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PEATLAND ECOLOGIST

Appropriate Assessment

Stage 1 Screening Report

for

BORD NA MÓNA
Naturally Driven

Cutaway Bog Decommissioning and Rehabilitation Plan

Oughter Bog, Co. Offaly

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1 INTRODUCTION

Bord na Móna have in recent years permanently ceased industrial peat production on a significant area of bog. In line with Bord na Móna's accelerated decarbonization strategy, the company has also committed to ambitious enhanced peatland decommissioning and rehabilitation improvements.

This strategy has been developed to optimise benefits of **peatland rehabilitation and restoration** for climate action. In addition, it will also have benefits for biodiversity, water (catchment management) and other ecosystem services. These improvements are in line with the Government Climate Action agenda and will bring with it, significant natural capital benefits. It will also create a stable natural landscape for the benefit of neighbours and local communities in former peat production areas.

Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Boora bog group (Ref. P0500-01). **As part of the condition 10.2 of the IPC license, decommissioning and rehabilitation of cutaway boglands is required. Oughter bog**, located within the above group, is also to be subject to the above referenced improvements as part of a scheme titled the **Peatland Climate Action Scheme (hereafter PCAS)**. The pertinent detail per BnM bog for both requirements under IPC license condition 10.2 and the proposed **PCAS** is described in a decommissioning and rehabilitation plan (hereafter 'plan' or 'the plan'), as required under Condition 10.2 of the respective IPC license. It is this plan which forms the subject of the appraisal herein.

The general objective of peatland rehabilitation is to ensure **environmental stabilisation** of the former industrial peat production areas. *Enhanced rehabilitation focuses on optimizing suitable hydrological conditions (stable water levels close to the surface) by blocking production field drains*, and other measures that will be planned in detail. This will create soggy peatland conditions that will be naturally colonised by plants and animals and will **allow compatible peatland habitats to re-develop**. It will also slow water movement across these bogs.

The **enhanced decommissioning** to be carried out on the bogs as part of the **PCAS** includes typically the lifting of rail line, removal of pump sites, removal of buildings (generally porto-cabins) and removal of level crossings.

This Screening for Appropriate Assessment Report has been prepared by **John Derwin, Independent Peatland Ecologist, BSc. Botany, MSc. Agr. Environmental Resource Management** and contains sufficient objective scientific information to facilitate the **Public Authority** to determine whether the decommissioning and rehabilitation outlined in the plan referenced above requires Appropriate Assessment, or whether the potential for significant effects on any designated European Site can be excluded.

The preparation of this Screening for Appropriate Assessment Report has had regard to:

- EU Habitats Directive (92/43/EEC)**,**
- EU Birds Directive (Council Directive (2009/147/EC)
- European Communities (Birds and Natural Habitats) Regulations 2011,
- Assessment of Plans and Projects significantly affecting Natura 2000 Sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, European Commission 2001,
- Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government (2010).
- Managing Natura 2000 Sites: The Provisions of Article 6 of the 'Habitats Directive' 92/43/EEC, European Commission, 2018.

- *Oughter Bog Cutaway Bog Decommissioning and Rehabilitation Plan 2021* (2021) as prepared by BnM – see **Appendix C** of this document.

For the avoidance of doubt, within this appraisal, no reliance is made on existing mitigation measures which form part of current or previous industrial peat production. The scope of this appraisal refers to the proposed decommissioning and rehabilitation only, as described in the Plan included as **Appendix C**.

1.1 Appropriate Assessment Process

Under Article 6(3) of the Habitats Directive, an Appropriate Assessment of the implications of any plan or project on a European Site is required before a project is approved. This must include all the aspects of the plan or project which can, either individually or in combination with other plans or projects, affect the conservation objectives of that European Site, in the light of the best scientific knowledge in the field. The competent national authorities are to authorise a plan, project or activity only if they have made certain that it will not adversely affect the integrity of any European Site.

This current document comprises a Screening to determine whether Appropriate Assessment is required. The Screening must identify whether the project, alone or in combination with other plans and projects, is likely to have significant effects on any European Site in view of the qualifying interests and conservation objectives of these sites; or whether the potential for such significant effects can be excluded. This test is completed with cognisance of emerging case law.

1.1.1 Stages of the Appropriate Assessment Process

Appropriate Assessment involves a number of steps and tests that are applied using a stage-by-stage approach. Each step or stage in the assessment process precedes and provides a basis for other steps. The four stages in an Appropriate Assessment (AA), are further described below.

Guidance on the Appropriate Assessment (AA) process was produced by the European Commission in 2002, which was subsequently developed into guidance specifically for Ireland by the Department of Environment, Heritage and Local Government (DEHLG) (2009). These guidance documents identify a staged approach to conducting an AA, as shown in **Figure 1.1.1**

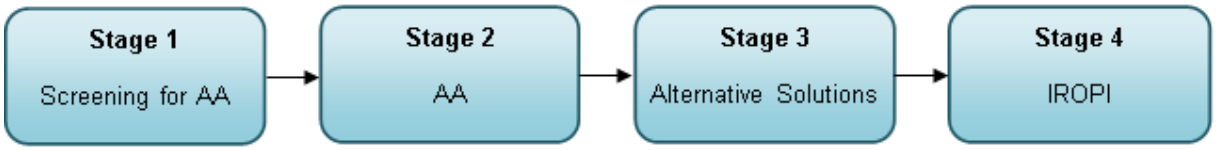


Figure 1.1: The Appropriate Assessment Process (from: Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities, DEHLG, 2009).

Stage 1 - Screening for AA

This stage examines the likely effects of a project either alone or in combination with other projects upon a European site and considers whether it can be objectively concluded that these effects will not be significant.

Stage 2 – Appropriate Assessment

In this stage, the impact of the project on the integrity of the European site is considered with respect to the conservation objectives of the site and to its structure and function. Mitigation measures should be applied to the point where no adverse impacts on the site(s) remain.

Stage 3 - Alternative Solutions

Should the Appropriate Assessment determine that adverse impacts are likely upon a European site, this stage examines alternative ways of implementing the project that, where possible, avoid these adverse impacts. For the avoidance of doubt, no reliance is placed on Stage 3.

Stage 4 - IROPI

Assessment where no alternative solutions exist and where adverse impacts remain: Where **imperative reasons of overriding public interest (IROPI) exist**, an assessment to consider whether compensatory measures will or will not effectively offset the damage to the European site will be necessary. European case law highlights that consideration must be given to alternatives outside the project area in carrying out the IROPI test. It is a rigorous test which projects are generally considered unlikely to pass. In any event, the proponent does not purport to place any reliance on Stage 4.

2 Baseline Studies

2.1 Desktop Review

The Biodiversity baseline information presented in this Appropriate Assessment reporting was collated from site investigations and field surveys, along with publicly available online resources including from the National Biodiversity Data Centre (NBDC), BirdWatch Ireland and their IWeBS dataset and the National Parks and Wildlife Service (NPWS) online webpage, which are regularly updated. Ecological surveys to inform the development of the appended Rehab plan are also referenced where applicable.

2.2 Field Studies

The information contained herein is based on a range of baseline surveys which have been completed at Oughter Bog by Bord na Mona and also by the current author. As part of the formulation of the Oughter Bog Rehabilitation Plan ecological field surveys were completed between 2012 and 2019 which included Extended Phase 1 Habitat Surveys. Habitat descriptions in the current reporting are based largely on these prior surveys, however previously identified habitat extents were ground truthed in visits over the winter period 2020/21. See Section 3.4.1.2 for habitat information and Section 2.4 for discussion.

A survey for wintering birds to inform the current Appropriate Assessment reporting were carried out on the 14th of January 2021 and the 24th March 2021. These involved extended transects through the bog designed to sample a representation of habitats onsite, with emphasis on wildfowl and followed a modified Brown and Shepherd approach[1]. There were no constraints to survey effort.

A breeding bird species list compiled July of 2020 has also been referenced where applicable.

In March of 2021 (24/03/21) a survey of all silt ponds (plus a 50m buffer),suitable drainage channels on site and the course of the Pollagh Stream (plus a 50m buffer) adjacent to the bog was undertaken for fields signs of mammals in line with Best Practice[2][3]. These field signs, as described in Neal & Cheeseman (1996) and Bang & Dahlstrom (2006), include:

- mammal breeding and resting places, such as setts, holts, lairs;
- pathways;
- prints;
- faecal deposits;
- latrines (and dung pits used as territorial markers);
- feeding signs (snuffle holes);
- hair;
- scratch marks.

Locations of field signs were geo-referenced and subsequently digitised. Weather conditions on the date of survey were bright with a southerly F2 wind, 80% cloud cover and sunny spells interspersed with showers. There were no constraints to survey effort.

[1] A. F. Brown & K. B. Shepherd (1993) A method for censusing upland breeding waders, Bird Study, 40:3, 189-195, DOI: 10.1080/00063659309477182

[2] National Roads Authority (2008.) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. The National Roads Authority, Dublin.

[3] Highways Agency (1999). Design Manual for Roads and Bridges - Nature Conservation Advice in Relation to Otters HA81/99. The Highways Agency, London.

2.3 Results

2.3.1 Desktop Review

2.3.1.1 Birds

Oughter Bog has attracted breeding wildfowl in the past including Northern Lapwing (Vanellus vanellus), Red-listed on the Birds of Conservation Concern in Ireland list and highlighted as a conservation priority in the Government's Prioritised Action Framework 2014-2020. Up to five breeding pairs have been recorded. Common Ringed Plover (*Charadrius hiaticula*), up to 5 breeding pairs and Common Snipe (*Gallinago gallinago*), Amber listed, (potentially up to 20 pairs) have also been recorded. Territorial or 'Roding' Woodcock (*Scolopax rusticola*), Amber listed, have previously been recorded in suitable habitat immediately adjacent to the west of the site and this species is considered a possible breeder at Oughter Bog. Black-headed Gull (*Chroicocephalus ridibundus*), Red listed for breeding birds has bred at Oughter Bog, north of the railway line and in the past and a small colony has existed in the SW of Oughter Bog. Both Whimbrel (*Numenius phaeopus*) and Black-tailed Godwit (*Limosa limosa*) have been recorded overflying Oughter Bog on Spring passage. Wheatear (*Oenanthe oenanthe*) occurs on Autumn passage.

Regarding breeding birds, more recently, in July of 2020, 'chipping' Snipe (*Gallinago gallinago*) were flushed at 2 no. locations on a walkover survey ; other species utilising the bog were Grey Heron (*Ardea cinerea*), Skylark (*Alauda arvensis*) (2 recorded in song on pioneering cutaway therefore considered a likely breeder).; and Buzzard (*Buteo buteo*) was also noted hunting.

A review of the available Biodiversity records from the National Biodiversity Data Centre (NBDC) on the two tetrads (N22C/N22D) which include Oughter bog found records of two bird species in N22C, Common Grasshopper Warbler (*Locustella naevia*) and Eurasian Woodcock (*Scolopax rusticolar*), which is amber listed. Tetrad N22D had no bird species listed.

2.3.1.2 Mammals

With regard to terrestrial mammals, Irish Hare (*Lepus timidus hibernicus*) is known to occur at Oughter, in addition European Hedgehog (*Erinaceus europaeus*) has been recorded in tetrad N22D, along with Eurasian Badger (*Meles meles*). Three species of bats, namely Lesser Noctule (*Nyctalus leisleri*), Common Pipistrelle *(Pipistrellus pipistrellus sensu lato*) and Soprano pipistrelle (*pipistrellus pygmaeus*) have been recorded.

2.3.1.3 Invasive Species

No invasive alien species of flora are known to occur in respect of Oughter Bog. American Mink (*Mustela vison*) has been recorded but is unlikely to be dispersed during PCAS activities.

2.3.2 Winter birds 2020/21

A total of 19 no. species were recorded at Oughter Bog during surveys conducted in the winter period 2020/21. Details of survey (weather) along with results are presented below including Conservation Status .

Weather 14.01.21	Bright/Zero Cloud/Dry/Vis. Excellent
Weather 24.03.21	Bright/Wind SF2/Could 80%/Cold with sunny spells and showers

Table 1. Bird Survey Results Winter 2020/21

Species	14.01.21	24.03.21	BOCCI*
LT	1	1	Green
MP	2	2	Red
RN	2	2	Green
WR	0	2	Green
WP	0	1	Green
BZ	0	3	Green
R	0	2	Green
D	0	2	Green
GJ	0	3	Amber
H	1	1	Green
S	3	3	Amber
SN	6	2	Red
RB	1	1	Green
L	0	3	Red
KF	1	0	Amber
BF	3	0	Green
SG	25	0	Amber
GP	4	0	Red
SC	1	0	Green

*Gilbert G, Stanbury A and Lewis L (2021), "Birds of Conservation Concern in Ireland 2020 –2026". Irish Birds 9: 523—544

The species and numbers are representative of the nature of the receiving environment at Oughter with the majority of the bog comprising pioneering poor fen vegetation along with bare peat and some scrub/woodland.

2.3.3 Mammal Survey 2021

Results of the described survey are provided below as **Table 2** and **Figure 1.**

Table 2: Results of Mammal Survey.

X (ITM)	Y (ITM)	Object	NOTES
620414	722640	American Mink	Scat
620406	722638	American Mink	Scat and Trackway to River
620255	722581	American Mink	Scat
620251	722578	American Mink	Scat
620257	722544	American Mink	Scat
620181	722642	American Mink	Scat
620966	722595	Badger	Snuffle Holes
621701	722092	Otter	Footprints in front of Drainage Pipe

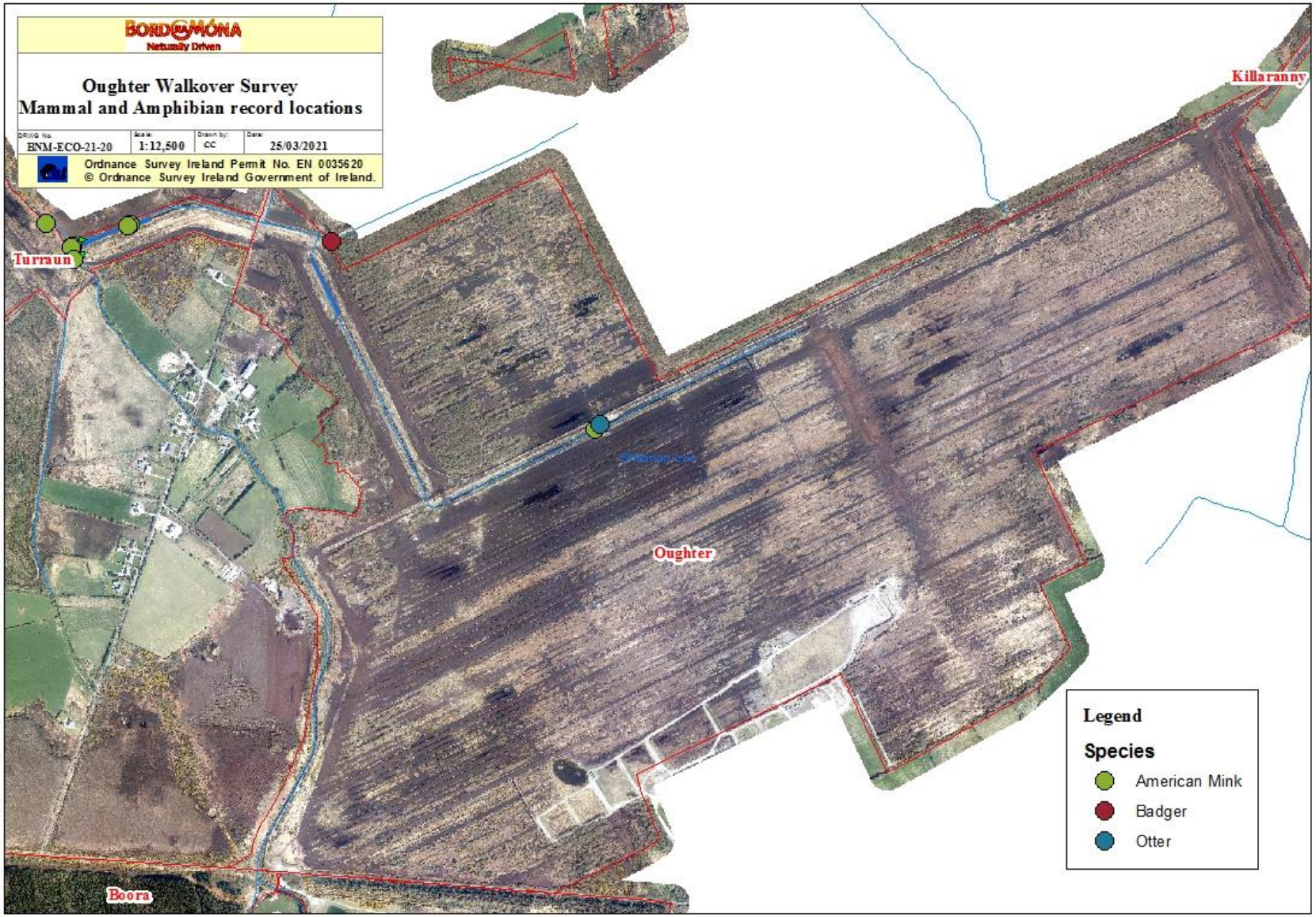


Figure 1. *Results of Oughter Bog Mammal Survey*

2.4 Certainty and Sufficiency of Data

All field survey work was carried out by qualified and experienced ecologists, and in line with Best Practice.

In addition, where required, or possible, specific data requests have been made to NPWS via the online data request facility, specifically with regards to records of sensitive species; and, to BirdWatch Ireland in respect of the results of IWeBS surveys, which are available upon request.

Further sources of data which were reviewed included previously commissioned baseline reporting of Bord na Mona Bog Groups, reporting to inform Bord na Mona wind farm proposals, and any available Bord na Mona wind farm monitoring reports where it was deemed there was overlap with the current scope of PCAS activities. Citations are provided at the end of this report for any reports which have been referenced.

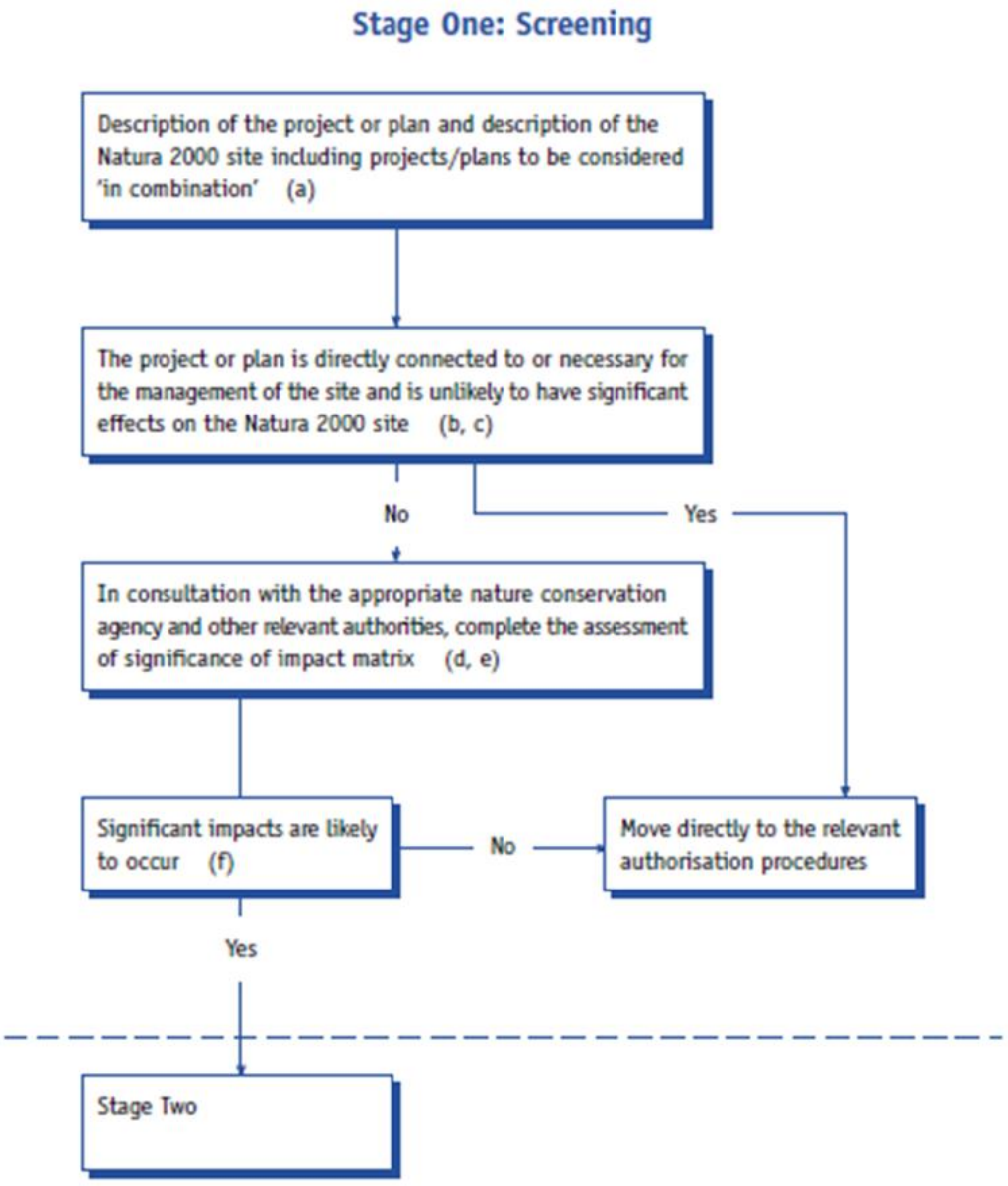
For the avoidance of doubt due regard has been given to the passage of time & any changes to the baseline environment in the interim period were considered by a suitably qualified ecologist; visits to inform the current appraisal were used as ground-truthing exercises to confirm the relevance or not of any previously defined baseline.

