoring program to track and verify any changes in baseline water quality conditions pre- and post-decommissioning and rehabilitation so that the success or otherwise can be tracked and verified for the National Parks & Wildlife Service, Environmental Protection Agency and Local Authority Water Program, amongst a range of stakeholders.

The main emission limit value associated with this bog is 35mg/l suspended solids, with trigger levels for ammonia of 1.42mg/l and COD 100mg/l.

Initial monthly ammonia concentrations from August to January 2021 have a range of 0.045 to 1.39mg/l with an average of 0.4484mg/l.

From an analysis of any monitoring over the past 5 yrs. of the IPC licence environmental monitoring programme, indicate that results were under the ELV for SS and the majority of the trigger levels for ammonia and COD (Table 3.1).

Table 3.1. *EPA Monitoring data (EPA) for the previous five years in relation to Derrycolumb Bog*

Bog	SW	Monitoring	Sampled	pH	SS	TS	Ammonia	TP	COD	Colour
Derrycolumb	SW-88	Q4 19	07/11/2019	7.6	9	260	1.7	0.05	45	249
Derrycolumb	SW-88A	Q4 19	07/11/2019	7.7	12	185	0.163	0.05	43	310
Derrycolumb	SW-89	Q4 19	07/11/2019	7	5	85	0.409	0.05	37	216
Derrycolumb	SW-90	Q4 19	07/11/2019	7.9	7	264	0.255	0.05	53	257
Derrycolumb	SW-91	Q4 19	07/11/2019	7.8	7	309	0.107	0.05	65	251
Derrycolumb	SW91-A	Q4 19	07/11/2019	7.3	6	213	0.094	0.05	82	396
Derrycolumb	SW-92	Q4 19	13/11/2019	7.8	3	360	0.107	0.05	72	232
Derrycolumb	SW-93	Q4 19	13/11/2019	7.4	2	233	0.112	0.05	85	339
Derrycolumb	SW-93A	Q4 19	13/11/2019	7.40	2	257	0.315	0.05	51	128
Derrycolumb	SW-88	Q2 17	29/05/2017	7.9	6	632	0.2	0.05	40	114
Derrycolumb	SW-88A	Q2 17	29/05/2017	7.7	5	320	0.37	0.05	39	124
Derrycolumb	SW-89	Q2 17	29/05/2017	7.7	5	374	0.17	0.05	50	144
Derrycolumb	SW-90	Q2 17	31/05/2017	7.7	6	280	0.46	0.05	42	110
Derrycolumb	SW-91	Q2 17	31/05/2017	7.8	5	408	0.26	0.05	42	116
Derrycolumb	SW91-A	Q2 17	31/05/2017	7.9	7	368	0.32	0.05	57	108
Derrycolumb	SW-92	Q2 17	31/05/2017	7.5	5	219	3.9	0.05	48	144
Derrycolumb	SW-93	Q2 17	31/05/2017	7.8	6	628	0.53	0.05	51	111
Derrycolumb	SW-93A	Q2 17	31/05/2017	7.6	10	308	0.05	0.05	42	125
Derrycolumb	SW-91	Q2 16	09/06/2016	7.3	19	302	0.85	0.33	112	267
Derrycolumb	SW-92	Q3 16	12/09/2016	7.2	12	176	0.16	0.12	89	225

Rehabilitation of cutaway peatland is closely linked with control of emissions. One of the criteria for successful rehabilitation is stabilisation through re-vegetation, which will stabilise all substrates and in turn remove the need for further silt control measures. This site is already largely vegetated. Re-wetted peat also aid the primary objective of stabilizing peat, as when peat is re-wetted it is not vulnerable to wind erosion. Re-wetted peat and the development of wet peatland habitats can also act as sinks for silt and mobile peat, and increases additional retention time for solids, and the peatland vegetation can quickly stabilise this material within blocked drains on site (by acting like constructed wetlands).

Water quality of water discharges from restored peatlands normally improves as a result of bog restoration measures and the restoration of natural peatland processes (Bonn *et al*., 20017). Bog restoration is also expected to improve water attenuation of the site as the drains are blocked, slowing water movement and water release from the site. Restored peatlands help slow the release of water and aid the natural regulation of floods downstream (Minayeva *et al*., 2017). The National River Basin Management Plan (NRBMP) 2018-2021 (DHPCLG,

2017) is the key national plan for Ireland to achieve the objectives of the Water Framework Directive (WFD). The NRBMP outlines how key actions such as Bord na Móna peatland rehabilitation is expected to have a positive impact on water quality and help the NWBMP deliver its objectives in relation to the WFD.

Water will still discharge from designated emission points when rehabilitation at Derrycolumb has been completed. This discharge will have improving water quality and there will be increased wetland attenuation, meaning slower release of water. This is expected to have a positive impact on downstream watercourses.

Decommissioning and Rehabilitation Programme Water Quality Monitoring.

The licence obligation of quarterly sampling regime on a selected number of ponds to be sampled over a 3 year cycle will not be adequate to be able to appropriately track the changing water chemistry that will occur as part of this enhanced rehabilitation programme, so this sampling regime will occur on a monthly basis.

In order to assist in monitoring surface water quality from this bog, it was agreed to increase the existing licence monitoring requirements of the IPC Licence, to sampling for the same parameters every month.

This new sampling programme commenced in November 2020 and is enabling a baseline to be established, with sampling to progress during the scheduled works, and for a period of up to 2 years' post rehabilitation. Depending on the period required to confirm that the main two parameters, suspended solids and ammonia as remaining compliant with the licence emission and trigger limit values and there is an improving trajectory in these two parameters i.e. reduction in concentration, the monitoring programme and intensity will be periodically reviewed and amended.

In the preparation of this monitoring programme, Bord na Mona have been providing the Local Authority Water Programme (LAWPRO) with details of the surface water emissions points associated with this bog and will be amending some of the proposed monitoring locations on foot of this engagement. LAWPRO have in turn provided details of their 2021 monitoring programme and these are included, where applicable, in the WQ map as Figure 3.7.

This is necessary to ensure that there is alignment with the WFD monitoring programme and that where possible, the monitoring programme will enable any improvements in water quality or establishing trends to be quantified against any available WFD monitoring data. It will also enable the periodic sharing of data which will inform the monitoring reports, success criteria and enable LAWPRO under the Water Framework Directive to track any changes in pressures and be aware of changes in water chemistry.

This enhanced monitoring programme will aim to include a minimum of 70% of a bogs drainage catchments, whatever number of surface water outlets these include.

Monitoring results will be maintained, trended every six months and reported on each year and as required, as part of the requirement to report on Condition 10.1 of the IPC Licence on Bog Rehabilitation in the Annual Environmental Report, and will be provided to LAWPRO and the EPA as required to inform progress and national monitoring requirements under the WFD. These results will also be available in April each year as a requirement of the Annual Environmental Report at www.epa.ie.

The parameters to be included as per condition 6.2 of the IPC Licence include monthly monitoring for pH, Flow, Suspended Solids, Total Solids, Total Phosphorus, Total Ammonia, Colour & COD. In addition, DOC has been included as a parameter to try and identify any changes in carbon in the surface water, and where required by

LAWPRO, to assist in investigating other changes in water chemistry, the series of parameters can be reviewed and amended.

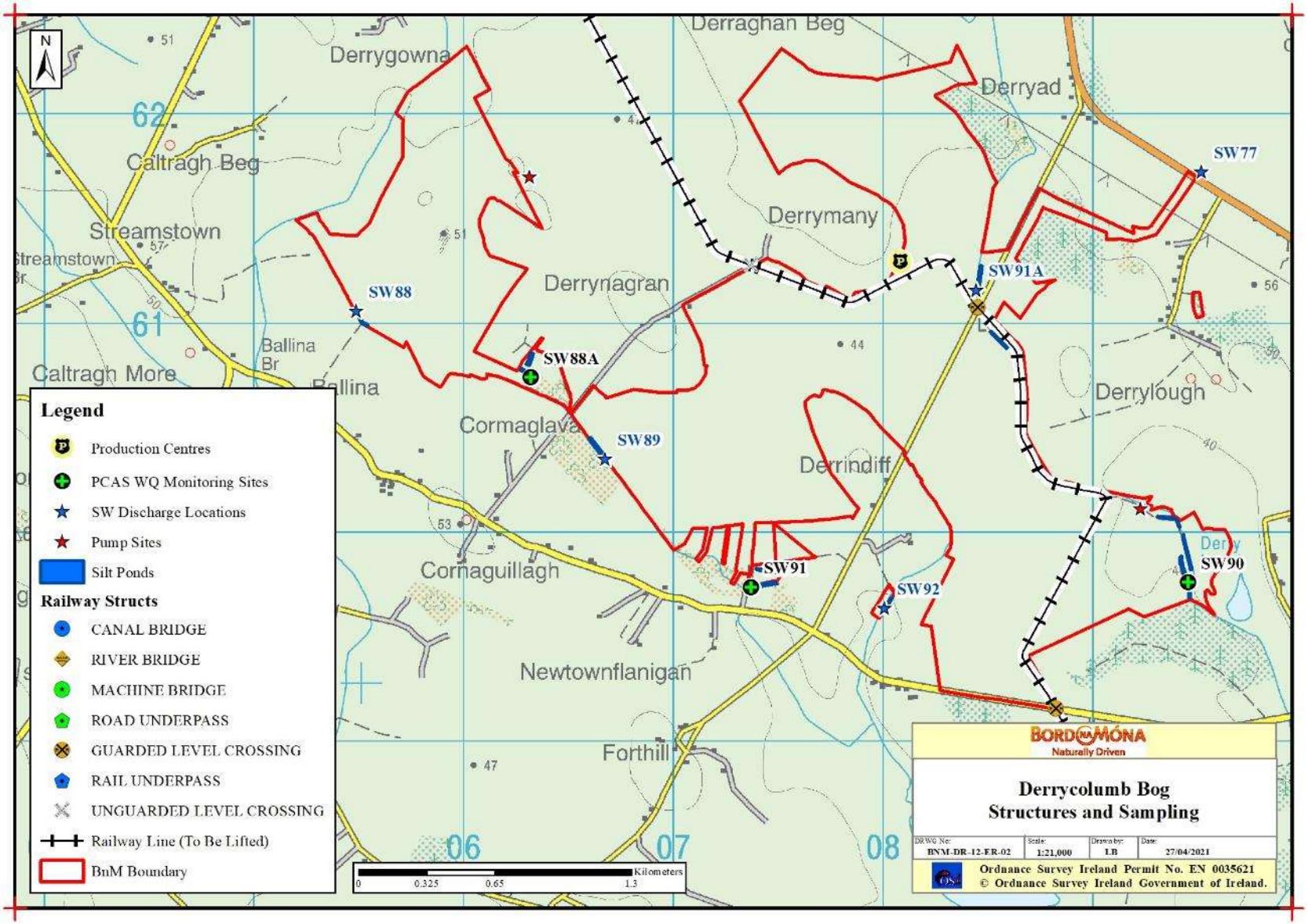

Figure 3.6 Map of Derrycolumb Bog showing relevant structures

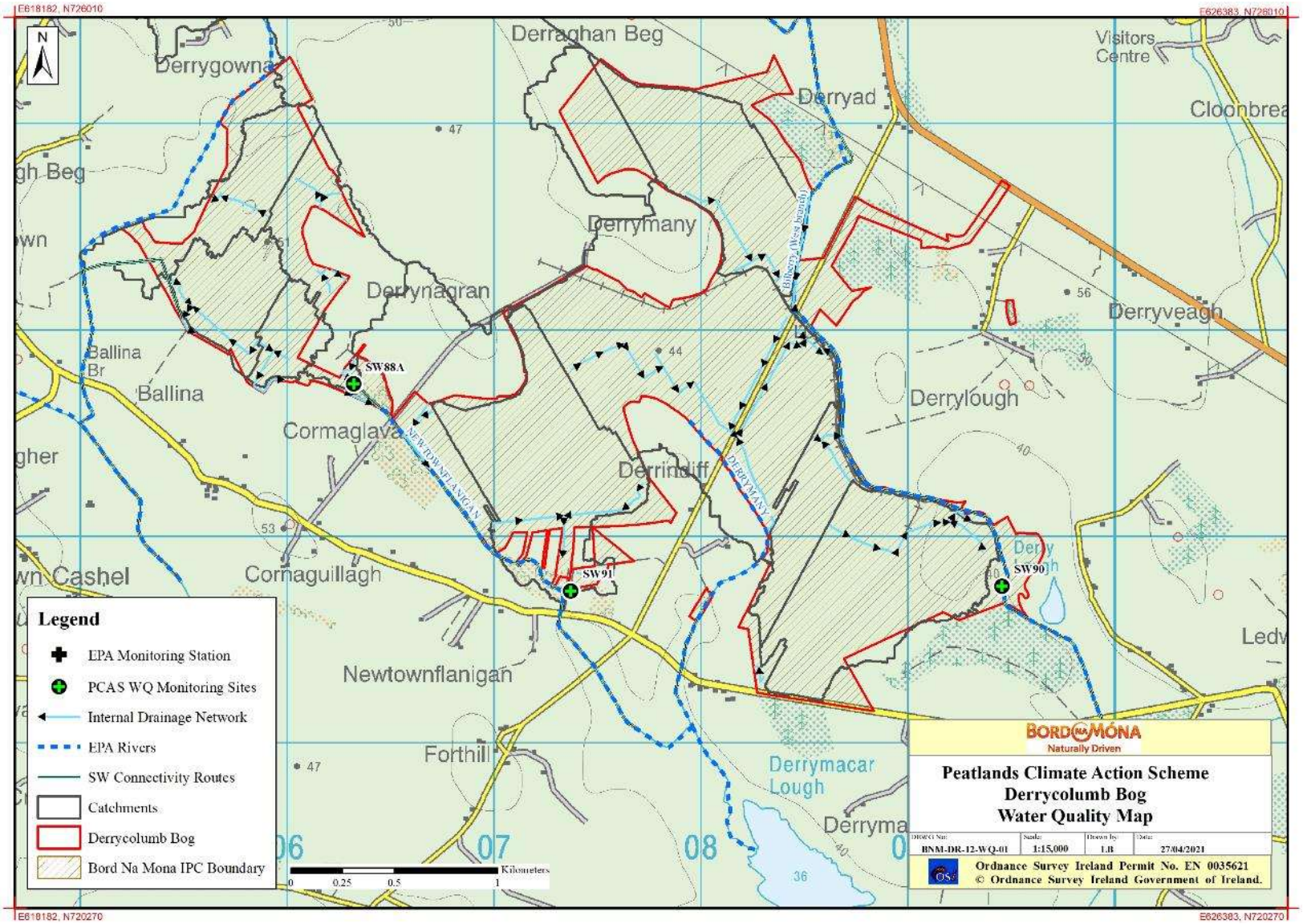

Figure 3.7 Water management features and water quality monitoring points at Derrycolumb Bog

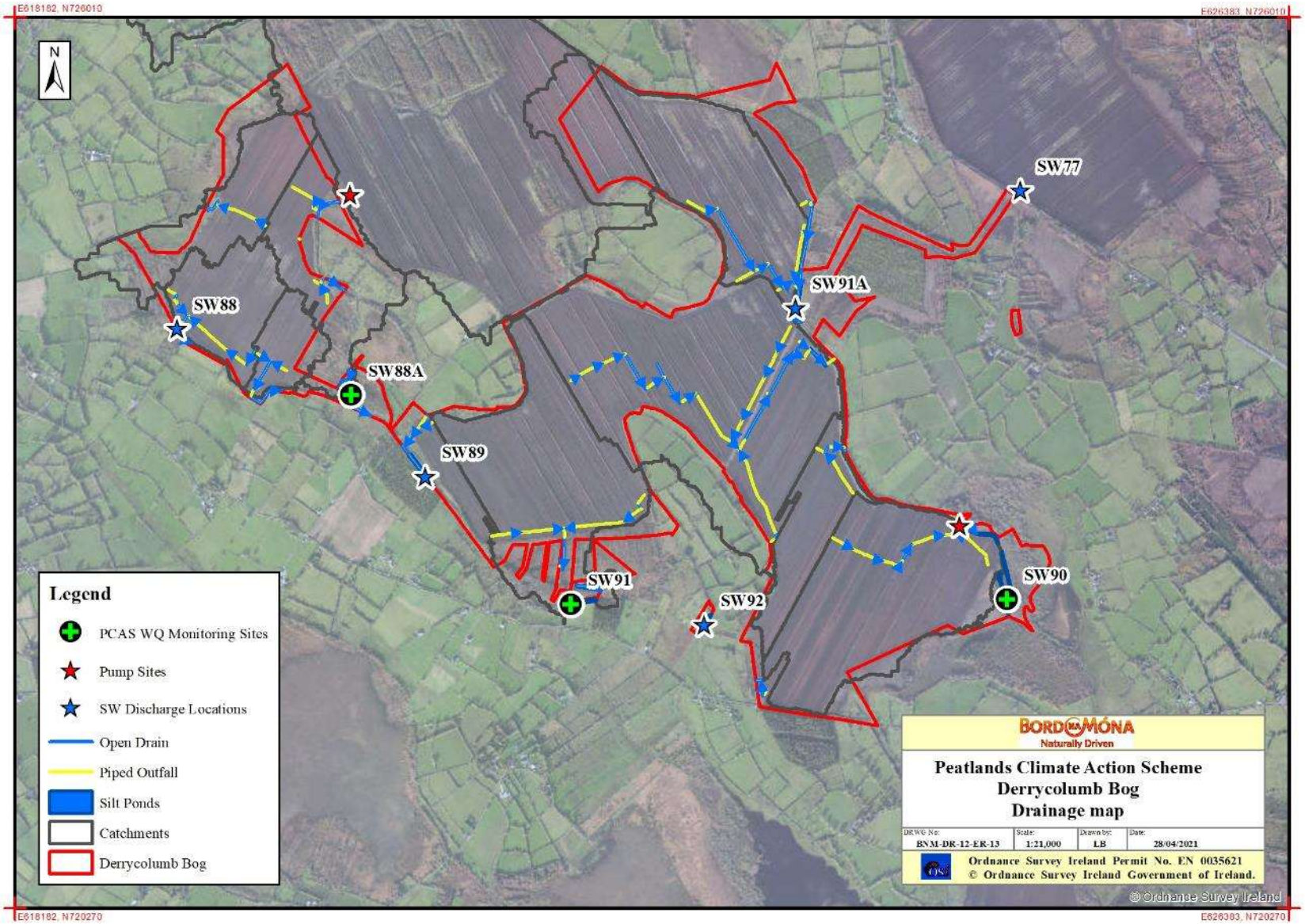

Figure 3.8 Pump sites at Derrycolumb Bog.

3.7 Fugitive Emissions to air

The bog is no longer in industrial peat production. Rehabilitation of the cutaway peatland will seek to re-wet the dry peat where possible, and re-vegetate all areas (whether wet or dry). Collectively, ceasing industrial peat production, re-wetting and re-vegetating will minimise any risk of emission to air from dust.

3.8 Carbon emissions

The bog is likely to be a carbon source as it is a drained (degraded) peatland with some active drainage, which facilitates the oxidation of peat. Peat extraction generally transforms a natural peatland which acts as a modest carbon sink into a cutaway ecosystem which is a large source of carbon dioxide (2–5 t C/ha/year) (Waddington & McNeil, 2002; Alm *et al*., 2007; Wilson *et al*., 2007, Wilson *et al*., 2015). Furthermore, they are also a significant source of methane (Huttunen *et al*., 2003; Laine *et al*., 2007a) as a consequence of the conditions within the peat body that provide a suitable environment for the microbial breakdown of plant litter and root exudates. Degraded peatlands also release carbon/GHG emissions via the fluvial/aquatic pathway (Dissolved Organic Carbon – DOC, Suspended Solids/Particulate Matter, degassing of GHGs from water).

The EPA-funded CarbonRestore Project (Renou-Wilson et. al. 2012) found that rewetting of drained peatlands can lead to restoration of functional peatland, such as the return of typical plant and animal species, which in turn may lead to the restoration of peat-formation and the C-sink function.

It is expected that Derrycolumb Bog will become a reduced Carbon source following rehabilitation. The site does have potential to become a carbon sink in part, in the longer-term. This depends on the success of the rehabilitation measures, the extent of development of *Sphagnum*-rich habitats, the balance of carbon fluxes from different cutaway habitats (some of the cutaway is expected to develop Reed Swamp and fen habitats with alkaline emission factors) and future climatic conditions.

3.9 Current ecological rating

(Following NRA (2009) Evaluation Criteria)

Current ecological rating (ranges from Local Importance (lower and higher value) to National Importance; following NRA (2009) Evaluation Criteria)

The majority of Derrycolumb Bog is deemed to be of Local Importance (lower value) due to the dominance of bare peat managed for industrial peat production. Some pioneer and semi-natural habitats such as birch woodland are rated higher and are deemed to be of **Local Importance (higher value)**. The bog partially overlaps with Derry Lough pNHA (NPWS Site Code: 001444) within its eastern section and where this occurs the area is deemed to be of **National Importance**.

3.10 Derrycolumb Bog Characterisation Summary

Derrycolumb is located approximately 9.5km to the west of Ballymahon in County Longford. This bog comprises three main sections that are divided by minor public roads. Derraghan Bog is located immediately adjacent to two sections of Derrycolumb and is connected via a rail link to Derrycolumb. To the south east, the next adjacent Bord na Móna Bog (Edera Bog) is also connected to Derrycolumb via a rail line. There are travel paths and drainage channels maintained around the bog formerly used for access and drainage of industrial peat production areas.

The margin of Derrycolumb Bog partially overlaps a proposed NHA (Derry Lough). It has historically been a pumped bog.

The current character of Derrycolumb Bog is best distinguished as a mosaic of cutaway bog comprising relatively shallow peat (western section), along with areas where deeper residual peat is still retained (eastern section). The deeper peat in the east lends itself towards development of embryonic peat forming habitats, whilst the western part of the bog is more suitable to the development of wetlands, as it now naturally contains a basin which will hold water. The bog has a partially pumped drainage regime and it is expected that some sections will develop as wetlands when pumping ceases.

There are areas of former production area that are constrained from Rehab due to the presence of Archaeological features. Longford County Council are proposing the construction of an amenity walkway within part of the bog, this proposed project is deemed compatible with the currently proposed rehabilitation.

4. CONSULTATION

4.1 Consultation to date

Consultation seeks to engage an audience of relevant stakeholders at both a national and local level. National stakeholders have been identified from varied bog restoration and rehabilitation efforts undertaken by Bord na Móna over the past 40 years, with particular emphasis on engagement with stakeholders during their Biodiversity Action Plan programme, since 2010. National Stakeholders includes relevant government departments and agencies, relevant semi-state bodies, NGOs and other environmentally-focused groups with a national remit.

There has been ongoing consultation about rehabilitation, biodiversity and other general issues over the years about Mount Dillion group bogs including Derrycolumb Bog with various stakeholders in relation to:

- General consultation with range of stakeholders at annual Bord na Mona Biodiversity Action Plan review days 2010-2018.
- Longford Wetland Wilderness (general proposal led by Longford County Council and other stakeholders. This has had several iterations. See Lough Ree and Mid Shannon, Spirit Level 2017. A feasibility study for Longford County Council).
- Feehan, J. (2004) A Long-Lived Wilderness; the future of the north midlands peatland network UCD/NWWPC.
- Lauder, A. & O'Toole L. (2017). Concept development for a landscape-scale Wetland Wilderness Park in the Mid Shannon Region. A report funded by the Heritage Council's Heritage Grant Scheme.
- Foss, P.J., Crushell, P. & Gallagher, M.C. (2017). Counties Longford &Roscommon Wetland Study. Report prepared for Longford and Roscommon County Councils.
- Midlands & East Regional WFD Operational Committee (River Basin Management Plans).
- Sub-committee on Shannon Flooding Work Programme and Measures (OPW, Waterways Ireland, ESB, LA's, Fisheries Ireland, NPWs etc).
- Archaeological Liaison Committee (National Museum of Ireland & Dept of Culture Heritage and the Gaeltacht).
- Midlands & East Regional WFD Operational Committee (River Basin Management Plans).
- Sub-committee on Shannon Flooding Work Programme and Measures (OPW, Waterways Ireland, ESB, LA's, Fisheries Ireland, NPWs etc.).
- Archaeological Liaison Committee (National Museum of Ireland & Dept of Culture Heritage and the Gaeltacht).
- Proposed greenway development at Derrycolumb (Longford County Council).

To inform the current Plan, both national and local stakeholders, including neighbours whose land adjoins Derrycolumb Bog and local representatives of national bodies (such as Regional National Parks and Wildlife Service staff) and relevant offices in County Councils (such as the Heritage or Environmental Offices) have been contacted. Any identified local interest groups have been sought and informed of the opportunity to engage with this rehabilitation plan, and when identified have been invited to submit their comments or observations in relation to the proposed rehabilitation at Derrycolumb Bog or the programme in general (see Appendix XI).

An advertisement about PCAS was also printed in the Longford Leader (January 2021) (a local newspaper that covers the Derrycolumb Bog area).

Further to the above, telephone correspondence was undertaken as either follow up to submissions received, or to instigate consultation. All correspondence received has been acknowledged and evaluated against the rehabilitation work proposed here; these are also summarised in Appendix XI.

4.2 Issues raised by Consultees

To date, a number of issues have been raised by consultees during the consultation process for both the current and previous drafts of the rehabilitation plan for Derrycolumb Bog – these are summarised below.

4.2.1 Assessments of rehabilitation

Queries on pre-rehabilitation assessments were raised by NPWS, DAFM, Longford County Council and the National Museum of Ireland in relation to Appropriate Assessment, Environmental Impact Assessment and Strategic Environmental Assessment.

4.2.2 Restoration scope

Restoration/rehabilitation of marginal habitats was raised by IPCC and BCI as worthy of consideration within the rehabilitation measures to support carbon sequestration and biodiversity objectives.

4.2.3 Monitoring

Further details on monitoring of ecological metrics, and how and where reporting on this monitoring would take place, was raised in the IPCC submission. Butterfly Conservation Ireland also suggested that monitoring of Large Heath butterfly be considered to assess the success of the proposed rehabilitation actions. The ICMSA queried if a hydrological baseline was being established on surrounding private land in relation to assessing ex-situ impacts arising from re-wetting. Michael Fitzmaurice TD queried what monitoring was being undertaken to assess carbon emission reductions and storage within the bogs as part of PCAS.

4.2.4 Flooding of adjacent land

Michael Fitzmaurice TD, IFA and ICMSA queried likely impacts arising from the proposed re-wetting associated with the rehabilitation in relation to flooding on adjoining lands and, specifically, with regards to the maintenance of drains. The IFA also raised the issue of Health and Safety in relation to raising water levels as well as possible impacts on land and property prices.

4.2.5 Land Management

The ICMSA queried the long-term management of the Bord na Móna's estate, particularly in relation to maintenance of drainage.

The NARGC suggested that heather be established on large area of the cutaways as this is beneficial from biodiversity and pollinators. NARGC were also keen to minimise the spread of scrub and woodland habitats to reduce habitats from predators (such as foxes) and were keen to seek control of so-called "vermin" species on the rehabilitated bogs.

4.2.6 Other issues

Other issues (raised by IPCC) included after use of the bog and turf cutting on the margins of the bog (outside of the area owned by Bord na Móna).

Longford County Council proposes to undertake a project comprising the construction of amenity trackway through part of Derrycolumb Bog.

Archaeological end of life survey of all the bogs were requested by National Museum of Ireland and National Monuments Unit.

For a complete summary of submissions received and replies, see Appendix XI.

4.3 Bord na Móna response to issues raised during consultation

4.3.1 Assessments of rehabilitation

Appropriate Assessment (AA) screening will be undertaken on all the bogs as part of PCAS and this is currently being undertaken by external consultants for Derrycolumb Bog. Where required, Natura Impact Statements shall be completed and submitted to the Minister in accordance with 42(9) and 42(10) of the Habitats Regulation, noting that Bord na Móna is prescribed as a 'public authority' under this legislation. In relation to the SEA Directive and EIAR Directive, this has been considered and the legal advice to date is that the scheme does not come under these Directives.

An Archaeological Impact Assessment (AIA) is also being undertaken on all of the bogs in PCAS. The aim for known archaeology on these bogs is to accomplish preservation in situ and we are taking steps to identify and avoid all known archaeology. We are doing this by including all known archaeology on our GIS from the AIA process, and either excluding or defining a buffer zone around these features, which will then be excluded from any ground works in these areas in the final plan. It is anticipated that any archaeology will benefit hugely from the ultimate remit of the rehabilitation, in that water tables will be raised thereby preserving in-situ. There is also an identified procedure for managing reports of stray finds that may arise during rehabilitation works.

An archaeological end of life survey of all the bogs as requested by National Museum of Ireland and National Monuments Unit is not part of the current scope of the scheme. Bord na Móna would be happy to assist such a survey, where possible.

All assessments undertaken as part of PCAS, including any future revisions to this plan or the Appropriate Assessment, will be available for public scrutiny once drafted.

4.3.2 Restoration scope

The scope of this rehabilitation plan covers the former Derrycolumb Bog industrial peat production area. As part of the PCAS, all restoration/rehabilitation options have been developed to support climate action and biodiversity objectives.

4.3.3 Monitoring

As part of the PCAS, a monitoring and verification plan has been developed to support climate action and biodiversity objectives. This will include stratified monitoring of bog condition, habitats and biodiversity at several

different scales. Some fauna monitoring (pollinator transect) is proposed as part of the monitoring and verification at Derrycolumb Bog during the period of the scheme (2021-2025). However, note that fauna typically take longer to respond to the changes in vegetation colonisation and habitats arising from the proposed rehabilitation measures identified for Derrycolumb Bog. The re-colonisation of species such as Large Heath is likely to take a longer timeframe.

Baseline hydrological monitoring will be undertaken as part of the hydrological assessment for Derrycolumb Bog. This will be used for monitoring and verification of the proposed measures.

4.3.4 Flooding on adjacent land

It is the intention of Bord na Móna that the re-wetting of the bogs will be carried out in such a manner that does not impact on third party lands. Where it is deemed that blocking of a shared drain would cause any adjoining lands to flood, this will be avoided and alterations made to the rehabilitation plan. In general, drains around the margins of the bog will not be blocked.

External consultants have been appointed to carry a hydrological assessment to identify any potential impacts to neighbouring lands and to mitigate against any such impacts.

The rehabilitation measures proposed at Derrycolumb Bog will generally result in reduced runoff and drainage from the existing peat fields through a mixture of techniques including drain blocking, cell bunding and re-profiling. It is intended that these measures will not significantly alter the existing topographical catchments and that the spine of the drainage networks, those which the upstream catchments drain through, will be retained by Bord na Móna. Based on evidence from other bogs, rehabilitation measures will reduce the run-off from the bog by returning the peatlands towards its natural water retention function.

Bord na Móna will continue to manage their land bank into the future. As peat production has now ceased on Bord na Móna lands and rehabilitation measures will be carried out, a regular drainage maintenance programme will not be required or carried out as would have been the case in the past. However, if issues arise with the Bord na Móna internal drainage system that affects upstream or downstream landowners, then these issues will be addressed by Bord na Móna through its care and maintenance programme.

4.3.5 Land Management

Bord na Móna will continue to have responsibilities for managing the land in their ownership as any landowner would. In addition, land still under an IPC licence will need to be managed in accordance with that licence.

It is expected that re-wetting will reduce area being colonised by Birch and other scrub species as conditions will be more suitable for wetter species. However, in drier areas that cannot be re-wetted, particularly where there is shallow (or no) residual peat, it is inevitable that drier vegetation communities, including Birch woodland and Heather-dominated vegetation, will develop. Although Heather-dominated habitats can support particular peatland species, these habitats (analogous to drier raised bog Face-bank ecotope) are typically associated with emitting Carbon from the remnant peat deposits. Such areas will be minimised in general within PCAS and habitats that reduce carbon emissions and, especially habitats with the potential to sequester carbon (such as *Sphagnum*-rich embryonic bog communities) will be promoted. However, it is expected that as naturally functioning peatland ecosystems develop that are analogous to embryonic raised bog, these will colonise with Heather and other ericoid species in time and typical raised bog hummocks will re-develop. Raised bog habitat

in good condition is known to support species such as Snipe, Red Grouse and Curlew and in time these sites could regain this potential.

4.3.6 Other issues (including amenity)

Creating amenity such as walking tracks is not part of the direct scope of PCAS. However, PCAS will enable and support future amenity development.

Amenity such as the greenway proposed by Longford County Council can be positively aligned and integrated to after-use plans following the completion of the proposed rehabilitation at Derrycolumb Bog. Rehabilitation measures proposed for Derrycolumb Bog do not need to be amended to integrate any future amenity track positioned along the margin of the former production bog or along the former bog railway.

Given the proximity of our peatlands to the Shannon basin, Bord na Móna are positioned to make significant contributions to future amenity and associated green infrastructure initiatives, not least the proposed Mid-Shannon Wilderness Park and proposed Biosphere Reserve. Bord na Móna are currently working with Longford County Council to develop c.10km of greenway trails through our peatlands at other peatland sites in the Mount Dillon bog group, including Corlea, Knappogue and Derryarogue.

Other issues, including after-use and management issues outside the boundary of Derrycolumb Bog, are acknowledged but are specifically outside the scope of this rehabilitation plan.

4.3.8 Concluding statement.

- No specific issues were raised during consultation that required significant changes to the substance of the rehabilitation plan.
- Issues raised by several consultees in relation to potential impacts on adjacent land had already been accounted for during the hydrological analysis and assessment, and corresponding adaptations to incorporate Drainage Management Plan mitigation measures.
- Several marginal drains will not be blocked to avoid impacts on adjacent lands, rights of way, or turf-banks.
- No changes were required to the rehabilitation plan to enable future potential amenity (greenway).
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5. REHABILITATION GOALS AND OUTCOMES

The rehabilitation goals and outcomes outline what Bord na Móna want to achieve by implementing the rehabilitation. These include:

- Meeting conditions of IPC Licence.
- Stabilisation or reduction in water quality parameters of water discharging from the site (e.g. suspended solids).
- Reducing pressure on receiving water-bodies that have been classified as At Risk from peatlands and from peat extraction, via stabilization or improving water-quality from this bog, and therefore, reducing pressures.
- Optimising hydrological conditions for **climate action benefits as part of PCAS**. Optimising hydrology for the development of embryonic *Sphagnum*-rich vegetation communities on deep peat, and eventually naturally functioning and peatland habitats.
- Optimising hydrological conditions for the development of Reed Swamp and fen on shallow more alkaline peat and other subsoils.
- Optimising hydrological conditions for the protection of exposed archaeological structures, their retention in situ and preservation into the future, where possible.
- The main goal and outcome of this plan is the successful rehabilitation (environmental stabilisation) of peatlands used for industrial peat production at the bog in a manner that is acceptable to both external stakeholders and to Bord na Móna and which optimise climate action and other ecosystem service benefits.

The rehabilitation goals and outcomes take account of the following issues.

- It will take some time for stable naturally functioning habitats to fully develop at Derrycolumb Bog. This will happen over a longer time-frame than the implementation of this rehabilitation plan
- Re-wetting residual peat will initially maintain and enhance the carbon storage capacity of the bog. There is scientific consensus that restoration of hydrology in damaged bog can improve carbon storage, water storage and attenuation and help support biodiversity both on the site and in the catchment (See Section 3.8). This will reduce carbon emissions from the site from a larger carbon source to a smaller carbon source. In time, the site has the capacity to develop in part as a carbon sink. PCAS is expected to deliver significant contributions to Ireland's climate action.
- It is not expected that the site has the potential to develop active raised bog (ARB) analogous to the priority EU Habitats Directive Annex I habitat within the foreseeable future (c.50 years). Furthermore, only a proportion of the bog has potential to develop *Sphagnum*-rich habitats in this timeframe. Nevertheless, re-wetting across the entire bog, as part of the Scheme, will improve habitat conditions of the whole bog. Other peatland habitats will develop in a wider mosaic that reflects underlying conditions.
- Rehabilitating former industrial peat production bog will also in the longer-term support other ecosystem services such as such the development of new habitat to support biodiversity and local attenuation of water flows from the bog.
- WFD status in receiving water bodies can be affected by peatlands and peat extraction, but is also affected by other sources such as agriculture. In addition, receiving water bodies that are assessed as At Risk from peatlands and from peat extraction are likely to have several contributary sources of impacts (private peat extraction and Bord na Mona).

- Bord na Móna are also planning rehabilitation measures in some adjacent bogs (e.g. Edera) in 2021. There are expected to be cumulative water quality and other ecosystem service benefits to receiving water bodies such as the Bilberry River from rehabilitation more than one bog in the same catchment.
- Re-wetting in general will benefit the future preservation of most known and unknown archaeological features.

6. SCOPE OF REHABILITATION

The principal scope of this enhanced rehabilitation plan is to rehabilitate the bog. This is defined by:

- The area of Derrycolumb Bog (Figure 3.1).
- EPA IPC Licence - Ref. P0504-01. As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. Derrycolumb bog is part of the Mount Dillon Bog group.
- The proposed Scheme is designed to exceed the stabilisation requirements as defined by the IPC Licence. PCAS is designed to enhance the ecosystem services of Derrycolumb Bog, in particular, optimising **climate action benefits**. The proposed improvements will mean that environmental stabilization is achieved (meaning IPC obligations are met) and, in addition, significant other ecosystem service benefits will be accrued.
- The local environmental conditions of Derrycolumb Bog identify wetland creation and deep peat re-wetting as the most suitable rehabilitation approach for this site. Derrycolumb Bog has a pumped drainage regime and a significant area is likely to develop as wetland habitats, particularly Reed swamp.
- The key objective of rehabilitation, as defined by this licence, is **environmental stabilisation** of the bog. Bord na Móna have defined the key goal and outcome of rehabilitation at Derrycolumb Bog as **environmental stabilisation** and **optimising deep peat re-wetting, and setting the site on a trajectory towards the development of embryonic peat-forming (*Sphagnum*-rich) vegetation communities on deep peat, and the development of Reed Swamp and fen on shallow more alkaline peat and other subsoils.**
- Rehabilitation of Derrycolumb Bog will support multiple national strategies of climate action, biodiversity action and other key environmental strategies such was the Water Framework Directive.
- **Time frame.** Rehabilitation measures will be carried out during the period of PCAS (2020-2025). The surrender of the licence is likely to extend beyond the PCAS timeframe.
- It is not proposed to carry out any rehabilitation in the narrow marginal raised bog remnants around the margins. Generally, these bog remnants are narrow, or are subject to turbary, and do not have positive bog restoration prospects.

6.1 Key constraints

- **Bog conditions.** Rehabilitation outcomes of sites are constrained by the environmental characteristics of these particular areas. For example, there is potential for raised bog restoration at some sites where there has not been significant industrial peat extraction and the peat body is largely intact (deep peat sites that are drained). At other sites, most of the peat mass has been removed, the environmental characteristics of these areas have therefore changed radically (peat depths, hydrology, water chemistry, substrate type, nutrient status, etc.) and there will therefore be different habitat outcomes (wetlands, fen, heathland, grassland and Birch woodland). At Derrycolumb Bog, production only started in the mid-1980's; the north-western portion has the shallowest depth of remaining peat, whereas the south-eastern portion has remaining peat depths of up to 4m. In addition, this bog was pumped to facilitate peat extraction. These are local factors that will influence the future trajectory of this bog, which need to be considered as part of the wider rehabilitation work.
- **Surrounding landscape and neighbours.** Another key constraint is the interaction between the Bord na Móna sites and the surrounding landscape. Care has to be taken that no active rehabilitation

management is carried out that could negatively and knowingly impact on surrounding land. This includes any hydrological management on neighbouring farmland, as well as potential changes to the hydrology of surrounding designated sites (particularly important for Derrycolumb given its proximity to a pNHA). It is anticipated that the work proposed here (blocking drains and re-wetting cutaway peatlands) will not have any adverse flooding impacts on adjacent land.

- **Archaeology**. The discovery of monuments or archaeological objects during peatland rehabilitation may potentially constrain the rehabilitation measures proposed for a particular area. While the rehabilitation will optimise hydrological conditions for the protection of exposed archaeological structures, their retention in situ and preservation into the future, any new archaeology may require rehabilitation measures will be reviewed and adapted. If this occurs, rehabilitation measures will be reviewed and adapted. An Archaeological Impact Assessment (Appendix XII) was carried out to mitigate against any impact on known archaeology at Derrycolumb. There is one known archaeological feature present and this will be excluded from rehabilitation measures, so the proposed rehabilitation will have no impact on any known archaeological material in the application area or the vicinity. Should any previously unknown archaeological material be uncovered during the rehabilitation works, it should be avoided and reported to Bord na Móna Archaeological Liaison Officer and the National Museum of Ireland.
- **Public Rights of Way**. Where a public right of way or similar burden exists on Bord na Móna property, consideration will be given to ensuring that this remain intact where possible. In some instances, depending upon previous land uses and management, alternative solutions may be required. These will be explored in consultation with local communities and statutory bodies.
- **Amenity development**. Longford County Council proposes to undertake a project comprising the construction of amenity trackway through part of Derrycolumb Bog. Amenity development, such as the development of tracks can be integrated and aligned with peatland rehabilitation. These tracks will generally use the old industrial railway network and will not overlap with peatland rehabilitation.

6.2 Key Assumptions

- It is assumed that Bord na Móna will have all resources required to deliver this project.
- It is expected that weather conditions will be within normal limits over the rehabilitation plan timeframe. Long periods of wet weather have the capacity to significantly affect ground conditions and constrain drain blocking and other ground activities.

6.3 Key Exclusions

The scope of this rehabilitation plan does not cover:

- The longer-term development of stable naturally functioning habitats to fully develop at Derrycolumb Bog. The plan covers the short-term rehabilitation **actions** and **an additional monitoring and after-care programme** to monitor the rehabilitation and to respond to any needs.
- This plan is not intended to be an after-use or future land-use plan for Derrycolumb Bog.
- The longer-term management of this site, potentially as a nature conservation site, or for amenity, or for other uses in the future.

7. CRITERIA FOR SUCCESSFUL REHABILITATION

This section outlines what criteria will be used to indicate successful rehabilitation and what critical success factors are needed to achieve successful rehabilitation. All criteria used to indicate successful rehabilitation will be measured to validate the achievement of the rehabilitation goals and outcomes and validate the completion of the rehabilitation.

The key objective of this enhanced rehabilitation plan is **environmental stabilisation** and the stabilisation of any emissions from the site that related to the former industrial peat extraction activities.

Rehabilitation is generally defined by Bord na Móna as

- stabilisation of bare peat areas via targeted active management (e.g. drain-blocking/re-wetting) slowing movement of water across the site and encouraging natural colonisation; and
- mitigation of key emissions (e.g. potential silt run-off).

In addition, Bord na Móna wish to optimise climate action and other ecosystem service benefits via enhanced rehabilitation measures. Enhanced rehabilitation will significantly go beyond what is required to meet rehabilitation and decommissioning obligations under existing EPA IPC licence conditions. The proposed interventions will mean that environmental stabilization is achieved (meaning IPC obligations are met) and, in addition, significant other benefits particularly for climate action will be accrued.

7.1. Criteria for successful rehabilitation to meet EPA IPC licence conditions:

- Rewetting of residual peat in the former area of industrial peat production to offset potential silt run off and to encourage/accelerate development of vegetation cover via natural colonisation, and reducing the area of bare exposed peat. See Table 7.1 for a summary of the criteria for successful rehabilitation and associated monitoring. The target will be the delivery of measures and this will be measured by an aerial survey after rehabilitation is completed.
- That there is a stabilising/improving concentration of suspended solids and ammonia associated with the measures undertaken to stabilise the peat surface by the blocking of the internal drainage system and the maximised rewetting of the peat surface.
- Receiving water bodies have been classified under the River Basin Management Plan and this classification includes waters that are At Risk from peatlands and peat extraction. The success criteria will be that the At Risk classification will see improvements in the associated pressures from this peatland or if remaining At Risk, that there is an improving trajectory in the pressure from this peatland.

With regard to predicting and estimating likely trends that might materialize or could be considered as a target, monitoring of surface water ammonia emissions from an adjoining Corlea bog in Mountdillon over the past 3 yrs., post cessation of peat extraction with ongoing rehabilitation, were considered. These are indicating a downward trend in Ammonia concentrations. As the monthly monitoring program at Derrycolumb continues in 2021 during the rehabilitation works, and data from the 2020 monitoring program is compiled, further trending will be produced to verify any ongoing trends (Figure 7.1).

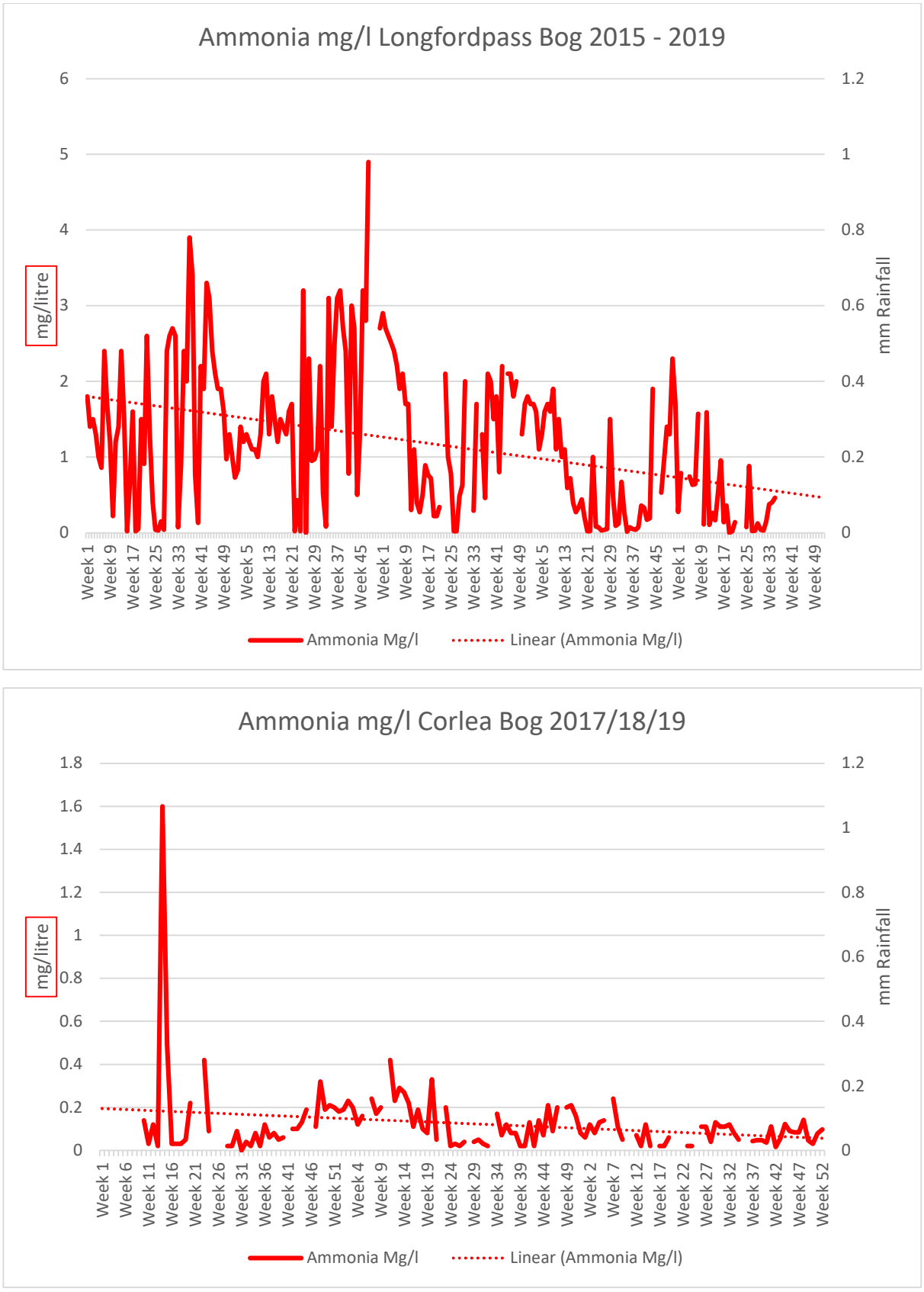

Figure 7.1. Ammonia levels over the period 2015-2019 at Longfordpass and Corlea.

Additional criteria for successful rehabilitation to optimise climate action and other ecosystem service benefits:

- Optimising the extent of suitable hydrological conditions to optimise climate action and other ecosystem service benefits (optimising deep peat re-wetting). This will be measured by an aerial survey after rehabilitation has been completed.
- Accelerating the trajectory of the site towards becoming a reduced carbon source/carbon sink. This will be measured through habitat mapping and the development of cutaway bog condition assessment. This cutaway bog condition assessment will include assessment of environmental and ecological indicators such as vegetation cover, vegetation communities, presence of key species, *Sphagnum* cover, bare peat cover and water levels (similar to ecotope mapping). Baseline monitoring will be carried after rehabilitation is completed (during the scheme). It is proposed that sites can be monitored against this baseline in the future.
- Reduction in carbon emissions. This will be estimated via a combination of habitat condition assessment and application of appropriate carbon emission factors derived from other sites. Baseline monitoring (habitat condition) will be carried after rehabilitation is completed (during the scheme). It is proposed that sites can be monitored against this baseline in the future.
- Improvement in biodiversity and ecosystem services. This will be demonstrated by metrics outlined in Section 9.1 that can be used to measure changes in ecosystem services (e.g. water quality parameters, development of pioneer habitats, breeding bird monitoring). This will be measured by collecting a range of scientific data that can then quickly be adapted and into metrics that can be used to measure changes in various ecosystem services. Baseline monitoring will be carried after rehabilitation is completed (during the scheme). It is proposed that sites can be monitored against this baseline in the future. These metrics will be defined in the context of the overall Scheme resources and after consultation with stakeholders.

Table 7.1. Summary of Success criteria, targets, how various success criteria will be measured and expected time-frames.

Criteria type	Criteria	Target	Measured by	Expected Time-frame
IPC validation	Rewetting in the former area of industrial peat production	Delivery of rehabilitation measures Reduction in bare peat. Minimum area of 428.2Ha rehabilitated following implementation of measures.	Aerial photography after rehabilitation has been completed – to demonstrate measures (drain-blocking)	2021-2025
IPC validation	Key water quality parameters	Stabilization/Improvement of key water quality parameters.	Water quality monitoring. Started in advance of the proposed rehabilitation.	2021-2023

	Ammonia, Phosphorous, Suspended solids, pH and conductivity	Trend at 6 monthly intervals downwards in nature.		
IPC validation	Reducing pressure from peat production on the local water body catchment (WFD)	At Risk classification will see improvements in the associated pressures from this peatland or if remaining At Risk, that there is an improving trajectory in the pressure from this peatland	EPA WFD monitoring programme	WFD schedule
Climate action verification	Optimising the extent of suitable hydrological conditions to optimise climate action and setting the site on a trajectory towards establishment of a mosaic of compatible peatland habitats	Optimal extent of suitable hydrological conditions Indicators of establishment of compatible cutaway habitats	Aerial photography, Cutaway bog condition map and Habitat mapping to map extent of suitable hydrological conditions. Baseline monitoring to be carried out during the scheme when rehabilitation is complete. Sites can be re-monitored in the future and compared against this baseline.	2021-2025
Climate action verification	Reduction in carbon emissions.	Reduction in carbon emissions	Carbon emissions – estimated using a high bog condition assessment and appropriate carbon emission factors.	2021-2025
Climate action verification	Biodiversity and ecosystem services. Habitat establishment	Improvement in biodiversity and ecosystem services.	Metrics that relate to selected biodiversity and ecosystem services (to be defined). Presence of key species – Sphagnum – Walkover survey	2021-2025

	Presence of key species – Sphagnum Breeding and wintering birds Pollinators		Breeding birds – Breeding bird survey Pollinators – Pollinator walk Baseline monitoring to be carried out during the scheme when rehabilitation is complete. Sites can be re-monitored in the future and compared against this baseline.	

Meeting climate action verification criteria and monitoring of these criteria after the scheme has been completed is dependent on support from the Climate Action Fund or other sources of funding. Note that monitoring and verification of the overall scheme will be stratified – not all these criteria will be measured at each individual site.

7.2. Critical success factors needed to achieve successful rehabilitation as outlined in the plan

The achievement of successful rehabilitation as outlined in the plan requires:

- **Funding to pay for resources required to deliver the planned rehabilitation (Bord na Móna and external).** Bord na Móna maintains a Provision on its balance sheet to pay for these future costs when industrial peat extraction ceases. Bord na Móna is fully committed to meeting its obligations relating to rehabilitation and decommissioning under the Integrated Pollution Control Licence. It is expected that additional costs of enhanced rehabilitation will be supported by Government through the Climate Action Fund.
- **Bord na Móna to have sufficient resources (staff and training) to deliver the planned rehabilitation with required associated skills and competencies.**
- **Bord na Móna to have sufficient resources (suitable machinery) and staff to maintain this machinery.**
- **Weather conditions to be within normal limits over the rehabilitation plan timeframe.** Long periods of wet weather have the capacity to significantly affect ground conditions and constrain the delivery of rehabilitation. The potential impact of wet weather on ground conditions can be reduced by appropriate planning and management. Bord na Móna have significant experience of managing these issues through 70 years of working in these peatland environments.
- **Rehabilitation measures to be effective.** The rehabilitation measures proposed in this plan are based on 40 years of Bord na Móna experience of peatland management and best practise applied internationally in peatland management. Measures proposed in this plan have already been shown to be affective at other sites. Bord na Móna will apply a flexible and adaptable approach to the more innovative rehabilitation measures proposed in this plan**.** If measures are not initially effective, Bord na Móna will review any requirement for additional practical rehabilitation.
- **Natural colonisation of vegetation to develop semi-natural habitats at a rate within the normal limits.** The development of naturally functioning semi-natural habitats on cutaway peatland takes time. Pioneer vegetation can develop relatively quickly (3-10 years) and wetland habitats can develop relatively quickly. Birch woodland make take 20-30 years to develop. However, it may take 50 years for active raised bog vegetation to re-develop on ground that was previously cutaway. Different environmental conditions will have a significant impact on the rate of natural colonisation, and as a result of the combination of

different environmental conditions and the application of different rehabilitation measures, there will be a variety of habitat outcomes.

- Rehabilitation measures have been designed to accelerate and work with natural colonisation and other natural processes. Bord na Móna experience of rehabilitation has shown that re-wetting improves conditions for natural colonisation and that natural colonisation is accelerated where the environmental conditions are most suitable. Rehabilitation measures have been designed to modify the conditions of areas within sites where conditions are less suitable for natural colonisation (modifying hydrology, topography, nutrient status or availability of potential seed sources).
- **Monitoring to be robust and effective.** Rehabilitation Monitoring will be established to validate the success of rehabilitation as required by Condition 10 of the IPC Licence and to verify the benefits of the proposed enhanced measures to optimise climate action. This will focus on a collecting a range of scientific data that can then quickly be adapted and into metrics that can be used to measure changes in various ecosystem services.