In the most part, due the continuation of industrial Peat Extraction by Bord na Mona up to and including the year 2019, it was considered that habitats at Oughter remained relatively unchanged from the point at which many prior baseline surveys were undertaken, and therefore, it is considered that data presented in prior baseline reporting was reflective of the current conditions.

3 Stage 1: Screening

3.1 Screening Evaluation Process

The Screening process examines the likely effects of the described Oughter Bog decommissioning and rehabilitation, as described in the appended 'plan' (**Appendix C**), either alone or in combination with other projects or plans, upon any European Site and considers whether it can be objectively concluded that these effects will not be significant. The Screening evaluation comprises four steps, as outlined in the diagram below:



3.2 Overview of Oughter Bog Decommissioning and Rehabilitation

Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Boora bog group (Ref. P0500-01). As part of Conditions 10.1 and 10.2 of this licence respectively, decommissioning and rehabilitation must be undertaken to ensure the permanent rehabilitation of the cutaway bog lands within the licensed area. Oughter bog is part of the Boora bog group. Oughter Bog is located in Co. Offaly. A document titled '*Oughter Bog Cutaway Bog Decommissioning and Rehabilitation 2021'* has been prepared specifically to describe the proposed decommissioning and rehabilitation measures at Oughter Bog and is appended to this document as **Appendix C**.

It is proposed by Government that Bord na Móna carry out a **Peatlands Climate Action Scheme (PCAS)** on peatlands previously used for energy production. The additional costs of the proposed Scheme will be supported by Government through the Climate Action Fund. Bord na Móna have identified a footprint of 33,000 ha (a subset of the BnM estate that has been used for energy production) as peatlands suitable for enhanced rehabilitation – including Oughter Bog. This proposed Scheme will significantly go beyond what is required to meet rehabilitation obligations under existing EPA IPC licence conditions.

Decommissioning seeks to address condition 10.1 of license Ref. P0500-01, which 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.

Decommissioning must take place at each bog prior to or concurrent with rehabilitation – the scale of decommissioning per bog varies dependant on the items/ infrastructure previously in place to facilitate prior peat extraction.

Enhanced decommissioning as part of the PCAS will enhance the future after use of the bog for amenity value, security against access for illegal and unsocial activities and general State and community benefit.

Rehabilitation seeks to address the requirements of Condition 10.2 of IPC License Ref. P0500-01 and is based on a reference document prepared by BNM per Bog for which the IPC license is applicable. See the following extract from IPC License Ref. P0500-01:

"*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."*

Oughter Bog was drained and developed for industrial peat production in the **1960s** and has been in **active peat production** since this period, until **2012**. The peat was harvested for fuel peat to be used in West Offaly Power Station in Shannonbridge (closed in 2020) and Derrinlough Briquette Factory (due for closure), Co. Offaly**.**

Since industrial peat production ceased in **2012**, the primary rehabilitation goal and outcome for Oughter Bog is **environmental stabilisation** of the bog.

Enhanced Rehabilitation interventions supported by the above referenced 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.

3.3 Screening Evaluation: Is the Project Directly Connected to or Necessary for Management of a European Site?

For a project or plan to be 'directly connected with or necessary to the management of the site', the 'management' component must refer to management measures that are for conservation purposes, and the 'directly' element refers to measures that are solely conceived for the conservation management of a site and not direct or indirect consequences of other activities.

Finding: **No, the proposed Oughter Bog Decommissioning and Rehabilitation is not directly connected to or necessary for the management of a European Site.**

3.4 Description of the proposed Decommissioning and Rehabilitation

3.4.1 Location, Size, Scale, Landcover

3.4.1.1 Location

Oughter Bog is located on the Blue-Bell to Cloghan road (R357) in County Offaly. It is situated 3.0km south of the village of Pollagh, 12.0km west of Tullamore and 9.5km east of Ferbane. Oughter bog lies to the south of the River Brosna and is drained by one of its tributaries **(See Fig. 1)**.

A portion of the former bog is now within a **Native Woodland Scheme** and is no longer in the ownership of BNM. Part of the southern portion of Oughter Bog cutaway has been leased and developed as **The Midlands National Shooting Centre of Ireland**.

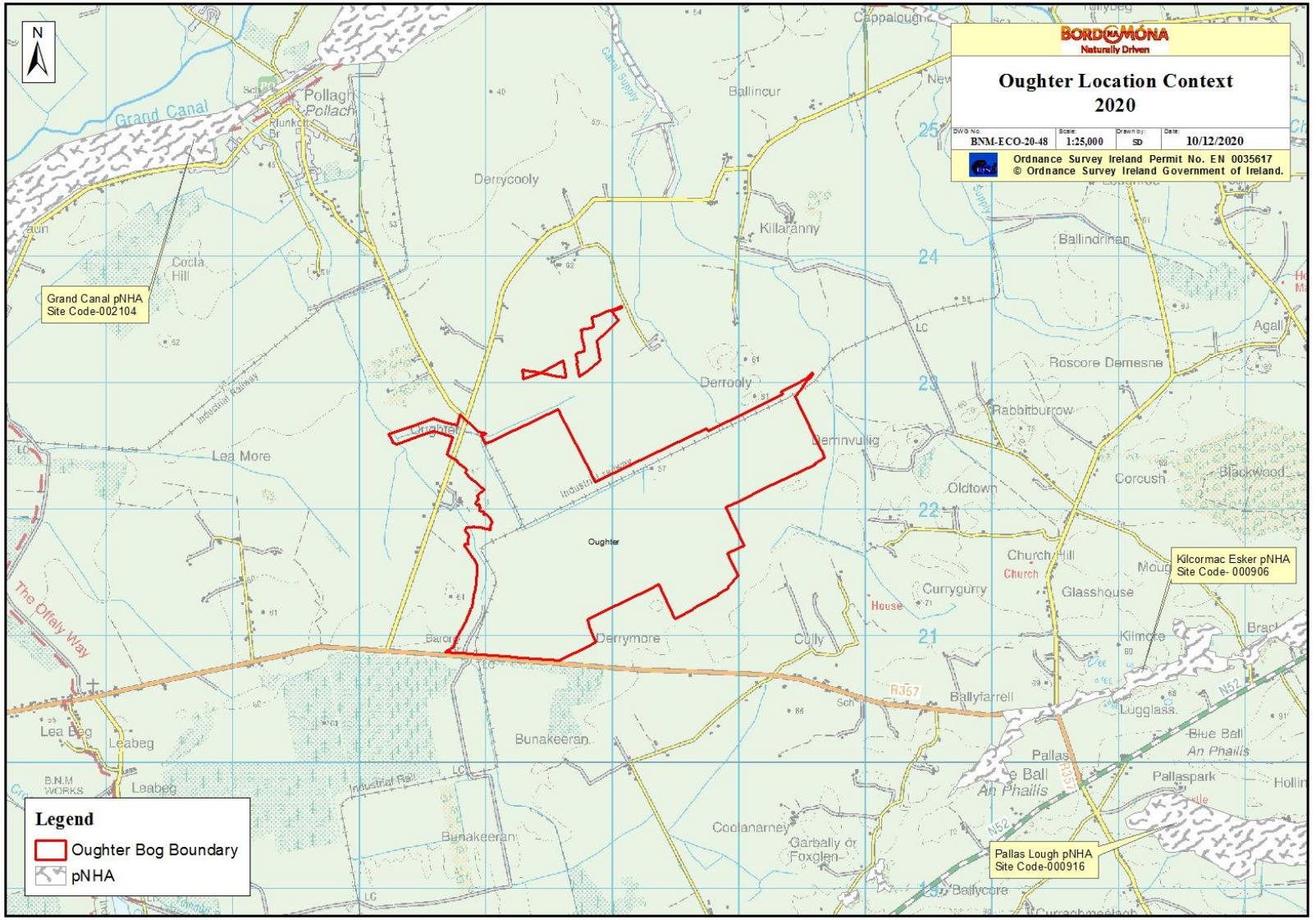
Oughter Bog is linked by rail, to Derrinlough Briquette Factory and to the recently closed West Offaly Power Station (WOP) at Shannon-bridge, and the rail-line provides the main access to the north-west of the site. Other adjacent BnM bogs include Turraun Bog, which is located to the north-west of Oughter Bog, Kilaranny Bog located to the north-east, while Pollagh Bog is located to the north and Boora Bog is located to the south-west.

Biodiversity and ecosystem services have been identified as the current primary land-use at Oughter. The southern portion of Oughter Bog has previously been leased and developed as The Midlands National Shooting Centre of Ireland. Bord na Móna will continue to review the future after-use of its land-bank. Any consideration of any other future after-uses for Oughter 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. Peat production activities have the potential to impact the habitats and environment of a bog. The ecological processes involved in the creation and maintenance of functioning, active bog systems are complex, happen over very long time periods (>1,000 years) and not all are fully understood. Nevertheless, the basis for the proposed approaches and implementation outlined in the document is the experience gained in 40 years of research and implementation of the after-use development, rehabilitation and restoration of the Bord na Móna cutaway bogs as well as best practise internationally (see reference documents).

The surrounding landscape is a mosaic consisting of low-lying agricultural land (pasture) interspersed with raised bogs, many of which have also been managed by Bord na Móna for peat production with some areas utilised for domestic turf-cutting. There are some drier grasslands found on mineral soils that overlay glacial mounds and ridges throughout the area.

The River Brosna lies 3.5km to the north-west of Oughter Bog and flows south-west for 25km into the River Shannon. The outflow streams from Oughter Bog discharge into this river system. To the north-east, the bog discharges via **3 silt ponds** into the Pollagh Stream The Pollagh Streams flow north under the Grand Canal and directly into the Brosna River.

Figure 2: Site Location of Oughter Bog



3.4.1.2 Size, Scale, Landcover

Size and Scale: Oughter Bog comprises **358.0ha** in total.

Oughter Bog (production area) is mainly composed of bare peat along with mosaics of pioneering vegetation and includes active drainage channels (**See Appendix C**).

The underlying geology at Oughter Bog is Limestone (Visean Limestones (Undifferentiated) with some Waulsortian Limestones also.

The underlying soils and sub-soils are classed as 'Cutover/ Cutaway Peat'.

Oughter Bog has a long history of industrial peat production. Fen peat and exposed underlying sub-soil is now exposed across the site. Peat depths (2015) generally vary across the site from **0.5-2m.**

Oughter Bog was originally developed for peat production in the **1960'**s. Commercial peat extraction ceased at Oughter Bog in **2012**. As a result, peat depths are limited on site with most peat depths at **0.5-2.0m**. The peat on site is mostly "red" or "Sphagnum peat" and was used as fuel peat supplying West Offaly Power.

In terms of size and scale, **decommissioning** at Oughter Bog includes, cleaning of existing **silt ponds** (**3** no.)

Enhanced measures may include the lifting of the existing rail line, decommissioning of existing level crossings and measures to restrict access to the bog.

The total area of Oughter Bog is **358.0 ha** of which **241.45ha** or **67.5%** of the present Landcover (2020) will be subject to **enhanced rehabilitation** measures/activities.

Landcover

Existing Habitats:

Oughter bog is considered a cutover bog with a relatively deep basin that is dominated by bare peat due to former industrial production. Oughter Bog has variable depths of peat. Most of the former peat production area (>**50%)** is bare peat and contains active drainage channels and there is pioneering vegetation in the south of the bog.

Industrial peat extraction at Oughter Bog ceased in **2012**. Bord na Móna does not intend to carry out any industrial peat production at this site in the future, so industrial peat extraction has permanently ceased. Currently the former peat production area comprises both bare peat and re-vegetated areas. The combination of active rehabilitation measures and natural colonisation will quickly establish and/or increase the extent of pioneer vegetation and will be planned to accelerate environmental stabilisation. Nevertheless, it will take some time (30-50 years) for naturally functioning peatland ecosystems to fully re-establish.

Parts of Oughter Bog (outside the areas owned and under the control of Bord na Móna) are currently used for a **Native Woodland Scheme**. 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 woodland establishment issues on the margins of Oughter 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 the rehabilitation plan considered potential impacts of these on the delivery of the stated objectives.

The area of Oughter Bog leased to **The Midlands National Shooting Centre** of Ireland is not considered part of the scope of this rehabilitation plan. Rehabilitation in other areas of the bog may also be constrained due to other property issues or issues such as rights of way. There are no known rights of way on this bog. However, a grazing agreement is in place for a small portion of cutaway at the northern end of the bog.

The bog is primarily divided into two main sections by a rail-line orientated NE-SW. The majority of the area south of the railway is classified as production-related cutaway. A large part of this area is bare peat. This area also contains some young pioneer Poor Fen vegetation, mainly Common Cotton-grass (*Eriophorum angustifolium*) and Soft Rush (*Juncus effusus*) spreading from the drains. Large sections are re-vegetating rather quickly and there are also some patches of Birch (*Betula* spp,) dominated scrub **(WS1).** There is some open water present, but it is minor in extent and some of this habitat may be transient. Some small mounds and ridges contain dry grassland and disturbed vegetation communities.

The western boundary of the bog is marked by a small stream. This western margin contains a mosaic of habitats and is used for access and as a Works area. It contains a range of habitats including Birch scrub **(WS1)** and Bramble (*Rubus* spp.) on old spoil heaps, with patches of Bracken (*Pteridium aquilinum*), wet grassland and dry grassland. The south-east section contains a small area of cutover bog **(PB4)** and improved grassland **(GA1)** adjacent to the BnM boundary.

The oldest area out of production is located adjacent to the east side of the shooting range. This area has almost completely re-vegetated and contains a diverse mosaic of vegetation communities including some indicators of **Rich Fen (PF1).** The main habitats are **Birch** scrub along with pioneer Bottle Sedge (*Carex rostrata*) and Common Cotton-grass (*Eriophorum angustifolium*) dominated vegetation with some of open water associated with small pools that that developed along the drains in this section.

Northern Section

The majority of the area north of the rail-line has been classified as cutaway and a large part of it has been taken over by a private **Native Woodland Scheme**. The majority of the area within the Native Woodland Scheme contains pioneer Soft Rush (*Juncus effusus*) dominated vegetation, and Birch scrub. Some drier sections still contain Bare Peat, pioneer dry grassland communities or disturbed vegetation communities. A range of tree species were planted in 2008 including Scot's Pine (*Pinus sylvestris*), Birch (*Betula* spp.) and Alder (*Alnus glutinosa*). Some sections contain young trees that are now overwhelmed by Soft Rush (*Juncus effusus*)**.** There is also some naturally regenerated emergent and closed Birch scrub **(WS1)** developing in this area.

The area outside the Native Woodland Scheme contains similar habitats. Of note is a relatively large pool of open water that has developed adjacent to the railway and contains a small patch of Common Reed (*Phragmites australis*)**.** Overall Common Reed was rare on this site.

A railway also branches off the main line and accesses the north-east corner of the site. A large drain in a deep trench is also located adjacent to the railway. Some Birch woodland **(WN7)** and Birch scrub **(WS1)** have developed along the western margin of this section.

Extent of Landcover requiring Decommissioning:

Decommissioning will be applicable across all of Oughter Bog.

Extent of Landcover requiring Rehabilitation:

The total area of Oughter Bog is 385.0ha of which 241.45ha or 67.5% of the present Landcover (2021) will be subject to **rehabilitation** measures/activities.

Future Landcover:

Following decommissioning and rehabilitation measures, future landcover of habitats currently evaluated as not requiring Rehabilitation (i.e. Access Tracks and rights of way, marginal lands such as agricultural land, and

marginal areas (e.g. high bog) around the edges of Oughter Bog) will remain in line with existing baseline trends for these habitats, albeit without any waste or materials which would have been left in situ in the absence of decommissioning.

For habitats where rehabilitation is undertaken, landcover is expected to eventually comprise Regenerating Degraded Raised bog communities; Poor fen, Scrub, Bog Woodland (or various mosaics of Birch Woodland, such as with Willow, or Pine); Riparian woodland and also riparian zones. The development of these habitats will reflect the varying underlying environmental conditions and in part will develop as a mosaic of habitats. Rehabilitation will also modify the local environmental conditions (e.g. hydrology and topography).

The proposed rehabilitation will mean that environmental stabilization is achieved (meaning IPC obligations are met) and, in addition, significant other positive quality effects particularly for climate action will be accrued.

3.4.2 Bog Characteristics

3.4.2.1 Hydrology and Hydrogeology

At Oughter Bog it is likely that a portion of these basins will re-wet with deeper water, creating a mosaic of wetland habitats.

Watercourses (major water features on/off site)

A small stream is located along the west boundary of the site. This flows north and is part of the River Brosna catchment. A large drain flows though the northern half of the site through a deep trench and runs adjacent to the rail-line. This drain may have been a natural drainage features that was channelised and deepened during the development of the bog. This drain also connects to the stream flowing north into the Pollagh Stream to the north-west. There is a second drain that flows towards the south-western margin and also connects to the Pollagh stream.

Oughter Bog is located in the Upper River Shannon Catchment. The catchment discharges via silt ponds to the **Pollagh Stream** and discharges north to the **River Brosna,** (BnM, 2021).

Silt ponds are present at to manage discharges to neighbouring water-courses. The bog has field drains running in a northeast to southwest orientation. Oughter bog is located in an area with a locally important bedrock aquifer (BnM, 2021).

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 discharges into a terminal silt pond that allows for settlement of suspended solids before discharging into the local stream systems (BnM, 2021).

3.4.2.2 Emissions

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. Re-wetted peat also aids the primary objective of stabilizing peat, as when peat is re-wetted it minimises risk 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) (BnM, 2021).

Water quality of water discharges from restored/rehabilitated peatlands normally improves as a result of bog rehabilitation and restoration measures and the restoration of natural peatland processes (Bonn *et al*., 20017). Peatland rehabilitation 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 the Bord na Móna cutaway rehabilitation is expected to have a positive impact on water quality and help the NWBMP deliver its objectives in relation to the WFD (BnM, 2021).

Water will still discharge from designated emission points when rehabilitation at Oughter Bog 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 status of the key downstream water body receptors and is expected to support the retention of **the current and future status of Pollagh Stream as being of Good Status** (BnM, 2021).

The main emission limit value associated with this bog is 35mg/l suspended solids, with trigger levels for ammonia of 3.7 mg/l and COD 100mg/l. From an analysis of any monitoring over the past 4 yrs. of the IPC licence environmental monitoring of some of the discharges from this bog, indicate that results were under the ELV for SS and trigger level for ammonia and COD. (**Table 2**).

Table 2. Water-sampling Oughter Bog

Bog	SW	Monitoring	Date Sampled	pH	SS	TS	NH3	TP	COD	Colour
Oughter	SW-18	Q3 19	10/09/2019	7.1	<2	424	0.188	<0.05	36	119
Oughter	SW-18	Q4 17	13/12/2017	7.4	8	288	0.46	0.05	64	223

Water quality monitoring at the bog will be established under IPC license requirements. 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 **(See Fig 3).**

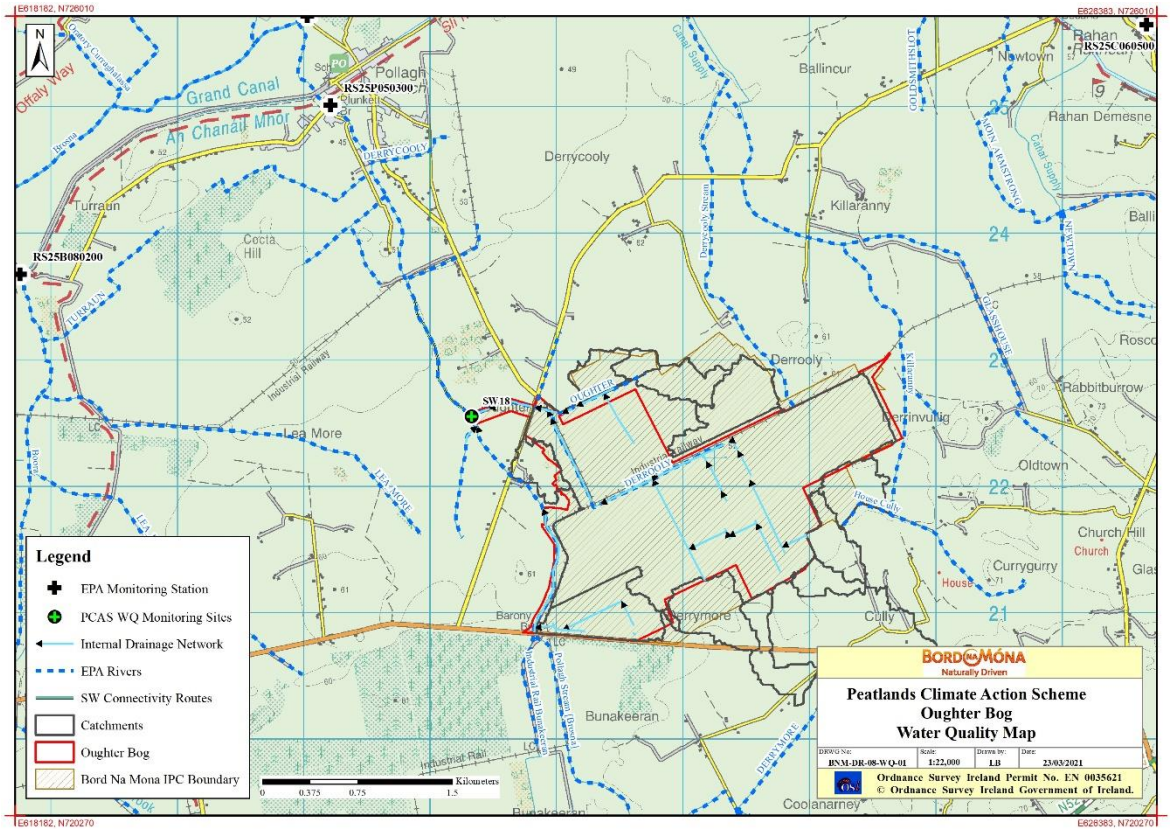


Figure 3 *Map of Oughter Bog showing water management features and water quality monitoring points.*

Fugitive Emissions to air

Industrial peat production has ceased at this bog. Rehabilitation of the cutaway peatland will seek to re-wet 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. (BnM, 2021).