8. REHABILITATION ACTIONS AND TIME FRAME

Peatland rehabilitation requires detailed planning and the use of data from desktop surveys and field surveys. This data in association with topographical and hydrological modelling (Figure 8.3 & 8.4) will be important in planning the future peatland landscapes and planning the use of the most appropriate rehabilitation methodologies to maximise climate action benefits. Hydrological modelling (Figure 8.3) indicates those areas that are likely to re-wet when drains are blocked, based on the current topography, and areas where water levels may have to be modified, where needed. Enhanced rehabilitation measures will look to optimise hydrological conditions for re-wetting peat in other areas. This planning is also essential for matching the most sustainable rehabilitation methodology to the most suitable cutaway environment to maximise the benefits of the resource outlay (maximising cost/benefit).

The rehabilitation actions will be a combination of PCAS measures to re-wet peat. The distribution of these measures is provisionally outlined in Figure 8.5. (Note that the actual distribution of these measures may be subject to change in response to stakeholder consultation and refinement of the enhanced rehabilitation measures.)

These enhanced measures for Derrycolumb Bog will include**:**

- Re-wetting the deep peat areas of the bog using berms and field re-profiling. This enhanced measure seeks to create large (c. 45m x 60m) flat areas or cells of shallow (< 10 cm) water conditions on bare peat, across multiple fields that are enclosed by shallow berms to retain shallow surface water;
- Inoculation of *Sphagnum* on compatible residual deep peat areas;
- Re-wetting some deep peat areas of the bog through regular field drain blocking using a dozer to create three peat blockages every 100 m along each field drain;
- Re-wetting some deep peat areas of the bog through more intensive field drain blocking using a dozer to create seven peat blockages every 100 m along each field drain;
- Blocking drains in targeted marginal (degraded) high bog area and re-wetting, where possible, using an excavator to install peat blockages. Some bog remnants are too small to benefit from this approach;
- Management of water levels with overflow pipes;
- The construction of berms to create wetlands;
- Intensive drain blocking to create wetlands, and the introduction of Reeds and other Rhizomes;
- Optimising water retention in wetland areas, including placement of berms where required;
- Re-assessment of the pumping regime and turning off pumps if this desired and has no significant external impact. Initial hydrological modelling indicates that a part of the site will develop a mosaic of wetland habitats with deeper water, when pumping is reduced or stopped. Hydrological management will look to optimise summer water levels to maximise the development of wetland vegetation (by looking to set water depths at < 0.5 m, where possible. It is inevitable that some sections will naturally have deeper water due to the variable topography). Water-levels will be adjusted at outfalls and by adjusting piped drainage. More sustainable permanent gravity drainage solutions will be examined. It is expected that a natural seasonal flooding regime will develop, with water-levels fluctuating in association with levels in the adjacent Lough Ree.
- Targeted fertiliser applications to accelerate vegetation establishment on headlands and high fields.
- Regular drain blocking (3/100) on dry cutaway adjacent to wetland mosaics, along with the blocking of outfalls and management of water levels;
- Silt ponds will be retained and maintained during the rehabilitation phase. During the monitoring and verification phase silt ponds will be continually inspected and maintained, where appropriate. When it is deemed that silt ponds are not required, as the bog has been successfully stabilised and there is no silt

run-off, the condition of the silt ponds will be reviewed. Silt ponds will either be de-watered (water levels lowered to a level where the silt pond will naturally develop as a small wetland feature), left in situ, or infilled (where discharges do not require silt control).

Table 8.1: Types of and areas for enhanced rehabilitation measures at Derrycolumb Bog. Note that the types of rehab and areas of rehab may change in response to stakeholder consultation and refinement of the enhanced rehabilitation measures.

Type		**Enhanced Rehabilitation Measure**	Extent (Ha)
Deep peat	DPT1	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes	
Deep peat	DPT2	More intensive drain blocking (max 7/100 m) + blocking outfalls and managing overflows	2.9
Deep peat	DPT3	More intensive drain blocking (max 7/100 m), + field reprofiling + blocking outfalls and managing overflows	75.2
Deep peat	DPT4	Berms and field re-profiling (45m x 60m cell) + blocking outfalls and managing overflows + drainage channels for excess water + *Sphagnum* inoculation	40.6
Deep peat	DPT5	Cut and Fill cell bunding (30m x 30m cell) + blocking outfalls and managing overflows + drainage channels for excess water + *Sphagnum* inoculation	4.4
Wetland	WLT2	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site	43.2
Wetland	WLT3	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes + Targeted blocking of outfalls within a site + constructing larger berms to re-wet cutaway + transplanting Reeds and other rhizomes	20.1
Wetland	WLT4	More intensive drain blocking (max 7/100 m), + blocking outfalls and managing overflows + transplanting Reeds and other rhizomes	95.9
Marginal land	MLT1	No work required	65.7
Silt ponds	MLT1	Silt ponds	1.0
Dry Cutaway	DCT1	Blocking outfalls and managing water levels with overflow pipes	
Dry Cutaway	DCT2	Regular drain blocking (max 3/100m) +blocking outfalls and managing water levels with overflow pipes+ targeted fertiliser treatment	77.8
Archaeology	ARCH	Areas with archaeology	1.6
Constraint	Constraint	Other Constraints (ROW/pNHA)	27.5
Total			**455.8**

8.1 Short-term planning actions (0-1 years)

- Seek formal approval of the enhanced plan from the EPA;
- Agree an *ex ante* budget of eligible costs (based on the approved enhanced plan) with the Scheme regulator;

- Develop a detailed site plan with detailed site drawings outlining how the various rehabilitation methodologies (The proposed Scheme PCAS) will be applied to Derrycolumb Bog. This will take account of peat depths, topography, drainage and hydrological modelling. (See map for an indicative view of the application of different rehabilitation methodologies);
- Carry out a hydrology and drainage management assessment of the proposed enhanced rehabilitation measures;
- Carry out a review of known archaeology and an archaeological impact appraisal of the proposed rehabilitation. Incorporate the results of this assessment into the rehabilitation plan to minimise known archaeological disturbance, where possible;
- Carry out a review of issues that may constrain rehabilitation such as known rights of way, archaeology, turbary and existing land agreements. A number of rights of way exists along or proximal to the margins of Derrycolumb Bog.
- Carry out a review of remaining milled peat stocks. It is expected that all peat stocks will eventually be removed or decommissioned.
- Carry out an ecological appraisal of the potential impacts of the planned rehabilitation, if needed, such as the presence of sensitive ground-nesting bird breeding species (e.g. Curlew) or larval webs of Marsh Fritillary butterfly, etc. The scheduling of rehabilitation operations will be adapted, as mitigation; and
- Ensure all activities comply with the environmental protection requirements of the IPC Licence.
- Carry out Appropriate Assessment of the Rehabilitation Plan. Incorporate any required mitigation measures from the AA in the plan for the delivery of rehabilitation and decommissioning across the site.
- Track implementation and enforcement of the relevant IPC Licence conditions, the mitigation measures (AA) and other environmental control measures during the implantation of the rehabilitation plan.

8.2 Short-term practical actions (0-2 years)

- Carry out proposed measures as per the detailed site plan. This will include a combination of pump management, drain blocking, peat field re-profiling, cell-bunding and fertiliser applications targeting headlands, high fields and other areas. All rehabilitation will be carried out with regard to environmental control measures (Appendix IV);
- Monitor the success of rehabilitation measures in relation to developing suitable hydrological conditions;
- Carry out the proposed monitoring, as outlined.
- While natural colonisation is expected to commence almost immediately once peat production ceases, Phase 2 actions will be carried out in targeted areas to accelerate re-vegetation and colonisation of target species. Phase 2 actions may include seeding of targeted vegetation and inoculation of *Sphagnum*;
- Silt ponds will be monitored during this period and there will be continued maintenance and cleaning to prevent potential silt run-off from the site during the rehabilitation phase; and
- Submit an *ex post* report to the Scheme regulator to verify the eligible measures to be carried out in year 1 of the Scheme, and an *ex ante* estimate for year 2 of the Scheme; and so on for each year of the proposed Scheme

8.3 Long-term (>3 years)

- Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary;
- Delivery of a monitoring, aftercare and maintenance programme (See section 10.2 below);
- Decommissioning of silt-ponds will be assessed and carried out, where required; and
- Reporting to the EPA will continue until the IPC License is surrendered.

8.4 Timeframe

- **2020-2021**: Short-term planning actions.
- **2021**: Short-term practical actions.
- **2021-2024**: Long term practical actions. Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.
- **2024**: Decommission silt-ponds, if necessary.

8.5 Budget and costing

Bord na Móna (BnM) appreciates the Minister's intention to support, via the Climate Action Fund, Bord na Móna in developing a package of measures, 'the proposed Scheme', for enhanced decommissioning, rehabilitation and restoration of cutaway peatlands referred to as, the Peatlands Climate Action Scheme'. *However, only the additional costs associated with the additional and enhanced rehabilitation, i.e, measures which go beyond the existing standard mandatory decommissioning and rehabilitation requirements arising from Condition 10 will be eligible for support.*

The measures funded by the proposed Scheme will deliver benefits across climate action (GHG mitigation through reduced carbon emissions and acceleration towards carbon sequestration), enrich the State's natural capital, increase eco-system services, strengthen biodiversity, improve water quality and storage attenuation as well as developing the amenity potential of the peatlands.

Bord na Móna maintains a provision on its balance sheet to pay for the future licence compliance costs of mandatory standard rehabilitation and decommissioning when industrial peat extraction ceases. This is updated every year - for more information see the Bord na Móna Annual Report (Bord na Móna 2020). Bord na Móna is fully committed to meeting its obligations relating to rehabilitation and decommissioning under the Integrated Pollution Control Licence.

At this time, a 'mandatory' rehabilitation provision (sufficient to discharge the requirement of Condition 10 in the licence) has been be allocated to the site based on the area of different types of cutaway across the site (See Appendix I).

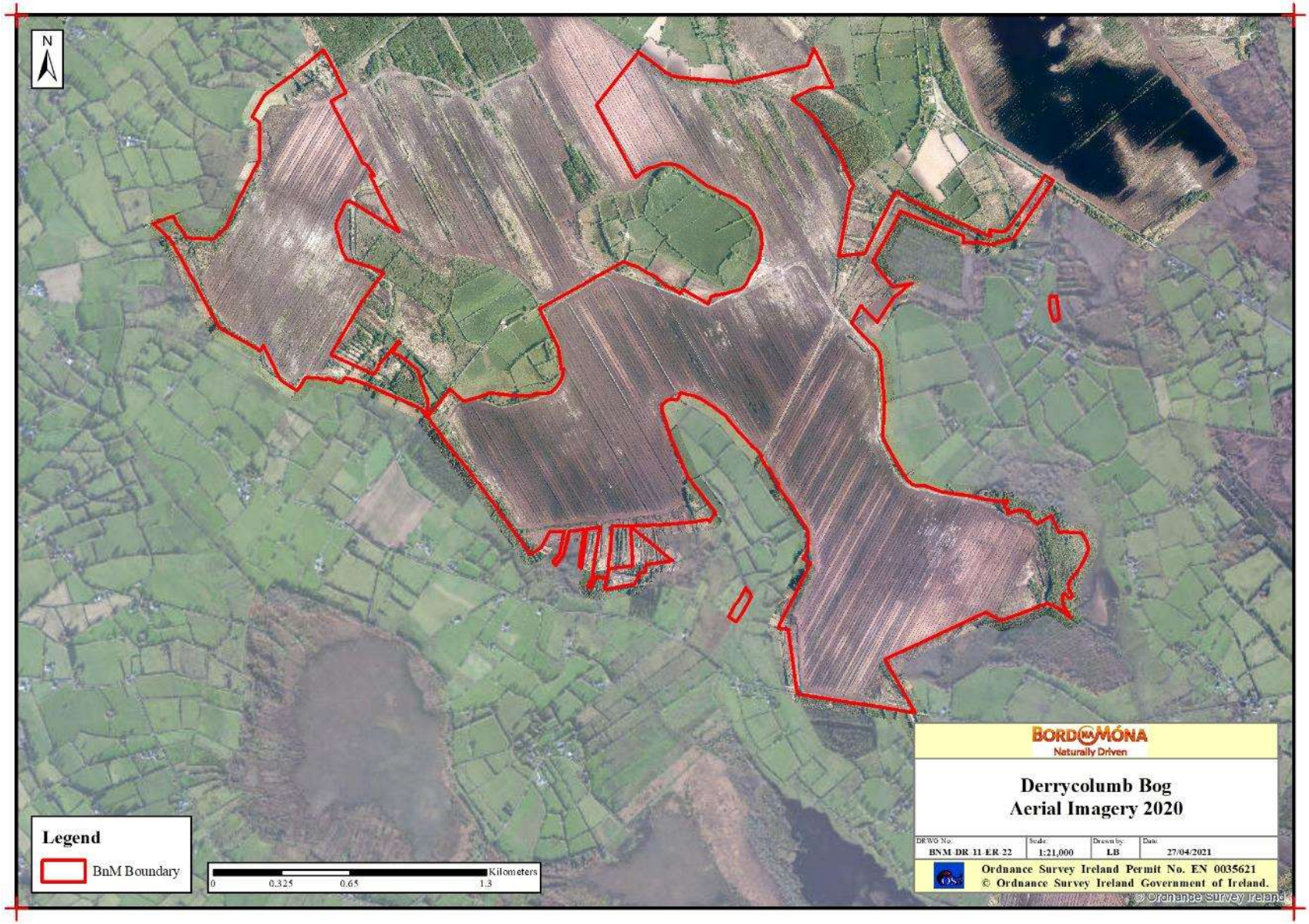

Figure 8.1. Aerial photo of Derrycolumb Bog. The majority of the bog is bare peat.

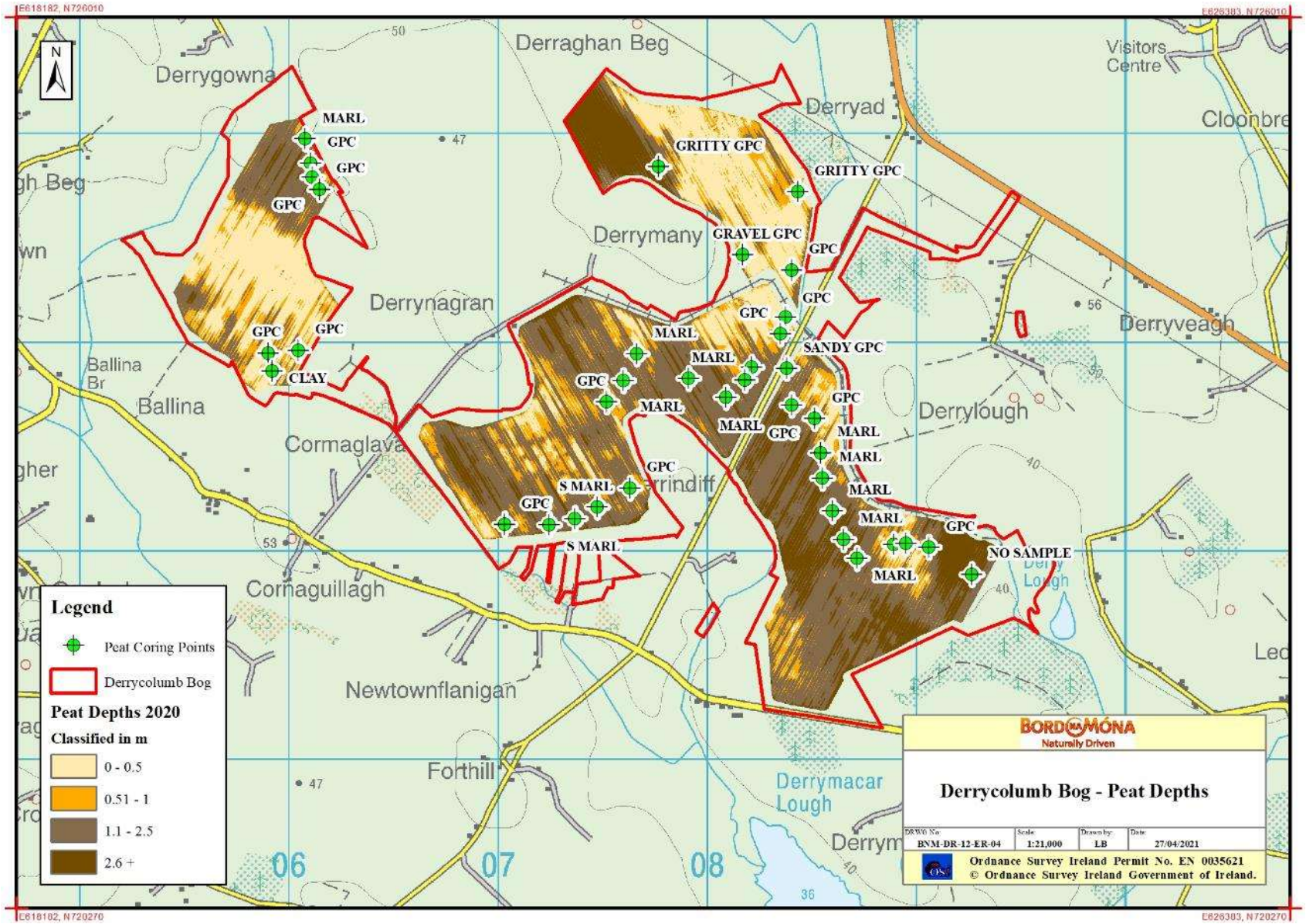

Figure 8.2. Peat Depth Map for Derrycolumb Bog. There are pockets of deep residual peat and areas that have been cutaway.

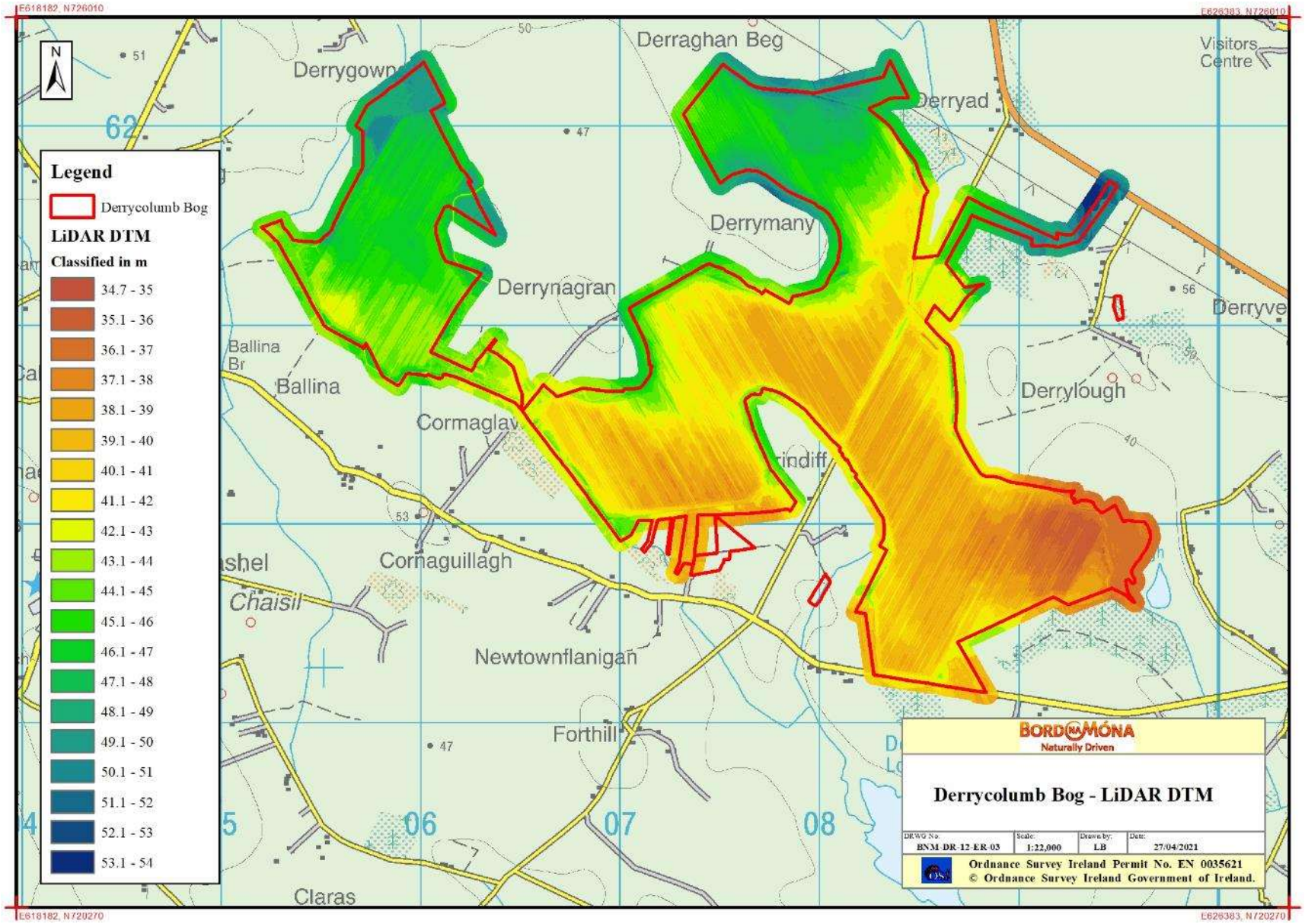

Figure 8.3. LIDAR topography map of Derrycolumb Bog. Low areas and basins are orange-yellow, more elevated areas are blue-green.

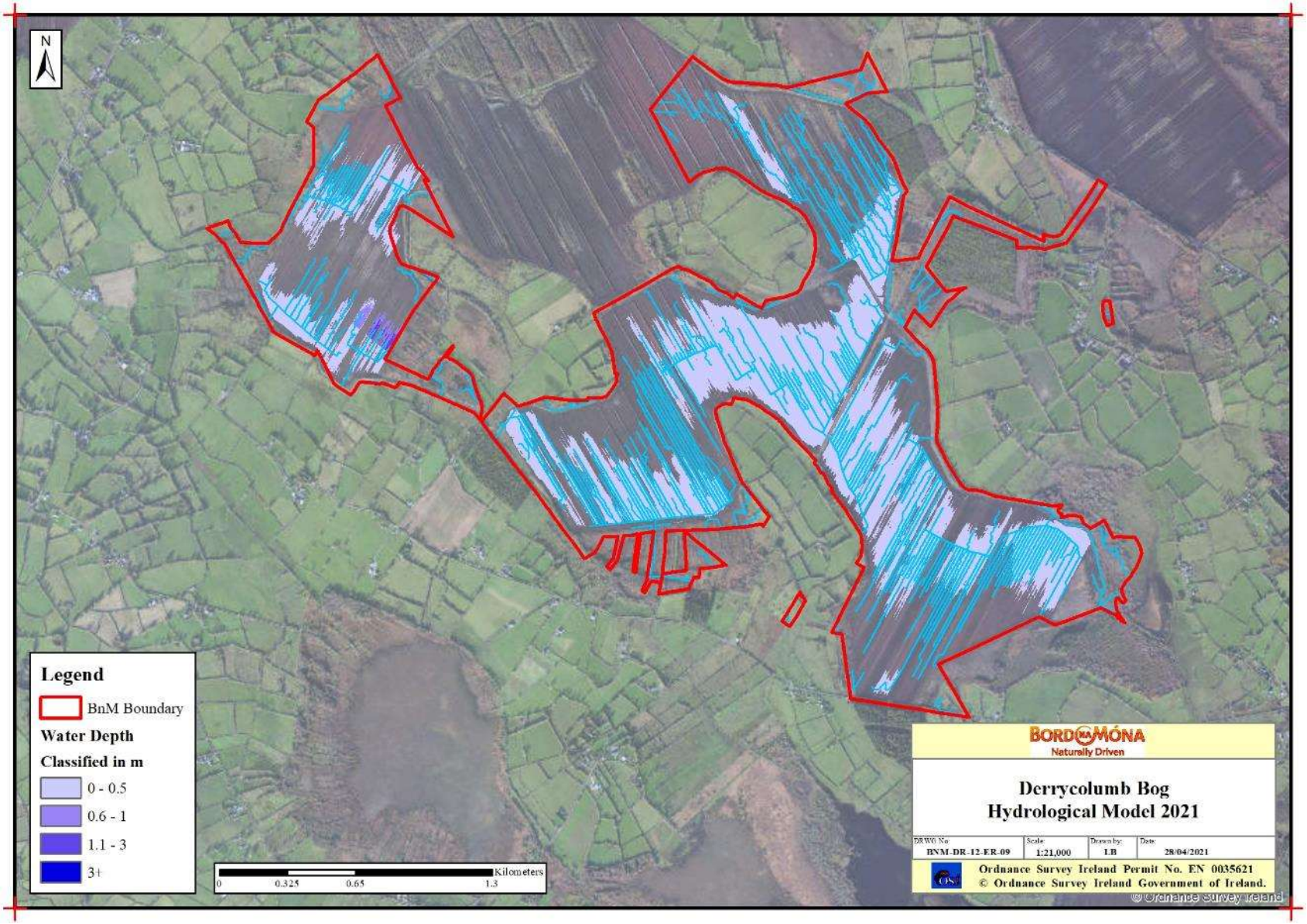

Figure 8.4. Hydrological modelling for Derrycolumb Bog showing range of expected water depths based on current topography and key flow-paths.

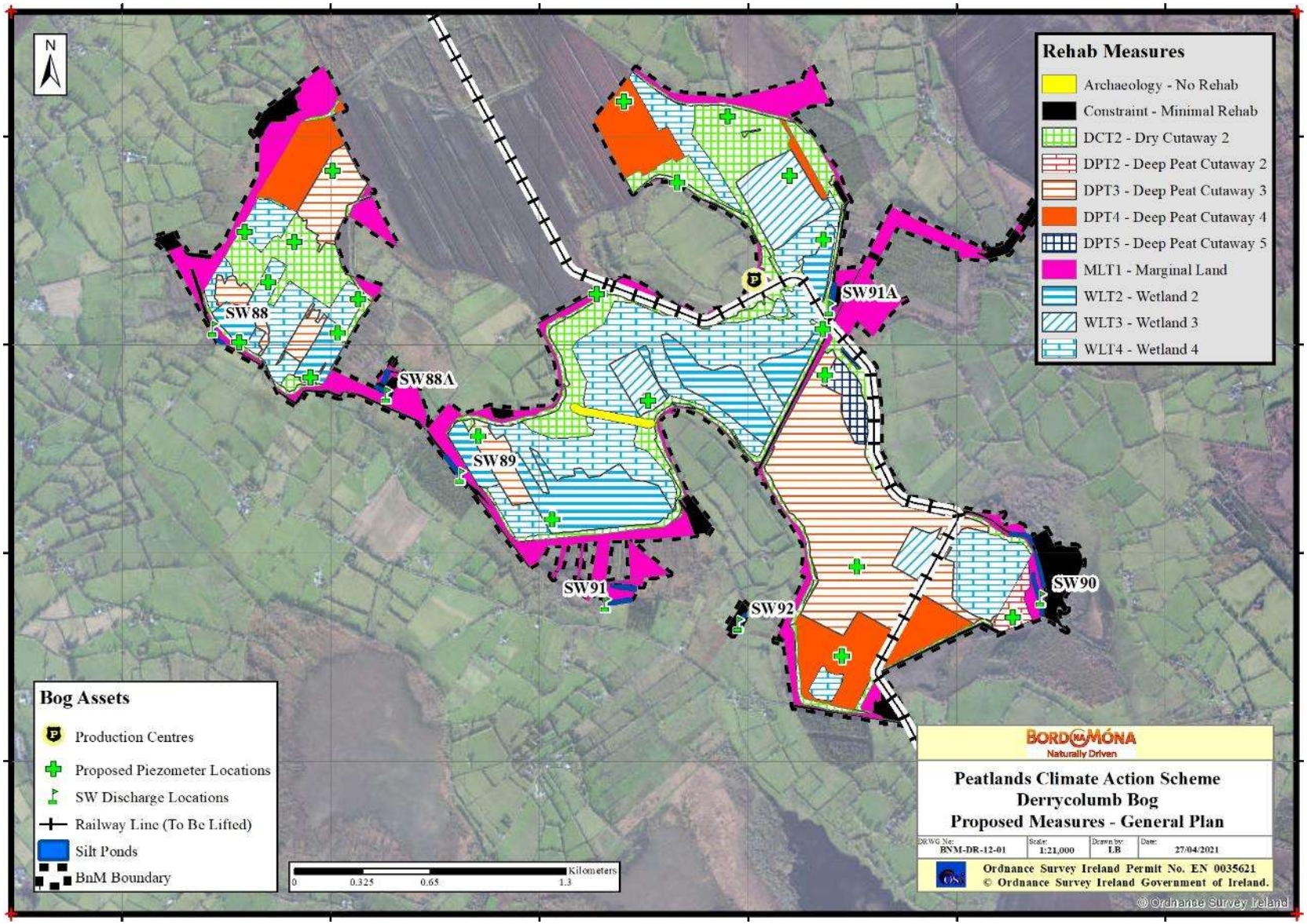

Figure 8.5. Indicative Enhanced Rehabilitation Plan for Derrycolumb Bog. *Note that the types of rehab and areas of rehab may change in response to stakeholder consultation and* refinement of the enhanced rehabilitation measures.