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 (BnM, 2021).

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. The EPA NEROS project carried out GHG flux research at Moyarwood Bog and found that Moyarwood Bog was overall a Carbon sink (sink for CO2 and a source for Methane) 6 years after bog restoration was carried out (Renou-Wilson et al. 2018) (BnM, 2021).

It is expected that Oughter Bog can become a reduced carbon source with sections having potential to develop as a carbon sink (albeit in the longer term) following rehabilitation. The potential of any cutaway site to develop as a reduced carbon source/carbon sink in the longer-term depends on the success of the

rehabilitation measures, the extent of development of any *Sphagnum*-rich or other peat-forming habitats, the balance of carbon fluxes from different cutaway habitats and future climatic conditions. This bog is expected to develop a mosaic of fen, Reed swamp, wet woodland, scrub and embryonic Sphagnum-rich habitats. Birch woodland is expected to develop on the drier mounds and peripheral headlands (BnM, 2021).

It is expected that the overall ecological value of this site will increase in the future as the site re-vegetates, matures and forms semi-natural habitats, such as more extensive areas of fen, Reed swamp and embryonic raised bog. Re-wetting across the entire bog, as part of the proposed Scheme, will improve habitat conditions of the whole bog, making the overall bog wetter. Other peatland habitats will develop in a wider mosaic that reflects underlying conditions. It will take some time for stable naturally functioning habitats to fully develop at Oughter Bog. Re-wetting residual peat will initially maintain and enhance the carbon storage capacity of the bog. There is a world-wide 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 (Grand-Clement *et al*., 2015; Anderson *et al*., 2017; Minayeva *et al*., 2017). This will reduce carbon emissions from the site from a larger carbon source to a smaller carbon source (BnM, 2021).

In time, the site has the capacity to develop in part as a carbon sink. *Sphagnum*-rich peatland communities are considered to be actively peat-forming and are considered to be carbon sinks (Renou-Wilson *et al*., 2011; NPWS2017a, Renou-Wilson *et al*., 2018) and have potential to develop on deeper residual peat. Other sections of the site will improve in condition after re-wetting and also have the capacity to develop as a reduced Carbon source as Reed Swamp, fen, scrub and bog woodland habitats develop (BnM, 2021).

The proposed Scheme is designed to exceed the stabilisation requirements as defined by the IPC Licence. This Scheme is designed to enhance the ecosystem services of Oughter Bog, in particular, optimising **climate action benefits**. The proposed interventions will mean that environmental stabilization is achieved (meaning IPC obligations are met) and, in addition, significant other ecosystem service benefits particularly for climate action will be accrued.

- No rehabilitation measures are proposed for the Native woodland Scheme Plantation or the National Firing Range, which are not managed by Bord na Móna.
- The local environmental conditions of Oughter Bog identify deep peat re-wetting, dry cutaway and wetland prescriptions as the most suitable rehabilitation approach for this site.
- The key goals and outcomes of rehabilitation set by Bord na Móna have defined the key goal and outcome of rehabilitation at Oughter Bog as **environmental stabilisation** and **optimising suitable hydrological conditions 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.**
- Enhanced Rehabilitation of Oughter Bog will support multiple National strategies of climate action, biodiversity action and other key environmental strategies such was the Water Framework Directive.
- It is not proposed to carry out any rehabilitation in the marginal cutover bog zone. The cutover bog mainly consists of active private turbary. (BnM, 2021).

3.4.2.3 Rehabilitation 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), and there will therefore be different habitat outcomes (wetlands, fen, heathland, grassland and Birch woodland).

• There are local factors that will influence the future trajectory of this site (hydrological and underlying geological conditions) which need to be considered as part of the wider rehabilitation work. There is significant potential for development of wetland habitats in this site due to the current drainage conditions and topography of the site. The bog is also underlain by shell marl, which will have a significant influence on water chemistry and the development of the future wetland habitats, meaning there is potential for more extensive rich fen development.

• **Surrounding landscape and neighbours.** Another key constraint is the interaction between the Bord na Móna sites and the surrounding landscape. Care must be taken to ensure that active rehabilitation management will not negatively and knowingly impact on surrounding land. This includes any hydrological management on neighbouring farmland. It is anticipated that the work proposed here (blocking drains and re-wetting cutaway peatlands) will not have any flooding impacts on adjacent land. Some boundary drains around Pollagh Bog will be left unblocked as blocking boundary drains could affect adjacent land.

• **Archaeology**. The discovery of monuments or archaeological objects during peatland rehabilitation may potentially constrain the rehabilitation measures proposed for a particular area. If this occurs, rehabilitation measures will be reviewed and adapted. An archaeological impact assessment of the proposed rehabilitation at Oughter Bog was carried out for the rehabilitation plan. There are no known archaeological features. Rehabilitation will take account of stray archaeological finds **(Appendix C)**.

Parts of Oughter Bog (outside the areas owned and under the control of Bord na Móna) are currently used by a **Native Woodland Scheme, the National Firing Range and 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. Bord na Móna are aware of such issues which may constrain the proposed rehabilitation actions, and this enhanced rehabilitation plan considered potential impacts of these on the delivery of the stated objectives (BnM, 2021).

Figure 4: Current Habitats at Oughter Bog (sourced from Rehabilitation Plan/Appendix C)

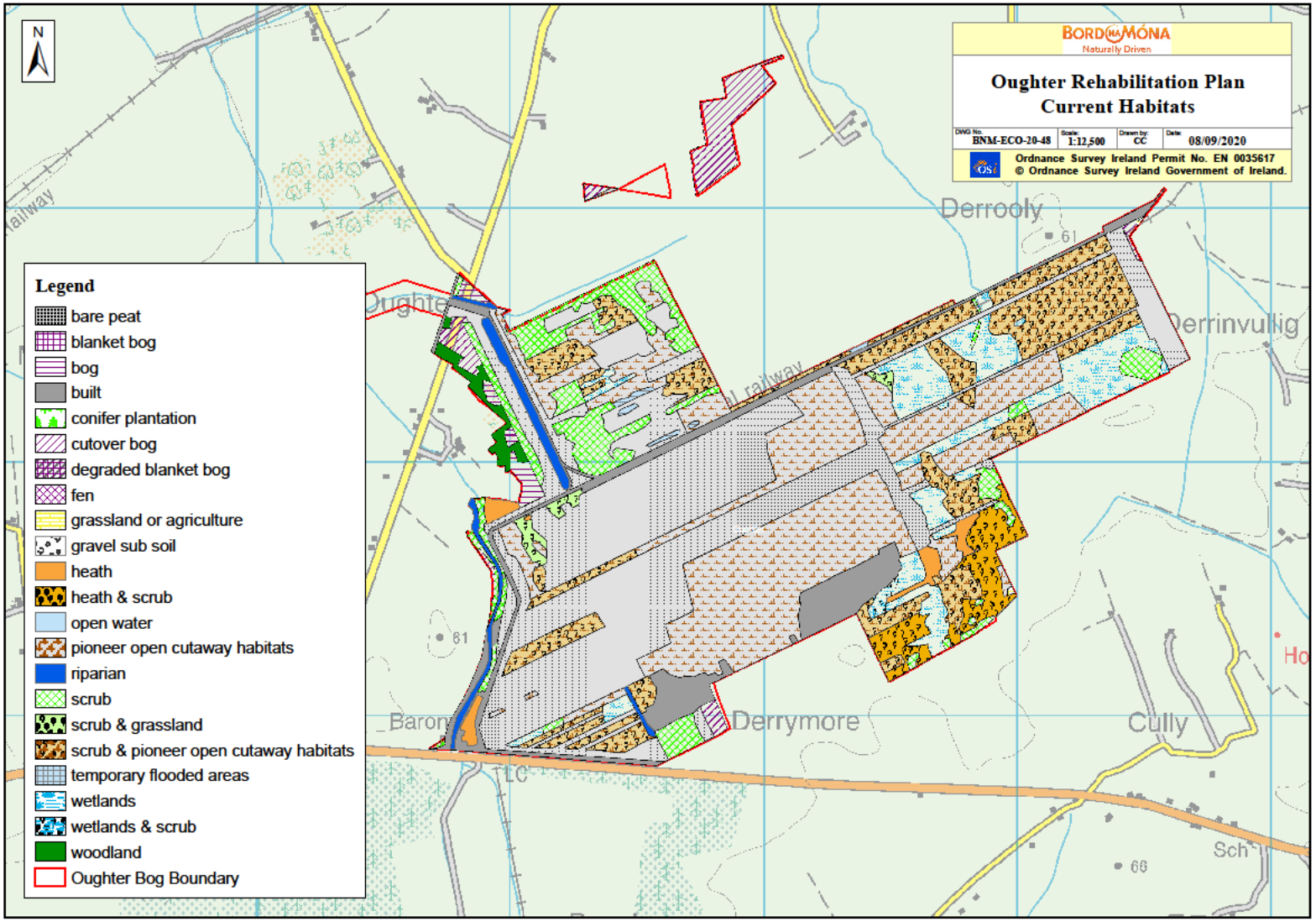


Figure 5. *Map of Oughter Bog showing structures, site infrastructure, silt ponds and designated emission points.*

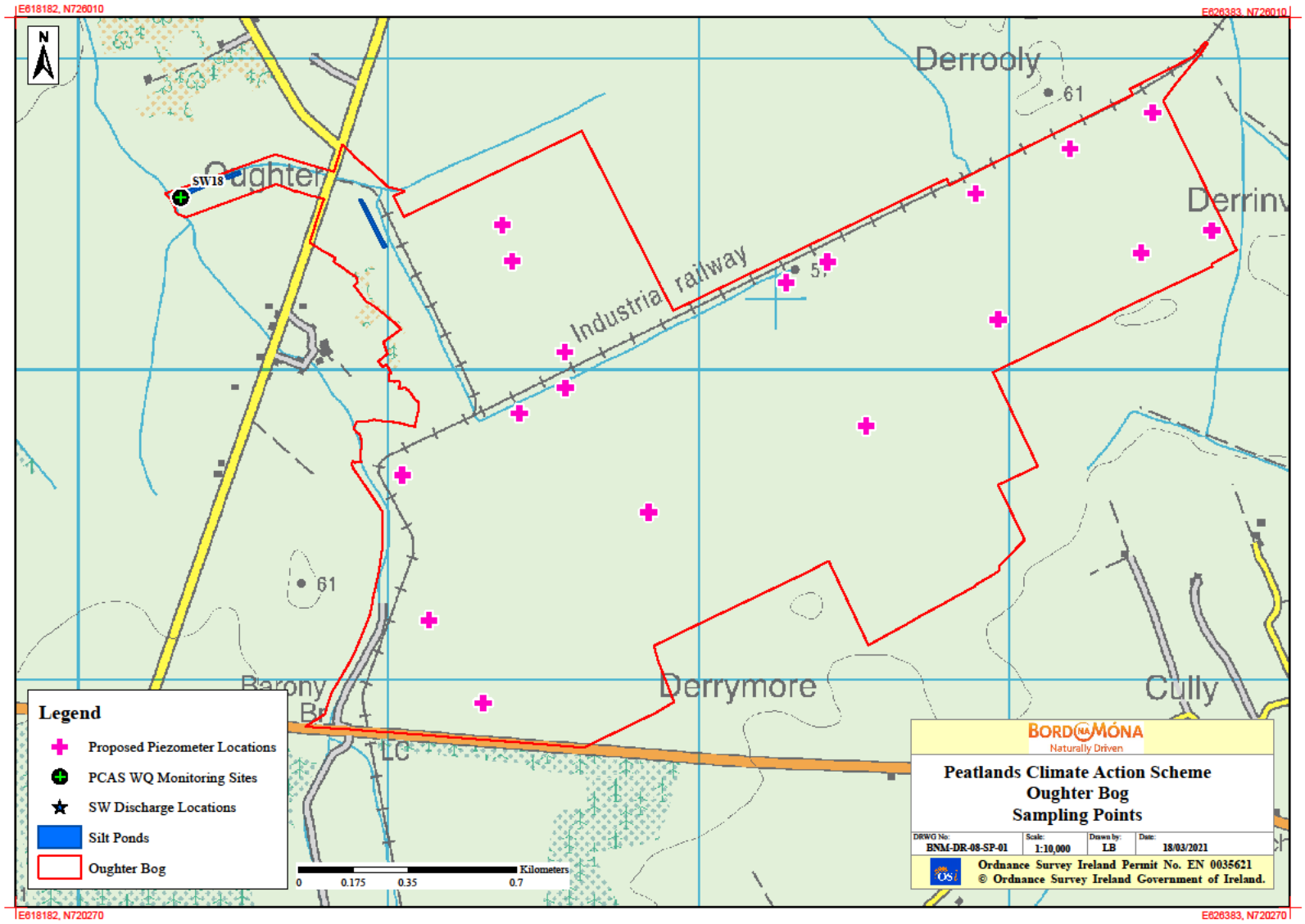
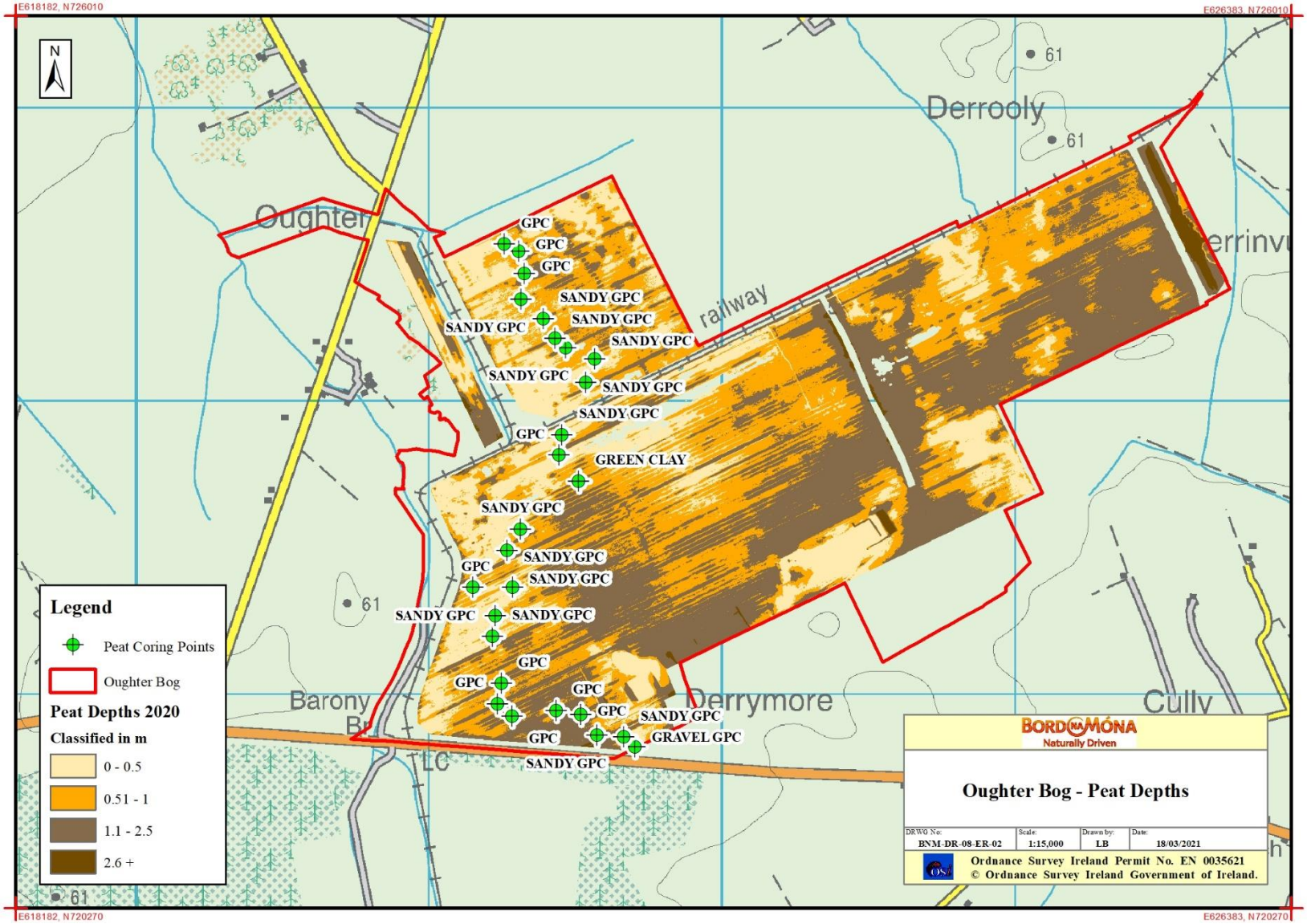


Figure 6 *Oughter Bog Aerial photograph showing bare peat areas.*

Figure 7. Peat Depth Map for Oughter Bog.



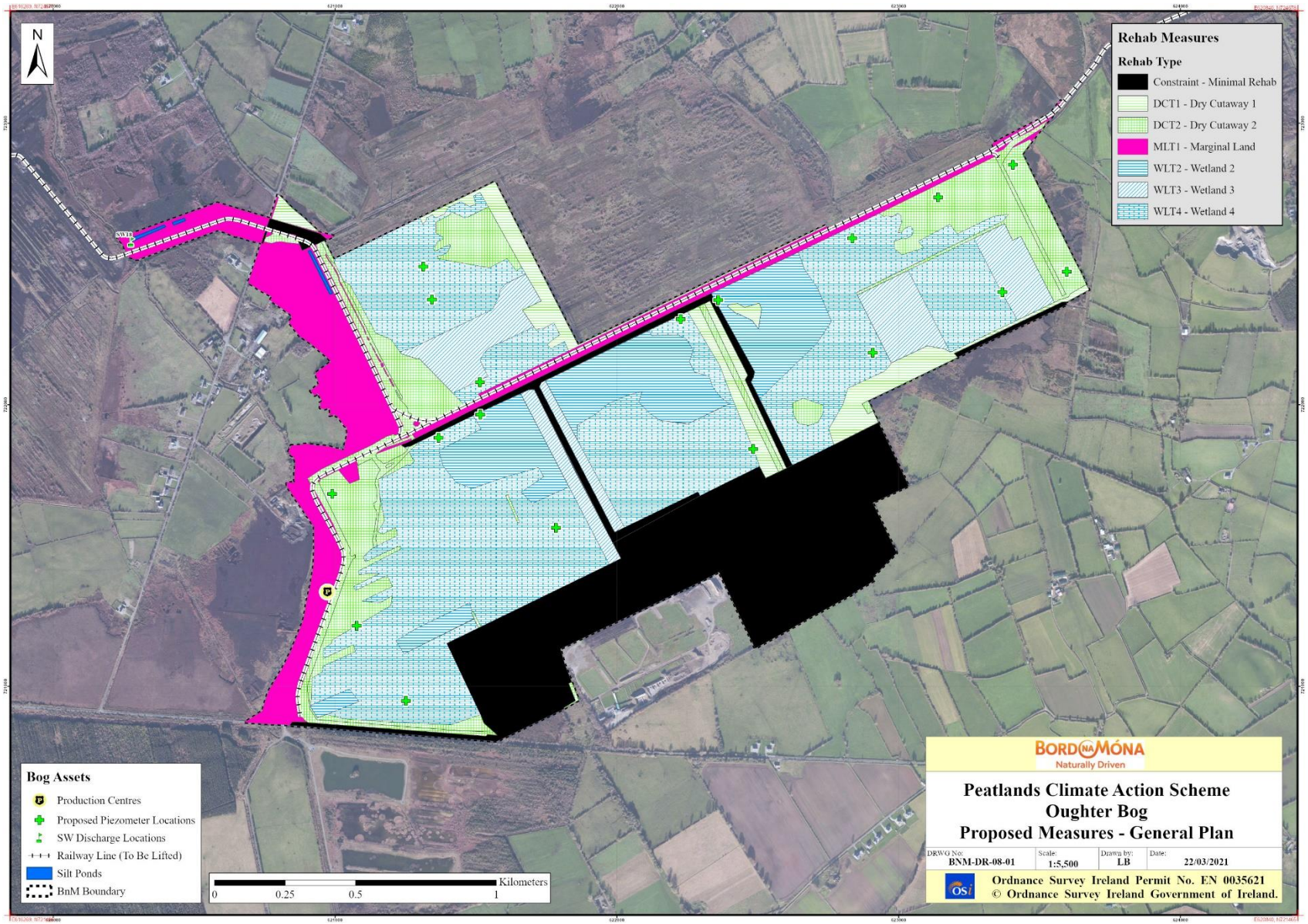


***Figure 8**. Indicative Enhanced Rehabilitation Plan for Oughter Bog*

3.4.3 Application of Protective Measures in the Screening Evaluation

The Screening evaluation to inform the AA process, presented in Section 3.8 below, has been **carried out in the absence of any protective measures or mitigation measures considered to avoid harmful effects on European Sites.**

3.4.4 Decommissioning and Rehabilitation Stage

The proposed decommissioning at Oughter Bog includes the cleaning and fencing of existing silt ponds. Enhanced decommissioning measures may include the lifting of the existing rail line, decommissioning of existing level crossings and measures to restrict access to sections of the bog. Porto cabin tea centre, fixed fuel tanks and septic tank are located at Turraun Bog, 1400m north-west of Oughter Bog site entrance.