9. AFTERCARE AND MAINTENANCE

9.1 Programme for monitoring, aftercare and maintenance

This programme for monitoring, aftercare and maintenance has been designed to meet the Conditions of the IPC Licence. This is defined as:

- There will be **initial quarterly monitoring assessments** of the site to determine the general status of the site, the condition of the silt ponds, assess the condition of the rehabilitation work, monitoring of any potential impacts on neighbours land, general land security, boundary management, dumping and littering.
- The number of these site visits will reduce after 2 years to bi-annually and then after 5 years to annual visits.
- These monitoring visits will also consider any requirements for further practical rehabilitation measures.
- The **baseline condition of the site will be established** post-rehabilitation implementation by using an aerial survey to take an up to date aerial photo, when rehabilitation is completed. This will be used to verify completion of rehabilitation measures. The extent of bare peat will be assessed using this baseline data, and habitat maps will be updated, if needed.
- **Water quality monitoring** at the bog will be established. The main objective of this water quality monitoring will be to establish a baseline and then monitor the impact of peatland rehabilitation on water quality from the bog.
- In order to assist in monitoring surface water quality from this bog, it is planned to increase the existing licence monitoring requirements to sampling for the same parameters to every month during the scheduled activities and for a period up to three years. post rehabilitation, depending on the period required to confirm that the main two parameters, suspended solids and ammonia are remaining compliant with the licence emission and trigger limit values and there is an improving trajectory in these two parameters i.e. reduction in concentration.
- Enhanced water quality monitoring will aim to include a minimum of 70% of a bogs drainage catchments.
- Monitoring results will be maintained, trended and reported on each year as part of the requirement to report on Condition 10.1 of the IPC Licence on Bog Rehabilitation in the Annual Environmental Report, which will be available in April each year at www.epa.ie.
- The parameters to be included (as per condition 6.2 of the IPC Licence) include monthly monitoring for pH, Suspended Solids, Total Solids, Total Phosphorus, Total Ammonia, Colour, and COD.
- This monthly sampling regime on a selected number of silt ponds will be carried out over a two-year cycle. The original (licence) requirement was for a quarterly sampling regime but this has been increased to a monthly regime to appropriately track the changing water chemistry that will occur as part of this enhanced rehabilitation. In addition, DOC will be included as a parameter to try and identify any changes in carbon in the surface water.
- If, after two years, key criteria for successful rehabilitation are being achieved and key targets are being met, then the water quality monitoring will be reviewed, with consideration of potential ongoing research on site. The water quality data, the aerial surveys and the habitat mapping will be collated and will be submitted to the EPA as part of the final validation report.
- If, after two years, key criteria for successful rehabilitation have **not** been achieved and key targets have **not** been met, then the rehabilitation measures and status of the site will be evaluated and enhanced, where required. This evaluation may indicate no requirement for additional enhancement of rehabilitation measures, but may demonstrate that more time is required before key criteria for

rehabilitation has been achieved. Monitoring of water quality will then also continue for another period to be defined.

- Where other uses are proposed for the site that are compatible the provision of biodiversity and ecosystem services, these will be assessed by Bord na Móna in consultation with interested parties. Other after-uses can be proposed for licensed areas and must go through the appropriate assessment process and planning procedures.

Additional monitoring measures are also proposed to monitor ecosystem service benefits that have been derived by rehabilitation. These proposed monitoring measures will be funded by the proposed Scheme or additional other funding. Monitoring of climate action and other ecosystem service benefits will be designed to take account of the requirements of monitoring benefits of the overall Scheme and will be stratified; that is not all monitoring will be carried out in each site. These are defined as:

- Vegetation and habitat monitoring after rehabilitation is completed using a cutaway bog condition assessment (Similar to ecotope mapping). This assessment will include assessment of on environmental and ecological indicators such as vegetation cover, vegetation communities, presence of key species, *Sphagnum* cover, bare peat cover and water levels.
- The condition of the bog can be assessed using the condition assessment and suitable Greenhouse Gas (GHG) emission factors can be assigned to different habitats. GHG emission factors have been determined for various peatland habitats in Ireland (Wilson *et al.*, 2015) and are constantly being refined with more and more research. BnM is actively supporting research into GHG fluxes in different rehabilitated peatland habitats. This means that potential GHG emissions can be estimated from the site, as the site continues along its trajectory towards a naturally functioning peatland ecosystem.
- It is proposed to monitor the improvement of some biodiversity ecosystem services. A breeding bird and Pollinator monitoring programme will be established. Specific pollinator indicators will be monitored (Bee and Butterfly). To be defined in relation to monitoring of the overall proposed Scheme and after consultation with stakeholders.

9.2 Rehabilitation plan validation and licence surrender – report as required under condition 10.4

IPC License Condition 10.4. *A final validation report to include a certificate of completion for the Rehabilitation Plan, for all or part of the site as necessary, shall be submitted to the Agency within six months of execution of the plan. The licensee shall carry out such tests, investigations or submit certification, as requested by the Agency, to confirm that there is no continuing risk to the environment.*

Reporting to the EPA will continue until the IPC License is surrendered. The bog will be included in the full licence surrender process as per the Guidance to Licensees on Surrender, Cessation and Closure of Licensed Sites EPA, 2012, when:

- The planned rehabilitation has been completed;
- The key criteria for successful rehabilitation has been achieved and key targets have been met;
- Water quality monitoring demonstrates that water quality of discharge is stabilising or improving; and
- The site has been environmentally stabilised.

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APPENDIX I: A STANDARD PEATLAND REHABILITATION PLAN TO MEET CONDITIONS OF THE IPC LICENCE

In the event that the proposed Scheme (PCAS) is not supported by additional funding, Bord na Móna is still obligated to carry out peatland rehabilitation to meet the conditions of the IPC Licence. Under its EPA licences and following cessation of peat extraction, BnM is mandated to 'decommission' its operations by removing materials 'that may result in environmental pollution' and establish that 'rehabilitation' measures have environmentally stabilised peat production areas.

This proposed standard peatland rehabilitation plan is outlined here to **estimate potential costs**. Bord na Móna will still be expected to cover the costs that would have accrued from standard decommissioning and rehabilitation activities, as part of its original obligations. The existing costs associated with both the removal of potentially polluting materials and the environmental stabilisation of the peatlands resides with Bord na Móna. However, the expenditure necessary to deliver the additional and enhanced decommissioning, rehabilitation and restoration and the benefits that flow from these measures and interventions/improvements will be eligible for funding by government through the Climate Action Fund.

The same process as outlined in Section 2 will be followed.

Scope of rehabilitation

The principal scope of this rehabilitation plan is to rehabilitate the bog. This is defined by:

- The area of Derrycolumb Bog (Figure 3.1).
- EPA IPC Licence - Ref. P0504-01. As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. Derrycolumb bog is part of the Mount Dillon Bog group.
- The current condition of Derrycolumb Bog. This site has pumped drainage. Pioneer wetland vegetation is developing across part of the site.
- The key objective of rehabilitation, as defined by this licence, is **environmental stabilisation** of the bog.
- To minimise potential impacts on neighbouring land. Some boundary drains around Derrycolumb Bog will be left unblocked as blocking boundary drains could affect adjacent land.

Rehabilitation goals and outcomes

The key rehabilitation goal and outcome for Derrycolumb Bog is environmental stabilisation of the site via wetland creation and deep peat re-wetting. This is defined as:

- Carrying out drain blocking to re-wet peat and slow runoff.
- Stabilising potential emissions from the site (e.g. suspended solids).
- Environmental stabilisation.

The outcome is setting the site on a trajectory towards establishment of natural habitats.

Criteria for successful rehabilitation:

- Rewetting of residual peat in the former area of industrial peat production to offset potential silt run off and to encourage development of vegetation cover via natural colonisation, and reducing the area of bare exposed peat.

- That there is a stabilising/improving concentration of suspended solids and ammonia associated with the measures undertaken to stabilise the peat surface by the blocking of the internal drainage system and the maximised rewetting of the peat surface. This will be demonstrated by developing a stable or downward trajectory of water quality indicators (suspended solids and ammonia) towards what would be typical of a re-wetted cutaway bog. This will be measured via water quality monitoring (suspended solids and ammonia).
- That the main water body associated with surface water from this bog continues to be excluded in the EPA's list of peat pressure water bodies as reported in the River Basin Management Plans. Where the water body has been identified as under pressure from peat extraction, that the intervening EPA monitoring programme associated with its Programme of Measures for this water body shows positive improvements in water quality impacts that were attributable to the original peat extraction activity.

Rehabilitation targets

- Demonstrating the delivery of the rehabilitation through site visits and through updated aerial photography (indicating presence of peat blockages and re-wetting). This will be demonstrated by a post rehab survey.
- Stabilising potential emissions from the site (potential silt run-off). The key target will be developing a stable or downward trajectory of water quality indicators (suspended solids and ammonia). This will be demonstrated by water quality monitoring results.

Rehabilitation measures: (see Figure Ap-1)

- Blocking field drains in the former industrial production area using a dozer to create regular peat blockages (three blockages per 100 m) along each field drain;
- Targeted drain blocking using peat blockages (installed with excavator) on the raised bog remnant in the south-east corner of the site.
- Pump management – reducing or ceasing pumping.
- Re-alignment of piped drainage; and management of water levels to create wetlands;
- No measures are planned for the other surrounding marginal peatland habitats.
- Silt ponds will continue to be maintained during the rehabilitation and decommissioning phase.
- Evaluate success of short-term rehabilitation measures and enhance where necessary.
- Decommissioning of silt-ponds will be assessed and carried out, where required.

Timeframe:

- 2021. 1st phase of rehabilitation. Field drain blocking and water-level management.
- 2021. 2nd phase. Further realignment of piped drainage and other re-wetting measures dependent on success of 1st phase re-wetting, as determined by pump management, ongoing monitoring of water levels and re-vegetation.
- Other enhancement measures such as fertiliser treatment will be carried out, if needed. These will be determined by ongoing monitoring.
- 2022-2024. Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.

- 2022-2024. Decommission silt-ponds, if necessary.

Table AP-1. Rehabilitation measures and target area.

Type	Code	Description	Area (Ha)
Deep peat	DPT1	Regular drain blocking (3/100 m) + blocking outfalls and managing water levels with overflow pipes	132.5
Dry cutaway	DCT1	Blocking outfalls and managing water levels with overflow pipes	76.4
Wetland	WLT1	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes	149.1
Marginal Land	MLT1	No work required (Marginal land)	70.0
Silt pond	N/A	Silt ponds	1.0
Other	Other	Other lands (no work required or. Archaeology constrained)	26.8
Total			**455.8**

Monitoring, after-care and maintenance

- There will be initial quarterly monitoring assessments of the site to determine the general status of the site, the condition of the silt-ponds, assess the condition of the rehabilitation work, asses the progress of natural colonisation, monitoring of any potential impacts on neighbouring land and general land security. The number of site visits will reduce after 2 years to bi-annually. These site visits will assess the need to additional rehabilitation.
- Water quality monitoring will be established.
- Monitoring results will be maintained, trended and reported on each year as part of the requirement to report on Condition 10.1 of the IPC Licence on Bog Rehabilitation in the Annual Environmental Report, which will be available in April each year at www.epa.ie.
- The parameters to be included (as per condition 6.2 of the IPC Licence) include monthly monitoring for pH, Suspended Solids, Total Solids, Total Phosphorus, Total Ammonia, Colour, and COD.
- This sampling regime on a selected number of silt ponds will be carried out over a two year cycle. The original (licence) requirement was for a quarterly sampling regime.
- Where other uses are proposed for the site, these will be assessed by Bord na Móna in consultation with interested parties. Other after-uses can be proposed for licensed areas and must go through the appropriate assessment and planning procedures.

Validation and IPC Licence surrender

Reporting to the EPA will continue until the IPC License is surrendered. The bog will be included in the full licence surrender process as per the Guidance to Licensees on Surrender, Cessation and Closure of Licensed Sites (EPA, 2012) when:

- The planned rehabilitation has been completed;
- Water quality monitoring demonstrates that water quality of discharge is stabilising or improving; and
- The site has been environmentally stabilised.

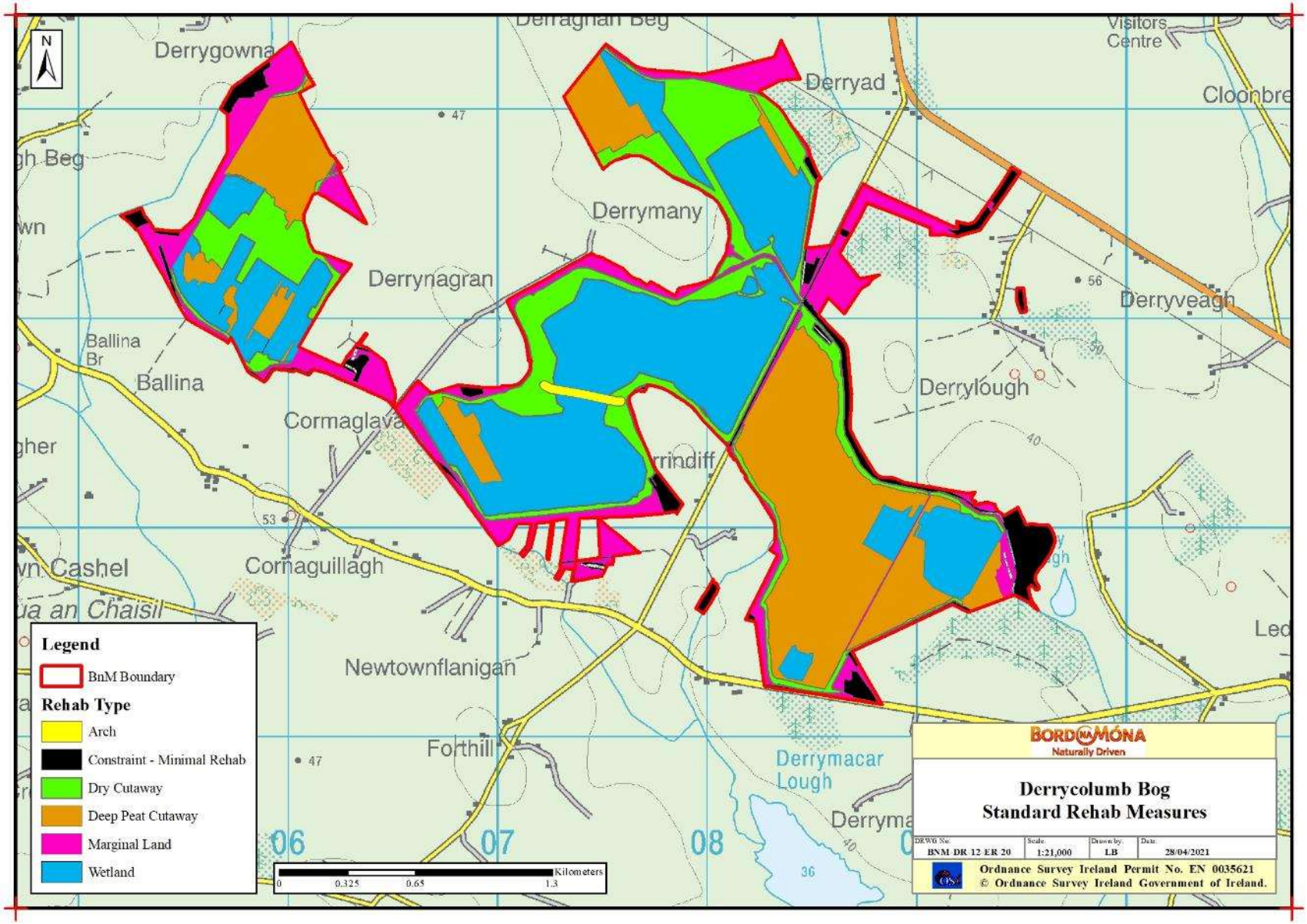


Figure Ap-1. Indicative standard rehabilitation plan for Derrycolumb Bog.

APPENDIX II: BOG GROUP CONTEXT

The Mount Dillon Bog Group IPC Licensed area is made up of two sub-groups Mount Dillion and Mostrim) and have been in industrial peat production for several decades. There are 28 defined sites covering a total area of 11,138 ha. Of the 28 sites, 23 mainly straddle the River Shannon within counties Roscommon and Longford, with five sites partially in County Westmeath to the east. Each bog area further comprises a range of habitats from bare milled peat production areas to re-colonising cutaway to workshops areas and transport infrastructure. Industrial peat extraction from these sites mainly supplied ESB power stations at Lanesborough (LRP) or for horticultural peat products.

Industrial peat extraction in the Mount Dillon Bog Group ceased in 2019. It is planned to supply remaining milled peat stocks to Lanesborough (LRP) during 2020. Both power stations will cease using peat by the end of 2020. All remaining peat stocks will also be removed. Intensive decommissioning and rehabilitation for the Mount Dillon Bog Group is expected to start in 2020/2021.

One bog site, Cloonmore, was never used for industrial peat production and several bogs in the Mostrim group have been drained but never fully developed and still retain typical high bog characteristics. These include Clonwhelan, Glenlough and a section of Mostrim. These sites have been zoned for biodiversity and a high bog drain blocking will be used to re-wet the high bog and encourage restoration of the raised bog habitat. Several sites (Glenlough, Mostrim, Clonwhelan and Clynan) were assessed by consultants for NPWS as part of the review of the raised bog Natural Heritage Area network (NPWS 2014).

A breakdown of the component bog areas for the Mount Dillon Bog Group IPC License Ref. PO504-01 is outlined in Table Ap-2. These areas are also outlined on Figure Ap-2 (Map of the Mount Dillon Bog Group).

Industrial peat production history varies across the Mount Dillon bog group, so there is a wide range of peat depths at present. Bogs close to Lanesborough tend to have shallower peat depths or have been cutaway, while some bogs on the periphery of the group tend to have deeper peat reserves. Several sites such as Mount Dillion and Garryduff have been mostly cutaway to the fen peat layers or in some cases to expose the underlying gravel/sub-soil. Several bogs in the Mostrim group have only been partially developed or have had no industrial peat production, and have relatively deep peat depths.

Table Ap-2a: Mount Dillon Bog Group names, area and indicative status (Mount Dillon Energy Peat sub-group).

Bog Name	Area (ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Begnagh	265	Cutover Bog Industrial peat production commenced at Begnagh Bog in 1977. Deep peat reserves remain on much of the former production area. Pumped bog drainage.	Begnagh Bog formerly supplied fuel peat for Lough Ree Power Some areas of cutaway on site are developing pioneer cutaway vegetation communities. LCC are proposing an amenity walkway for this bog	2020	Draft 2017
Clooneeny	358	Cutover Bog Industrial peat production commenced at Clooneeny Bog in 1985 and ceased in 2020. Deep peat reserves remain on much of the former production area. Clooneeny is considered a deep peat cutover bog. Pumped bog drainage.	Clooneeny Bog formerly supplied including; horticultural peat and fuel peat for Lough Ree Power Most of the former production area on site is bare peat. Some areas of cutaway on site are developing pioneer cutaway vegetation communities. Bog restoration has been carried out in a bog remnant that was damaged by turf cutting trespass.	2020	Draft 2017

			LCC are proposing an amenity walkway for this bog		
Cloonmore	102	N/A	Never developed for industrial peat production; scattered plots.	N/A	N/A
Cloonshannagh	494	Cutover Bog Industrial peat production commenced at Cloonshannagh Bog in 1985. Deep peat reserves remain across the former production area. Cloonshannagh is considered a deep peat cutover bog.	Cloonshannagh Bog formerly supplied horticultural peat, and fuel peat for Lough Ree Power Restoration work has been carried out on a 38ha section of high bog within Cloonshannagh Bog. Some of the former production area on site is developing pioneer cutaway vegetation communities, the remainder of the site is bare peat	2020	Draft 2017
Cloonshannagh Rail Link	28	Cloonshannagh rail link is a link between sites.	N/A	N/A	N/A
Corlea	163	Cutaway Bog Industrial peat production commenced at Corlea Bog in 1960. Long-term peat extraction has created shallow cutaway. Corlea was a pumped bog. Pumped bog drainage – pumping has ceased.	The former production area at Corlea has already extensively colonised. Pioneer wetland and scrub development has occurred over much of the site. Large wetlands have developed with the cessation of pumping. Some wetland and rehabilitation management was undertaken between 2016-2019. Part of site leased to local community development group to develop amenity walkway in association with Longford County Council. LCC are proposing an amenity walkway for this bog	2018	Finalised 2019
Derraghan	289	Cutover Bog Industrial peat production commenced at Derraghan Bog in the 1940's. Most of the former production area has shallow peat reserves. Some pockets of deep peat remain. Derraghan is considered a shallow peat cutover bog. Pumped bog drainage.	Derraghan Bog formerly supplied fuel peat for Lough Ree Power. Part of the site developed into a licenced ash facility for Lough Ree Power. Much of the former production area at Derraghan has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities. A small area has been used for a BirchWater trail as part of the BnM Herbs Project.	2020	Draft 2017
Derryadd	653	Cutover Bog Industrial peat production commenced at Derryadd Bog in 1960. Long-term peat extraction has left shallow cutaway. Some pockets of deep peat remain. Pumped bog drainage.	Much of the former production area has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities Derryadd Bog is part of the footprint of Derryadd Windfarm for which planning permissions were granted in 2020. An amenity walkway is proposed.	2020	Draft 2019
Derryadd2	328	Cutover Bog Industrial peat production commenced at Derryadd 2 Bog in 1960. Long-term peat extraction has left shallow cutaway. Some pockets of deep peat remain. Pumped bog drainage.	Much of the former production area has been out of peat production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities Derryadd 2 Bog is part of the footprint of Derryadd Windfarm for which planning permissions were granted in 2020. An amenity walkway is proposed.	2020	Draft 2019
Derryarogue	895	Cutaway Bog Industrial peat production commenced at Derryarogue Bog in 1941. Long-term peat extraction has left shallow cutaway. Some pockets of deep peat remain. Pumped bog drainage – pumping has been reduced.	Much of the former production area has been out of production for some time. These areas have already extensively colonised with pioneer wetland, cutaway and scrub vegetation communities. Derryarogue Bog is part of the footprint of Derryadd Windfarm for which planning permissions were granted in 2020. An amenity walkway is proposed.	2020	Draft 2019

Derrycashel	388	Cutaway Bog Industrial peat production commenced at Derrycashel Bog in 1951. Long-term peat extraction has left shallow cutaway. Some pockets of deep peat remain. Pumped bog drainage – pumping has been reduced.	Derrycashel Bog formerly supplied fuel peat for Lough Ree Power Much of the former production area at Derryarogue has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities. Some wetland and rehabilitation management was undertaken (c.60ha) between 2014-2015.	2018	Draft 2021
Derrycolumb	454	Cutaway & Cutover Bog Industrial peat production commenced at Derrycolumb Bog in the 1980's. Most of the former production area still has deep peat reserves. Pumped bog drainage.	Derrycolumb Bog formerly supplied fuel peat for Lough Ree Power Much of the former production area at Derrycolumb has been out of production for some time. These areas have already extensively colonised with pioneer wetland and scrub vegetation communities. LCC are proposing an amenity walkway for this bog	2019	Draft 2021
Derrymoylin	356	Cutover Bog Industrial peat production commenced at Derrymoylin Bog in 1985 and ceased in 2020. This site still has residual deep peat.	Derrymoylin Bog formerly supplied fuel peat for Lough Ree Power. Most of the former production area on site is bare peat.	2020	Draft 2017
Derryshannoge	452	Cutover Bog Industrial peat production commenced at Derryshannoge Bog in 1985 and ceased in 2020. This site still has residual deep peat. Pumped bog drainage.	Derryshannoge Bog formerly supplied fuel peat for Lough Ree Power. Much of the former production area at Derryshannoge has been out of production for some time. These areas have already extensively colonised with pioneer cutaway and scrub vegetation communities.	2020	Draft 2017
Edera	281	Cutover Bog Development for industrial peat production commenced at Edera Bog in 1990's. Active extraction from Edera began in 2003 and ceased in 2018. This site still has residual deep peat.	Edera Bog formerly supplied fuel peat for Lough Ree Power. The majority of the former production area is bare peat. LCC are proposing an amenity walkway for this bog	2020	Draft 2021
Erenagh	93	Cutover Bog Development for industrial peat production commenced at Erenagh Bog in 1970's. This site still has residual deep peat. Pumped bog drainage.	Erenagh Bog formerly supplied; fuel peat for Lough Ree Power. Much of the former production area has been out of production for some time. These areas have already extensively colonised with pioneer cutaway and scrub vegetation communities.	2020	Draft 2017
Granaghan	212	Cutover Bog Development for industrial peat production commenced at Granaghan Bog in 1980's. This site still has residual deep peat. Pumped bog drainage.	Granaghan Bog formerly supplied horticultural peat, and fuel peat for Lough Ree Power. The majority of Granaghan Bog former production area is bare peat.	2020	Draft 2017
Killashee	110	Cutover Bog Development for industrial peat production commenced at Killashee Bog in 1985. This site still has residual deep peat.	Killashee Bog formerly supplied horticultural peat, and fuel peat for Lough Ree Power. The majority of Killashee Bog former production area is bare peat. Some areas have colonised with pioneer cutaway and scrub vegetation communities.	2020	Draft 2017
Knappoge	313	Cutaway Bog Peat Production at Knappoge bog commenced in 1963. Peat depths on the former production area are generally shallow. Pumped bog – pumping has now been stopped	Knappoge Bog formerly supplied fuel peat for Lough Ree Power. The majority of Knappoge Bog former production area is bare peat. Some areas have colonised with pioneer cutaway and scrub vegetation communities. Ceasing pumping has created large wetlands. An amenity trackway is under construction.	2018	Draft 2021
Lough Bannow	739	Cutaway Bog Peat Production at Lough Bannow bog commenced in the 1960's,. Peat depths on the former production area are generally shallow.	Much of the former production area at Lough Bannow has been out of production for some time. These areas have already extensively colonised with pioneer cutaway and scrub vegetation communities.	2020	Draft 2019

		Pumped bog	A small (35ha) conifer plantation was established in 1980's by Coillte. Lough Bannow is part of the footprint of Derryadd Windfarm for which planning permissions were granted in 2020. An amenity walkway is proposed.		
Moher	483	Cutover Bog Peat Production at Moher bog commenced in the 1960'S.. Peat depths on the former production area remain relatively deep. Pumped bog drainage.	Moher Bog formerly supplied fuel peat for Lough Ree Power. Much of the former production area is bare peat	2020	Draft 2017
Mount Dillon	592	Cutaway Bog Peat Production at Mount Dillon bog commenced in the 1940'S. Peat depths on the former production largely shallow. Pumped bog	Mount Dillon Bog formerly supplied fuel peat for Lough Ree Power. Much of the former production area at Mount Dillon has been out of production for some time. These areas have already extensively colonised with pioneer cutaway, wetland and scrub vegetation communities.	2020	Draft 2017

Table Ap-2b: Mount Dillon Bog Group names, area and indicative status (Mostrim sub-group).