The decommissioning phase may overlap with the rehabilitation phase of the project. For example, rail line lifting may occur concurrently or after rehabilitation activities. In some instances, outer spurs are to be left in place to facilitate rehabilitation access, meaning these lines will not be lifted until rehabilitation is complete.

The proposed Oughter Bog **enhanced rehabilitation** comprises a series of bespoke (to Oughter Bog) interventions designed to stabilise the existing baseline and meet compliance with the requirements of the existing EPA, IPC License and the proposed PCAS. Prescriptive measures are unique to the existing baseline habitats and comprise 4 broad categories, 1) those associated with (exposed) Bare Peat; 2) measures associated with Dry Cutaway: 3) measures associated with the creation of wetland habitats on shallow peats; and 4) measures associated with marginal lands, such as access roads, improved grassland around the periphery of the bog.

3.4.4.1 Decommissioning and Rehabilitation Access

Access will be through the existing entrance beside the level crossing to the north-west of Oughter Bog. This has a rail-line link and machinery track to Turraun Bog to the west. There is existing infrastructure already in place via access tracks to facilitate the previous peat extraction. No change to baseline conditions to facilitate access for either decommissioning or rehabilitation is required.

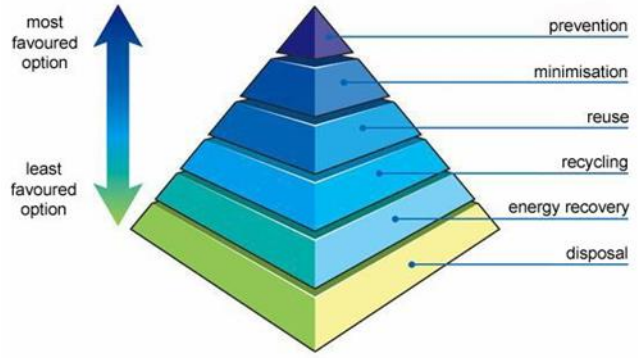
3.4.4.2 Standard Methodology for Decommissioning

Decommissioning at Oughter Bog will involve the deployment of a work crew to collect and oversee the removal of any remaining plant or potentially contaminating waste left *in situ* in line with Condition 7 of License Ref. P0500-01. This condition specifically requires that BnM's procedures for the 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 the IPC license 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 EPA. Waste sent off-site for recovery or disposal shall only be conveyed to a waste contractor, as agreed by the EPA, 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.

A full record, which shall be open to inspection by authorized persons of the EPA at all times, shall be kept by the licensee (BnM) on matters relating to the waste management operations and practices at Oughter Bog. This record shall as a minimum contain details of the following:

- The names of the agent and transporter of the waste;
- The name of the persons responsible for the ultimate disposal/recovery of the Waste;
- The ultimate destination of the waste;
- Written confirmation of the acceptance and disposal/recovery of any hazardous waste consignments sent off-site;
- 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;
- Details of any rejected consignments.

A copy of this Waste Management record shall be submitted to the Agency as part of the AER for Oughter Bog. As required by the license, these waste items will be removed for recycling or disposal, using external contractors with the required waste collection permits, with waste records maintained as required. Where possible, Bord na Mona 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 license.

Access Restriction

Decommissioning may also include measures to restrict access to the bog or silt ponds.

Rail lines

Regarding the lifting of rail lines this will be facilitated by a manual work crew either a) loading rail line components onto a trailer and removing a) direct to contractor, b) to a consolidation area via tractor, prior to disposal, or c) utilizing the rail line itself to remove the components in reverse order onto a locomotive trailer, with again, the parts being delivered up the rail line to be stored and/or disposed of, in line with IPC license conditions.

Decommissioning and De-Gassing Mobile Fuel Tanks: There are no Mobile-Fuel tanks remaining on Oughter Bog. There are Fixed Fuel Tanks at Turraun Bog, 1400m north-west of Oughter Bog, site entrance.

Decommission and Removal of Porto-cabin tea centre and materials store: The tea-centre on Oughter Bog has already been removed. The tea centre at Turraun Bog (1400m to north-west) will be used by staff during enhanced rehabilitation works. Tea centres are used to provide canteen and welfare facilities for bog operations and are, a portacabin that typically contain tables and chairs, a fridge, lockers, cabinets, sinks and other fixtures and fittings.

Bog areas clean up: These bog areas include the parking spaces for production plant and equipment, locations for storing rail line, drainage pipes and stockpile covering. All remaining or unconsolidated old and unused polythene will be collected for recycling or disposal, depending on condition. Any remaining older and immobile plant will be brought in from bog and removed off site. Any remaining hazardous waste oils, fluids and batteries will be removed off site by qualified appropriate hazardous waste contractors. All remaining unused drainage pipes will be gathered up for reuse, recycling or disposal. All remaining, unconsolidated unused rail line sections will be collected from the bog and stored at the main access location for dismantling.

A degree of Monitoring is required under Condition 10.1 of the IPC license under which Peat Extraction and now Decommissioning and Rehabilitation is to take place. This environmental monitoring carried out during the aftercare and maintenance period of Decommissioning and Rehabilitation, has to ensure no Environmental Pollution has been caused, and is subject to an Independent Closure Audit (ICA) followed by an EPA Exit Audit (EA) in order to facilitate IPC License surrender. Monitoring will entail a number of visits per annum (initially quarterly for 2 years, reducing to bi-annually and then annually after 5 years) to monitor water quality and habitat progression.

3.4.4.3 Standard Methodology for Rehabilitation Activities

The proposed Oughter Bog Rehabilitation will be undertaken using standard Best Practices in peatland restoration. These are based on published information in the Irish context, Methodologies developed through Rehabilitation trials, Best Practices employed elsewhere in Europe on peatland rehabilitation and restoration but also the 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), including examples such as the BnM Raised Bog Restoration Project[4] -see also Section 2.6.2 Sources of Information.

In terms of rehabilitation the ecological and site information collected during Bord na Móna ecological baseline surveys, additional site visits, stakeholder input, and monitoring and desktop analysis forms the basis for the planning of peatland rehabilitation at Oughter Bog, along with:

- Significant international engagement during this period with other countries in relation to best-practise regarding peatland rehabilitation and after-use through the International Peatland Society and the Society for Ecological Restoration (Joosten & Clarke, 2002; Clarke & Rieley, 2010; Gann et al., 2019); and
- Consultation and engagement with internal and external stakeholders.
- GIS Mapping
- BnM drainage surveys
- Bog topography
- Hydrological modelling

[4] Bord na Móna 2014. Blocking Drains in Irish raised bogs. The Bord na Móna Raised Bog Restoration Project. Cris, R. Buckmaster, S. Bain, C. Reed, M. (Eds) (2014) Global Peatland Restoration demonstrating SUCCESS. IUCN UK National Committee Peatland Programme, Edinburgh.http://www.iucn-uk-peatlandprogramme.org/sites/www.iucn-uk-peatlandprogramme.org/files/IUCNGlobalSuccessApril2014.pdf

Rehabilitation Packages

The key interventions to be applied to deep peat cutover bog restoration/rehabilitation is re-wetting peat to encourage natural colonisation of typical vegetation and the development of *Sphagnum*-rich peat-forming vegetation communities. The key interventions to be applied to areas of shallow residual peat prone to flooding, and areas of exposed marl or underlying substrate are effectively those to target the production of wetlands, or fen forming habitats. Some areas of residual peat, due to modelled water levels will effectively only be subject to water level management. Areas of marginal and higher elevated ground within the former production area, such as headlands will also be subject to drain blocking and fertiliser application. Certain prescriptions will require management to ensure water-levels remain close to the surface of the peat for most of the year (100mm ± 50mm).

Several different approaches can be taken to this type of restoration/rehabilitation, and the rehabilitation packages with different rehabilitation/restoration intensities to managing suitable hydrological conditions are proposed (see **Table 3, below**) with detailed drawings presented in Appendix D.

Note the table below excludes constrained areas and rehabilitation categories with no intervention.

Deep Peat Cutover Bog		**Extent (Ha)**
DCT1	Blocking outfalls and managing water levels with overflow pipes	15.25
DCT2	Regular drain blocking (max 3/100 m) + blocking outfalls and managing water levels with overflow pipes + targeted fertiliser treatment	44.12
WLT2	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes	35.43
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 and transplanting Reeds and other rhizomes	22.94
WLT4	More intensive drain blocking (max 7/100m) +blocking outfalls and managing overflows +transplanting reeds and other rhizomes	123.06
MLT1	No works Required (Marginal land)	40.45
	Silt Ponds	0.35
	Constraint	71.63
Total		**353.23**

Table 3 Rehabilitation Measures proposed at Oughter Bog.

The constituent prescriptions which combine to form each respective rehabilitation package are further described below, namely;

1. Regular Drain Blocking (3/100m) (Dozer)
2. Intensive Drain Blocking (max 7/100m) (Excavator)
3. Modification of Outfalls
4. Management of Water Levels
5. Construction of larger berms (wetand)
6. Transplanting Reeds and other rhizomes
7. Retention of Hydraulic Breaks

1.Regular Drain Blocking (3/100m – Speed Bump with Dozer)

Typical existing bare peat fields are cambered (higher) in the centre and lower towards the drains, helping drainage of the fields but limiting the re-wetting of the central area. The concept of drain blocking is to raise the water levels in the drains to re-wet the cutaway and slow the water movement through the bog. 'Speed Bumps' allow for peat subsidence and to prevent water from flowing over the drain block and eroding it before it becomes stabilised.

Phase 1 begins with the creation of a 'key' on either side of the drain. The dozer cuts down and pushes out peat 0.5-1m from the edge of the drain, with an equivalent section on the other side of the drain.

The next step comprises forming the 'Speed Bump' itself. A strip of peat is taken from the central camber of the field, pushed into the drain and keyed area and compacted by a bull-dozer tracking over the drain block, to form an approximately 5m Wide 'Speed Bump'.

Fields are then completed with Speed Bumps (at an approximate ratio of 3 Per 100m). Speed bumps are profiled to ensure that the overall field profile is lower in the centre and higher over the drain blocks.

See Methodology Drawing PCAS-0100-001 included as Appendix D.

2. Intensive Drain Blocking (max 7/100m)

Before building of dams, the sides and bottom of the ditch is cleaned using the excavator to remove dry degraded peat, to ensure a good peat-to-peat contact. If any vegetation is present, it is carefully removed and left aside for replacement at the end of the process.

A 'key' is then cut in either side of the drain approximately 500mm deep, and it is ensured that the width is wider than the actual drain. Approximately 500mm depth of peat is removed from the bottom of the drain also and placed behind the machine for replacement later.

An area is opened behind the machine to be used as a borrow pit. Using the surface layer of peat (i.e. the top 100-200mm) is avoided, as it is likely to be very permeable. Only the deeper, more compacted peat is used to build the dam. (again, if any vegetation is present, it is carefully removed and left aside for replacement at the end of the process).

Peat is then dug out from the borrow pit and placed into the drain compacting it in 300mm layers. The peat is compacted firmly using the excavator bucket before laying more peat from the borrow pit.

The dam is built up to a height at least 300mm-500mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries. Any vegetation taken in step 1 or step 3 is then placed on the top of the dam, to help bind and stabilise the drain block.)

The borrow pit is backfilled with the peat extracted from the bottom of the drain in step 2. The sides of the peat borrow hole are firmly pressed with the excavator bucket to grade the sides of the borrow pit.

This enhanced measure's main objective is to block drains with peat dams to raise water levels, re-wetting peat and slowing water movements through the bog.

See Methodology Drawing PCAS-0100-002 included as Appendix D.

4. Blocking Outfalls and Management of Water Levels

A description of a number of techniques in respect of outfall modification and management of water levels follows. Some, such as blocking of outfalls, are applicable across multiple rehabilitation prescriptions, whilst techniques such as the cutting of 'taps' are more applicable to those bogs which are subject to periodic inundation e.g. through rainfall or flooding and where water needs to be diverted from one part of the bog to another by way of management, or to create wetland areas.

The cutting of what is colloquially called a 'tap' in a high (production) field is described first. This is effectively a method for diverting standing water from one side of a high field to another, to manage the water level in both fields and eventually direct excess surface water towards an outfall. The blocking of outfalls is a measure to prevent water discharge from a bog through a pre-existing pathway or drainage feature, whilst the raising of pipes works similarly to produce water flow at a higher invert level, within specified areas of the pre-existing drainage network. Both of these measures are essential to the management of water levels.

'V' Tap Across High Field To Control Water Levels

An excavator is used to Create a 'V'-Shaped Tap across a high field to allow water pass from a field with water to a field with little or none. The excavator approaches the proposed 'tap' location along the surface of the high field. It then proceeds to excavate a V-shaped trench or drain to the desired depth to permit water to flow between the fields to either side.

Blocking of Outfall

An Excavator is used to form a key on either side of the drain which forms the outfall from the bog or field. A strip of peat is taken from the centre of the adjacent field, pushed into the drain and compacted by the bull-dozer tracking over the drain block from the opposite side of the drain to the excavator. The approximate width of the block is 3-5 times the width of the drain. Blocks have to be wide enough to prevent water moving around the blockage and to prevent further leakage when the block subsides. Where possible and available, vegetation is used to cover the peat forming the outfall blockage. This measure is strongly linked with the next in respect of water level management.

Raise Piped Culverts to control water levels

The first step is to block the existing drain where the pipe exits to stop flows. A new transverse field drain and pipe is then placed above the route of the previously blocked and now redundant pipe, to a specified invert level. The drain holding the new, raised pipe, is filled in using an excavator or bulldozer as appropriate.

See Appendix D: Methodology Drawing PCAS-0100-014.

5. Construction of Larger Berms (Wetland)

Typical existing production fields are cambered (higher) in the centre and lower towards the drains, helping drainage of the fields but limiting the re-wetting of the central area. The concept of cross berms is to slow the water movement through the bog and promote the creation of enclosed areas of wetland habitat with shallow water levels – in particular in areas where shallow peat depths remain.

The typical approach can be described as a number of phases.

Phase 1: Forming Key and Initial Drain Block
An Excavator is used to form a key in the Drain where the berm crosses. A strip of peat is taken from the central camber of the field, pushed into the drain and compacted by the bull-dozer tracking over the drain block from the opposite side of the drain to the excavator. A key is also formed similarly on the opposite side of the production field at the end of the proposed berm.

Phase 2: Forming Peat Berm
Next the bull-dozer is used to complete the central cross section of Berm by taking peat from the centre of the field and pushing it in line with the field to form an approximately 5m Wide x 500mm High Cross Berm.

See Appendix D Methodology Drawing PCAS-0100-010.

6. Transplanting Reeds and other Rhizomes

Reed inoculation is viewed as suitable management option for cutaway bogs that have had pumped drainage during industrial peat production and cutaway bogs that are likely to develop as wetlands in the future.

Reed or other vegetation inoculation is particularly suitable for large areas of bare peat cutaway where there are currently limited natural seed sources. Introduced material can then establish and then provide additional seed sources to accelerate natural colonisation. There is potential to establish and diversify selected small areas with target species (Reeds, Bulrush, Saw Sedge), which in turn (and in combination with natural colonisation) can then naturally colonise the remaining bog area.

Reed rhizomes are collected from a donor site using an excavator (donor sites might include other wetlands on BNM property or Silt Ponds for example). They are then transported to the new wetland area using a tractor and trailer. The Reed rhizomes were then distributed through the wetland area and then re-planted using the excavator. It is expected that planted Reeds will grow and establish new clumps that would then spread and naturally colonise across the wetland.

7. Retention of Hydraulic Breaks.

To sustain hydrological continuity through the margins of the proposed rehabilitation and decommissioning site and to avoid flooding of adjacent lands, it is proposed to retain certain key hydraulic breaks (drains) along the margins of the bog site where recommended. These works will be completed to retain peripheral surface water drainage around the margins of the bog rehabilitation sites allowing hydrological flow from lands upstream of the site to areas downstream of the rehabilitation site. These works may require localised instream excavation, widening and regrading of existing drains with tracked excavators, in other instances any debris or materials which reduces conveyance capacity will be removed.

3.4.4.4 Silt Ponds

Silt Ponds/ Outfalls – **3 no. Silt ponds with a total volume of 5234m^3 are in place at Oughter Bog and connected to the existing drainage network.** These silt ponds, already stipulated in respect of Peat Extraction under IPC license. Regular cleaning and reporting on same already forms part of annual (AER) reporting submitted to EPA. All Silt Ponds at Oughter Bog are currently compliant with EPA requirements. **Table 4** below, and **Figure 11** overleaf summarise and illustrate the onsite Silt Pond locations.

Silt ponds will be cleaned prior to the commencement of PCAS activities in line with an existing silt pond maintenance procedure, and thereafter during rehabilitation and decommissioning at normal intervals (following inspection) until IPC license closure. There are **3 silt ponds at Oughter Bog**, These silt ponds discharge to the **Pollagh Stream**, which discharges into the **River Brosna catchment**.

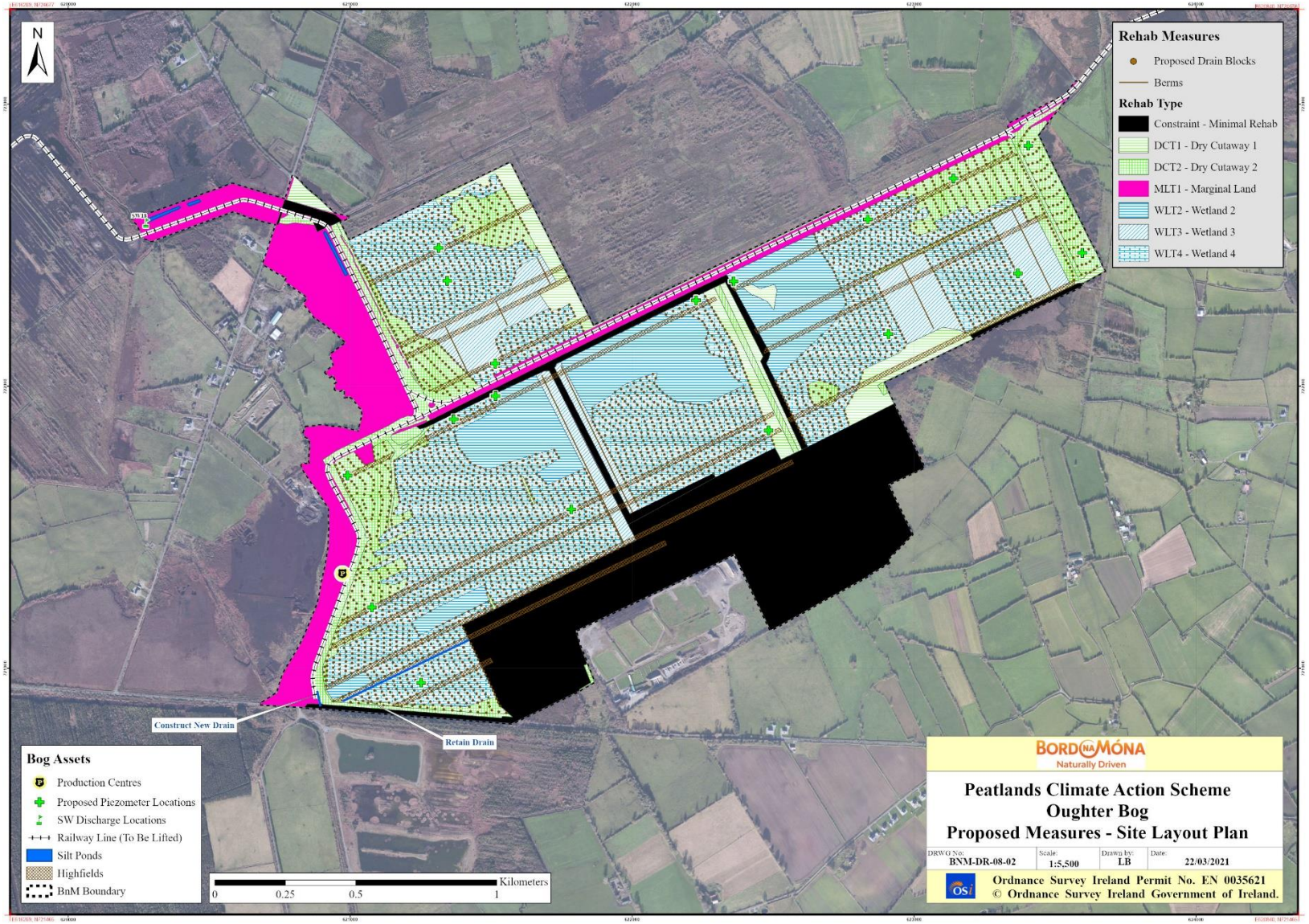
Table 4 Silt Ponds in use at Pollagh Bog

Bog Name	IPC License Reference	Pond No.	Area (m^2)	Volume (m^3)
Oughter	500	OT 37	1338	112
	500	OT 37A	461	692
	500	OT38	1698	2535
		Total	**1690.00**	**5234**

The cleaning procedure is as follows:

- If the silt pond system has a by-pass channel or a stand-by pond, then the drainage is diverted through these. If not, then the inlet to the pond is blocked or the supply pump switched off for the duration of the cleaning.
- If the outlet from the pond has a **weir** then the level is lowered to de-water the silt. If not, then the outlet pipe is blocked for the duration of the cleaning.
- The pond is cleaned from the inlet to the outlet either from one side, if the width allows or from both sides, if not.
- The silt is deposited as far back from the silt pond as possible with the excavator, or additionally with the aid of a dozer if space is limited.
- If necessary, a peat bund is left between the pond and the excavated silt to retain liquid sludge from flowing back into the pond.
- When the pond has been cleaned the inlet is opened and the pond allowed to fill before lowering the outlet weir.
- If the drainage was diverted during the maintenance, then it is redirected back into the pond.
- Once cleaned, the date is entered on to the inspection log.

Figure 9: Indicative detailed design in respect of Oughter (PCAS) Rehabilitation Plan



3.4.4.5 Decommissioning and Rehabilitation Timescale and Resource Requirements

Duration

Rehabilitation activities will be completed within a period of **7 months** and are scheduled to be completed before the end of **202**1, largely within the period **April-October** as this is optimum conditions.

Decommissioning activities will be completed within a period of approximately **12 months**. In general activities will be carried out between the months of **April and October** inclusive.

The duration of activities provided are approximate and may be slightly shorter or longer, depending on weather conditions and progress on rehabilitation prescriptions. Activities may cease for the winter months due to rainfall and poor ground conditions. In any case, the rehabilitation period will not be longer than 1 year.

3.4.4.5.1 Hours of Work

Normal Decommissioning and Rehabilitation times will be daylight hours between **08.00 and 17.30hrs** Monday to Friday.

3.4.4.6 Use of Natural Resources

Land Requirement: There is no land requirement in respect of **decommissioning**. In total **rehabilitation** activities will take place on **241.45** hectares of land. As rehabilitation through stabilisation and land cover change is the primary objective, no 'negative quality' land take is associated with Rehabilitation. No land take is required for e.g. the storage of vehicles – vehicles are typically left in situ at points of work or on 'headlands'.

Water: No additional water is required for either decommissioning or rehabilitation.

Soils/Peat:

Regarding **decommissioning** some peat or topsoil material which is contaminated may be removed in line with Schedule 2 of the IPC license. This is considered negligible in magnitude.

During **rehabilitation**, minor quantities of existing peat will be excavated from drainage trenches and/or an immediately adjacent borrow pit at peat dam locations and immediately used to form peat dams. Borrow pits are re-instated, as the final step in dam creation, by the excavator driver profiling the surrounding peat/scraw into place over the excavated borrow pit. In each instance the magnitude of extracted peat is negligible. Similarly, the installation of overflow pipes may require excavation of minor quantities of peat, and/or subsoil dependant on location (Insertion of peat blockages/overflow pipes may interact with underlying subsoils where peat depths are shallow). All material used will be from the immediate vicinity and no transport of material will be required.

Existing bare peat surfaces will be re-profiled in line with pre-defined 'levels' where required to 're-wet' areas of currently dry peat. This may be through use of a dozer or a screw leveller. Bull-dozers will be used to create 'speed bumps' or dams across existing drainage channels adjacent to re-profiled areas, by 'dozing' peat displaced in re-profiling into place at pre-defined dam locations. Bull-dozers may also be used to in-fill drains with peat displaced by screw levelling.

Hydrocarbons will be used on-site during decommissioning and rehabilitation activities and will be limited to the diesel or petrol fuel and mechanical oils used by any onsite site machinery and equipment.

3.4.4.7 Emissions & Wastes during Rehabilitation

Dust, Noise, Vibration: Dust, noise and localised vibration along access routes arising from the arrival and departure of **decommissioning** vehicles or **rehabilitation** machinery will be localised to the access tracks or rail line, will occur in low volumes and last for a negligible duration – it is common practice on BnM working bogs to leave vehicles *in situ* once on site, therefore daily trips into and out of the bog are not expected. Dust and noise limits are currently set on IPC licenses.

Regarding rehabilitation, the extent of dust, noise and localised vibration from individual machines creating peat dams to block drains or blocking outfalls is momentary in duration and therefore considered negligible in magnitude. Much of Oughter is vegetated.

Durations overall are expected over a **7-12 month** period at Oughter Bog or until rehabilitation/ decommissioning is complete.

Fuel and some pipes may require to be delivered. No blasting or piling is required.

Wastes: General waste will arise from the presence of staff. Very small quantities of chemical waste will be generated, this waste is limited to solid waste oil, such as oily rags.

Welfare Facilities: Welfare facilities are not available at Oughter Bog but will be provided at Turraun Bog to the west, which can be accessed via the level-crossing to the north-west of Oughter Bog.

3.4.5 Operational Stage

Duration: Once constructed and commissioned, the proposed Decommissioning and Rehabilitation will remain permanently in place.

Operational Activities: Operational activities will mainly comprise non-intrusive **environmental & ecological monitoring (including surface water monitoring, vegetation monitoring** but also the use of drones to provide catalogues of **aerial photography)** and may also include minimal works such as repairs to existing peat blockages, adjustment of overflow pipes (where required) and or **fertilisation** to increase successional rates. Maintenance of existing silt ponds to reduce emissions to local water bodies, as conditioned by the existing IPC license, will still be required.

Operational Access: Operational access will be through the Level Crossing to south-west of Oughter Bog, where existing infrastructure is already in place via access tracks to facilitate the previous peat extraction.

Timing of Operational Activities: It is expected that **scheduled inspection and maintenance activities** will be carried out by a 2-4 person team, typically for **1 day per month,** for the foreseeable future.

Use of Natural Resources: During the Operational Stage, there is limited requirement for the use of natural resources – negligible quantities of peat or subsoil may be used to repair existing or create additional drain blocks.

Emissions & Wastes: During the Operation Stage of Rehabilitation there will be negligible exhaust fumes, dust and noise emitted by maintenance vehicles and or other equipment such as drones during occasional maintenance works, such as to outflows.

Fugitive emissions to air: Collectively, ceasing industrial peat production, re-wetting and re-vegetating will minimise any risk of emission to air from dust. During the operational stage of Peatland Rehabilitation, typical emission of dust from exposed peat to air is expected to cease.

Carbon Emissions: Following rehabilitation and into the early operational stage Oughter Bog may continue to be a carbon source, however as habitats stabilise following intervention, the bog is expected to, over time, become a carbon sink in part.

3.4.6 Other Projects and Plans with Potential to Cause In-Combination Effects

The location of the proposed Oughter Bog decommissioning and rehabilitation does not overlap the footprint of any other existing projects or plans. Further consideration is given to other plans or projects within a zone of influence of 15km below.

Other bogs within the larger Boora Bog Group will also be subject to both decommissioning and rehabilitation to meet IPC license conditions. This has the potential to result in **in-combination effects** from the release of hydrocarbons, emissions to air and water. These bogs include Pollagh Bog, Turraun Bog, Derries Bog, Boora Bog, Lemanaghan Bog, Derrybrat Bog, Noggusboy Bog, Drinagh Bog and Clongowney Bog. The total area proposed for rehabilitation in 2021 is **3,423ha.** All of these bogs will be subject to individual Appropriate Assessment Screening and Appropriate Assessment if required.

There is also a planning application for a windfarm at Drinagh Bog and Clongowney Bog. (https://www.derrinloughwindfarmplanning.ie). Again, this is subject to a planning application with Appropriate Assessment reporting to minimise impact on surrounding habitats.

Peat extraction through **turbary** occurs at locations within 15km of Oughter Bog. This has the potential to result in in-combination effects from the release of hydrocarbons, emissions to air and water, and through modification to drainage regimes.

A planning search of the National Planning Database found a number of proposed or consented developments within 15km of Oughter Bog, including **private dwellings** or amendments to private dwellings, and a number of agricultural led planning applications such as for slatted sheds/ amendments to existing farm infrastructure etc.

There is one local authority jurisdiction within **15km** of Oughter Bog (Offaly County Council). Offaly County has Development Plans relating to Heritage and Biodiversity.

There is a current ongoing NPWS Raised Bog Restoration Project which may include at some date, raised bogs within **15km** of Oughter Bog. Restoration activities at these bogs may have the potential for in combination effects with decommissioning and rehabilitation at Oughter Bog, however there is no currently known temporal or spatial overlap between any planned restoration activities and the decommissioning and rehabilitation of Oughter Bog.

3.4.6.1 Other BnM Bog Group Decommissioning and Rehabilitation

Other BnM bogs within the larger Boora group will also be subject to decommissioning and rehabilitation to meet the various, pertinent, IPC license conditions. However, currently, the only known temporal overlap between these proposed activities elsewhere in the Boora group is at **Pollagh Bog (1.5km north), Turraun Bog (0.5km west), Derries Bog (3.5km west)** and **Boora Bog (200m south**) with a combined area of **3,065ha**. The construction phase of decommissioning and rehabilitation at Oughter bog may overlap with Pollagh Bog, Turraun Bog, Derries Bog and Boora Bog. Pollagh Bog, Turraun Bog and Derries Bog are hydrologically downstream from Oughter Bog and share connectivity to downstream European Sites.

The Operational stage of Oughter Bog Decommissioning and Rehabilitation will overlap the Rehabilitation stage of other bogs within the Boora group however the expected magnitude of any effects from Oughter at this lifecycle stage are evaluated as insufficient to result in in-combination effects. The possibility of likely significant in combination effects can reasonably be excluded on this basis.

The decommissioning and rehabilitation of any other bogs within the greater Boora Group will be subject to Appropriate Assessment and it is assumed the requisite mitigation will be in place should the potential for any adverse effects on European site integrity be identified as part of the Appropriate Assessment process. This should also identify the potential for any sequential or additive in-combination pathways, in particular should temporal overlap exist.

3.4.6.2 Turbary

Private turbary exists at Oughter Bog on Bord na Mona land where a limited area (1 plot comprising ca.0.65ha in total) is subject to turf-cutting activities annually. Licensed turbary occurs at various locations within **15km** of Oughter Bog, including several locations where the pathways for downstream in combination effects on European Sites may exist, primarily via drainage to EPA blue line watercourses to facilitate turbary. Unauthorised private turbary may also exist.

3.4.6.3 NPWS Raised Bog Restoration at Crosswood Bog SAC (002337)

An Appropriate Assessment (of the National Raised Bog SAC Management Plan 2017-2022) has been carried out in accordance with Regulation 42(11) and 42(12) of the European Communities (Birds and Natural Habitat) Regulations 2011-2015 and has had regard to the findings of the Natura Impact Statement, the conservation and management measures set out in the National Raised Bog SAC Management Plan 2017-2022 and which constitute plan-level mitigation measures, and the submissions and observations received on the (draft) National Raised Bog SAC Management Plan[5]. One of the primary mitigation elements proposed is that screening for appropriate assessment and if necessary appropriate assessment will be carried out in relation to any site specific/project level measures including restoration measures and turf-cutting. If AA of a project at site level determines that adverse effects are likely, or cannot be ruled out, the project will either not be pursued or, where considered appropriate, the derogation steps of Article 6(4) will apply, but only in a case in which there are imperative reasons of overriding public interest (IROPI) requiring a project to proceed, there are no less damaging alternative solutions, and compensatory measures have been identified that can be put in place.

On this basis, it is assumed that the appropriate level of Appropriate Assessment has or will be carried out in respect of any future proposed restoration activities at the above bog, and that any required mitigation to avoid adverse effects on European Site integrity will be in place.

[5] https://www.npws.ie/sites/default/files/general/AA%20Determination%20NRBMP%202017_2022_0.pdf

3.4.6.4 Agricultural Activity

Given the proximity of Oughter Bog to the River Brosna, there is potential for agricultural activities and their respective emissions to air (noise as a source of disturbance) and water (sediment, runoff, deleterious materials) to combine with source effects from decommissioning and rehabilitation at Oughter Bog. Most of these activities are not subject to Appropriate Assessment, and form part of the existing baseline environment.

3.4.6.5 Local Authority Development Plans

The following development plans have been identified:

- Offaly County Development Plan 2021 – 2027
- Offaly County Heritage Plan 2017-2021

It is assumed that the above, or any other plans including those currently at draft status, will be subject to the requirement for Appropriate Assessment which can reasonably be assumed to provide mitigation to avoid adverse effects on European Sites.

3.4.6.6 Proposed Wind Farm at Derrinlough, Co. Offaly

A planning application from BnM for an 85MW wind farm comprising 1,660 ha with 21 wind turbines, 185m in height, 2 two permanent 120m anemometry masts and 1 electrical substation building, 2 permanent underpasses, 5 temporary construction areas and ancillary facilities, boundary security fence, a site entrance and access track, CCTV security system, and all associated works in the townland of Derrinlough, is being reviewed by Offaly County Council. The planning information outlines mitigation which will be in place to avoid secondary effects such as adherence with a construction and environmental management plan (CEMP), good site practice around storage of oils, wastes and other potentially damaging materials, a fuel management plan, a sediment and erosion control plan, best practice culvert design and a regular programme of environmental auditing and monitoring of the constructed drainage and attenuation structures and drainage crossings to ensure attenuation performance to regulatory standards at the site. The application site is upstream of the River Shannon Callows SPA, but the findings presented in the NIS conclude that the proposed development will not have an adverse impact on any European Sites, either alone or in combination with other plans or projects.

3.4.6.7 Other Projects or Activities

The likelihood of cumulative interaction with other plans or projects is considered low, due to limited temporal or spatial overlap; the absence of hydrological connectivity or shared hydrological catchment with many of the other plans or projects described, the separation distance or setback buffers between the described plans or projects and European Sites, and the requirement for Appropriate Assessment for other plans or projects, such as private dwellings, forestry entrances, slatted sheds, masts and amendments to existing planning consents, which can reasonably be assumed to provide mitigation to avoid adverse effects on European Sites, should it be required.

3.5 European Sites under consideration

3.5.1 Distance of the Project to European Sites

For the proposed Oughter Bog decommissioning and rehabilitation, a limited zone of potential impact is predicted, due to the relatively small scale, duration and localised nature of the activities proposed.

Nevertheless, a precautionary **15km** distance was chosen to evaluate the potential for effects (alone and in-combination) on European Sites.

There are **6 European Sites within 15km of Oughter Bog** – 5 Special Areas of Conservation (SAC) and 1 Special Protection Area (SPA). The locations of these European Sites are illustrated in **Figure 10** with the distances from the Development and comment on hydrological connectivity provided in **Table 5**. An additional **2 European sites** are included as they occur 18.5km west of the project area and have a **downstream hydrological connection (26km hydrologically).**

Table 5: Proximity of the proposed Oughter Bog Rehabilitation Plan to European Sites

European Site (SAC or SPA)	Site Code	Distance from the Development*	Hydrological Connectivity (Y/N: If Yes Downstream or Upstream connectivity relative to Pollagh Bog)
Clara Bog SAC	000572	6.5km NE	N
Charleville Wood SAC	000571	8.5km E	N
Ferbane Bog SAC	000575	10.5km W	N
Clonaslee Eskers and Derry Bog SAC	000859	9.5km S	N
Moyclare Bog SAC	000581	13.5km W	N
Slieve Bloom Mountains SPA	004160	11.9km S	N
****River Shannon Callows SAC**	**000216**	**18.5km SW**	**Y: Downstream**
****Middle Shannon Callows SPA**	**004096**	**18.5km SW**	**Y: Downstream**

*All distances cited are the closest straight line distance as measured using GIS.
** Sites outside 15km zone but hydrologically linked to the project site

The Qualifying Interests/Special Conservation Interests and locational context for each of the **eight** European Sites examined in this Screening Report are provided in **Table 6.**

The Site Synopsis and Conservation Objectives for each site are available in full on the National Parks & Wildlife Service website at https://www.npws.ie/protected-sites and references including date of access, are included in **Section 3.** Conservation Objectives were reviewed to inform the current appraisal – in particular to identify any possible sensitivities and resultant pathways for likely significant effects.

Figure 10: European Sites within 15km of Oughter Bog, Co. Offaly

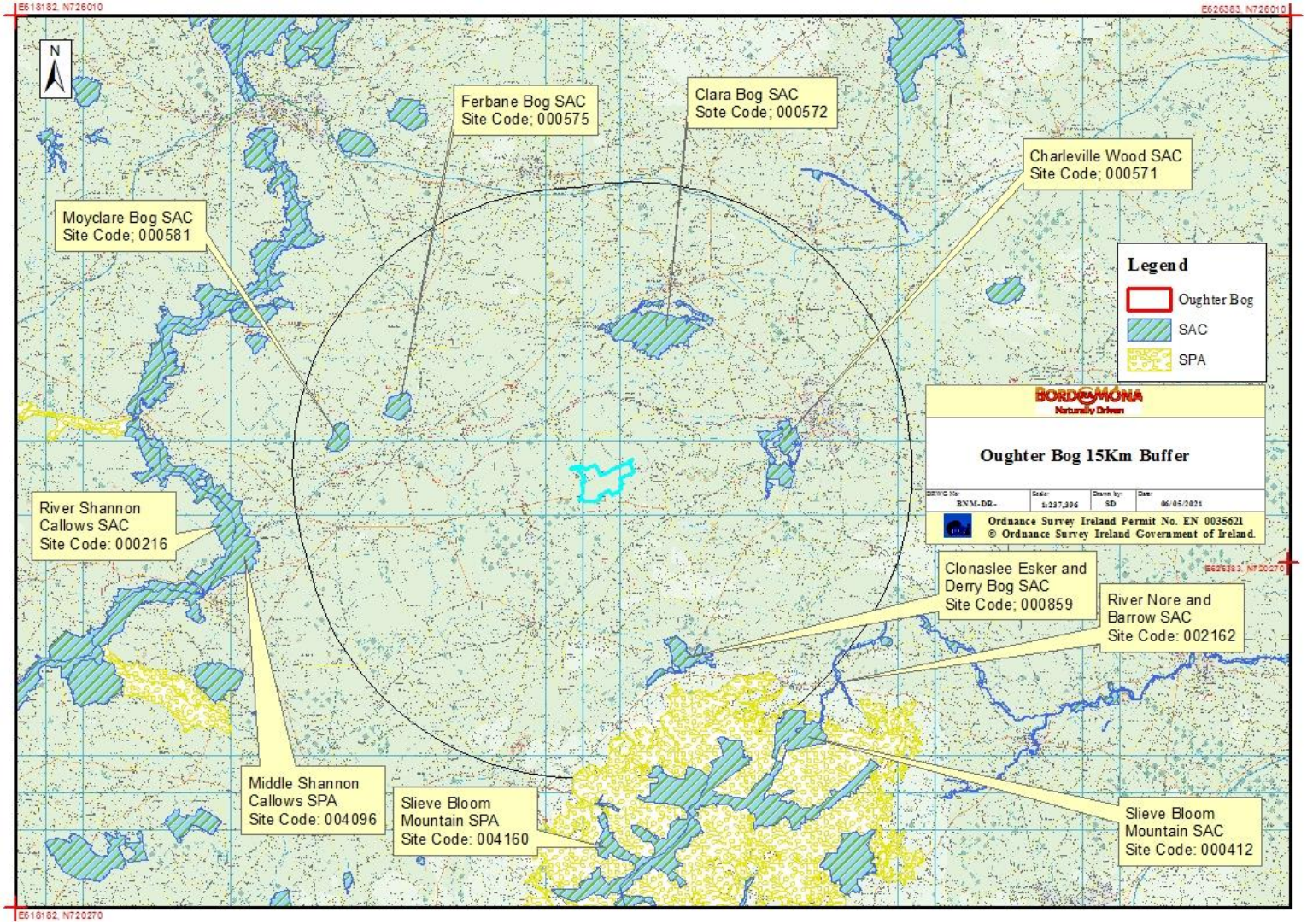


Table 6: Description of European Sites within a 15km-18.5km radius of Pollagh Bog