Bog Name	**Area (ha)**	**Stage of development**	**Land-Use and History**	**Peat Production Cessation**	**Rehab Plan Status**
Clonwhelan	212	Development Bog. Clonwhelan Bog was drained in the 1980's but never brought into commercial peat production. Clonwhelan is a deep peat development bog.	Rehabilitation complete Raised bog restoration completed 2019	N/A	Finalised 2018
Clynan	402	Development Bog. Clynan Bog was drained in the 1980's. Sod peat production occurred around the margins and over a portion of the site.	Clynan Bog formerly supplied horticultural peat (sod moss) & fuel turf. Some rehabilitation work has been carried out on Clynan bog East already to buffer an undrained bog remnant. Raised bog restoration potential.	2020	Draft 2017
Coolcraff	412	Cutover Bog Industrial peat production commenced at Coolcraff Bog in the 1980's. The site was developed for milled peat production 2015-2018. Deep peat reserves remain over the majority of the former production area.	Coolcraff Bog formerly supplied a range of commercial functions including; horticultural peat. Much of the former production area at Coolcraff is bare peat. One section of high bog to the north or site was excluded from production and so never developed on the basis of high conservation value raised bog habitat.	2020	Draft 2017
Coolnagun	668	Cutaway Bog Industrial peat production commenced at Coolnagun Bog in 1941. Coolnagun is considered a deep peat cutover bog with areas of shallow cutaway.	Coolnagun Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat for Lough Ree Power. Much of the former production area at Coolnagun is bare peat. Some small patches of pioneer cutaway vegetation communities are developing. Some bog restoration work was undertaken already along the eastern margin.	2020	Draft 2017

Glenlough	328	Development bog Glenlough Bog was first developed in the 1980's. It was re-ditched in 2003-2005. Only a small part of the bog was fully brought into peat production for sod peat. Deep peat reserves remain over the majority of the former production area. Some of the bog has never been subject to commercial peat extraction.	Glenlough Bog formerly supplied a range of commercial functions including; horticultural pea. Degraded high bog vegetation remains over the majority of the bog. The former production area is a mosaic of vegetation. This site has raised bog restoration potential.	2020	Draft 2020
Milkernagh	627	Cutover Bog Industrial peat production commenced at Milkernagh Bog in 1950. Long-term peat extraction has created shallow cutaway in places. Deep peat reserves remain in parts on the former production area. Milkernagh is considered cutover bog with variable peat depths. Milkernagh has a pumped drainage regime.	Milkernagh Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat for Lough Ree Power. Much of the former production area at Milkernagh is bare peat. Pioneer cutaway vegetation communities are developing in places.	2020	Draft 2017
Mostrim	442	Development Bog/Cutover Bog The majority of Mostrim was drained but never developed. Industrial peat production commenced in parts of Mostrim Bog in the 1980's. Peat extraction has significantly affected parts of this bog but deep peat reserves remain on the former production area.	Mostrim Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat for Lough Ree Power. Raised bog restoration at Mostrim is ongoing with > 50% completed in Jan 2021.	2020	Finalised 2020

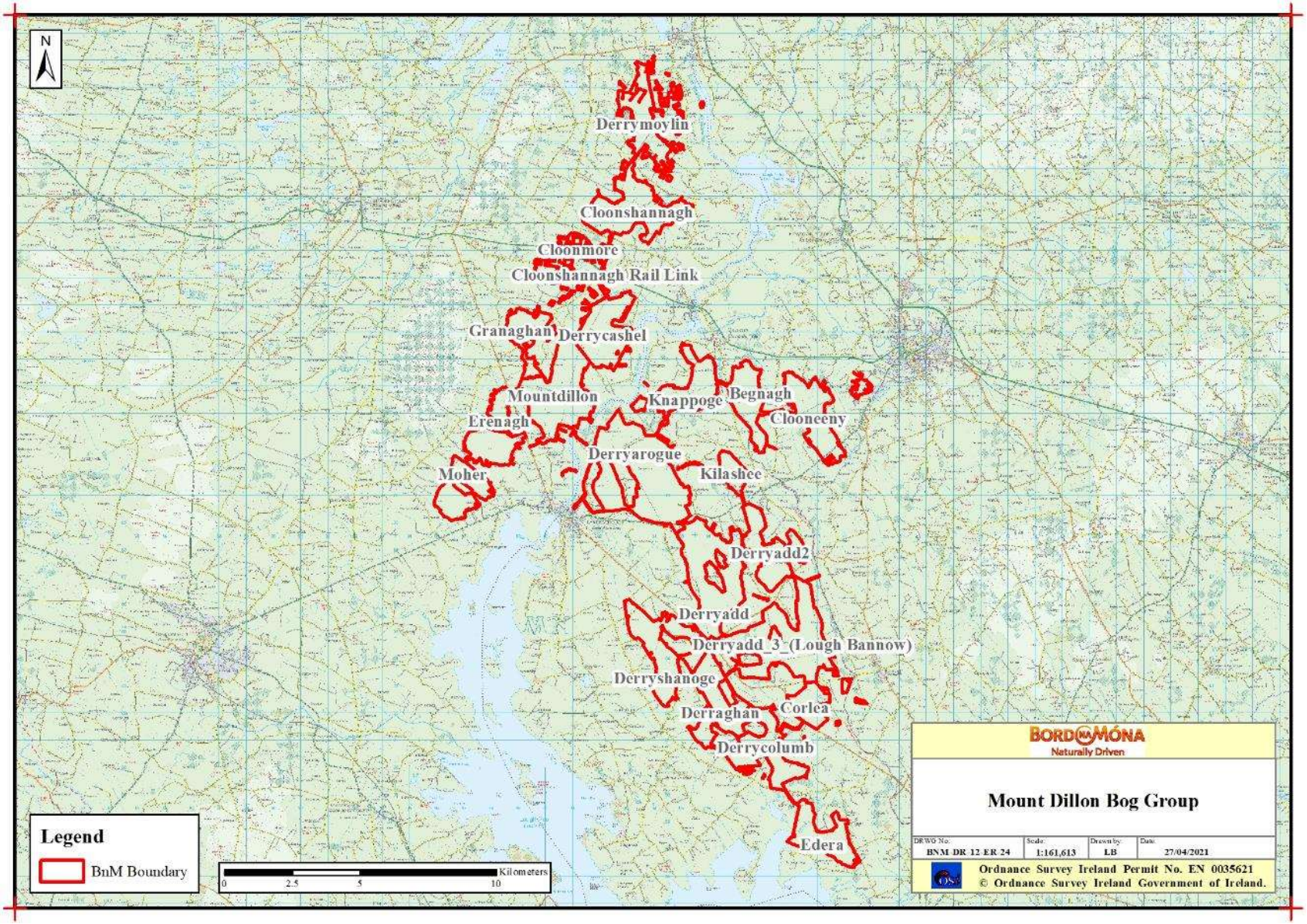


Figure Ap-2: Mount Dillon Bog Group

APPENDIX III: ECOLOGICAL SURVEY REPORT

Ecological Survey Report

Note: This report outlines an ecological survey of the bog. This report should not be taken as a management plan for the site as other land-uses may still be considered. Information within this report may inform the development of other land-uses and identify areas with particular biodiversity value.

Bog Name:	**Derrycolumb**	**Area (ha):**	458ha
Works Name:	Mount Dillon	**County:**	Longford
Recorder(s):	BnM Ecology Section	**Survey/ monitoring Date(s):**	19th & 23rd July 2012 September 2012 March 2013

Habitats present (in order of dominance)

The most common habitats present at this site include:

- Bare peat (BP) (Codes refer BnM classification of pioneer habitats of production bog.
- Pioneer dry heath communities (dHeath)
- Silt Ponds (Silt) with associated habitats such as scrub, Bracken, rank grassland (GS2), dry calcareous grassland (gCal) and typical pioneer communities of disturbed areas (disTuss).

The most common habitats present around the margins at this site include:

- Birch woodland (WN7) (Codes refer to Heritage Council habitat classification, Fossitt 2000),
- Scrub (WS1) (Gorse scrub and Birch scrub developing of dry high bog around margins)
- Raised bog (PB1)
- Cutover bog (PB4) (several small fragments)
- Wet grassland (GS4).

Description of site

Derrycolumb Bog is located approximately 9.5km to the west of Ballymahon in County Longford. This site is located within three main sections that are divided by minor public roads. Derraghan Bog is located immediately adjacent to two sections of the site and a rail link connects Derrycolumb Bog with Derraghan Bog to the north and Edera Bog to the south. The overall majority of the site is in active industrial peat production. The peat is used as fuel peat in Lough Ree Power in Lanesborough. Derrycolumb Bog has been in full industrial peat production to supply Lough Ree Power. A number of pumps are located on the site.

Derrycolumb Bog is divided in three main sections – south-eastern, mid and northern-western sections. These sections are separated by minor public roads.

The south/eastern section of the site contains the deepest peat reserves of between 1.1m and 2.6m of peat, a large proportion of which is “red” or “Sphagnum” peat. A small area in the south eastern corner of this section is within the area that is designated as the Derry Lough pNHA. The pNHA consists of wet grassland, fen, fen woodland and open water; there is no production bog within the pNHA. The boundary of this section of the site contains a section of raised bog that includes a small number of active areas. This area contains Heather, Purple Moor Grass, Bog Asphodel, Bog Cotton, sun dew (including *Drosera intermedia*) and Deer Grass along with *Sphagnum magnellicum*, *S. subnitens* and *S. papillosum*. A silt pond and a section of Birch woodland is also located in this area. The southern boundary of the site has a small area of remnant raised bog that is used for domestic turf cutting. A river flows along the northern boundary of the site and a berm was constructed along a section of the river in 2010 in order to prevent the site from flooding in times of high flow.

The mid-section of the site is the largest portion of the site and this area curves around a section of farmland that is located to the north. The majority of this section is in active industrial peat production however a section of cutaway has emerged in recent years. These areas of cutaway are becoming vegetated by a mix of emergent Soft Rush along with Birch and Willow.

The north/western section of the site has been in industrial peat production for a number of years and the centre of this section has been cutaway and is becoming vegetated with Soft Rush and Marsh Arrow Grass. A relatively large section of Birch woodland is located in the southern section of the site and is made up of Birch and Willow. There has been some dumping of construction waste and old cars in this area.

Other habitats along the margins of the site include Birch woodland, wet grassland, dry heath and cutover bog. Overall, large areas of the site contain less than 2m of peat and contain exposed marl and gravel; however some areas of the bog are young in terms of industrial peat production and still retain a dome and "red" or "Sphagnum" peat. A number of pumps are situated around the site and are used to prevent flooding.

Designated areas on site (cSAC, NHA, pNHA, SPA other)

- Derry Lough pNHA (site code- 001444) overlaps with the boundary of the south eastern corner of the site.

Adjacent habitats and land-use

Adjacent habitats include lowland depositing river (FW2), wet grassland (GS4), improved agricultural grassland (GA1)(deer farm), cutaway bog (PB4), Conifer plantation and raised bog (PB1).

Watercourses (major water features on/off site)

- Tributaries of the Bilberry River are located along the northern and southern boundaries of the site.
- The site is within the Shannon region.

Peat type and sub-soils

Some sections of the site contain in excess of 2.6m of peat, however the majority of the site contains less than 2m of peat with considerable areas of the site at a point where they are cutaway or almost cutaway.

Fauna biodiversity

Birds

Several bird species were noted on the site during the survey.

- Common species observed at the site include Grey Heron, Grey Crow, Robin, Blackbird and Raven.

Mammals

Signs of several mammal species were noted on the site during the survey.

- Fox
- Badger
- Pine Marten
- Otter

Other species

Green Veined White, Small Heath, Painted Lady, Wall Brown, Small Copper and Meadow Brown Butterflies.
References Cross, J.R. 2006. The Potential Natural Vegetation of Ireland. Biology and Environment: Proceeding of the Royal Irish Academy, Vol. 106B, No. 2, 65-116 (2006). European Commission (2013). Interpretation manual of European Union Habitats. European Commission DG Environment Nature ENV B.3. Fossitt, J. (2000). A guide to habitats in Ireland. Kilkenny. The Heritage Council. NRA (2009). Guidelines for Assessment of Ecological Impacts of National Road Schemes (Revision 2). National Roads Authority.

APPENDIX IV. ENVIRONMENTAL CONTROL MEASURES TO BE APPLIED TO BOG REHABILITATION

- Bog restoration/rehabilitation measures will be restricted to within the footprint of the proposed rehabilitation area.
- The proposed rehabilitation will have due regard to noise limits and hours of operation (i.e. dusk and dawn) to minimise any potential disturbance on resident and local fauna that utilise the site and immediate environs.
- All plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (SI 359/1996).
- The proposed activities will be restricted to daylight hours and there will be no requirement for artificial lighting.
- Silt ponds will be inspected and maintained as per the IPC Licence.
- During periods of heavy precipitation and run-off, activities will be halted.
- Measures will be carried out using a suitably sized machine and in all circumstances, excavation depths and volumes will be minimised where possible.
- All machines will be regularly checked and maintained prior to arrival at the site to prevent hydrocarbon leakage.
- Hoses and valves will be checked regularly for signs of wear and will be closed and securely locked when not in use.
- Fuelling and lubrication of equipment shall only be carried out in designated areas away from surface water drainage features and ecologically sensitive areas.
- Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling.
- Vehicles will never be left unattended during refuelling.
- No direct discharges to waters will be made. No washings from vehicles, plant or equipment will be carried out on site.
- All plant refuelling will take place using mobile fuel bowsers. Only dedicated trained and competent personnel will carry out refuelling operations.
- Mobile storage such as fuel bowsers will be bunded to 110% capacity to prevent spills. Tanks for bowsers and generators shall be double skinned. When not in use, all valves and fuel trigger guns from fuel storage containers will be locked. All pumps using fuel or containing oil will be locally and securely bunded where there is the possibility of discharge to waters.
- Potential impacts caused by spillages etc. during rehabilitation will be reduced by keeping spill kits and other appropriate equipment on-site.
- Site activities will be carried out in accordance with 'best practice'. In order to ensure compliance and implementation of 'best practice', these measures will be communicated to relevant Bord na Móna staff and updated as required.

APPENDIX V. BIOSECURITY

No invasive flora species have been recorded at Derrycolumb Bog.

The potential for importation or introduction of non-native plant species (such as Japanese Knotweed, Himalayan Balsam, etc.) during future rehabilitation management, such as drain-blocking using excavators, has the potential to result in the establishment of invasive species within the site. Section 49 of the European Communities (Birds and Natural Habitats) Regulations 2011 prohibits the introduction and dispersal of invasive alien species (particularly plant species) listed on Part 1 (third column) of the 'Third Schedule'.

This section aims to reduce the risk from, and impacts of, invasive species and protecting biodiversity on lands under Bord na Móna ownership. Rehabilitation and decommissioning in the bog will have due regard to the relevant biosecurity measures outlined below:

- Records of problematic invasive species within the various bog units will be marked out with signs to highlight areas of infestation to personnel.
- All plant machinery will be restricted from disturbing known colonies of invasive species.
- All plant machinery will avoid unnecessary crossings to adjoining lands.
- Good site hygiene will be employed to prevent the introduction and spread of problematic invasive alien plant species (i.e. Japanese Knotweed (*Fallopia japonica*), Himalayan Balsam (*Impatiens glandulifera*), Himalayan Knotweed (*Persicaria wallichii*), etc.) by thoroughly washing vehicles prior to entering the area.

The biosecurity measures outlined above are in line with best practice guidelines issued by the National Roads Authority (NRA, 2010) – The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads and broadly based on the Environment Agency's (2013) – The Knotweed Code of Practice: Managing Japanese Knotweed on Development Sites (Version 3, amended in 2013, accessed on the Environment Agency's website on the 11th of July 2016).

In addition to the above, Best Practise measures around the prevention and spread of Crayfish plague[6] and any other aquatic based IAS will be adhered with throughout all rehabilitation measures and activities.

[6] https://www.biodiversityireland.ie/projects/invasive-species/crayfish-plague/

APPENDIX VI. POLICY AND REGULATORY FRAMEWORK

Bord na Móna Plc is a publicly owned company, originally established in 1934 to develop some of Ireland's extensive peat resources for the purposes of economic development and to support energy security, In the decades since its establishment the company has employed tens of thousands of people in its fuel, energy, and horticultural growing media businesses. For much of its history the company's support of important national policy aims has been enabled and encouraged in a variety of ways by Government.

Today, Bord na Móna is undertaking a number of highly significant actions in support of climate policy. These actions involve a radical transformation and decarbonisation of nearly the entire Bord na Móna business. This transformation will be driven by unlocking the full potential of our land and creating significant value for Ireland and the Midlands in particular. Bord na Móna have now announced the complete cessation of industrial peat production across its estate (January 2021).

Bord na Móna is an integral part of the economic, social, and environmental fabric of Ireland and Irish life. As a key employer in the Midlands, the company is conscious that its obligations go beyond purely commercial and environmental – there is also a social responsibility to employees and the communities served by Bord na Móna. It is the company's role and absolute priority to ensure that its long-term strategy delivers on all of these important areas in a robust and balanced way.

There are a wide range of policies, plans, legislation and land designations that inform the development of this Bord na Móna peatland rehabilitation plan. Bord na Móna have also developed and operate various policies and strategies that also inform the development of this rehabilitation plan.

1 EPA IPC Licence

Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Mount Dillon bog group (Ref. PO-504-01). As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the boglands within the licensed area. The bog is part of the Mount Dillon Bog group. This regulatory requirement is the main driver of the development of this rehabilitation plan.

2 The Peatlands Climate Action Scheme (PCAS)

Bord na Móna (BnM) appreciates the Minister's intention to support, via the Climate Action Fund, Bord na Móna in developing a package of measures, 'the proposed Scheme', for the enhanced decommissioning, rehabilitation and restoration of cutaway peatlands, referred to as the 'Peatlands Climate Action Scheme'. The enhanced decommissioning, rehabilitation and restoration of the peatlands funded by the proposed Scheme will deliver benefits across climate action (GHG mitigation through reduced carbon emissions and acceleration towards carbon sequestration), enrich the State's natural capital, increase eco-system services, strengthen biodiversity, improve water quality and storage attenuation as well as developing the amenity potential of the peatlands.

It is envisaged that Bord na Móna carry out an enhanced decommissioning, rehabilitation and restoration scheme, (PCAS), across a footprint of 33,000 ha. This proposed scheme will significantly go beyond what is required to meet rehabilitation and decommissioning obligations under existing EPA IPC licence conditions. Interventions and measures supported by the Scheme will ensure that environmental stabilisation is achieved (meaning IPC obligations are met), and importantly, significant additional benefits, particularly relating to climate action and other ecosystem services, will also be delivered. However, only the costs associated with the additional and

enhanced measures, i.e., those which go beyond the existing decommissioning and rehabilitation requirements arising from Condition 10, will be eligible for support under the proposed Scheme.

3 National Climate Policy

The National Policy Position establishes the fundamental national objective of achieving a transition to a competitive, low carbon, climate-resilient and environmentally sustainable economy by 2050. It sets out:

- the context for the objective;
- clarifies the level of GHG mitigation ambition envisaged; and
- establishes the process to pursue and achieve the overall objective.

The evolution of climate policy in Ireland will be an iterative process based on the adoption by government of a series of national plans over the period to 2050. GHG mitigation and adaptation to the impacts of climate change are to be addressed in parallel national plans – respectively through the National Climate Action Plan. The plans will be continually updated, as well as being reviewed on a structured basis at appropriate intervals and, at a minimum, every five years. This will include early identification and ongoing updating of possible transition pathways to 2050 to inform sectoral strategic choices.

Bord na Móna is following a decarbonisation programme aimed at reducing the carbon emissions from its activities. The company aims to further develop renewable energy and resource recovery markets with a key objective of reducing the carbon intensity of all products. In addition, the carbon emission mitigation benefits associated with the post-peat extraction rehabilitated peatland following re-wetting, revegetation and colonisation of significant areas with native woodland will make a significant contribution to achieving the State's carbon emission reduction targets.

4 National Peatlands Strategy

The National Peatlands Strategy (2015) contains a comprehensive list of actions, necessary to ensure that Ireland's peatlands are preserved, nurtured and become living assets within the communities that live beside them. It sets out a cross-governmental approach to managing issues that relate to peatlands, including compliance with EU environmental law, climate change, forestry, flood control, energy, nature conservation, planning, and agriculture. The Strategy has been developed in partnership between relevant Government Departments/State bodies and key stakeholders through the Peatlands Council.

The strategy recognises that Ireland's peatlands will continue to contribute to a wide variety of human needs and to be put to many uses. It aims to ensure that Ireland's peatlands are sustainably managed so that their benefits can be enjoyed responsibly. It aims to inform appropriate regulatory systems to facilitate good decision making in support of responsible use. It also aims to inform the provision of appropriate incentives, financial supports and disincentives where required. The strategy attempts to strike an appropriate balance between different needs, including local stakeholders like turf-cutters and semi-state bodies such as Bord na Móna.

In line with a National Peatlands Strategy recommendation, a Peatlands Strategy Implementation Group (PSIG), was established, assisted in the finalisation of the Strategy, is overseeing subsequent implementation and will report to Government on an annual basis on the implementation of the actions and principles contained within the Strategy.

Bord na Móna is a key stakeholder in the National Peatlands Strategy and the Peatlands Strategy Implementation Group. The strategy recognises the potential for some Bord na Móna sites to be restored and to contribute to the national SAC and NHA network of protected raised bog sites. The strategy also recognises the various different values of cutaway bog and developed six key principles (with Bord na Móna) for the after-use of cutaway bog.

- Bord na Móna will continue to assess and evaluate the potential of the company's land bank, using a land use review system. The assessment will help prepare a set of evidence based management plans for the various areas of peatland. These plans will also inform its cutaway bog rehabilitation.
- The policy of Bord na Móna is not to open up any undrained new bogs for peat production.
- Lands identified by Bord na Móna as having high biodiversity value and/or priority habitats will be reserved for these purposes as the principal future land use.
- Generally, Bord na Móna cutaway bogs that flood naturally will be permitted to flood unless there is a clear environmental and/or economic case to maintain pumped drainage.
- In deciding on the most appropriate afteruse of cutaway peatlands, consideration shall be given to encouraging, where possible, the return to a natural functioning peatland ecosystem.
- This will require re-wetting of the cutaway peatlands which may lead in time to the restoration of the peatland ecosystem.
- Environmentally, socially and economically viable options should be analysed to plan the future use of industrial cutaway peatlands, in conjunction with limiting factors as outlined in Bord na Móna's Strategic Framework for the Future Use of Peatlands.

The National Peatlands Strategy highlights the importance and value of developing peatland rehabilitation plans for Bord na Móna cutaway sites and implementing this peatland rehabilitation.

5 National River Basin Management Plan 2018-2021 (Water Framework Directive)

The National River Basin Management Plan (2018-2021) (Department of Housing, Planning, Community and Local Government 2017) is the key national plan for Ireland to achieve the objectives of the Water Framework Directive (WFD). In broad terms, the objectives of the WFD are (1) to prevent the deterioration of water bodies and to protect, enhance and restore them with the aim of achieving at least good status and (2) to achieve compliance with the requirements for designated protected areas.

The NRBMP outlines how peat extraction can be a potentially significant pressure on various water quality parameters. Peatland rehabilitation of Bord na Móna cutaway (in addition to other measures) is part of the WFD (2018-2021) programme of measures. The NRBMP takes account of the fact that Bord na Móna is in the process of phasing out the extraction of peat for energy production, that it set a target to rehabilitate 9,000 ha of cutaway bogs (covering 25 peatlands) by 2021 (in 2018) and will look to implement best-available mitigation measures to further reduce water quality impacts caused by peat extraction while the phasing-out process is taking place. This NRBMP rehabilitation target is set to be superseded by the acceleration of the Bord na Móna de-carbonisation programme and the proposed Scheme **(PCAS)**.

The development of 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 NWBMP deliver its objectives in relation to the Water Framework Directive and is one of the five key principle actions.

6 National Biodiversity Action Plan 2016-2021

The National Biodiversity Action Plan 2016-2022 has a vision that biodiversity and ecosystems in Ireland are conserved and restored, delivering benefits essential for all sectors of society and that Ireland contributes to efforts to halt the loss of biodiversity and the degradation of ecosystems in the EU and globally. Ireland's 2nd National Biodiversity Action Plan outlines the main policies, strategies, actions and targets in relation to biodiversity. This plan has several Bord na Móna specific objectives and actions including implementing the BnM Biodiversity Action Plan 2016-2021 and overlaps with both the National Peatlands Strategy and the National Raised Bog Special Areas of Conservation Management Plan 2017-2022.

7 National conservation designations

Bord na Móna operates in a wider landscape that also includes a network of European and National nature conservation sites (Special Areas of Conservation (SACs), Special Protection Areas (SPAs), National Heritage Areas (NHAs, cNHAs) and National Nature Reserves). Bord na Móna will take account of this network of conservation objectives and their conservation objectives when developing these rehabilitation plans. It is expected that peatland rehabilitation will, in general, benefit the conservation objectives of this network of nature conservation sites.

8 National Raised Bog Special Area of Conservation Management Plan 2017-2022.

The National Raised Bog Special Area of Conservation Management Plan 2017-2022 sets out a roadmap for the long-term management, restoration and conservation of protected raised bogs in Ireland. The Plan strikes an appropriate balance between the need to conserve and restore Ireland's raised bog network as part of Ireland's commitments towards the EU Habitats Directive, and the needs of stakeholders and gives recognition to the important role that communities have to play in the conservation and restoration of raised bogs. The National Raised Bog Special Areas of Conservation (SACs) Management Plan 2017-2022 is part of the measures being implemented in response to the on-going infringement action against Ireland in relation to the implementation of the EU Habitats Directive, with regard to the regulation of turf cutting on the Special Areas of Conservation (SACs). The then Minister for Arts, Heritage and the Gaeltacht, also published a **Review of Raised Bog Natural Heritage Area Network** in 2014.

Bord na Móna has played a key role in the development of the National Raised Bog Special Area of Conservation Management Plan 2017-2022 and the Review of the Raised Bog Natural Heritage Area Network. Several Bord na Móna sites were assessed by the National Parks and Wildlife Service as part of the above Plan and Review and there is an expectation that several Bord na Móna sites will be designated as SACs and NHAs in the future. This will reinforce the network of protected raised bog sites and replace in part sites that will be de-designated as they have been deemed to be significantly damaged and are deemed to have no raised bog restoration prospects.