	European Site Name and Code	Qualifying Interest / Special Conservation Interest and Code *denotes a priority habitat	Summary Description (from Site Synopsis)	Data Source
1	Clara Bog SAC (000572)	[7110] Raised Bog (Active)* [7120] Degraded Raised Bog still capable of regeneration. [7150] Depressions on peat substrates of the *Rhynchosporion* [91D0] Bog Woodland*	Clara Bog is a site of considerable conservation significance as it consists of a raised bog, a rare habitat in the E.U. and one that is becoming increasingly scarce and under threat in Ireland. Ireland has a high proportion of the total E.U. resource of raised bog (over 60%) and so has a special responsibility for its conservation at an international level. Active raised bog and bog woodland are listed as priority habitats on Annex I of the E.U. Habitats Directive.	NPWS (2015) Clara Bog SAC 000572. Version dated 27.11.2015. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 16.12.2020
2	Charleville Woods SAC (000571)	Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*) [91E0] *Vertigo moulinsiana* (Desmoulin's Whorl Snail) [1016]	Charleville Wood is one of the most important ancient woodland sites in Ireland. The woodland has a varied age structure, and the understorey and ground layers are also well-represented. Alluvial forest is a priority habitat listed on Annex I of the E.U. Habitats Directive, while the rare snail species, *Vertigo moulinsiana*, is listed on Annex II of this Directive.	NPWS (2020) Charleville Woods SAC 000571. Version dated 21.01.2020. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 16.12.2020
3	Clonaslee Eskers and Derry Bog SAC (000859)	Alkaline fens [7230] *Vertigo geyeri* (Geyer's Whorl Snail) [1013]	Clonaslee Eskers and Derry Bog SAC is of conservation importance for the presence of alkaline fen vegetation and is considered one of the best sites in the south-east region for this habitat. Of further conservation importance is the presence of the rare snail *Vertigo geyeri*.	NPWS (2013) Clonaslee Eskers and Derry Bog SAC 000859. Version dated 24.09.2013. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 16.12.2020
4	Ferbane Bog SAC (000575)	[7110] Raised Bog (Active)* [7120] Degraded Raised Bog still capable of regeneration. [7150] Depressions on peat substrates of the *Rhynchosporion*	Ferbane Bog is a site of considerable conservation significance as it consists of a raised bog, a rare habitat in the E.U. and one that is becoming increasingly scarce and under threat in Ireland. Active raised bog, is listed as priority habitats on Annex I of the E.U. Habitats Directive.	NPWS (2013) Ferbane Bog SAC 000575. Version dated 29.08.2013. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 16.12.2020

	European Site Name and Code	Qualifying Interest / Special Conservation Interest and Code *denotes a priority habitat	Summary Description (from Site Synopsis)	Data Source
5	Moyclare Bog SAC (000581)	[7110] Raised Bog (Active)* [7120] Degraded Raised Bog still capable of regeneration. [7150] Depressions on peat substrates of the *Rhynchosporion*	Moyclare Bog is of considerable conservation significance as it consists of a raised bog, a rare habitat in the E.U. and one that is becoming increasingly scarce and under threat in Ireland. Active raised bog, is listed as priority habitats on Annex I of the E.U. Habitats Directive.	NPWS (2013) Moyclare Bog SAC 000851. Version dated 02.09.2013. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 16.12.2020
6	Slieve Bloom Mountains SPA (004160)	Hen Harrier (*Circus cyaneus*)	The Slieve Bloom Mountains SPA is of ornithological importance because it provides excellent nesting and foraging habitat for **breeding Hen Harrier** and is one of the top sites in the country for the species. There are three species present, Hen Harrier, Merlin and Peregrine, which are listed on Annex I of the E.U. Birds Directive.	NPWS (2015) Slieve Bloom Mountains SPA 004160. Version dated 20.01.2015. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 16.12.2020
7*	Shannon Callows SAC (00216)	[6410] *Molinia* Meadows [6510] Lowland Hay Meadows [8240] Limestone Pavement* [91E0] Alluvial Forests* [1355] Otter (*Lutra lutra*)	The Shannon Callows has the largest area of lowland semi-natural grassland and associated aquatic habitats in Ireland. Excellent examples of two habitats listed on Annex I of the E.U. Habitats Directive occur within the site – *Molinia* meadows and lowland hay meadows with good examples of a further two Annex habitats (both with priority status). The presence of Otter, an Annex II species, adds further importance	NPWS (2020) Shannon Callows SAC 000216. Version dated 22.10.20. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 16.12.2020
8	Middle Shannon Callows SPA (004096)	Whooper Swan (*Cygnus cygnus*) [A038] Wigeon (*Anas penelope*) [A050] Corncrake (*Crex crex*) [A122] Golden Plover (*Pluvialis apricaria*) [A140] Lapwing (*Vanellus vanellus*) [A142] Black-tailed Godwit (*Limosa limosa*) [A156] Black-headed Gull (*Chroicocephalus ridibundus*) [A179] Wetland and Waterbirds [A999]	The Middle Shannon Callows SPA has extensive areas of callow, or seasonally flooded, semi-natural, lowland wet grassland, along both sides of the river. The diversity of semi-natural habitats present and the sheer size of the site attract an excellent diversity of bird species, including significant populations of several.	NPWS (2012) Shannon Callows SAC 000216. Version dated 10.01.12 National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht. Accessed online 16.12.2020

3.6 Sources of Information & Consultation

3.6.1 Consultation

Consultation seeks to engage an audience of relevant stakeholders at both a national and local level.

To inform the current Oughter Bog Rehabilitation Plan, both national and local stakeholders, including neighbours whose land adjoins Oughter 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 Oughter Bog (see Appendix C).

See Section 4 of the Rehabilitation Plan included as Appendix C for a full consultation report.

The findings and feedback from the consultation process have been fed into the final rehabilitation and decommissioning plans. Due cognisance was also given to information available on the NPWS website at:

https://www.npws.ie/development-consultations#.

3.6.2 Sources of Information

Other sources of Information, which were considered during this Screening evaluation, included both desktop studies and fieldwork:

- Review of the Conservation Objectives, Site Synopsis and Site boundary information for the European Sites within with study area;
- Review of OSI Discovery Mapping for the 15km study area around Oughter Bog;
- Review of EPA online mapping for watercourse features (https://gis.epa.ie/EPAMaps/);
- Review of location and layout mapping for proposed Rehabilitation;
- Review of the detailed description of proposed Decommissioning and Rehabilitation measures, including methodologies specific to the main categories of land types under consideration, which occur in cutaway bogs;
- Review of other plans and projects within 15km
- Review of the results of previous Ecological Surveys of Oughter Bog, along with recent confirmatory site visits;

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

- 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);
- 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 2019;
- Spatial data in respect of Article 17 reporting, available online at https://www.npws.ie/maps-and-data/habitat-and-species-data/article-17.
- Spatial data in respect of Article 12 reporting, available online at https://www.npws.ie/maps-and-data/habitat-and-species-data/article-12-data.
- Available data on Hen Harrier such as reported by the Breeding Hen Harrier Survey for the National Parks and Wildlife Service.
- Planning peatland rehabilitation 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):Bord na Móna Biodiversity Action Plan

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3.7 Potential Sources, Pathways and Timing of Impacts to European Sites (SACs & SPAs)

3.7.1 Potential Sources, Pathways and Timing of Impacts to SACs

3.7.1.1 Direct Impact to Habitats within the SAC *(no potential for this impact to occur)*

There is no spatial overlap between Oughter Bog and any of the SAC's under consideration. It can therefore reasonably be concluded that there is no potential for direct impact/effects (such as habitat loss, or loss of habitat connectivity) on any SAC's from the proposed decommissioning and rehabilitation of Oughter Bog. Possible pathways can only exist for indirect effects on SAC's either secondary, cross-factor or 'ex-situ'. Therefore, there is **no possibility of direct impacts to SAC** habitats, and this impact pathway is screened out from further evaluation. No potential for likely significant effects identified.

3.7.1.2 Indirect loss or degradation of terrestrial or aquatic habitats within SAC boundaries

Sources (all outside SAC boundaries): Movement of soil or peat, machinery; earthworks, excavations, installation of pipes/ temporary overburden storage, cleaning of silt ponds, removal of waste and/ or raw material, lifting of rail; use of fuels, chemicals or fertiliser.

Pathway: water runoff flow paths, watercourses,air

Potential Oughter Bog Decommissioning and Rehabilitation Impact/Pathway Connectivity:

The identified impact sources could possibly reduce water quality or aquatic habitat quality in the local context, where all works are located outside of and at a distance from any designated SAC. The closest SAC is Clara Bog SAC which is **6.9km to the north-east** and hydrologically unconnected, whilst the closest downstream hydrologically connected SAC is the River Shannon Callows SAC which is **18.5km** to the southwest (straight line distance, 26km downstream).

The current appraisal evaluates the possibility for any effects in downstream hydrologically connected SAC European Sites through sediment/contaminant/nutrient laden runoff, or the spread of invasive species, with regard to any indirect habitat loss, reduction in habitat extent, or degradation effects (i.e. to habitat quality) in respect of Qualifying Interests.

Timing of Impacts: The potential for impact sources arising from the project only relates to the stage (i.e. Decommissioning and Rehabilitation), when groundworks and use of machinery will take place for a limited duration - in this instance expected to be up to **12 months**. Once decommissioning and rehabilitation are complete, the decommissioned and rehabilitated Oughter Bog will require some monitoring, generally involving visual inspections of habitat succession, sometimes using drones, and any ongoing scheduled maintenance such as of silt ponds, or collection of water samples. Due to the negligible (both in terms of source magnitude but also duration) and non-intrusive nature of operational activities, and the hydrological distance, there is no potential for the operational phase of the proposed decommissioning and rehabilitation to cause effects to European Sites and it is accordingly screened out.

Possible Causes of Habitat Degradation

Additional sediment contributions entering water courses adjacent to or upstream of individual watercourses, could have localised negative implications for fish and invertebrates due to physical damage and reduced feeding/foraging, as well as negative impacts due to compaction of spawning gravels by sediment causing mortality impacts for salmonid eggs (affecting recruitment) and interfering with invertebrate life stages within gravel substrates (interstitial spaces). Dependant on proximity, source magnitude and dilution factor, these impacts may extend beyond localised effects and could in turn result in secondary effects downstream receptors.

Given the location of Oughter Bog, the separation distance of 26km to the nearest downstream European Sites, and the dilution factor of the Brosna-Shannon catchment, it is considered that likely significant effects can reasonably be excluded.

Water quality effects due to contamination by fuels, oils or cementitious material has the potential to lead to localised direct toxicity events, or sub-lethal degradation of aquatic habitat quality. Dependant on proximity, source magnitude and dilution factor, the release of large volumes of sediment and /or deleterious materials to habitats adjacent to, within, or upstream from an SPA may reduce the quality of terrestrial and riparian habitats as foraging or roosting resources for SCI's, and/or result in effective habitat loss should SCI's cease to utilise degraded habitats.

Given the location of Oughter Bog, negligible usage magnitude of source fuels and/or other contaminants, the separation distance to the nearest downstream European Sites, it is considered that likely significant effects can reasonably be excluded.

Watercourse morphology relates to the shape of a watercourse channel, its bed and banks and how erosion, transportation of water, sedimentation and the composition of riparian vegetation changes this shape over time. In the absence of mitigation there is potential for sediment deposition at a scale which may alter tributary channel morphology within or ex-situ an SPA thus reducing the suitability of receiving habitats for SCI's and affect Site Integrity and/or Conservation Objectives – particularly those which seek to maintain or restore the favourable conservation condition of the wetland habitat at the designated SPA as a resource for the regularly-occurring migratory waterbirds that utilise it.

Invasive aquatic species include non-native, terrestrial invasive species such as Japanese Knotweed (*Fallopia japonica*) or Himalayan Balsam (*Impatiens glandulifera*), invasive riparian vegetation (Japanese knotweed) and also fish and mobile invertebrate fauna, such as Asian clam (*Corbicula fluminea*), Signal crayfish (*Pacifastacus leniusculus),* or non-native shrimp species). Aquatic invasive species may be introduced to unaffected catchments or spread within infected watercourses to hydrologically connected SPA's during the course of instream works or transported via excavated material by site machinery.

In the absence records of the presence of invasive species, a hydrological distance of 26km, significant effects on European Sites/Conservation Objectives evaluated as **unlikely**.

3.7.1.3 Indirect or ex-situ disturbance or displacement of Qualifying Interests

Sources (all outside SAC boundaries): Decommissioning and Rehabilitation activities; movement of construction machinery and vehicles including rail; presence of personnel; noise and vibration and/or visual intrusion from construction works and construction machinery.

Pathway: land cover, contact, air, visibility

Potential Oughter Bog Decommissioning and Rehabilitation Impact/Pathway Connectivity: The impact sources identified above may result in possible localised impacts occurring within the local context of the decommissioning and rehabilitation area during the construction phase. Any such impacts resulting in disturbance or displacement effects on Annex II species listed as Qualifying Interests of SACs (e.g., Otter) would be *ex situ* and separated from any European Site (the closest European Site designated for **Otter is 18.5km** distant, 26km downstream). There are no impact sources identified which would extend outside of the local extent of the works area which could indirectly result in disturbance or displacement of Qualifying Interests of any SAC.

Timing of Impacts: As outlined above, the potential for effects only relates to the construction stage of decommissioning and rehabilitation. The scale and duration of any operational phase sources of disturbance or displacement are considered insufficient to result in likely significant effects.

The Qualifying interest under consideration is **Otter (*Lutra lutra*).** This European site holds a population of Otter, a species listed on Annex II of the E.U. Habitats Directive. Suitable habitat (foraging and breeding) exists for this species at or adjacent to Oughter Bog and evidence of Otter was recorded at Oughter bog in March of 2021, when footprints were noted exiting from a drain feature in the centre of the bog (although notably no evidence was recorded from silt ponds on site).

The following is based on information sourced from the Habitats Directive Article 17 Reporting produced in 2019 by NPWS and submitted to the EU by the Irish Government, in addition to peer reviewed publications.

The territories of Otters can stretch for several kilometres; the total length of the home range depends on the availability of food. The smallest territories are thought to occur at coastal sites, where territories may be as small as 2km**. The longest territories occur in upland streams where an individual may have to range more than 20km to find sufficient food. Oughter Bog is located in the midlands and so these extreme upland ranges do not apply**. Territorial marking typically occurs by means of sprainting or anal secretions. These marks are left mostly at features such as bridge footings, boulders, grass tussocks and stream confluences. Within their territories an individual otter may utilise a number of resting sites within its territory; these can be hidden refuges above ground (couches), or under-ground chambers (holts). Holts tend to be natural crevices, associated with the roots of trees growing along river and lake banks. These natural recesses provide the otter with a holt that has multiple entrances from which the otter can escape if disturbed. Couches occur frequently in dense vegetation and may be associated with frequently used runs and slides into the water. The rearing of cubs occurs within 'natal holts', which are not marked by spraint. Although capable of breeding at any time of the year, a peak in breeding occurs during the summer and early autumn.

Otters that live in rivers and lakes tend to not be completely nocturnal, described as being crepuscular – activity peaks at dusk and dawn. Otters are principally piscivorous (fish eating), relying predominantly on salmonids (salmon and trout), but also eel and small fish species such as stickleback. However, Otters are not limited to fish and feed opportunistically on a range of prey when available: frogs are frequently eaten by Otters, and the remains of invertebrates (crayfish), birds and small mammals have also been found in spraints.

Within the most recent Habitats Directive Article 17 Reporting: the conservation status of Otter is listed as 'Favourable' under *Range*, *Population*, *Habitat for the Species*, and *Future Prospects*- overall favourable. The current favourable reference range is considered to be large enough to allow the long-term survival of the species and is greater than the estimated range of the species when the habitats directive came into force in Ireland.

Regarding habitat for the species, habitat availability and quality is not considered to be or to have been a limiting factor in the species range, based on its widespread occurrence. Hence the underlying trend in habitat is evaluated as having remained 'stable'. No conservation measures are reported as being needed.

Regarding future prospects Article 17 reporting describes Otter as a species whose range is extensive and stable, having recovered from a previous decline. The broad habitat niche is occupied and is generally considered to be in good condition. No significant threats or pressures were identified. The overall trend in conservation status is improving.

Regarding Natura 2000 sites specifically, the short-term trend in population size within the Natura network is 'increasing'. This is considered to be applicable both to the Shannon Callows SAC and where it occurs at Oughter Bog.

Regarding Oughter, see section 2.3.3 for the results of a mammal survey conducted in March of 2021. No holts, either natal or non-natal holts, were recorded at Oughter Bog Indirect or ex-situ mortality of Qualifying Interests

Sources (all outside SAC boundaries): Decommissioning and Rehabilitation activities; movement of construction machinery and vehicles including rail; presence of personnel; noise and vibration and/or visual intrusion from construction works and construction machinery.

Pathway: contact

Potential Oughter Bog Decommissioning and Rehabilitation Impact/Pathway Connectivity: The impact sources identified above may result in possible localised impacts occurring within the local context of the decommissioning and rehabilitation area during the construction phase. Any such impacts resulting in disturbance or displacement effects on Annex II species listed as Qualifying Interests of SACs (e.g., Otter) would be *ex situ* and separated from any European Site (the closest European Site designated for **Otter is 18.5km** distant, 26km downstream). There are no impact sources identified which would extend outside of the local extent of the works area which could indirectly result in mortality of Qualifying Interests of any SAC.

Timing of Impacts: As outlined above, the potential for effects only relates to the construction stage of decommissioning and rehabilitation. The scale and duration of any operational phase sources of disturbance or displacement are considered insufficient to result in likely significant effects. Operational use of wetland features such as berms by Otter is considered sufficiently unlikely to reasonably exclude operational effects, in addition, Oughter Bog is not subject to seasonal inundation during the winter months which may act as a source of berm failure and any resultant disturbance or mortality.

Rating

Otters are rated as a very high sensitivity receptor (based on International importance ratings) and may be sensitive to mortality through inadvertent collision with moving vehicles or machinery, in particular during hours of darkness. There were no Otter holts located at Oughter Bog (surveyed in 2021).

Effects are therefore more likely in respect of foraging or resting animals, primarily within aquatic habitats but also within adjacent riparian corridors and /or whilst crossing the bog/ utilising drains in close proximity to proposed works. Many of the watercourses (including drainage for peat extraction) present whilst not within an SAC boundary, are ultimately hydrologically connected to a downstream SAC (**26km distant**) which includes Otter as a Qualifying Interest.

3.7.1.4 In combination or Cumulative effects

There is potential for cumulative effects from other plans or projects which may result in similar source-impact-pathways to Otter within other tributaries or within the River Brosna complex.

There is potential for cumulative effects from other plans or projects in respect of the above identified pathways in respect of water quality which may result in similar source-impact-pathways to waterbodies upstream of or within the SAC's's under consideration.

The decommissioning and rehabilitation of **Pollagh, Turraun, Derries** and **Boora Bogs** by BnM, which are also within the River Brosna catchment approx. 24.0km and upstream of the River Shannon Callows SAC, may also create pathways for likely significant/potentially adverse effects on Otter and or water quality; these projects are known to temporally overlap works proposed for Oughter Bog.

However, these are to be subject to Appropriate Assessment reporting and in the event likely significant effects are evaluated, mitigation is to be provided to ensure no adverse effects occur.

Additional sources of disturbance such as baseline agricultural activities are considered unlikely to result in in combination adverse effects.

Various sources of water quality, flow regime or water morphology related effects or disturbance, with linkage to activities such as Agriculture or Turbary, within SAC's constitute activities requiring consent (ARC) of the minister and therefore are **unlikely** to result in in combination adverse effects.

All other plans or projects identified (including restoration works by NPWS on raised bogs) are subject to Appropriate Assessment and it is assumed that in-combination effects are therefore **unlikely**, due to the requirement for mitigation if potentially adverse effects are identified. The order of magnitude of possibly cumulative effects is that of the proposed decommissioning and rehabilitation at Oughter Bog alone.

3.7.2 Potential Sources, Pathways and Timing of Impacts SPAs

3.7.2.1 Direct Impacts to Habitats within SPAs

Due to the distance between the Oughter Bog decommissioning and rehabilitation and the Middle Shannon Callows/ Slieve Bloom Mountains Special Protection Areas (with no overlap with Oughter Bog), **there is no potential for loss or fragmentation of habitats or loss of connectivity of habitats within a Special Protection Area. There are no habitats where both the SPAs and likely rehabilitation measures overlap** (all within the rehabilitation category of 'Marginal Lands[6]' and only including limited drain blocking or no intervention) and therefore, there is **no potential for direct impacts to the SPA** to occur. Therefore, all SPA's can be excluded from consideration in respect of direct effects.

3.7.2.2 Indirect loss, reduction or degradation of terrestrial or aquatic habitats within SPA sites

Sources (some but not all inside SPA boundaries): Movement of soil or peat, machinery; earthworks, excavations, temporary overburden storage, cleaning of silt ponds, installation of pipes, removal of waste and/or raw material, lifting of rail; use of fuels, chemicals or fertiliser.

Pathway: water runoff flow paths, watercourses, air

Potential Oughter Bog Decommissioning and Rehabilitation Impact/Pathway Connectivity: The identified impact sources could reduce water quality or aquatic habitat quality in the local context – with none of this potentially occurring within any SPA boundary. The current appraisal evaluates the possibility of any effects to downstream hydrologically connected SPAs through sediment/contaminant/nutrient laden runoff, changes to hydrological regimes or morphology of supporting watercourses, or through the spread of invasive species, regarding any indirect (effective) habitat loss or degradation effects to Special Conservation Interests.

Decommissioning and Rehabilitation (hereafter D&R) at Oughter Bog will require direct excavation of the banks and bed of the existing drainage channels (peat production drains), levelling of existing stock-piles, movement of peat to create various dams/speedbumps and wetland berms, where required, and excavations to lift or remove outfall pipes. It will require the use of machinery and involve the removal of waste, including raw material, potentially contaminated soils or peat, railway infrastructure, and fuel.

The proposed Decommissioning and Rehabilitation at Oughter Bog does not overlap any SPA boundary which drains to the Brosna catchment. Effects on one hydrologically connected, downstream SPA, are evaluated to determine the potential (or not) for significant effects.

[6] The assignation 'Marginal Lands' refers to the location of these lands around the periphery or margin of the BNM bog, and is not used in this instance as a term to rank ecological value.

Timing of Impacts: The potential for impact sources arising from the PCAS project only relates to the Decommissioning and Rehabilitation Stage, when groundworks and use of machinery will take place for a limited duration -in this instance expected to be up to **7 months (April-October)**.

Once decommissioning and rehabilitation are complete, the decommissioned and rehabilitated Oughter Bog will require minimal monitoring, generally involving visual inspections of habitat succession, sometimes using drones, and any ongoing scheduled maintenance such as of silt ponds. Due to the negligible (both in terms of source magnitude but also duration) and non-intrusive nature of operational activities, there is no potential for the operational phase of the proposed decommissioning and rehabilitation to cause significant effects to European Sites.

3.7.2.3 Cumulative or in combination effects

There is potential for cumulative effects from other plans or projects which may result in similar source-impact-pathways on the Middle Shannon Callows SPA.

The decommissioning and rehabilitation of **Pollagh, Turraun, Derries** and **Boora Bogs** by BnM, which are also within the River Brosna catchment but approx. **24.0km** upstream of the Middle Shannon Callows SPA boundary. However, these are to be subject to Appropriate Assessment reporting and in the event likely significant effects are evaluated, mitigation is to be provided to ensure no adverse effects occur.

Various sources of land use change within the SPA - with linkage to activities such as Agriculture and Turbary - constitute activities requiring consent (ARC) of the minister and therefore unlikely to result in in combination adverse effects.

All other plans or projects identified are subject to Appropriate Assessment and it is assumed that in-combination effects are therefore unlikely, due to the requirement for mitigation if likely significant/potentially adverse effects are identified. The order of cumulative effects is that of the proposed decommissioning and rehabilitation at Oughter Bog.

3.7.2.4 Indirect or ex-situ disturbance/displacement of bird species of Special Conservation Interest

Sources (some but not all inside SPA boundaries): Decommissioning and Rehabilitation activities; movement of construction machinery and vehicles including rail; installation of pipes; presence of personnel; noise and vibration and/or visual intrusion from construction works and machinery.

Pathway: air[7], visibility

Potential Oughter Bog Decommissioning and Rehabilitation Impact/Pathway Connectivity: The impact sources identified above, in addition to the impact pathways are evaluated with regard to potential in-situ or ex-situ disturbance or displacement effects on bird species listed as Special Conservation Interests of the SPA sites.

The proposed development is not directly adjacent/overlapping any SPA but is **11.9km** north of the Slieve Bloom Mountains SPA, and **18.5km** north-east of Middle Shannon Callows SPA.

The above SPA's cited are too distant from sources of disturbance associated with the project under consideration for SCI species to be subject to disturbance or displacement related effects whilst in-situ, i.e.

[7] Air is a pathway for airborne vibration (noise)

within the European Site. However, 1 of the SPA's described share some possible connectivity through SCI species of wildfowl, notably **Whooper Swan, Golden Plover** and the general category 'Wetlands and Waterbirds'. The second SPA shares some possible connectivity through the SCI species **Hen Harrier.**

Timing of Impacts: As outlined above, the potential for effects only relates to the decommissioning and rehabilitation Stage as source magnitude during any operational phase activities can be screened out. In terms of Timing of Effects, this is limited to a maximum of **7 months (April-October)**, which is outside the winter period (**October to March**) when most of the SCI species for which these sites are designated are present[8].

3.7.2.4.1 Middle Shannon Callows SPA

Corncrake

Regarding Corncrake, no breeding has occurred by this species within the Middle Shannon Callows and the former breeding population within the SPA is now considered **extinct**. In 2002, 2003, 2006, 2007, 2008 and 2012 heavy rainfall led to flooding events during the Corncrake breeding season. This contributed to an acute level of breeding failure and led to severe declines in Corncrake numbers; from 23 in 2005 to just one in 2011 and 2012. While 2013 saw an increase in the number of calling males to 2 (during the census period), just one calling male was recorded in 2014 and finally in 2015, for the first time no Corncrake was heard on the Shannon Callows[9].

Whooper Swan

Regarding Whooper Swan, the latest Article 12 reporting data available from NPWS relates to the period 2010. The wintering population size for this period, based on a best estimate of the number of individuals wintering was 10,520. Trends, both short term (2000-2010) and long-term (1986-2010) were all positive and increasing. The main pressures and threats comprise *Utility and service lines*, *renewable abiotic energy use, modification of cultivation practices*, *other agriculture activities*, *outdoor sports and leisure activities, recreational activities*, *and other forms of pollution* (sources relating to lead poisoning referenced only).

Results of the Irish Wetland Bird Survey (IWeBS[10]) for the winter period 2009/10 – 2015/16 report a population size (ROI) of 11,852 individuals (from Crowe *et al*., 2015), of which 4,052 were associated with the SPA network. The peak (2011-2015) population associated with the Shannon Callows was 305 birds.

Regarding connectivity to Oughter Bog and potential linkage between the River Brosna and the Shannon Callows, Scottish Natural Heritage (SNH)[11] recommends a core range of **5km** from night-time roosts be assumed in respect of foraging Whooper Swan during the winter months when establishing connectivity between a proposed wind farm development and nearby SPA's. However, it is also accepted that the

[8] Periods are as defined in the SNH document '*Survey Methods for use in assessing the impacts of onshore windfarms on bird communities*'. (2005). SNH, Battleby, Scotland.

[9] NPWS (2015) A framework for Corncrake Conservation to 2022. National Parks and Wildlife Service, Department of Arts, Heritage & the Gaeltacht. Available online at:

https://www.npws.ie/sites/default/files/publications/pdf/A%20Framework%20for%20Corncrake%20Conservation%20to%202022%20%28Nov2015%29.pdf

[10] Lewis et al. (2019). Irish Wetland Bird Survey: Waterbird Status and Distribution 2009/10-2015/16. Irish Wildlife Manuals, No. 106. National Parks and Wildlife Service, Department of culture, Heritage and the Gaeltacht, Ireland.

[11] https://www.nature.scot/sites/default/files/2018-08/Assessing%20connectivity%20with%20special%20protection%20areas.pdf

distribution of the Whooper Swan population wintering in Ireland may change over the winter months, possibly due to birds dispersing southwards (as the winter progresses) from their original arrival grounds[12].

Suitable foraging habitat (improved grazing fields) for Whooper Swan occurs along the River Brosna (3.5km north) and adjacent to Oughter Bog (due west, within 100m of decommissioning and rehabilitation activities).

No Whooper Swan were recorded at Oughter Bog on site visits within the winter period 2020/21.

Wigeon

The latest Article 12 reporting data available from NPWS in respect of **Wigeon** relates to the period 2006-2011. The wintering population size for this period, based on a five-year mean was 56,350 of which 43,746 occurred within the SPA network. Trends, both short term (1999-2011) and long-term (1987-2011) were all negative and decreasing. The main pressures and threats comprise *outdoor sports and leisure activities, recreational activities*, *renewable abiotic energy use*, *marine and freshwater aquaculture*, *hunting and collection of wild animals* (terrestrial), *pollution to surface waters*, *marine water pollution*, *other forms of pollution, invasive non-native species*, *human induced changes in hydraulic conditions* and *other ecosystem modifications*.

Results of the Irish Wetland Bird Survey (IWeBS) for the winter period 2009/10 – 2015/16 report a population size (ROI) of 50,452 individuals of which 38,514 were associated with the SPA network and describes long term declines in the wintering population of Wigeon in Ireland. The peak count in the period 2011-15 for the Shannon Callows was 1,351.

No species-specific guidance is available with which to establish connectivity distances to SPA's, however, a foraging distance of up to **16km** is stated in Cramp 1977-1993. Wigeon are almost entirely vegetarian feeding mainly on leaves, stems, stolons, bulbils and rhizomes of plants. Suitable foraging and roosting habitat occur close to Oughter Bog along the River Brosna (3.5km north).

No Whooper Swan were recorded at Oughter Bog on site visits within the winter period 2020/21.

Golden Plover

The latest Article 12 reporting data available from NPWS in respect of **Golden Plover** relates to the period 2006-2011. The wintering population size for this period, based on a five-year mean was conservatively 99,870 individuals of which 81,907 occurred within the SPA network. Trends in the short term (1999-2011) were negative in quality and decreasing, however over the long-term (1987-2011) unknown. The main pressures and threats comprise *renewable abiotic energy use*, *modification of cultivation practices*, *marine and freshwater aquaculture*, *outdoor sports and leisure activities, recreational activities*, and *marine water pollution*.

Results of the Irish Wetland Bird Survey (IWeBS) for the winter period 2009/10 – 2015/16 report a population size (ROI) of 80,707 individuals of which 63,123 were associated with the SPA network, and describes long terms declines in the wintering population of Golden Plover in Ireland, possibly due to short-stopping. The peak count in the period 2011-15 for the Shannon Callows was 7,610.

Golden Plover feed on a variety of soil and surface-living invertebrates, principally beetles and earthworms, but also plant material such as berries, seeds and grasses, and in winter are known to be attracted to mown grass or close-grazed pastures, stubbles, fallows, harvest-fields and other farmlands of open character, including flood lands (Cramp 1977-1993). Golden Plover will utilize cutaway bog for diurnal roosting. Suitable

[12] Wernham, C.V., Toms, M.P., Marchant, J.H., Clark, J.A. Sitiwardens, G.M.&Baillie, S.R. (eds). 2002. *The Migration Atlas; movements of the birds of Britain and Ireland.* T. & A.D.Poyser, London.

habitat therefore is available for this species along the River Brosna, 3.5km north of Oughter Bog (foraging and roosting), and within the bog boundary (for roosting only, although none have been recorded).

No species-specific guidance is available with which to establish connectivity distances to wintering bird-based SPA's, however, a foraging range of up to **11km** is cited in respect of breeding season foraging, and it is also known that cold weather can result in movements of Golden Plover during the winter. However, the separation distance from Oughter Bog to the Middle Shannon Callows is **18.5km** with a hydrological separation of **26km.**

A single observation of 4 Golden Plover were recorded at Oughter Bog on site visits within the winter period 2020/21.

Lapwing

The latest Article 12 reporting data available from NPWS in respect of **Lapwing** relates to the period 2006-2011. The wintering population size for this period, based on a five-year mean was 88,580 individuals of which 69,488 occurred within the SPA network. Trends in the short term (1999-2011) and long-term (1987-2011) were negative in quality and decreasing. The main pressures and threats comprise *renewable abiotic energy use*, *modification of cultivation practices*, *marine and freshwater aquaculture*, *outdoor sports and leisure activities, recreational activities*, and *marine water pollution*.

Results of the Irish Wetland Bird Survey (IWeBS) for the winter period 2009/10 – 2015/16 report a population size (ROI) of 69,823 individuals of which 48,232 were associated with the SPA network and describes long term declines in the wintering population of Lapwing in Ireland. The peak count in the period 2011-15 for the Shannon Callows was 7,672.

Lapwing feed on chiefly small invertebrates, which live on or in the ground. During the winter, they utilize habitats such as arable fields and pastures in addition to coastal and estuarine habitats. Suitable habitat is available for this species along the River Brosna 3.5km north of Oughter Bog. No species-specific guidance is available with which to establish connectivity distances to wintering bird-based SPA's. However, it is also known that cold weather can result in movements of Lapwing during the winter.

Lapwing (3 no.) were recorded at Oughter in March of 2021, however these were breeding birds. Birds were recorded in display and holding territory.

Black-tailed Godwit

The latest Article 12 reporting data available from NPWS in respect of **Black-tailed Godwit** relates to the period 2006-2011. The wintering population size for this period, based on a five-year mean was 18,080 individuals of which 16,752 occurred within the SPA network. Trends in the short term (1999-2011) and long-term (1987-2011) were positive in quality and increasing. The main pressures and threats comprise marine and freshwater aquaculture, *renewable abiotic energy use*, *fishing and harvesting aquatic resources*, *modification of cultivation practices*, *outdoor sports and leisure activities, recreational activities*, *human induced changes in hydraulic conditions* and *marine water pollution*.

Results of the Irish Wetland Bird Survey (IWeBS) for the winter period 2009/10 – 2015/16 report a population size (ROI) of 17,862 individuals of which 16,575 were associated with the SPA network, and describes a sustained population increase and range expansion over the last century in Ireland. The peak count in the period 2011-15 for the Shannon Callows was 220.

In Ireland, Black-tailed Godwits are known to undertake movements during the winter between sites to feed on freshwater grassland, for example the Blackwater Callows, which is **25km** inland from surrounding SPA's

such as at Cork Harbour, Ballymacoda and Dungarvan has supported birds which also utilized the aforementioned nearby coastal complexes[13].

Suitable habitat is present for Black-tailed Godwits along the River Brosna 3.5km north of Oughter Bog. However, no godwits were recorded on Oughter Bog during the winter period 2020/2021 as there is no suitable habitat on the bog itself.

No Whooper Swan were recorded at Oughter Bog on site visits within the winter period 2020/21.

Black-headed Gull

Black-headed Gull is a SCI species for the middle Shannon Callows SPA in respect of wintering birds. The latest Article 12 reporting data available from NPWS in respect of Black-headed Gull relates to the period 2006-2011. The wintering population size for this period, based on a five-year mean was 50181 individuals of which 39252 occurred within the SPA network. Trends in the short term (1999-2011) and long-term (1987-2011) were unknown. The main pressures and threats comprise marine and freshwater aquaculture, *Marine water pollution*, *fishing and harvesting aquatic resources*, *renewable abiotic energy use*, and *other ecosystem modifications*. The North & West European Population is thought to be stable or declining (Wetlands International, 2018).

Results of the Irish Wetland Bird Survey (IWeBS) for the winter period 2009/10 – 2015/16 are limited in respect of this species insofar as counting of Black-headed Gulls is optional, and no recent counts are available for the Middle Shannon Callows. Crowe,2015 describes a peak count of 1284 for the Shannon Callows in the period 1994/95 – 2000/01.

Habitats utilized by this species during the winter months include inland, wet grasslands, where food such as insects and earthworms can be collected. Suitable habitat is present adjacent to Oughter in the form of grazed, wet grassland. However, no Black-headed Gulls were recorded at Oughter Bog 2020/2021.

No species-specific guidance is available with which to establish connectivity distances to wintering bird-based SPA's, however, the species has been described as developing seasonal patterns of movements between foraging areas and secure roosts 'many km' distant; and recorded travelling up to **25-30km** to a nocturnal, wintertime, roost (Cramp 1977-1993).

No Whooper Swan were recorded at Oughter Bog on site visits within the winter period 2020/21.

Wetlands and Waterbirds

The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the wetland area contained in the SPA and the waterbirds that utilize this resource are of special conservation interest for 'Wetland & Waterbirds'. In addition to the Special Conservation Interests described above, the Site Synopsis for the Middle Shannon Callows SPA describes a wide range of species as utilizing the site, including Mute Swan, Teal, Tufted Duck, Dunlin, Curlew and Redshank. The callow grasslands present in the SPA provide optimum feeding grounds for these various species of waterfowl, while many of the birds also roost or rest within the (European) site.

Wetland habitats occur within and adjacent to the Oughter Bog boundary, outside the peat extraction areas and but are too limited to be attractive to a large assemblages of Waterbirds. The only waterbirds recorded at Oughter were Greylag goose, Mallard and Heron.

[13] Hayhow, D.B. (2009). *Consequences of winter habitat use in a migratory shorebird. Thesis submitted for the degree of Doctor of Philosophy at the University of East Anglia, Norwich, 2009*. Available at: https://ueaeprints.uea.ac.uk/id/eprint/10607/1/Thesis_hayhow_d_2009.pdf

As the construction phase of decommissioning and rehabilitation will involve the use of heavy machinery, disturbance/displacement effects on waterbirds listed as Special Conservation Interests for the various SPA's to which possible connectivity has been established has been identified as a potential source impact pathway for likely significant effects.

However, as the construction phase is expected to be of a temporary to **short-term duration**, the disturbance effects are considered similarly temporary to short term in duration. Due to the proximity of suitable habitat to the proposed works, wintering wildfowl and waders may utilise the locality. However, as the proposed works are scheduled to take place between **April and October,** the potential for adverse effects through the disturbance/displacement of wintering or passage wildfowl is considered unlikely.

Therefore, with a separation distance from Oughter Bog to the Middle Shannon Callows of **18.5km** and a hydrological separation of **26km,** it is considered likely that significant effects on Waterbirds, which may utilize the River Brosna proximal to Pollagh Bog and ex-situ the Middle Shannon Callows can be reasonably **excluded.**

3.7.2.4.2 Slieve Bloom Mountains SPA

This SPA is designated in respect of the following Special Conservation Interests:

- Hen Harrier (*Circus cyaneus*) [A082] (Breeding)

Slieve Bloom Mountain SPA is one of the strongholds for **breeding** Hen Harrier in the country and has supported 11 pairs between 1998 and 2000, as described in the Site Synopsis). Scottish Natural Heritage have recorded a **Breeding Hen Harrier foraging rage of approximately 4km (SNH, 2017). As Oughter Bog is over 11km from Slieve Blooms SPA it is beyond the foraging range of breeding Hen Harrier** within the Slieve Blooms SPA**.** Therefore, it is considered that no connectivity exists between this SPA and Oughter Bog. As a consequence, rehabilitation actions within Oughter Bog are unlikely to have any impact on breeding Hen Harrier within the Slieve Blooms SPA.

Breeding Hen Harrier

Breeding Hen Harrier foraging rage is approximately **4km (SNH, 2017).** As Oughter Bog is over **11km** distant from Slieve Blooms SPA, it is beyond the foraging range of breeding Hen Harrier within the Slieve Blooms SPA.

Recommended distances to be assumed by SNH/NatureScot in terms of connectivity during the breeding season are a core range of 2km, with maximum range of 10km.

In respect of Hen Harrier potential connectivity to Slieve Blooms SPA (>11km distant) from individuals which may occur proximal to Oughter Bog is therefore unlikely. Rehabilitation actions within Oughter Bog are unlikely to have any impact on breeding Hen Harrier within the Slieve Blooms SPA.

Wintering Hen Harrier

Hen Harrier utilise peatlands, grassland mosaics and pre thicket forest habitats during the winter months when they disperse from breeding sites. They feed predominantly on small bird species such as Meadow Pipit and Skylark. No species-specific guidance is available with which to establish connectivity distances to wintering bird-based SPA's, however, they are known to undertake journeys of over **150km**. Hen Harrier winter roosts have been recorded within **5km** of Oughter Bog, but no roosts have been recorded on the site**.** Therefore, no potential for any direct effects to winter roosts exist. Secondary or indirect disturbance to foraging birds is expected to be momentary to brief and highly reversible, with ultimately a negligible magnitude.

3.7.2.5 Cumulative and in combination Effects

There is potential for cumulative effects from other plans or projects which may result in similar source-impact-pathways to the SCI's under consideration, and their respective SPA's (i.e. Middle Shannon Callows SPA and Slieve Bloom Mountain SPA).

The decommissioning and rehabilitation of Pollagh Bog by BnM, which is also within the River Brosna catchment, **18.5km** north-east and **26.0km** upstream of the Middle Shannon Callows SPA, may result in likely significant/potentially adverse effects on SCI's similarly; this project is known to temporally overlap works proposed for Oughter Bog. However, these are to be subject to Appropriate Assessment reporting and in the event likely significant effects are evaluated, mitigation is to be provided to ensure no adverse effects occur.

Additional sources of disturbance such as baseline agricultural activities /turbary within or in close proximity to the SPA's under consideration, and in suitable habitat for SCI's, are considered in the large part unlikely to result in in combination adverse effects - primarily due to habituation to these background baseline activities. In instances where sources of disturbance greater than baseline levels occur within SPA's they may constitute Activities Requiring Consent and thus be regulated in terms of the likelihood of significant effects stemming from these.

All other plans or projects identified are subject to Appropriate Assessment and it is assumed that in-combination effects are therefore **unlikely**, due to the requirement for mitigation if potentially adverse effects are identified. The order of cumulative effects is that of the proposed decommissioning and rehabilitation at Oughter Bog.

It is acknowledged that, following decommissioning and rehabilitation, the presence of an undisturbed wetland habitat the size of Oughter Bog Bog, may provide foraging opportunities, attract wildfowl species as a refugium, and/or act as a disturbance buffer to birds utilising the River Brosna corridor. These positive quality effects may ultimately positively impact the SCI's and benefit the Conservation Objectives of the adjacent SPA.