Bord na Móna has also responded to the needs of the NRBMP and provided several sites to the government for the relocation of turf-cutters from SACs. This is part of a suite of ongoing bog conservation measures in the NRBMP to manage turf-cutting in protected sites. Bord na Móna and the National Parks and Wildlife Service continues to engage regarding the ongoing relocation of turf-cutters from protected raised bog sites.

9 All-Ireland Pollinator Plan 2015-2020

The All-Ireland Pollinator Plan 2015-2020 outlines key objectives and actions to protect and support pollinating insects and the habitats they rely on. There are several Bord na Móna specific actions in this plan including the adoption of pollinator-friendly management within the Bord na Móna network of sites. One action to help achieve this objective is habitat rehabilitation and restoration, where possible, of pollinator-friendly habitats, including peatland habitats.

10 Land-use planning policies

As Bord na Móna operates in many counties across Ireland, it is important to note the respective development plans in these counties. Many of the existing development plans recognise the potential that exists in the after-use of cutover/cutaway peatlands. Bord na Móna seeks to work with all of the relevant local authorities to ensure that the most appropriate after-uses are reflected in local planning policy. The following areas of consistent importance are of both direct and indirect relevance to Bord na Móna: heritage, tourism, biodiversity/conservation, landscape, wind energy, and economy/enterprise.

Derrycolumb Bog is located in an area zoned by Longford County Council as open countryside[7].

11 National Archaeology Code of Practise

Bord na Móna operates under an agreed Code of Practice regarding archaeology with the Department of Arts, Heritage and the Gaeltacht and the National Museum of Ireland which provides a framework to enable the Company to progress peat extraction whilst carrying out archaeological mitigation.

The Code replaced a set of Principles agreed with the Department of Arts, Heritage and the Gaeltacht in the 1990s. Under the Code Bord na Móna, the Minister and Director work together to ensure that appropriate archaeological mitigation is carried out in advance of peat extraction.

- BNM must ensure that any monuments or archaeological objects discovered during peat extraction are protected in an appropriate manner by following the Archaeological Protection Procedures.
- BNM must ensure that any newly discovered monuments on Bord na Móna lands are reported in a timely manner to the National Monuments Service of the Department of Arts, Heritage and the Gaeltacht.
- BNM must ensure that any archaeological objects discovered on Bord na Móna lands are reported immediately to the Duty Officer of the National Museum of Ireland.
- Bord na Móna will endeavour to adhere to this code of practise during the peatland rehabilitation phase and appropriate archaeology mitigation is carried out before and during cutaway peatland rehabilitation. An Archaeological Impact Assessment is being carried out for the proposed rehabilitation at this site (Appendix IX). The recommendations of this assessment have been incorporated into the rehabilitation plan to minimise impacts on known archaeology. In addition, Bord na Móna will adhere to the Archaeology Code of Practise relating to management of stray archaeological finds that may arise during cutaway peatland rehabilitation and decommissioning.

[7] http://www.longfordcoco.ie/services/planning/development-plan-2015-2021/longford-cdp-2015-2021-written-statement.pdf

12 Bord na Móna Biodiversity Action Plan 2016-2021

Rehabilitation of industrial peatlands is a key objective of the Bord na Móna Biodiversity Action Plan 2016-2021. This action plan outlines the main objectives and actions around biodiversity on Bord na Móna lands. The Bord na Móna Biodiversity Action Plan also outlines key International and European policy in relation to biodiversity. This includes the **United Nations Convention on Biodiversity 2011-2020 (CBD)** and **European Biodiversity Strategy to 2020**. Further details of these policies and Bord na Mónas responses can be found in the Bord na Móna Biodiversity Action Plan (Bord na Móna 2016). Both policy documents highlight targets such as reducing pressure on biodiversity, promoting sustainability, habitat restoration and benefits of ecosystem services.

One example of a key CBD target is:

- *"Restore at least 15% of degraded areas through conservation and restoration activities."*

The EUs headline target for progress by 2020 is to:

- *"halt the loss of biodiversity and the degradation of ecosystems in the EU by 2020, restore them as far as feasible, while stepping up the EU contribution to averting global biodiversity loss."*

The Derrycolumb Bog Rehabilitation Plan is aligned to the CBD target and the EU Biodiversity Strategy target and will help Ireland meet its commitment to these international Biodiversity polices.

13 Bord na Móna commitments

Bord na Móna made the commitment in 2009 not to develop any new peatland sites for industrial peat production. The company has continued to work with different stakeholders.

The company announced that peat production would be cut by over 50 percent in 2019 and would entirely cease over most of its lands by the mid-2020s. Rehabilitation measures will continue to be carried out with the focus on re-wetting and rehabilitation of cutover and cutaway areas in line with national policies (such as the National Peatland Strategy, the National Biodiversity Action Plan, the Climate Action Plan 2019, the Water Framework Directive, etc.) and rehabilitation guidelines set down by the Environmental Protection Agency. To date, 15,000 hectares of cutaway and cutover bog have been rehabilitated using this approach with 5,000 hectares in active rehabilitation.

In line with Bord na Móna's accelerated decarbonisation programme, the company has also committed to a significantly larger rehabilitation target. This is reflected in our plans to rehabilitate a further 20,000 hectares of cutaway and cutover bog to wetland and woodland mosaics by 2025. In addition, we plan to restore a further 1,000 hectares of raised bog habitat by 2025. These targets are significant in both timing and scale and are indicative of Bord na Móna's increased new ambition in this area.

These commitments outline the importance of peatland rehabilitation to Bord na Móna. The company will continue to demonstrate environmental responsibility and continue to deliver on these commitments in relation to peatland rehabilitation and in relation to the future management of these lands to maximise their benefits, particularly their ecosystem service benefits, along with the sustainable development of a portion of the land bank for other uses.

14 Bord na Móna Strategic Framework for the future use of cutaway peatlands 2020

The general after-use strategy of Bord na Móna is outlined in the Bord na Móna Strategic Framework for Future-Use of Cutaway Bogs 2020. This document outlines how Bord na Móna's cutover peatland estate is complex in nature with great variability in terms of peat depths, peat types, drainage, subsoil condition and environmental value. Thus, future options require consideration on a site-specific basis, also bearing in mind the considerable internal variation within bogs. The development of the land-bank will also take account of national needs, while also taking account of the various national legislation, policies and plans related to the management of peatlands. In general, Bord na Móna will seek to balance and optimise commercial, social, and environmental value of these sites, while taking account of the need for sustainability and their biodiversity value.

Any consideration of other future after-uses for Bord na Móna land such as development or other mixed uses will be conducted following the relevant planning guidelines and consultation with relevant authorities and will be considered within the framework of this peatland rehabilitation plan.

APPENDIX VII. DECOMMISSIONING

1. Condition 10 Decommissioning

This is a requirement of the applicable Integrated Pollution Control Licence issued by the Environmental Protection Agency. This condition 10.1 requires the following:

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.

The main success criteria pertaining to successfully complying with this condition is ensuring that no environmental liability remains from this infrastructure and material and that the bog can be deemed suitable for surrender of the licence under section 95 of the EPA Acts. This is achieved by Bord na Móna identifying and quantifying any mechanical and infrastructural resources that were installed in the bog to enable the development and production operation at the site. This list is then refined to identify any items that would be deemed as possibly resulting in environmental pollution, should they not be removed.

Typically, these items/infrastructures would be any remaining, unconsolidated plant, equipment and attachments, waste materials, unused raw materials such as land drainage pipes, remaining peat stockpiles, stock pile covering, pumps, septic tanks and fuel tanks.

In relation to this bog, the list and tasks would be as follows:

Item	Description	Derrycolumb Decommissioning Plan
1	Clean-up of remaining or unconsolidated waste or materials located in Bogs, Yards, Buildings and Offices	Clean-up of Bog
2	Cleaning Silt Ponds	Cleaning Silt Ponds
3	Decommissioning Peat Stockpiles	Peat Stockpile Management via Levelling
4	Decommissioning or Removal of Buildings and Compounds	Not relevant
5	Decommissioning Fuel Tanks and associated facilities	Decommissioning and De-Gassing Mobile Fuel Tanks
6	Decommissioning and Removal of Bog Pump Sites	Where feasible
7	Decommissioning or Removal of Septic Tanks	De-sludge Septic Tank

In addition, condition 7 of the licence requires these now defined waste items to be disposed of or recovered as follows:

7.1 Disposal or recovery of waste shall take place only as specified in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* of this licence and in accordance with the appropriate National and European legislation and protocols. No other waste shall be disposed of/recovered either on-site or off-site without prior notice to, and prior written agreement of, the Agency.

7.2 Waste sent off-site for recovery or disposal shall only be conveyed to a waste contractor, as agreed by the Agency, and only transported from the site of the activity to the site of recovery/disposal in a manner which will not adversely affect the environment.

7.3 A full record, which shall be open to inspection by authorized persons of the Agency at all times, shall be kept by the licensee on matters relating to the waste management operations and practices at this site. This record shall as a minimum contain details of the following:

7.3.1 The names of the agent and transporter of the waste.

7.3.2 The name of the persons responsible for the ultimate disposal/recovery of the

waste.

7.3.3 The ultimate destination of the waste.

7.3.4 Written confirmation of the acceptance and disposal/recovery of any hazardous waste consignments sent off-site.

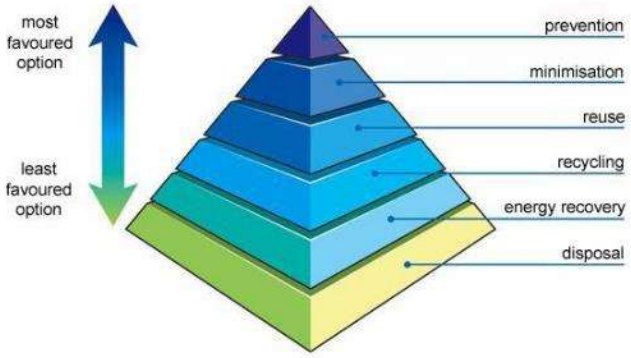
7.3.5 The tonnages and EWC Code for the waste materials listed in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* sent off-site for disposal/recovery.

7.3.6 Details of any rejected consignments.

A copy of this Waste Management record shall be submitted to the Agency as part of the AER for the site.

As required by the licence, these waste items will be removed for recycling or disposal, using external contractors with the required waste collection permits, approved under 7.2, with waste records maintained as required under 7.3.

Where possible, Bord na Móna will utilize the appropriate waste hierarchy to identify waste that can reused or recycled ahead of disposal.



The validation of the success of condition 10.1 is carried out through an Independent Closure Audit (ICA), followed by and EPA Exit Audit (EA) and the eventual partial or full surrender of the licence.

2. Enhanced Decommissioning.

The remaining infrastructure does not constitute a risk to the environment and would not be a requirement of condition 10 of the licence. The removal of these are deemed as enhanced measures. These may enhance the future afteruse of the bog for amenity value, security against access for illegal and unsocial activities and general State and community benefit. In relation to this bog, this would include the infrastructure defined below:

Item	Enhanced Decommissioning Type	Derrycolumb Decommissioning Plan
1	Removal of Railway Lines	Removal of Railway Lines
2	Decommissioning Bridges and Underpasses	Not Applicable
3	Decommissioning Railway Level Crossing	Decommissioning Railway Level Crossing
4	Restricting Access (bogs and silt ponds)	Restricting Access to Bog.
5	Removal of High Voltage Power Lines	Where feasible

APPENDIX VIII. GLOSSARY

Cutaway Bog: A Bord na Móna site generally becomes cutaway when it is economically unviable to continue industrial peat extraction or when the majority of peat has been removed.

Deep peat cutover bog. Deep peat cutaway bog is defined as former raised bogs that have been in industrial peat production, where production has ceased but the residual peat depth is typically in excess of 2m. *Sphagnum* mosses are key species of raised bogs and the majority of the peat mass is formed from these mosses. *Sphagnum* species and other raised bog species are a key part of raised bog habitat function and prefer more acidic, nutrient poor, water-logged conditions. Typical raised bog *Sphagnum* mosses and other bog species do not thrive with the more typical alkaline water chemistry of cutaway bog but do grow well in these more acidic conditions where peat has been re-wetted. There is potential to re-develop *Sphagnum*-rich plant communities in these conditions if the peat can be re-wetted. This brings the opportunity of re-developing *Sphagnum*-rich vegetation communities that are considered Carbon sinks or peat-forming habitats and restoring the carbon sequestration function of these sites.

Dry cutaway bog: Cutaway bog is categorised as dry cutaway where it is not practical or feasible to re-wet these areas completely. It is inevitable that some areas of cutaway will remain relatively dry due to the heterogenous topography of the cutaway, as well as requirements for continued drainage on site for identified after-uses, or off site in relation to neighbouring lands or other infrastructure. Ridges and mounds of glacial deposits can become exposed during peat extraction and form a heterogenous topographical mosaic separated by basins. Dry cutaway may have very thin or no residual peat where ridges and mounds have been exposed. The exposed sub-soils are a mix of glacial gravels, muds and tills that can be quite free-draining. Dry cutaway may also have deeper residual peat but in a location (ie. at the margin) where the peat can not be re-wetted due to boundary constraints. Dry cutaway may also develop in situations where there a relatively steep slope that inhibits re-wetting. The majority of dry cutaway will develop towards grassland, heath, scrub and dry woodland habitats.

Enhanced decommissioning: This is defined as decommissioning carried out under proposed Scheme, which is proposed to externally funded.

Enhanced rehabilitation: This is defined as rehabilitation carried out under proposed Scheme, which is proposed to be externally funded. It is proposed by Government that Bord na Móna be obligated to carry out enhanced decommissioning, rehabilitation and restoration on peatlands. This proposed Scheme will significantly go beyond what is required to meet rehabilitation and decommissioning obligations under existing EPA IPC licence conditions. Interventions and activities supported by the Scheme will ensure that environmental stabilisation is achieved (meaning IPC obligations are met), and importantly, significant additional benefits, particularly relating to climate action and other ecosystem services, will also be delivered. However, only the costs associated with the additional, enhanced and accelerated measures, i.e., those interventions which go beyond the existing decommissioning and rehabilitation requirements arising from Condition 10 will be eligible for support under the proposed Scheme.

Marginal land. Marginal land is defined as land around the margin of the industrial peat production area. This margin generally contains a range of habitats including scrub, Birch woodland, cutover bog and raised bog remnants. It has a variety of land-uses including turf-cutting (private turbary). The Scheme will consider potential rehabilitation and restoration actions (e.g. drain blocking) within marginal land zones, where appropriate.

Rehabilitation: Rehabilitation is defined in general by Bord na Móna as environmental stabilisation of the former cutaway. This is generally achieved via re-wetting, where possible, and natural colonisation of the former cutaway, with or without intervention. It is not possible to restore raised bog habitats on BnM cutaway in general

in the short-term. In general, most of the peat mass has been removed from many BnM cutaway sites and the environmental characteristics of these areas have therefore changed radically (peat depths, hydrology, water chemistry, substrate type, nutrient status. This means there will therefore be different habitat outcomes (wetlands, fen, heathland, grassland and Birch woodland). Other after-use development may also serve to act as rehabilitation.

Restoration: Ecological restoration to defined as the process of re-establishing to the extent possible the structure, function and integrity of indigenous ecosystems and the sustaining habitats they provide" (SER 2004). Defined in this way, restoration encompasses the repair of ecosystems (Whisenant 1999) and the **improvement of ecological conditions in damaged wildlands** through the **reinstatement of ecological processes**. In general, Bord na Móna cutaway peatlands cannot be restored back to raised bog in a reasonable timeframe as their environmental conditions has changed so radically (with the removal of the acrotelem – the living layer and much of the peat mass). However, they can be returned to a **trajectory** towards a naturally functioning peatland system (Renou-Wilson 2012). **Raised bog restoration** is an objective of some BnM sites where there is residual natural raised bog vegetation and where the majority of the peat is still intact.

Standard rehabilitation: This is defined as rehabilitation that is designed to meet the conditions of the EPA IPC Licence. The key objective of rehabilitation is environmental stabilisation. This is achieved by a combination of re-wetting, where possible, and natural colonisation of the former cutaway, with or without intervention**.** Other after-use development may also serve to act as rehabilitation.

Standard decommissioning: This is defined as decommissioning that is designed to meet the conditions of the EPA IPC Licence. This is defined as to 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.

Wetland cutaway bog. Wetland cutaway bog is defined as former raised bogs that have been in industrial peat production, where production has ceased and the majority of peat has been cutaway, and where this cutaway has the potential to be re-wetted. A significant number of Bord na Móna sites have pumped drainage and these sites are likely to develop a mosaic of wetland habitats when pumping in reduced or stopped. The water chemistry of wetland cutaway frequently is strongly influenced by the more alkaline sub-soils that have been exposed during peat production. This means that pioneer vegetation is more typical of fen and wetland, rather than raised bog. Wetland cutaway will have a broad range of hydrological conditions depending on the local topography. In some cases, these wetlands may form deep water (> 0.5 m) whilst other areas may have the water table at or just below the surface of the ground.

APPENDIX IX. EXTRACTIVE WASTE MANAGEMENT PLAN

(Minimisation, treatment, recovery and disposal)

Objective:
The objective of this generic plan is to comply with the requirements of regulation 5 of the Waste Management (Management of Waste from Extractive Industries) Regulations, and to prevent or reduce waste production and its harmfulness.

Scope:
This plan covers IPPC Licence's P0504-01, Mountdillon Group of Bogs in Counties Roscommon, Longford and Westmeath,

1.0 Extractive Waste:
Waste classified as extractive waste from peat extraction operations arise from three operations associated with this activity.

1.1 Silt Pond excavations and maintenance.
All peat extraction activities in Mountdillon serviced by a silt lagoons/ponds. During the excavation of these silt ponds, pre IPPC Licensing in 1999 and since licensing, the excavated material is stored adjacent to the silt pond, where it either remains in situ ores levelled out. As required by condition 6.6, these silt lagoons are cleaned twice per annum or more often if inspections dictate. These silt cleanings are also deposited on the same location, adjacent to the silt pond, where they may be levelled periodically to allow room for subsequent cleanings. These mounds of silt pond excavation material and cleanings are generally no higher that 2-3 metres.

1.2 Power Station screenings:
Lough Ree Power Ltd screens the peat from the bogs prior to processing. This screening removes oversized peat, stones and bogs timbers. Schedule 3 (ii) of the IPPC licence permits disposal of these peat screenings back to the bog, where it is levelled and graded into the surrounding peat landscape. These locations have been agreed with the Agency as per condition 7.4 of the IPPC Licence, and as per the attached locations.

1.3 Bog Timbers:
During peat extraction operations, bog timbers often arise in the bog surface and are required to be cleared. These timbers consist of bog pine, oak and some yew. Some of these timbers, such as the oak and yew are removed for use in the wood craft industry, with the remaining bog pine stockpiled in locations at the opposite end of each bog, where it generally becomes a habitat for flora and fauna. These piles of timber are generally no higher than 1-2 metres.

2.0 P0504-01 IPPC Licence Extractive Waste Conditions

2.1 Condition 7.5 Extractive Waste Management
The licensee shall draw up a Waste Management Plan (to be known as an Extractive Waste Management Plan) for the minimisation, treatment, recovery and disposal of extractive waste. This Plan shall meet the requirements of regulation 5 of the Waste Management (Management of Waste from the Extractive Industries) Regulations,2009. The Plan shall be submitted for agreement by the Agency by the 31' December2012. The Plan shall be reviewed at least once every five years thereafter in a manner agreeable to the Agency and amended in the event of substantial changes to the operation of a waste facility or to the waste deposited. Any amendments shall be notified to the Agency.
All extractive waste shall be managed in accordance with the Extractive Waste Management Plan. A report on the implementation of the Extractive Waste Management Plan shall be provided in the AER.

2.2 Condition 7.6 Waste Facility
(i) No new waste facility may be developed or an existing waste facility modified unless agreed by the Agency.
(ii) The licensee shall ensure that all existing waste .facilities are managed and maintained to ensure their physical stability and to prevent pollution or contamination of soil, air, surface water or groundwater.
(iii) The licensee shall ensure that all new waste facilities are constructed, managed and maintained to ensure their physical stability and to prevent pollution or contamination of soil, air, surface water or groundwater.
(iv) Operational measures shall be continuously employed to prevent damage to waste facilities from personnel, plant or equipment.
(v) The licensee shall establish and maintain a system for regular monitoring and inspection of waste facilities.
(vi) All records of monitoring and inspection of waste facilities, as required under the licence, shall be maintained on-site in order to ensure the appropriate handover of information in the event of a change of operator or relevant personnel.

2.3 Condition 7.7 Excavation Voids
7.7.1 Unless otherwise agreed by the Agency, only extractive waste shall be placed in excavation voids.
7.7.2 When placing extractive waste into excavation voids for rehabilitation and construction purposes, the licensee shall, in accordance with regulation 10 of the Waste Management (Management of Waste from the Extractive Industries) Regulations, 2009, and the Extractive Waste Management Plan:

- Secure the stability of the waste
- Put in place measures to prevent pollution of soil, surface water and ground water.
- Carry out monitoring of the extractive waste and excavation void.

Condition 7.5. Extractive Waste Management Plan. 5 (1)

3.0 Minimisation.
3.1 Silt pond excavation material and cleanings.
IPPC Licence conditions require all production areas to be serviced by an appropriately designed silt pond based on storage volume and retention time. Condition 6.6 requires all ponds to be cleaned bi-annually and more often if inspections dictate, so the only opportunity for minimisation of same is through Standard Operating Procedures. These are required under condition 2.2.2 (i) regarding minimisation of suspended solids, and are in-place to minimise the generation of silt, which in-turn will minimise the generation of silt pond waste.

3.2 Power Station Screenings.
These screenings cannot be minimised as they are a consequence of peat production, stones, timbers and oversize peat materials are naturally occurring on the bog, and are required to be removed prior to processing.

3.3 Bog Timbers.
Bog timbers are also naturally occurring materials within a bog and are required to be removed prior for production. The volume of these bog timbers varies from bog to bog and as such their minimisation is not controllable or quantifiable.

4.0 Treatment
4.1 Silt pond excavation material and cleanings.
The silt pond excavation material and silt cleanings do not require any treatment for its end use which will be either backfilling these silt pond voids as per condition 7.7.1 above as part of the Bog Rehabilitation Plan, or reincorporated into the surrounding peatlands.

4.2 Power Station Screenings.
The factory screenings are permitted to be returned to the bog as they were naturally occurring materials from the bog, and as such do not require any treatment to serve this purpose.

4.3 Bog Timbers
As per 1.3 above, these timbers are stockpiled at two locations in each bog, as per the attached list of sites and become habitats for various flora and fauna.

5.0 Recovery
5.1 Silt pond excavation material and cleanings.
Condition 2.2.2 (vi) requires the reuse of silt pond waste to be examined. This was undertaken in 2006, the outcome of which was that this waste peat silt material, as a fuel, was contaminated with sub-soils, rendering it unsuitable for combustion. In addition, volumes are small compared to overall peat production volumes.

5.2 Power Station Screenings.
Given the nature of these screenings as outlined in 1.2 above, there is no further use identified and they are permitted to be disposed of back to the bog.

5.3 Bog Timbers
Investigations into processing these materials into smaller fractions for potential heating purposes did not yield any viable results. In addition, these older stockpiles are now classified as habitats and as such would not be considered for reuse as a fuel.

6.0 Disposal
6.1 Silt pond excavation material and cleanings.
Schedule 3 (ii) permits the disposal of silt pond cleanings (Lagoon Sediments) to the bog and these locations, adjacent to the silt pond site, are presented in the attached spreadsheet, with associated grid coordinates.

6.2 Power Station Screenings.
Schedule 3 (ii) permits the disposal of screenings (Peat Screenings) to the bog at designated locations agreed under Condition 7.4, and these locations, are presented in the attached spreadsheet, with associated grid coordinates.

6.3 Bog Timbers
These naturally occurring bog timbers are stockpiled at locations in each bog, grid coordinates attached.

7.0 Extractive Waste Management Plan

5 (2a)(i)
The vast majority of peat extraction bogs were all designed and drained for production prior to the 1960's and as such the production fields layout cannot' be altered. Under our Cleaner Reduction Procedures, various design changes have been implemented to the production machines and process to reduce lost peat which eventually is captured in the silt ponds and requires removal as waste peat silt. This along with training and ongoing research and development will continuously reduce waste peat and subsequently waste silt pond cleanings. Bog timbers are present naturally in various volumes and quantities in different bogs and as peat production involves stripping peat in layers, the exposure, generation and removal of these timbers is unavoidable. Work has been undertaken recently into project looking at grinding of these bog timbers in situ using a timber miller, and if this project becomes viable it will contribute to the reduction of bog timbers.

5 (2a)(ii)
Given the nature and expanse of peat bogs, the stockpiling and storage of these waste materials do not present a visual, storage or stability problem. As required under Condition 10 of the IPPC Licence, the silt pond excavations and screenings will be utilised to backfill the silt pond voids once the bogs have finished and stabilised in accordance with out Bog Rehabilitation Plan. Storage of these wastes in the interim, open to the elements does not present a change on the nature of these wastes that will threaten the environment or prevent their reuse during the bog rehabilitation process.

5 (2a)(iii)
Under Condition 10 of the IPPC Licence, all silt ponds will be decommissioned once the bog surface has stabilised, in agreement with the Agency. This will involve the removal of weirs and flow controls, returning the silt pond back to its original drain or removing the silt pond from the drainage system. Both of these activities will involve placing the silt pond extraction and cleaning material back into the excavation void.

5 (2a)(iv)
The peat bogs do not contain any topsoil, so this is not required.

5 (2a)(v)
Peat mineral resources do not undergo any treatment.

5 (2b)
These three extractive waste are all being reused and recovered back to their original extraction points and have not undergone any physical, chemical, or biological change.

5 (2c)(i, ii & iii)
These three extractive wastes, stored on the bog for reuse or recovery during the bog rehabilitation phase, do not require any management or monitoring during the operation of these bogs. Silt pond excavations and cleanings are stored adjacent to the silt pond and quickly revegetated and stabilise, the screenings are graded back into the bog at the agreed locations upon disposal and the bog timbers do not prevent any water or airborne danger to the environment.

5 (3)
The three extractive wastes arising from peat extraction operations at this site are classified wastes from mineral non-metalliferous excavation, with an EWC code of 0101 02. The materials are not classified as hazardous under Directive 91/689/EEC20, and do not contain substances or preparations classified as dangerous under Directives 67/548/EEC5 or 1999/45/EC6 above a certain threshold.
The peat excavations and cleanings are stored in locations and in a manner that they could not collapse, and are remote in their nature. The stockpiles are located adjacent to silt ponds that are cleaned regularly and as such these stockpiles are managed and levelled to facilitate further cleanings.
Therefore the material stored at these waste facilities would not be considered to be a Category A waste facility.

Classification in accordance Annex II.

Waste Material	Description	**C**lassification	Chemical Process treatment	Deposition description	Transport System
Silt Pond Excavations and cleanings	Peat and mineral soils associated with peatlands. Stored for reuse during bog rehabilitation, with no displacement of overburden	01 01 02	None	Excavated from silt ponds by excavator and deposited adjacent to the silt pond.	Excavator
Peat Screenings	Stones, timbers and oversized peat particles, reincorporated into low areas, agreed with the Agency, and stabilized under normal natural bog conditions	01 01 02	None	Removed by screen at the factory and transported by tractor and trailer to the designated and agreed locations	Tractor and trailer.
Bog Timbers	Pine, Oak and Yew species, stored at locations in each bog. Not subject to any stability issues due to exposure to atmospheric/meteorological conditions.	01 01 02	None	Removed from the bog surface by excavator and transported by tractor and trailer to the agreed locations	Tractor and Trailer

Description of operations.
Silt pond excavations arise from the requirement to have silt ponds treating all peat extraction sites. Silt pond cleanings arise from the removal of peat silt from silt ponds as required under IPPC Licence. Bog timbers arise from preparation of the bogs surface for peat production. Estimated quantities of materials are below:

Closure plan. (Bog Rehabilitation Plan).
Condition 10.1 – 10.3 of the IPPC Licence requires the following:

- 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.
- 10.1.2 Implement the agreed cutaway bog rehabilitation plan (refer Condition 10.2).

10.2 Cutaway Bog Rehabilitation Plan:

- 10.2.1 The licensee shall prepare, to the satisfaction of the Agency, a fully detailed and costed plan for permanent rehabilitation of the cutaway boglands within the licensed area. This plan shall be submitted to the Agency for agreement within eighteen months of the date of grant of this licence.
- 10.2.2 The plan shall be reviewed every two years and proposed amendments thereto notified to the Agency for agreement as part of the AER. No amendments may be implemented without the written agreement of the Agency.

10.3 The Rehabilitation Plan shall include as a minimum, the following:

- 10.3.1 A scope statement for the plan; to include outcome of consultations with relevant Agencies, Authorities and affected parties (to be identified by the licensee).
- 10.3.2 The criteria which define the successful rehabilitation of the activity or part thereof, which ensures minimum impact to the environment.
- 10.3.3 A programme to achieve the stated criteria.
- 10.3.4 Where relevant, a test programme to demonstrate the successful implementation of the rehabilitation plan.
- 10.3.5 A programme for aftercare and maintenance.

10.4 A final validation report to include a certificate of completion for the Rehabilitation Plan, for all or part of the site as necessary, shall be submitted to the Agency within six months of execution of the plan. The licensee shall carry out such tests, investigations or submit certification, as requested by the Agency, to confirm that there is no continuing risk to the environment. This plan including maps and ecological classifications are available on file at the Mountdillon IPPC Licence Coordinators office.
The location in relation to the silt pond excavations and cleanings are adjacent to the silt ponds, which are considered under the Shannon River Basin Management Plan in accordance with the requirements of Directive 2000/60/EC.
Screenings and bog timbers are all naturally occurring elements of peatland and there placement back to the bog in smaller concentrated designated waste facilities does not constitute a risk to the prevention of water compliance.
The lands under where these materials are deposited are peatlands and are un-effected by the placing of this material.

Review.
This plan will be reviewed every five years, the first review to take place in September 2017. This review will entail an inspection of these waste facilities to ensure their placing, management, maintenance and stability comply with the requirements of the Extractive Waste Management requirements and condition 7.5, 7.6 and 7.7 of the Mountdillon IPPC Licence P0504-01.

APPENDIX X. MITIGATION MEASURES FOR THE APPLICATION OF FERTILISER

- Any fertiliser used will be Rock Phosphate and will not be applied in the following conditions:
    1. The land is waterlogged;
    2. The land is flooded, or it is likely to flood;
    3. The land is frozen, or covered with snow;
    4. Heavy rain is forecast within 48 hours (forecasts will be checked from Met Éireann).
    5. The ground slopes steeply and there is a risk of water pollution, when factors such as surface run-off pathways, the presence of land drains, the absence of hedgerows to mitigate surface flow, soil condition and ground cover are taken into account.
- No fertiliser will be spread on land within 2 metres of a surface watercourse.
- Buffer zones in respect of waterbodies, as specified on https://www.epa.ie/about/faq/name,57156,en.html, will be adhered with at all times with regard to fertiliser application. Reproduced as follows:

Water body / Feature	Buffer zone
Any water supply source providing 100m^3 or more of water per day, or serving 500 or more people	200 metres (or as little as 30 metres where a local authority allows)
Any water supply source providing 10m^3 or more of water per day, or serving 50 or more people	100 metres (or as little as 30 metres where a local authority allows)
Any other water supply for human consumption	25 metres (or as little as 30 metres where a local authority allows)
Lake shoreline	20 metres
Exposed cavernous or karstified limestone features (such as swallow holes or collapse features)	15 metres
Any surface watercourse where the slope towards the watercourse exceeds 10%	10 metres
Any other surface waters	5 metres*

APPENDIX XI. CONSULTATION SUMMARIES

Table APXI -1 Consultees contacted

Bog Name	Contact Organisation	Contact Name	Date of Issue	Communication Format	Date Response Received	Response format
Derrycolumb	Longford County Council - Director of Services (Strategic Infrastructure and Climate Change)	John Brannigan	04/01/2021	E-mail		
Derrycolumb	Longford County Council	Donal Mac Beatha	04/01/2021	E-mail	01/12/2020	E-mail
Derrycolumb	Longford County council	Liam Flynn Executive Planner	04/01/2021	E-mail		
Derrycolumb	Longford County Council - Heritage Officer	Mairead Ni Chonghaile	04/01/2021	E-mail		
Derrycolumb	Eastern and Midland Regional Assembly		04/01/2021	E-mail		
Derrycolumb	Chairperson of Longford County Council	*Paul Ross (pross@longfordcoco.ie)*	04/01/2021	E-mail		
Derrycolumb	*Longford County Councillors - Ballymahon District*	*Cllr. Colm Murray (colmmurray@longfordcoco.ie)*	04/01/2021	E-mail		
Derrycolumb	*Longford County Councillors - Ballymahon District*	*Cllr. Mick Cahill (mcahill@longfordcococ.ie)*	04/01/2021	E-mail		
Derrycolumb	*Longford County Councillors - Ballymahon District*	*Cllr. Mark Casey (markcasey@longfordcoco.ie)*	04/01/2021	E-mail		
Derrycolumb	*Longford County Councillors - Ballymahon District*	*Cllr. Gerard Farrell (gfarrell@longfordcoco.ie)*	04/01/2021	E-mail		

Derrycolumb	*Longford County Councillors - Ballymahon District*	*Cllr. Pat O'Toole (potoole@longfordcoco.ie)*	04/01/2021	E-mail		
Derrycolumb	TD Roscommon - Longford Westmeath	Peter Burke (peter.burke@oireachtas.ie)	04/01/2021	E-mail		
Derrycolumb	TD Roscommon - Longford Westmeath	Sorca Clarke (sorca.clarke@oireachtas.ie)	04/01/2021	E-mail		
Derrycolumb	TD Roscommon - Longford Westmeath	Joe Flaherty (joe.flaherty@oireachtas.ie)	04/01/2021	E-mail		
Derrycolumb	TD Roscommon - Longford Westmeath	Robert Troy (robert.troy@oireachtas.ie)	04/01/2021	E-mail		
Derrycolumb	Environmental Protection Agency	Brian Meeney	07/01/2021	E-mail		
Derrycolumb	National Parks and Wildlife Service	Brian Lucas, Adele Shelton, Ciaran o Keeffe, Deirdre Lynn.	04/01/2021	E-mail		
Derrycolumb	NPWS Regional Network	District Conservation Officer (North Midlands) 0761002579.	04/01/2021	E-mail		
Derrycolumb	Dept of the Housing Local Government and Heritage	Malcom Noonan (Minister of State for Heritage and Electoral Reform)	AMC			
Derrycolumb	National Monuments Service	Margaret Keane (Margeret.keane@chg.gov.ie)	04/01/2021	E-mail		
Derrycolumb	National Museum of Ireland (Irish Antiquities Division)	Isabella Mulhall (imulhall@museum.ie)	04/01/2021	E-mail		
Derrycolumb	Dept of Environment Climate and Communications	Minister - Eamon Ryan	AMC			

Derrycolumb	Dept of Environment Climate and Communications	Noel Regan	04/01/2021	E-mail		
Derrycolumb	Dept of Rural and Community Development	Minister - Heather Humpreys				
Derrycolumb	Office of Public Works	Minister of State - Patrick O Donovan				
Derrycolumb	Dept of Agriculture, Food and the Marine	Pippa Hackett Minister of State for Land Use and Biodiversity)	AMC			
Derrycolumb	Inland Fisheries Ireland	general email contact (info@fisheriesireland.ie)	04/01/2021	E-mail		
Derrycolumb	Waterways Ireland	head office - info email	04/01/2021	E-mail		
Derrycolumb	The Heritage Council	Lorcan Scott (mail@heritage council.ie)	04/01/2021	E-mail		
Derrycolumb	An Forum Uisce (The Water Forum)	info@thewaterforum.ie	04/01/2021	E-mail		
Derrycolumb	Longford Wilderness Park (Clandillon Civil Consulting)	Heather Scully	04/01/2021	E-mail		
Derrycolumb	Longford Wilderness Park (Longford County Council)	Brian Ross (bross@longfordcoco.ie)	04/01/2021	E-mail		
Derrycolumb	An Taisce	info@antaisce.org	04/01/2021	E-mail		
Derrycolumb	Friends of the Irish Environment	admin@friendsoftheirishenvironment.org	04/01/2021	E-mail		
Derrycolumb	Friends of the Earth	Oisin Coughlan	04/01/2021	E-mail		
Derrycolumb	Birdwatch Ireland	general email contact (info @birdwatchireland.ie) or Oonagh Duggan (oduggan@birdwatchireland.ie)	04/01/2021	E-mail		

Derrycolumb	Irish Peatlands Conservation Council	Email: bogs@ipcc.ie	04/01/2021	E-mail	25/01/2021	E-mail
Derrycolumb	Irish Wildlife Trust	Email: info@iwt.ie	04/01/2021	E-mail		
Derrycolumb	Bat Conservation Ireland	info@batconservationireland.org	04/01/2021	E-mail		
Derrycolumb	Woodlands of Ireland	info@woodlandsofireland.com	04/01/2021	E-mail		
Derrycolumb	Butterfly Conservation Ireland	Jesmond Harding/info email	04/01/2021	E-mail	12/01/2021	E-mail
Derrycolumb	Community Wetlands Forum (part of Irish Rurallink)	info@irishrurallink.ie	04/01/2021	E-mail		
Derrycolumb	Turf Cutters and Contractors Association	General e-mail contact	15/01/2021	E-mail		
Derrycolumb	Longford Public Participation Network (PPN)	General e-mail contact	04/01/2021	E-mail		
Derrycolumb	Sustainable Water Action Network (SWAN)	http://www.swanireland.ie/	04/01/2021	E-mail		
Derrycolumb	Irish Farmers Association (Roscommon/ Sligo/ Leitrim/Longford)	roscommon@ifa.ie	04/01/2021	E-mail	21/01/2021	E-mail
Derrycolumb	Irish Farmers Association (Head Office)	Tim Cullinan (President)	04/01/2021	E-mail		
Derrycolumb	National Association of Regional Game Councils	Email - nargc@nargc.ie	04/01/2021	E-mail		
Derrycolumb	Midlands & East Regional WFD Operational Committee	Ray Spain Co-ordinator Local Authority Water Programme (rspain@lawaters.ie)	04/01/2021	E-mail		
Derrycolumb	Shannon Flood Risk State Agency Co-ordination Working Group	Jackie Stewart - Flood Risk management Policy (Jackie.Stewart@opw.ie)	04/01/2021	E-mail		

Derrycolumb	ICMSA (Irish Creamery Milk Suppliers Association)	General e-mail contact	04/01/2021	E-mail		
Derrycolumb	ICSA (Irish Cattle and Sheep Farmers Association	General e-mail contact	04/01/2021	E-mail		
Derrycolumb	Just Transition Commissioner	Kieran Mulvey				
Derrycolumb	CARO (Climate Action Regional Office) Eastern and Midlands	Alan Dunney	04/01/2021	E-mail		
Derrycolumb	Local Authority Water Programme	Margaret Keegan	01/02/2021	E-mail		

Table APXI -2 Response summary from Consultees contacted

Organisation	Summary of Response by Stakeholder	BnM Response
Longford County Council	Longford County Council responded to consultation via e-mail and made the following points; 1) Longford County Council supports proposed rehabilitation measures and any actions that seek to enhance the biodiversity of the region. 2) Acknowledges the role BnM play in the rehabilitation of post industrialised lands for the just transition agenda within the state. 3) State that a AA screening and EIA screening is desirable for each site. 4) Suggest tree planting programme be integrated into rehabilitation measures. 5) Describes the potentially positive impact the PCAS scheme can have on the application for biosphere reserve designation of the surrounding lands. 6) Provided planning documentation for a proposed amenity walkway close to/through Derrycolumb Bog	BnM acknowledged and will give due cognisance to all points raised, within the rehabilitation plan for Derrycolumb Bog. BnM responded via e-mail.
National Parks and Wildlife Service	Responded through e-mail thread on the 02, 03,07,09/12/2020. Points discussed were; 1) To advise of the requirement to investigate if assessment under the SEA and birds directives for each site.	BnM acknowledged via e-mail. Also, phone conversation with local NPWS Conservation Ranger Sue Moles.
National Museum of Ireland (Irish Antiquities Division)	Responded through e-mail 28/12/2020, Issues raised were; 1) The request that due diligence be taken during works to protect any archaeologically significant findings or areas 2) The NMI reiterated the importance of peatlands for the preservation of archaeology and requested they be consulted as part of any EIA undertaken	BnM acknowledged and responded via e-mail to assure BnM will give due cognisance to all points within the rehabilitation plan for all bogs. A virtual meeting/PCAS presentation was held for NMI on 18/01/2021
Office of Public Works	Responded via e-mail 01/12/2020 querying the reason for inclusion of OPW in the stakeholders list.	BnM responded with an explanation via e-mail on 01/12/2020.
Local Authority Waters Programme	To advise of dual roles within LawPro and request shapefiles of bogs where works would be conducted.	BnM acknowledged and will give due cognisance to all points within the rehabilitation plan for all sites. BnM responded via e-mail.
Irish Peatlands Conservation Council	Responded to consultation through e-mail. Among issues raised for Derrycolumb were; 1. Request that local stakeholders and landowners are considered with regard to hydrological planning. 2. Request that dissolved organic carbon be monitored and reported. 3. Request that a map describing areas that could be utilised by conservation groups to carry out species specific conservation projects be included in rehabilitation plans. 4. Request that hydrological maps and data should be included in the rehabilitation plans. 5. Request the tracking of the development of peat forming plant species.	BnM acknowledged and will give due cognisance to all points raised, within the rehabilitation plan for Derrycolumb Bog. BnM responded via e-mail.
Butterfly Conservation Ireland	Responded to consultation via e-mail with a submission on Derrycolumb. Concerns raised were: 1) Alterations to the text of the rehab plan. 2) Request for all turf cutting on BnM land to end. 3) Suggest monitoring for Large Heath Butterfly or food plant Hare's-tail Cottongrass. 4) Suggested alterations to habitat design in rehab plan to further connect regional high bog habitats. 5) Raised concerns over future land use. 6) Suggest that Small Heath and Wall Brown butterfly species habitat requirements are taken into account by rehabilitation plan.	BnM acknowledged via e-mail; Phone conversation with Jesmond Harding 19/01/2021.
Midlands & East Regional WFD Operational Committee	Responded via e-mail on 03-07/12/2020 to voice support for PCAS and provide a list potentially supportive NGOs	BnM acknowledged and will give due cognisance to all points within the rehabilitation plan for all sites. BnM responded via e-mail.

Irish Farmers Association	Responded to consultation regarding Derrycolumb and the PCAS project at large on multiple dates throughout ongoing discourse. Specific submission on Derycolumb Bog received from Roscommon, Sligo, Leitrim and Longford IFA Office. Concerns raised were: 1) Potential for flooding on adjacent lands. 2) Health and Safety 3) Perceived potentially detrimental impact of PCAS on property value	A meeting was held by BnM on 18/02/2021 the to present details on PCAS to the IFA and members. Dialogue is ongoing.
ICMSA (Irish Creamery Milk Suppliers Association)	Responded to consultation regarding the PCAS project at large on multiple dates throughout ongoing discourse. Concerns raised included future management and care and maintenance of BnM sites, particularly in relation to boundary drains, with a request for a written commitment to avoid flooding on adjacent lands. Also sought a baseline assessment of hydrology on BnM land and neighbouring areas.	A virtual meeting was held by BnM on 17/12/2020 and 03/03/2021 (when a presentation was provided) to provide details on PCAS to the ICMSA and members. Dialogue is ongoing.
Lorcán Scott (The Heritage Council)	Responded to consultation via e-mail on 04/01/2021 asking for more information on PCAS and looking to be involved in any seminar or information events.	BnM responded via phone conversation 11/01/2021.
Irish Raptor Study Group	Responded to consultation via email on 09/01/2021 asking for more information on PCAS.	BnM acknowledged and responded to queries via email on 11/01/2021; Phone conversation with Ryan Wilson Parr 21/01/2021.
National Association of Regional Game Councils (NARGC)	Responded seeking a meeting and made a submission. Main points raised were: 1. Need to grow heather in the cutaways as part of PCAS 2. Need to remove birch and other tree species and avoid scrub encroachment. 3. Control of “vermin” species.	A virtual meeting was held by BnM on 28/01/2021 (when a presentation was provided) to provide details on PCAS to the NARGC and members.
Dept. of Agriculture, Food & the Marine (DAFM)	Submission by e-mail to express support for PCAS. Recommended; 1) That local landowners and stakeholders be considered as part of the consultation process. 2) EIA assessment be carried out prior to PCAS works. 3) Hydrological assessments are carried out with a view to protecting adjoining lands from adverse impacts	BnM acknowledged and responded via e-mail to assure BnM will give due cognisance to all points within the rehabilitation plan for Derrycolumb Bog. A virtual meeting/PCAS presentation was held for DAFM on 11/12/2020

APPENDIX XII. ARCHAEOLOGY

Role of the Archaeological Liaison Officer

1. To communicate this Code of Practice and the *Archaeological Protection Procedures* (Appendix IV) to all personnel operating on the bog.

2. To ensure that all notices relating to the *Archaeological Protection Procedures* are posted and maintained at appropriate locations on the bog.

3. To report any stray finds, presented to the Liaison Officer from his/her group of bogs, to the Duty Officer of the National Museum of Ireland.

4. To provide for the appropriate protection of the stray find, whether in-situ or removed from the bog, as directed by the Duty Officer of the National Museum of Ireland.

Code of Practice

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Code of Practice

5. To arrange for the delivery or collection of the stray find, as directed by the Duty Officer of the National Museum of Ireland.

6. To complete the Report of Discovery of Archaeological Object(s) in Bogs (Appendix V), as directed by the Duty Officer of the National Museum of Ireland.

7. To maintain a file of all stray finds and associated documentation and provide copies to the Project Archaeologist.

8. To provide assistance, where required, to the Department during archaeological surveys.

9. To provide assistance, where required, to Bord na Móna's Consultant Archaeologists, during investigation and mitigation of monuments.

10. To report to the Bord na Móna members on the Archaeology Management Liaison Committee any planned developments or new activities on cutaway peatland areas within his/her group of bogs.

BORD NA MÓNA Naturally Driven	**Procedure: ENV017**	**Rev: 1**
Title: Archaeological Findings	**Approved: EM**	**Date: 13/10/2020**

1) Purpose

The purpose of this procedure is to describe the arrangements in Bord na Móna for findings of Archaeological material (Stray Finds).

All objects, sites or monuments, no matter how fragmentary, are important elements of our heritage.

2) Procedure

1. Check whether there are any known archaeological monuments in your area.
2. Be vigilant at all times - objects or traces of structures can be found on the field surfaces, in the drain faces, on the bog margins or caught within the mechanics of machinery.
3. If an object is found leave it in place, if it is safe to do so, note its position and immediately contact your Archaeological Liaison Officer who will assess the situation and contact the Duty Officer of the National Museum of Ireland.
4. Resist the temptation to investigate the find spot as this may disturb fragile archaeological deposits.
5. If the object is already dislodged or is in imminent danger, remove it carefully, mark its find spot and report it immediately to your Archaeological Liaison Officer.
6. Objects made of wood, leather or textile, which are removed from peat should be kept in conditions similar to those in which they are found. This can be done by packing them in peat or, if waterlogged, placing them in a clean basin of water and sealing the container. Resist the temptation to clean or remove peat from the object.
7. If timbers or other materials, such as gravel or stones, which could be part of a man-made structure are noted on the bog, mark the location and report it immediately to your Archaeological Liaison Officer. If you suspect the find is of archaeological importance, resist the temptation to expose it any further as this could result in damage to the structure.
8. Report anything that looks unnatural in the bog – your Archaeological Liaison Officer will decide whether it should be referred to the appropriate authorities.

NOTE: Our archaeological heritage is a finite, non-renewable resource. Once a site is destroyed its information is lost forever and we have lost the chance to understand a little more about our past, where we have come from and perhaps the opportunity to learn for the future.

Your Archaeological Liaison Officer is ……

3) Records

Revision Index			
Revision	Date	Description of change	Approved
1	13/19/2020	First release	EMcD
2			

Archaeological Impact Assessment of Proposed Bog Rehabilitation at Derrycolumb Bog, Co. Longford. Dr. Charles Mount.

Archaeological Impact Assessment of Proposed Bog Decommissioning and Rehabilitation at Derrycolumb Bog, Co. Longford

Report For

Bord Na Móna Energy Ltd.

Author

Dr. Charles Mount

Bord Na Móna Project Archaeologist

Introduction

The EPA (2020) *Guidance on the process of preparing and implementing a bog rehabilitation plan* notes that the licensee should characterise the bog prior to embarking on detailed planning and implementation. This characterisation should detail how the land is classified in terms of statutory protections, e.g. as European sites, world heritage sites, RAMSAR sites, National Heritage Areas, national monuments, archaeological heritage, etc. This archaeological impact assessment report was prepared by Dr. Charles Mount for Bord na Móna Energy Ltd to fulfil this characterisation in relation to archaeological heritage. It represents the results of a desk-based assessment of the impact of proposed bog rehabilitation of c.456 hectares at Derrycolumb Bog, Co. Longford on the known archaeological heritage of the bog. The proposed rehabilitation actions will be a combination of measures to create wetlands and re-wet deep peat as outlined in the draft Methodology Paper for the proposed Bord na Móna Decommissioning, Rehabilitation and Restoration Scheme. These enhanced measures for Derries Bog will include:

- Blocking field drains in the former industrial production area using a dozer to create regular peat blockages (three blockages per 100 m) along each field drain.
- Targeted drain blocking using peat blockages (installed with excavator) on the raised bog remnant in the south-east corner of the site.
- Pump management – reducing or ceasing pumping.
- Re-alignment of piped drainage; and management of water levels to create wetlands.
- No measures are planned for the other surrounding marginal peatland habitats.
- Silt ponds will continue to be maintained during the rehabilitation and decommissioning phase.
- Evaluate success of short-term rehabilitation measures and enhance where necessary.
- Decommissioning of silt-ponds will be assessed and carried out, where required.

Derrycolumb Bog is located c.1.8km north-east of Newtown Cashel, Co. Longford, south-west of the R392 road. The bog occupies the townlands of Ballina, Cormaglava, Derrindiff, Derryad, Derrycolumb, Derrygowna, Derrylough, Derrymacar, Derrymany, Derrynagran, Derrynagran beg and Forthill, on OS 6 inch sheet Longford No. 22.

Methodology

This is a desk-based archaeological assessment that includes a collation of existing written and graphic information to identify the likely archaeological potential of Derries Bog. The extent of the rehabilitation is indicated in Fig. 1. This area was examined using information from:

- The IAWU Peatland Survey
- The Bord na Móna 1999 Re-assessment Survey
- The Bord na Móna excavation programme
- The Sites and Monuments Record that is maintained by the Dept of Housing, Local Government and Heritage
- The Excavations database
- Previous assessments

An impact assessment has been prepared and recommendations have been made.

Desktop assessment

IAWU Peatland survey

Derrycolumb Bog was surveyed (unlicenced) by the Irish Archaeological Wetland Unit (IAWU) in 1991 as part of the Archaeological Survey of Ireland Peatland Survey. In total 78 sightings of archaeological material were noted. This included 77 sightings of Toghers and one sighting of worked wood. It was not part of the remit of the IAWU to produce reports on individual bogs prior to 2000 but the survey results were notified to the National Monuments Service (NMS) and included as part of the Record of Monuments and Places (RMP) (see Fig. 1). The depths of the sightings below the surface were not recorded.

Recorded Monuments

The Record of Monuments and Places (RMP) for Co. Longford which was established under Section 12 of the National Monuments (Amendment) Act, 1994 was examined as part of the assessment (DAHGI 1996). This record was published by the Minister in 1996 and includes sites and monuments that were known in Derrycolumb Bog before that date. This review established that there are 78 sightings of archaeology in the RMP grouped into five archaeological complexes situated in the proposed rehabilitation area (see Fig. 1). These are the sightings recorded by the IAWU in 1991 and reported to the NMS.

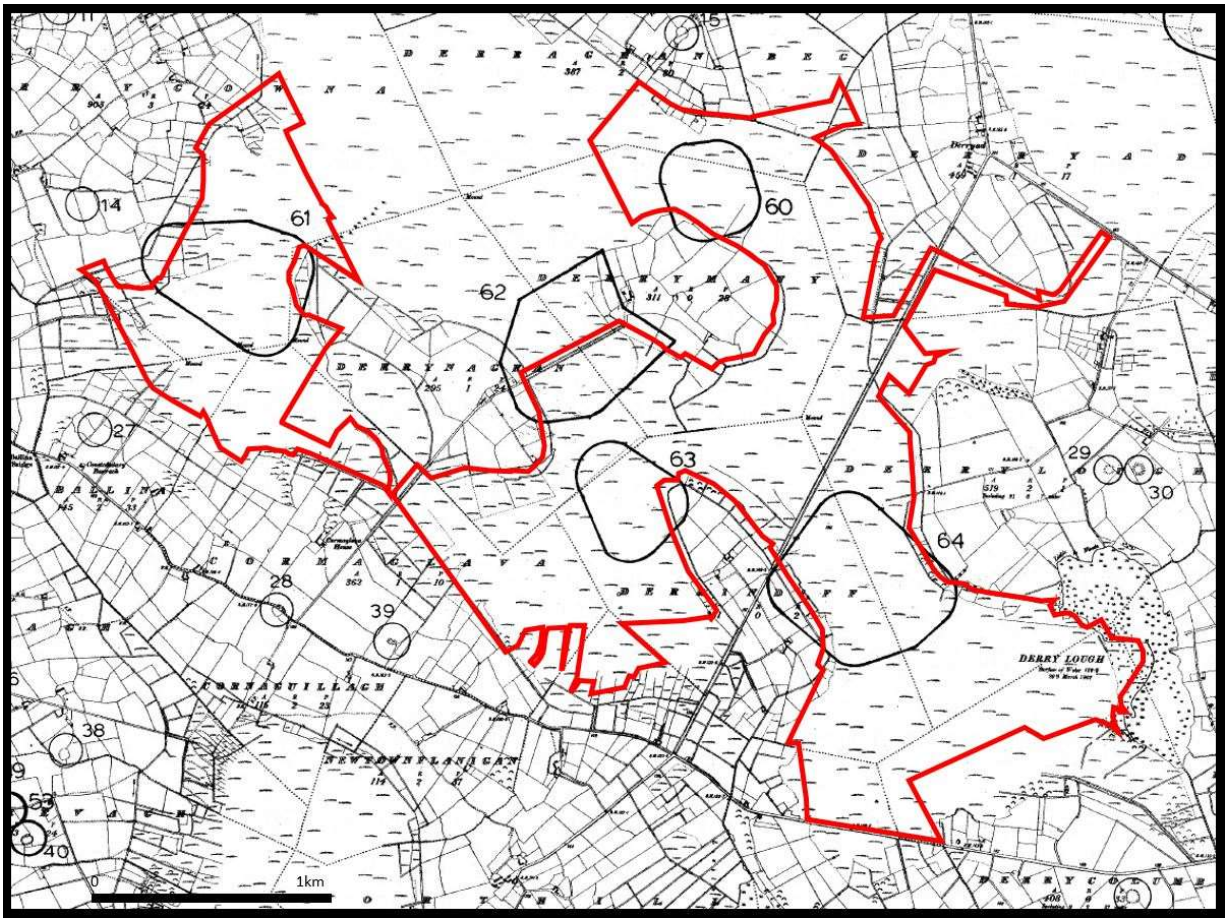

Fig. 1. Derrycolumb Bog, Co. Longford, detail of the Record of Monuments and Places map sheet No. 22. The proposed rehabilitation area is outlined with the redline. There are numerous Recorded Monuments in the rehabilitation area grouped into five complexes.

RMP No.	NGR E	NGR N	Townland	RMP Classification	SMR Classification
LF022-059----	20784	26296	Derraghan Beg/Corlea	Togher Possible	Road - class 3 togher
LF022-060---	20780	26186	Derrymany	Archaeological Complex	-
LF022-06001-	20779	26179	Derrymany	Togher	Road - class 3 togher
LF022-06002-	20775	26184	Derrymany	Togher	Road - class 3 togher
LF022-06003-	20774	26189	Derrymany	Togher	Road - class 3 togher
LF022-06004-	20781	26189	Derrymany	Togher	Road - class 3 togher
LF022-06005-	20785	26182	Derrymany	Togher	Road - class 3 togher
LF022-061---	20585	26146	Derrygowna	Archaeological Complex	
LF022-06101-	20559	26155	Derrygowna	Togher	Road - class 3 togher
LF022-06102-	20562	26149	Derrygowna	Togher	Road - class 3 togher
LF022-06103-	20579	26157	Derrygowna	Togher	Road - class 3 togher
LF022-06104-	20578	26155	Derrygowna	Togher	Road - class 3 togher
LF022-06105-	20587	26154	Derrygowna	Togher	Road - class 2 togher
LF022-06106-	20584	26153	Derrygowna	Togher	Road - class 3 togher
LF022-06107-	20594	26151	Derrygowna	Togher	Road - class 3 togher
LF022-06108-	20603	26151	Derrygowna	Togher	Road - class 3 togher
LF022-06109-	20595	26130	Derrygowna	Togher	Road - class 3 togher
LF022-062---	20780	26186	Derrynagran/Derrymany	Archaeological Complex	-
LF022-06201-	20726	26111	Derrynagran	Togher	Road - class 3 togher
LF022-06202-	20726	26112	Derrynagran	Togher	Road - class 3 togher
LF022-06203-	20723	26113	Derrynagran	Togher	Road - class 3 togher
LF022-06204-	20723	26113	Derrynagran	Togher	Road - class 3 togher
LF022-06205-	20723	26113	Derrynagran	Togher	Road - class 3 togher
LF022-06206-	20727	26110	Derrynagran	Togher	Road - class 3 togher
LF022-06207-	20728	26113	Derrynagran	Togher	Road - class 3 togher
LF022-06208-	20728	26114	Derrynagran	Togher	Road - class 3 togher
LF022-06209-	20711	26105	Derrynagran	Worked Wood	Structure - peatland
LF022-06219-	20718	26108	Derrynagran	Togher	Road - class 3 togher
LF022-06232-	20713	26124	Derrynagran	Togher	Redundant record
LF022-06242-	20728	26106	Derrynagran	Togher	Road - class 3 togher
LF022-06243-	20728	26139	Derrymany	Togher	Road - class 3 togher
LF022-06244-	20728	26109	Derrynagran	Togher	Road - class 3 togher
LF022-06247-	20728	26114	Derrynagran/Derrymany	Togher	Road - class 3 togher
LF022-06248-	20730	26112	Derrynagran	Togher	Road - class 3 togher
LF022-06249-	20729	26114	Derrynagran	Togher	Road - class 3 togher
LF022-06250-	20729	26115	Derrynagran	Togher	Road - class 3 togher
LF022-06259-	20736	26115	Derrymany	Togher	Road - class 3 togher
LF022-06260-	20730	26112	Derrynagran	Togher	Road - class 3 togher
LF022-06261-	20710	26122	Derrymany	Togher	Road - class 3 togher
LF022-06262-	20724	26113	Derrynagran	Togher	Road - class 3 togher
LF022-06263-	20721	26116	Derrynagran	Togher	Road - class 3 togher
LF022-063---	20748	26058	Derrindiff	Archaeological Complex	-
LF022-06301-	20758	26055	Derrindiff	Togher	Road - class 2 togher
LF022-06302-	20749	26046	Derrindiff	Togher	Road - class 3 togher
LF022-06303-	20740	26068	Derrindiff	Togher	Road - class 3 togher
LF022-064---	20844	26024	Derrindiff/Derrylough	Archaeological Complex	-
LF022-06401	20843	26017	Derrindiff	Togher	Road - class 3 togher
LF022-06402	20827	26026	Derrindiff	Togher	Road - class 3 togher
LF022-06403	20828	26021	Derrindiff	Togher	Road - class 3 togher
LF022-06404	20823	26024	Derrindiff	Togher	Road - class 3 togher
LF022-06405	20822	26023	Derrindiff	Togher	Road - class 3 togher
LF022-06406	20818	26021	Derrindiff	Togher	Road - class 2 togher
LF022-06407	20832	26012	Derrindiff	Togher	Road - class 3 togher
LF022-06408	20841	26029	Derrindiff	Togher	Road - class 3 togher
LF022-06409	20841	26031	Derrindiff	Togher	Road - class 3 togher
LF022-06410	20841	26032	Derrindiff	Togher	Road - class 3 togher
LF022-06411	20847	26020	Derrindiff	Togher	Road - class 3 togher
LF022-06412	20847	26019	Derrindiff	Togher	Road - class 3 togher
LF022-06413	20846	26018	Derrindiff	Togher	Road - class 3 togher
LF022-06414	20846	26012	Derrindiff	Togher	Road - unclassified

LF022-06415	20848	26013	Derrindiff	Togher	Road - class 1 togher
LF022-06416	20838	26008	Derrindiff	Togher	Road - class 3 togher
LF022-06417	20836	26008	Derrindiff	Togher	Road - class 3 togher
LF022-06418	20841	26003	Derrindiff	Togher	Road - class 3 togher
LF022-06419	20846	26012	Derrindiff	Togher	Road - class 3 togher
LF022-06420	20847	26012	Derrindiff	Togher	Road - class 3 togher
LF022-06421	20841	26011	Derrindiff	Togher	Road - class 3 togher
LF022-06422	20837	26007	Derrindiff	Togher	Road - class 3 togher
LF022-06423	20836	26005	Derrindiff	Togher	Road - class 3 togher
LF022-06424	20839	26047	Derrylough	Togher	Road - class 3 togher
LF022-06425	20840	26041	Derrylough	Togher	Road - class 3 togher
LF022-06426	20847	26024	Derrylough	Togher	Road - class 3 togher
LF022-06427	20849	26017	Derrylough	Togher	Road - class 3 togher
LF022-06428	20857	26021	Derrylough	Togher	Road - class 3 togher
LF022-06429	20857	260021	Derrylough	Togher	Road - class 3 togher
LF022-06430	20849	26017	Derrylough	Togher	Road - class 3 togher
LF022-06431	20859	26016	Derrylough	Togher	Road - class 2 togher
LF022-06432	20853	26015	Derrylough	Togher	Road - class 3 togher
LF022-06433	20855	26014	Derrylough	Togher	Road - class 3 togher
LF022-06434	20859	26011	Derrylough	Togher	Road - class 3 togher
LF022-06435	20868	26018	Derrylough	Togher	Road - class 3 togher
LF022-06436	20829	26110	Derrylough	Togher	Road - class 3 togher
LF022-06437	20826	26112	Derrylough	Togher	Road - class 3 togher

Table 1. List of sightings of archaeology recorded by the IAWU in Derrycolumb Bog notified to the NMS and include in the SMR.

Bord na Móna rea-assessment survey

Derrycolumb Bog was surveyed (unlicenced) by the ADS Ltd in 1999 as part of the Bord na Móna re-assessment survey. Only four of the sightings identified by the IAWU in 1991 could be located (see Table 2). As peat harvesting continued every year between 1991 and 1999 the 74 sightings that could not be relocated were presumably removed.

SMR No	1999 catalogue number	IAWU catalogue number
LF022-064006-	99DBSE0033a-f	DYH0011
LF022-064014-	99DBSE0019a	DIF0019
LF022-064015:-	99DBSE0007a-t	DIF0020
LF022-063001-	99DBNW0014a-s	DIF0001

Table 2. List of sightings of archaeology identified by IAWU in 1991 that could be relocated by the 1999 re-assessment survey in Derrycolumb Bog.

The 1999 re-assessment survey reported an additional 26 sightings of new material within the rehabilitation area consisting of 14 platforms, 10 toghers, 1 post row and 1 redundant record (see Table 3). These sightings were reported to the NMS and incorporated into the SMR.

SMR No.	1999 Cat No.	NGR E	NGR N	Townland	SMR Classification	Depth BS cm
LF022-169----	99DNSW0014A-B	605637	761570	Derrygowna	Road - class 3 togher	0
LF022-106----	99DBNW024A	607335	761650	Derrindiff	Road - class 3 togher	0
LF022-107----	99DBNW0026A-B	607324	761576	Derrindiff	Road - unclassified togher	0
LF022-108----	99DBNW0021A	607443	761527	Derrindiff	Platform - peatland	0-20
LF022-109----	99DBNW0020A	607411	761529	Derrindiff	Platform - peatland	0
LF022-111----	99DBSE035A	608514	760245	Derrindiff	Road - class 3 togher	0
LF022-112----	99DBSE031A-B	607458	760153	Derrindiff	Road - class 2 togher	0
LF022-113----	99DBNW018A	607383	761697	Derrindiff	Platform - peatland	0
LF022-115----	99DBSE0028A	608389	760259	Derrindiff	Platform - peatland	0-20
LF022-116----	99DBNW0017A-B	607452	761616	Derrindiff	Road - unclassified togher	55-60
LF022-117----	99DBNW0013A	607488	761544	Derrindiff	Road - unclassified togher	0

LF022-118----	99DBSE0002A	608286	760232	Derrindiff	Platform - peatland	0
LF022-119----	99DBSE036A	608442	760149	Derrindiff	Platform - peatland	0
LF022-120----	99DBSE018A	608393	760198	Derrindiff	Platform - peatland	0
LF022-121----	99DBSE027A	608389	760221	Derrindiff	Platform - peatland	0-20
LF022-122----	99DBSE0017A	608367	760185	Derrindiff	Redundant record	Not in situ
LF022-123----	99DBSE0004A	608290	760173	Derrindiff	Road - unclassified togher	0
LF022-124----	99DBSE0006A	608316	760243	Derrindiff	Platform - peatland	0-20
LF022-132----	99DBSE0020A	608480	760200	Derrylough	Platform - peatland	0
LF022-135----	99DBSE0026A	608442	760338	Derrylough	Post row - peatland	0
LF022-136----	99DBSE0037A	608521	760274	Derrylough	Platform - peatland	0
LF022-137----	99DBSE0032A	608538	760122	Derrylough	Road - unclassified togher	0
LF022-164----	99DNSW0005A	605992	761525	Derrygowna	Platform - peatland	0-20
LF022-165----	99DNSW0006A	605981	761511	Derrygowna	Platform - peatland	0-20
LF022-166----	99DNSW0012A-C	605829	761713	Derrygowna	Road - unclassified togher	0
LF022-180----	99DBNW0027A	607189	761642	Derrynagran	Platform - peatland	0-20

Table 3. List of sightings of archaeology in the rehabilitation area made by the 1999 re-assessment survey included in the SMR.

Most of the sightings made by the 1999 re-assessment survey were on the surface and the deepest sighting was 99DBNW0014S (RMP LF022-06301-) at 1.05m. This trackway extended across the bog a distance of 385m across 19 fields, and when last investigated in 1999 its depth ranged from on the surface down to 1.05m in depth. In 2015 a sighting this trackway (RMP LF022-06301-) was still visible just below the surface (see Fig. 2). Data provided by Bord na Móna relating to the period 2008-2015 indicated that an average of 0.81m depth of peat had been removed from the bog surface during that seven-year period. This would have removed all of the sightings identified by the 1999 survey except for RMP LF022-06301-.

Fig. 2. Sighting 99DNSE0014h of RMP LF022-06301- taken in 2015.

Sites and Monuments Record

The Sites and Monuments Record (SMR) which is maintained by the Department of Housing, Local Government and Heritage was examined as part of the assessment on the 2nd of February 2021. The SMR consists of records included in the RMP and additional sites and monuments notified to the Dept. since the publication of the RMP. This review established that 128 sightings of archaeological material have

been entered in the SMR in the proposed rehabilitation area. The sightings are indicated in Table 1 above and continued in Table 4 below and in Fig. 2. These are all sightings identified by the IAWU survey in 1991 and the re-assessment survey in 1999 that were notified to the NMS It is known that 74 of these sightings could not be relocated by the re-assessment survey in 1999 and had presumably been removed by that date. Since 2008 more 0.81m depth of peat of bog has been removed from the bog.

SMR No.	1999 Cat No.	NGR E	NGR N	Townland	SMR Classification
LF022-060006-	-	607783	761748	Derrymanny	Road - class 3 togher
LF022-061010-	-	605972	761515	DERRYGOWNA	Structure - peatland
LF022-169----	99DNSW0014A-B	605637	761570	DERRYGOWNA	Road - class 3 togher
LF022-062064-	-	607214	761065	Derrynagran	Redundant record
LF022-062065-	-	607113	761098	Derrynagran	Redundant record
LF022-062069-	-	607253	761130	Derrynagran	Redundant record
LF022-064038-	-	608309	760126	Derrindiff	Road - class 3 togher
LF022-064040-	-	608387	760128	Derrindiff	Road - class 3 togher
LF022-064041-	-	608340	760206	Derrindiff	Redundant record
LF022-064042-	-	608400	760136	Derrindiff	Road - class 3 togher
LF022-064043-	-	608351	760546	Derrylough	Road - class 3 togher
LF022-064044-	-	608335	760463	Derrylough	Redundant record
LF022-064045-	-	608549	760169	Derrylough	Road - class 3 togher
LF022-106----	99DBNW024A	607335	761650	Derrindiff	Road - class 3 togher
LF022-107----	99DBNW0026A-B	607324	761576	Derrindiff	Road - unclassified togher
LF022-108----	99DBNW0021A	607443	761527	Derrindiff	Platform - peatland
LF022-109----	99DBNW0020A	607411	761529	Derrindiff	Platform - peatland
LF022-110----	-	607926	760904	Derrindiff	Post row - peatland
LF022-111----	99DBSE035A	608514	760245	Derrindiff	Road - class 3 togher
LF022-112----	99DBSE031A-B	607458	760153	Derrindiff	Road - class 2 togher
LF022-113----	99DBNW018A	607383	761697	Derrindiff	Platform - peatland
LF022-115----	99DBSE0028A	608389	760259	Derrindiff	Platform - peatland
LF022-116----	99DBNW0017A-B	607452	761616	Derrindiff	Road - unclassified togher
LF022-117----	99DBNW0013A	607488	761544	Derrindiff	Road - unclassified togher
LF022-118----	99DBSE0002A	608286	760232	Derrindiff	Platform - peatland
LF022-119----	99DBSE036A	608442	760149	Derrindiff	Platform - peatland
LF022-120----	99DBSE018A	608393	760198	Derrindiff	Platform - peatland
LF022-121----	99DBSE027A	608389	760221	Derrindiff	Platform - peatland
LF022-122----	99DBSE0017A	608367	760185	Derrindiff	Redundant record
LF022-123----	99DBSE0004A	608290	760173	Derrindiff	Road - unclassified togher
LF022-124----	99DBSE0006A	608316	760243	Derrindiff	Platform - peatland
LF022-132----	99DBSE0020A	608480	760200	Derrylough	Platform - peatland
LF022-135----	99DBSE0026A	608442	760338	Derrylough	Post row - peatland
LF022-136----	99DBSE0037A	608521	760274	Derrylough	Platform - peatland
LF022-137----	99DBSE0032A	608538	760122	Derrylough	Road - unclassified togher
LF022-144----	-	608142	761099	Derrymanny	Platform - peatland
LF022-145----	-	608117	761093	Derrymanny	Road - unclassified togher
LF022-146----	-	608224	761193	Derrylough/Derrymanny	Road - gravel/stone trackway - peatland
LF022-153----	-	608045	761336	Derrynagran	Road - unclassified togher
LF022-154----	-	607172	761125	Derrynagran	Platform - peatland
LF022-155----	-	607175	761121	Derrynagran	Platform - peatland
LF022-160----	-	608086	761274	Derrynagran	Road - unclassified togher
LF022-164----	99DNSW0006A	605992	761525	DERRYGOWNA	Platform - peatland
LF022-165----	99DNSW0006A	605981	761511	DERRYGOWNA	Platform - peatland
LF022-166----	99DNSW0012A-C	605829	761713	DERRYGOWNA	Road - unclassified togher
LF022-180----	99DBNW0027A	607189	761642	Derrynagran	Platform - peatland
LF022-181----	-	607159	761145	Derrynagran	Platform - peatland
LF022-182----	-	607166	761136	Derrynagran	Platform - peatland
LF022-183----	-	607170	761136	Derrynagran	Platform - peatland
LF022-187----	-	607164	761130	Derrynagran	Platform - peatland

Table 4. List of additional sightings added to the SMR following the 1999 re-assessment survey. Note this table also includes sightings and redundant records from the 1991 IAWU survey not included in the RMP.

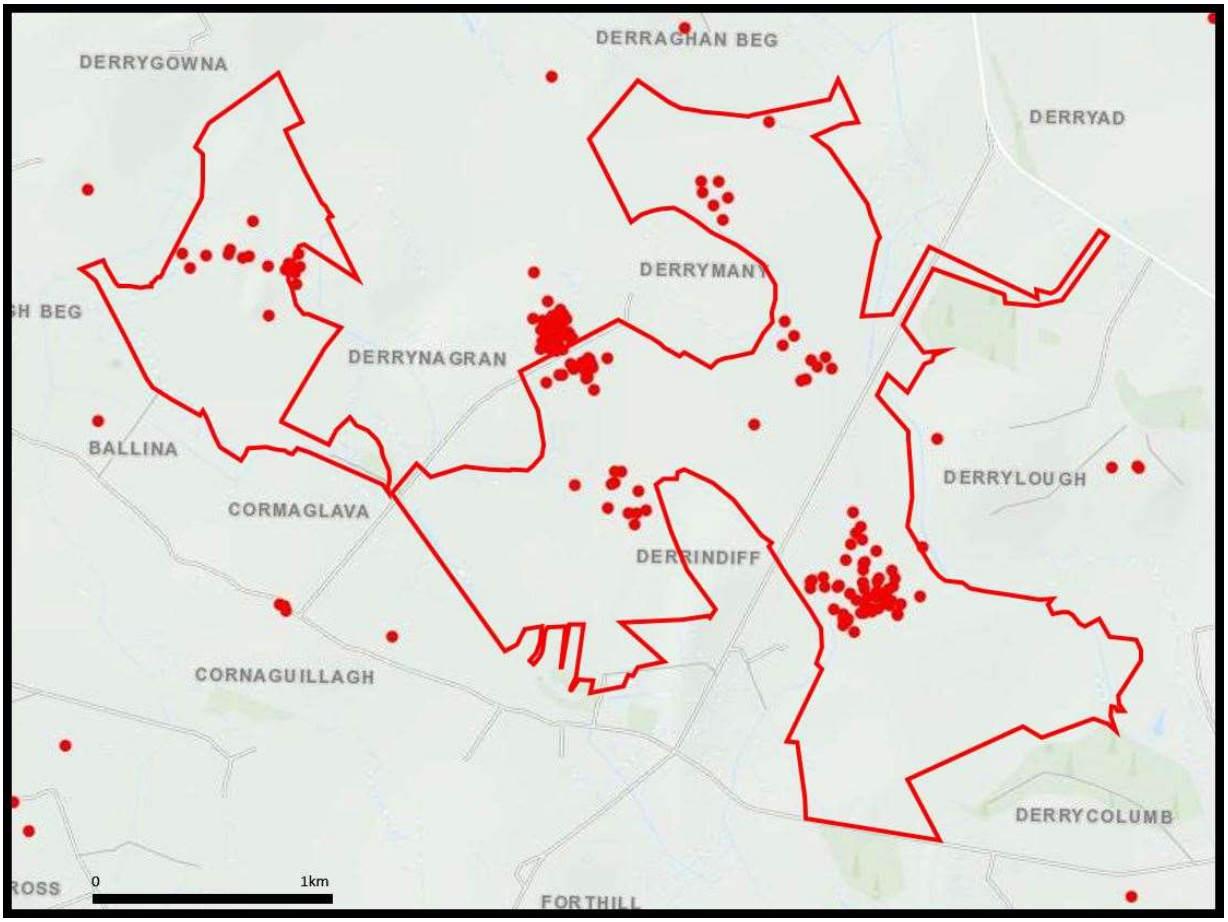

Fig. 2. Derrycolumb Bog, Co. Longford, detail of the Sites and Monuments Record. The proposed rehabilitation area is outlined with the redline. There are numerous SMRs in the area.

Archaeological excavations

An 18m stretch of a Bronze Age Road-Class 1 Togher (LF022-064015, 99DBSE0007A-T) in Derrindiff and Derrylough townlands was excavated by the IAWU in 1991 (Moloney 1993). When visited in 1999 this togher was found to be at the surface and being milled. A Bronze Age Road-Class 2 Togher which was visible for 385m (LF022-063001-, 99DBNW0014A-S) was also excavated by the IAWU in 1991. In 2001, 18 cuttings were excavated under 10 licences by Jane Whitaker in the rehabilitation area as part of the Bord na Móna excavation programme (see Table 5) (Whitaker 2009).

SMR No.	1999 Cat No.	NGR E	NGR N	Townland	Classification	Cuttings	License No.
LF022-064015-	99DBSE007A-T	20848	26013	Derrindiff	Road - class 1 togher	4	01E0585
LF022-106----	99DBNW024A	607335	761650	Derrindiff	Road - class 3 togher	1	01E0766
LF022-121----	99DBSE027A	608389	760221	Derrindiff	Platform - peatland	1	01E0587
LF022-112----	99DBSE031A-B	607458	760153	Derrindiff	Road - class 2 togher	1	01E0589
LF022-06406-	99DBSE0033A-F	20818	26021	Derrindiff	Road - class 2 togher	5	01E0590
LF022-111----	99DBSE035A	608514	760245	Derrindiff	Road - class 3 togher	1	01E0591
LF022-120----	99DBSE018A	608393	760198	Derrindiff	Platform - peatland	1	01E0586
LF022-119----	99DBSE036A	608442	760149	Derrindiff	Platform - peatland	1	01E0592
LF022-111----	99DBSE035A	608514	760245	Derrindiff	Road - class 3 togher	1	01E0591
LF022-113----	99DBNW018A	607383	761697	Derrindiff	Platform - peatland	1	01E0765

Table 5. Licensed excavations carried out in Derrycolumb Bog.

Reported finds

There are three reported finds from Derrycolumb Bog recorded in the Topographical Files of the National Museum of Ireland. These are the upper stone of a rotary quern (1979:75) from Derrymanny townland; a socketed bronze dagger (1956:458a) from Derrynagran townland and a pointed wooden stake (1956:458b) found in association with the bronze dagger.

Previous assessments

Derrycolumb Bog has been the subject of an Environmental Impact Assessment Report carried out by Irish Archaeological Consultancy LTD in 2018 for Bord na Móna Energy Limited in relation to IPC Licence P0500-01. The assessment noted that there was a high potential for archaeological features to be uncovered during the course of any future development works in Derrycolumb Bog.

Impact assessment

There are 128 known sightings of archaeology in the rehabilitation area. It is known that 74 of these sightings could not be relocated by the re-assessment survey in 1999 and had presumably been removed by that date. The remaining 54 sightings were mostly visible on the surface with some extending to a maximum depth of 1.05m. Estimates of the peat removed from the bog based on the results of drone survey of the bog carried out by Bord na Móna indicates that since 2008 more 0.81m depth of peat of bog has been removed from the bog. This would have removed all the remaining sightings of archaeology except for some sightings of RMP LF022-06301- (99DBNW0014A-S) which when surveyed in 1999 extended for 385m across 19 fields (see Fig .3). The proposed rehabilitation works may have an impact the remaining sightings of RMP LF022-06301- (99DBNW0014A-S). The proposed works also have the potential to impact previously unknown archaeological material.

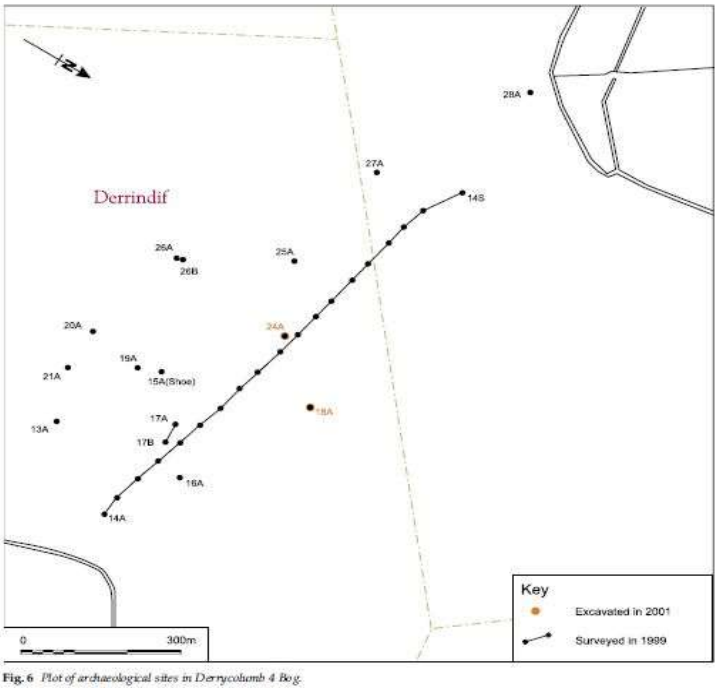

Fig. 6 *Plot of archaeological sites in Derrycolumb 4 Bog.*

Fig 3. Plan of the 19 sightings of RMP LF022-06301- (99DBNW0014A-S) indicated with the continuous black line.

Recommendations

There is only one known surviving archaeological monument in Derrycolumb Bog RMP LF022-06301-. The area of this monument should be avoided by the regeneration works. Should any previously unknown archaeological material be uncovered during the rehabilitation works, it should be avoided and reported to the Bord na Móna Archaeological Liaison Officer and the National Museum of Ireland.

Conclusion

This is a desk-based archaeological assessment and includes a collation of existing written and graphic information to identify the likely archaeological potential of the proposed rehabilitation area. There is only one known surviving archaeological monument in Derrycolumb Bog RMP LF022-06301-. The area of this monument should be avoided by the regeneration works. Should any previously unknown archaeological material be uncovered during the rehabilitation works, it should be avoided and reported to the Bord na Móna Archaeological Liaison Officer and the National Museum of Ireland.

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15 February 2021