3.8 Screening Evaluation of the Potential for Effects on European Sites (SACs & SPAs)

The Screening evaluation is based on a conceptual site model which identifies potential impact source-pathways between the described Oughter Bog decommissioning and rehabilitation and each European Site. This allows for an assessment of any potential for significant effects on the Qualifying Interests/ Special Conservation Interests and their respective Conservation Objectives. The relevant stage of the Oughter Bog decommissioning and rehabilitation is the construction stage, no impact source-pathways are identified during the operational stage.

The following impact source-pathways for the **6 SAC sites** are evaluated in relation to any potential for significant effects (Table 3 below):

- Indirect loss or degradation of terrestrial or aquatic habitats within SAC sites, alone and in combination;
- Indirect or ex-situ disturbance or displacement of species of Qualifying Interest, alone and in combination.

The following impact source-pathways for the **2 SPA sites** are evaluated in relation to any potential for significant effects (Table 4 below):

- Direct Impacts to Habitats within SPAs
- Indirect loss, reduction or degradation of terrestrial or aquatic habitats within SPA sites, alone and in combination;
- Indirect or ex-situ disturbance/ displacement of bird species listed as Special Conservation Interests, alone and in combination.

As described in Section 2.7.1.1 and 2.7.1.2, there is **no potential for direct effects to habitats** within SAC or SPA sites.

The evaluation found **no potential for in-combination effects** with regard to Other Plans or Projects including the plans or projects described in Section 2.4.5.

Table 7: Evaluation of Possibly Significant Effects to the 6 SAC sites

	European Site	Separation Distance from Pollagh Bog	Hydrological Connection – Yes/No	Evaluation of the potential for Oughter Bog decommissioning and rehabilitation, either alone or in combination with other plans or projects, to cause either of the following effects to the 6 SAC Sites: **1**. Indirect loss or degradation of terrestrial or aquatic habitats within the SAC site; **2**. Indirect/ex-situ disturbance or displacement of species of Qualifying Interest. **3.** Indirect or ex-situ mortality of Qualifying Interests
1	Clara Bog SAC (000572)	6.9km NE	No	**1: Screened Out - No likelihood for significant indirect loss or degradation of terrestrial or aquatic habitats within the SAC** Due to the absence of downstream hydrological pathways and the separation distance of **6.9km** between proposed activities and this European Site, no pathways for effects are identified. **2: Screened Out - No potential for indirect or ex-situ disturbance or displacement of species of Qualifying Interests** Qualifying Interests only relate to habitats and plant species which are not sensitive to indirect disturbance at the distance of separation from proposed activities. **3: Screened Out - No potential for indirect or ex-situ mortality to species of Qualifying Interests** Qualifying Interests only relate to habitats and plant species which are not sensitive to indirect mortality at the distance of separation from proposed activities.
2	Charleville Woods SAC (000571)	8.5km E	No	**1: Screened Out - No likelihood for significant indirect loss or degradation of terrestrial or aquatic habitats within the SAC** Due to the absence of downstream hydrological pathways and the separation distance of **8.5km** between proposed activities and this European Site, no pathways for effects are identified. **2: Screened Out - No potential for indirect or ex-situ disturbance or displacement of species of Qualifying Interests** Qualifying Interests only relate to habitats and plant species which are not sensitive to indirect disturbance at the distance of separation from proposed activities. **3: Screened Out - No potential for indirect or ex-situ mortality to species of Qualifying Interests** Qualifying Interests only relate to habitats and plant species which are not sensitive to indirect mortality at the distance of separation from proposed activities.
3	Ferbane Bog SAC (000575)	10.8km W	No	**1: Screened Out - No likelihood for significant indirect loss or degradation of terrestrial or aquatic habitats within the SAC** Due to the absence of hydrological pathways and the separation distance of **10.8km** between proposed activities and this European Site, no pathways for effects are identified.

	European Site	Separation Distance from Pollagh Bog	Hydrological Connection – Yes/No	Evaluation of the potential for Oughter Bog decommissioning and rehabilitation, either alone or in combination with other plans or projects, to cause either of the following effects to the 6 SAC Sites: **1**. Indirect loss or degradation of terrestrial or aquatic habitats within the SAC site; **2**. Indirect/ex-situ disturbance or displacement of species of Qualifying Interest. **3.** Indirect or ex-situ mortality of Qualifying Interests
				2: Screened Out - No potential for indirect or ex-situ disturbance or displacement of species of Qualifying Interests Qualifying Interests only relate to habitats and plant species which are not sensitive to indirect disturbance at the distance of separation from proposed activities. **3: Screened Out - No potential for indirect or ex-situ mortality to species of Qualifying Interests** Qualifying Interests only relate to habitats and plant species which are not sensitive to indirect mortality at the distance of separation from proposed activities.
4	Moyclare Bog SAC (000591)	13.5 W	No	**1: Screened Out - No likelihood for significant indirect loss or degradation of terrestrial or aquatic habitats within the SAC** Due to the absence of hydrological pathways and the separation distance of **13.5km** between proposed activities and this European Site, no pathways for effects are identified. **2: Screened Out - No potential for indirect or ex-situ disturbance or displacement of species of Qualifying Interests** Qualifying Interests only relate to habitats and plant species which are not sensitive to indirect disturbance at the distance of separation from proposed activities. **3: Screened Out - No potential for indirect or ex-situ mortality to species of Qualifying Interests** Qualifying Interests only relate to habitats and plant species which are not sensitive to indirect mortality at the distance of separation from proposed activities.
5	Clonaslee Esker and Derry Bog SAC (000859)	9.5 S	No	**1: Screened Out - No likelihood for significant indirect loss or degradation of terrestrial or aquatic habitats within the SAC** Due to the absence of hydrological pathways and the separation distance of **9.5km** between proposed activities and this European Site, no pathways for effects are identified. **2: Screened Out - No potential for indirect or ex-situ disturbance or displacement of species of Qualifying Interests** Qualifying Interests only relate to habitats and plant species which are not sensitive to indirect disturbance at the distance of separation from proposed activities. **3: Screened Out - No potential for indirect or ex-situ mortality to species of Qualifying Interests** Qualifying Interests only relate to habitats and plant species which are not sensitive to indirect mortality at the distance of separation from proposed activities.

	European Site	**Separation Distance from Pollagh Bog**	**Hydrological Connection – Yes/No**	**Evaluation of the potential for Oughter Bog decommissioning and rehabilitation, either alone or in combination with other plans or projects, to cause either of the following effects to the 6 SAC Sites:** **1**. Indirect loss or degradation of terrestrial or aquatic habitats within the SAC site; **2**. Indirect/ex-situ disturbance or displacement of species of Qualifying Interest. **3.** Indirect or ex-situ mortality of Qualifying Interests
6	River Shannon Callows SAC (000216)	18.5km SW	Yes: Downstream	**1: Screened Out - No likelihood for significant indirect loss or degradation of terrestrial or aquatic habitats within the SAC** Notwithstanding the downstream hydrological connectivity of **26.0km,** when considered in light of dilution factors, a separation distance of **18.5km** from proposed activities and the negligible linkage to the terrestrial habitats for which this European Site is designated **(6410] *Molinia* Meadows; [6510] Lowland Hay Meadows; [8240] Limestone Pavement*; [91E0] Alluvial Forests*)** no pathways for effects are identified. **2: Screened Out - No Possibility for indirect or ex-situ disturbance or displacement of species of Qualifying Interest** Notwithstanding the downstream hydrological connectivity of **26.0km**, between the proposed activities and this European Site, possible pathways for localised effects on (*ex-situ*) **Otter** can be screened out as the possibility of having harmful effects are negligible. This is because Otter territories has been recorded to cover a maximum range of **20km** which is less than the hydrological distance between the project site and the European site. In addition, otters are nocturnal, and project operations will only be carried out in daylight hours. Finally, the proposed works will be carried out on the industrial peat cutaway which consists of bare peat and is not utilised by otter, as confirmed by a recent survey. This survey found no **otter holts within Oughter Bog Rehabilitation area.** **3: Screened Out - No Possibility for indirect or ex-situ mortality to species of Qualifying Interest** Due to a hydrological connectivity distance of **26km** between proposed activities and this European Site, possible pathways for localised effects on (*ex-situ*) **Otter** are negligible and can be screened out as having harmful effects. Accidental or inadvertent mortality is considered unlikely given no holts were located at exact locations of PCAS activity and animals will have the opportunity to avoid potential contact if active during daylight hours.

Table 8: Evaluation of Possibly Significant Effects to the 2 SPA sites

	European Site	Separation Distance from Pollagh Bog	Hydrological Connection – Yes/No	Evaluation of the potential for Oughter Bog decommissioning and rehabilitation, either alone or in combination with other plans or projects, to cause either of the following effects to the 2 SPA Sites: 1. Direct Impacts to Habitats within SPAs 2. Indirect loss, reduction or degradation of terrestrial or aquatic habitats within or in close proximity to the SPA site; 3. Indirect or Ex-Situ disturbance or displacement of bird species of Special Conservation Interest.
1	Middle Shannon Callows SPA (004096)	18.5km SW	Yes: Downstream	**1: Screened Out - Possibility for direct loss, reduction or degradation of terrestrial or aquatic habitats within the SPA** Due to the separation distance of **18.5km and a hydrological distance of 26.0km** to this SPA, possible pathways for direct effects can be **excluded.** **2: Screened Out - Possibility for indirect loss, reduction or degradation of terrestrial or aquatic habitats within or in close proximity to the SPA** Due to the separation distance of **18.5km**, to this SPA and a hydrological connection distance of **26km** between proposed activities and this European Site, no possible pathways for effects were identified. **3: Screened Out - Possibility for indirect or ex-situ disturbance or displacement effects of bird species of Special Conservation Interest** Bird species of Special Conservation Interests for this SPA include Whooper Swan, Wigeon, Lapwing, Black-tailed Godwit, Black-headed Gull and Golden Plover, along with 'wetland and waterbirds'. Due to the **18.5km** separation distance from **Oughter Bog** to the **Middle Shannon Callows SPA** and a downstream hydrological distance of **26.0km**, it is considered unlikely that wintering, transiting or displaced species (i.e Ex-situ) **Whooper Swan** from this SPA would be attracted to the wetland habitats (primarily Poor Fen) at Oughter Bog, within the time-frame of the project (**April-October**) and hence be subject to possible disturbance events. Therefore, these potential impacts can be screened out. Effects on Corncrake are screened out as the species no longer occurs. Regarding Golden Plover numbers recorded from Oughter do not suggest a resultant magnitude of effect stemming from possible disturbance pathways as being likely to significantly affect distant European Sites, therefore this species can be screened out.
2	Slieve Bloom Mountains SPA	11.5km S	No	**1: Screened Out - No Possibility for direct loss or degradation of terrestrial or aquatic habitats within the SPA** With no hydrological connectivity and a separation distance of over **11.5km** from proposed activities and the negligible linkage to the bird species for which this European Site is designated (**Hen Harrier - Breeding**) no pathways for effects are identified.

	European Site	**Separation Distance from Pollagh Bog**	**Hydrological Connection – Yes/No**	**Evaluation of the potential for Oughter Bog decommissioning and rehabilitation, either alone or in combination with other plans or projects, to cause either of the following effects to the 2 SPA Sites:** 1. Direct Impacts to Habitats within SPAs 2. Indirect loss, reduction or degradation of terrestrial or aquatic habitats within or in close proximity to the SPA site; 3. Indirect or Ex-Situ disturbance or displacement of bird species of Special Conservation Interest.
				2: Screened Out - No potential for indirect or ex-situ disturbance or displacement of species of Qualifying Interests *Breeding* Due to no hydrological connectivity between proposed activities and this European Site, with no possible pathways for localised effects on (*ex-situ*) **Hen Harrier,** this species can be screened out in the absence of harmful effects. In addition, possible pathways for localised effects on (*ex-situ*) **Hen Harrier** are limited due to the exceedance in separation distance of the SNH/NatureScot recommended threshold for Connectivity during the **breeding season,** which would exclude any significant disturbance to foraging Hen Harrier during the time-frame of the project (**April to October**). *Non-breeding* There is a separation distance of over **11.5km** and no hydrological connectivity between proposed activities and this European Site. In addition, possible pathways for localised effects on (*ex-situ*) **Hen Harrier** are limited due to a restricted foraging range of **4km** during **breeding** season. **Winter** roosts occur within **5km** of the project site, but none have been recorded within Oughter itself. Finally, the proposed works will be carried out on the industrial peat cutaway which is not preferentially selected for roosting by Hen Harrier. Therefore, impacts on wintering Hen Harrier can be screened out as harmful effects such as accidental or inadvertent mortality when carrying out activities are negligible within foraging habitat with no wintering roosts, in scenarios where birds are likely to avoid close proximity to source of mortality such as moving vehicles. Disturbance to foraging or transiting birds during the winter period is evaluated as momentary to brief, reversible and of negligible overall magnitude, and further reduced due to the limited extent of Rehabilitation during the winter months.

3.9 Evaluation of the impact of Oughter Bog Decommissioning and Rehabilitation on the Integrity of the European Sites under consideration

Using the checklist in the Table below, the proposed Oughter Bog Decommissioning and Rehabilitation Plan, as described in **Appendix C**, both alone and in-combination with other projects, for **likely significant effects** on the integrity of the European Sites under consideration is examined.

Table 9: Integrity of European Site checklist

Does the project or plan have the potential to: **Yes/No**	Clara Bog	Charleville Woods	Cloonaslee Esker and Drrry Bog	Frebane Bog	Moyclsare Bog SAC	River Shannon Callows SAC	Middle Shannon Callows SPA	Slieve Bloom Mountains SPA
- cause delays in progress towards achieving the conservation objectives of the site?	No	No	No	No	No	No	No	No
- interrupt progress towards achieving the conservation objectives of the site?	No	No	No	No	No	No	No	No
- disrupt those factors that help to maintain the favourable conditions of the site?	No	No	No	No	No	No	No	No
- interfere with the balance, distribution and density of key species that are the indicators of the favourable condition of the site?	No	No	No	No	No	No	No	No
- change the dynamics of the relationships (between, for example, soil and water or plants and animals) that define the structure and/or function of the site?	No	No	No	No	No	No	No	No
- interfere with predicted or expected natural changes to the site (such as water dynamics or chemical composition)?	No	No	No	No	No	No	No	No

Does the project or plan have the potential to: **Yes/No**	Clara Bog	Charleville Woods	Cloonaslee Esker and Drrry Bog	Frebane Bog	Moyclsare Bog SAC	River Shannon Callows SAC	Middle Shannon Callows SPA	Slieve Bloom Mountains SPA
- reduce the area of key habitats?	No	No	No	No	No	No	No	No
- reduce the population of key species?	No	No	No	No	No	No	No	No
- change the balance between key species?	No	No	No	No	No	No	No	No
- reduce diversity of the site?	No	No	No	No	No	No	No	No
- result in disturbance that could affect population size or density or the balance between key species?	No	No	No	No	No	No	No	No

3.10 Screening for Appropriate Assessment: Conclusion Statement

The Screening Evaluation provided herein has examined the potential for any effects arising via source pathway linkages with regard to connectivity to designated European Sites (SACs and SPAs) within the zone of influence of all predicted Project impacts. An extended buffer zone of **15km** was further considered, in line with NPWS guidance (DoEHLG, 2009), for evaluation of effects on any European Site which may arise associated with the proposed decommissioning and rehabilitation of Pollagh Bog, as required. There are a total of **6** European sites located within the 15km zone of consideration with an additional **2** European sites with a **downstream hydrological connection (*)**:

1. Clara Bog SAC	Site code 000572
2. Charleville Woods SAC	Site code 000571
3. Ferbane Bog SAC	Site Code 000575
4. Moyclare Bog SAC	Site Code 000591
5. Clonaslee Esker and Derry Bog SAC	Site Code 000859
6. Slieve Bloom Mountains SPA	Site Code 004160
7. Shannon Callows SAC (*)	Site Code 000216
8. Middle Shannon Callows SPA(*)	Site Code 004096

This Screening Statement has been prepared to provide sufficient objective scientific information in support of the proposed development, in order to allow an Appropriate Assessment determination in the context of Article 6(3) of the Habitats Directive. The report has been prepared in order to evaluate the significance of potential effects on European sites from the proposed decommissioning and rehabilitation of Oughter Bog, as described in **Appendix C**, alone and in-combination with other developments.

Appropriate Assessment Stage One Screening of all European sites identified evaluated that the potential for significant effects on the Special Conservation Interests or Qualifying Interests of **All (no. 8)** European Sites could be excluded.

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Appendix A FONSE

Finding of No Significant Effects Report (FONSE)

In accordance with the EC (2001) guidance document, *Assessment of plans and projects significantly affecting Natura 2000 sites – Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC*, A Finding of No Significant Effects Report has been completed for the proposed Decommissioning and Rehabilitation Plan for Oughter Bog. The standard matrix for this report provided in Annex 2 of the guidance document was followed. Line items in italics are taken directly from the guidance document.

Finding of No Significance Effects Report	
Name and location of the Natura 2000 sites	The Screening Evaluation provided herein has examined the potential for any effects arising via source pathway linkages with regard to connectivity to designated European Sites (SACs and SPAs) within the zone of influence of all predicted Project impacts. An extended buffer zone of **15km** was further considered, in line with NPWS guidance (DoEHLG, 2009), for evaluation of effects on any European Site which may arise associated with the proposed decommissioning and rehabilitation of Oughter Bog, as required. There is a total of **6** European sites located within the 15km zone of consideration **with an additional 2 European sites hydrologically linked downstream***: 1. Clara Bog SAC — Site code 000572 2. Charleville Woods SAC — Site code 000571 3. Ferbane Boy SAC — Site code 000575 4. Moyclare Bog SAC — Site code 000581 5. Clonaslee Eskers and Derry Bog SAC — Site code 000859 6. Slieve Bloom Mountains SPA — Site code 004168 7. River Shannon Callows SAC* — Site code 000216 8. Middle Shannon Callows SAC* — Site code 004096

Finding of No Significance Effects Report	
Description of the project or plan	**Overview:** Bord na Móna operates under IPC Licence issued and administered by the EPA to extract peat within the Boora bog group (Ref. P0500-01). As part of Conditions 10.1 and 10.2 of this license respectively, decommissioning and rehabilitation must be undertaken to ensure the permanent rehabilitation of the bog lands within the licensed area. Oughter bog is part of the Boora bog group. Oughter Bog is located in Co. Offaly. A document titled 'Oughter Bog Cutaway Bog Decommissioning and Rehabilitation Plan 2021' has been prepared specifically to describe the proposed decommissioning and rehabilitation measures at **Oughter Bog** as appended to this document as **Appendix C**. **Purpose:** The decommissioning and Rehabilitation of **Oughter Bog** as required under IPC license.
Is the Project or Plan directly connected with or necessary to the management of the site (provide details)?	No
Are there other projects or plans that together with the project of plan being assessed could affect the site (provide details)?	Yes: In addition to the proposed decommissioning and rehabilitation plan the following projects were considered: 1 Other BnM Bog Group Decommissioning and Rehabilitation 2 NPWS Raised Bog Restoration at Crosswood Bog SAC 3 Turbary 4 Agriculture 5 Local Authority Development Plans
The Assessment of Significant Effects	
Describe how the project or plan (alone or in combination) is likely to affect the Natura 2000 site	The results are that **is there is no *potential* for the Decommissioning and Rehabilitation plan to cause any effects to the following 8 no. European Sites:** 1. Clara Bog SAC Site code 000572 2. Charleville Woods SAC Site code 000571

Finding of No Significance Effects Report			
	3. Ferbane Bog SAC Site code 000575 4. Moyclare Bog SAC Site code 000581 5. Clonaslee Eskers and Derry Bog SAC Site code 000859 6. River Shannon Callows SAC Site code 000216 7. Middle Shannon Callows SPA Site code 004095 8. Slieve Bloom Mountains SPA Site code 000575 *T*herefore, these EU sites have been 'Screened Out' at Stage One of the Appropriate Assessment process.		
Explain why these effects are not considered significant	Stage 1 Conceptual Models have been presented in respect of each European Site within the extended **15km** study area. Within same, potential sources of effects have been examined. In respect of the European Sites listed above, the Potential for Significant Effects can be excluded, due to an absence of impact pathways and separation distance. We refer to Section 2.8 and 2.9 of the Appropriate Assessment Report for detailed examination.		
Name of Agency or Body Consulted	**Summary of Response**		
NPWS	We refer Section 2.6.1 of the Appropriate Assessment Report for details.		
Data Collected to Carry out the Assessment			
Who carried out the assessment	*Sources of Data*	*Level of assessment completed*	*Where can the full results of the assessment be accessed and viewed*
John Derwin,	A combination of consultation, desktop studies and field surveys.	Following screening it can reasonably be concluded that there is no possibility of Significant Effects on **all of these** European sites as a result of the proposed decommissioning and rehabilitation, as described in **Appendix C**.	Bord na Mona, Leabeg, Blueball, Tullamore, Co. Offaly, R35 P304.

Finding of No Significance Effects Report			
		With regard to the following listed EU Sites, Significant Effects, in the absence of mitigation (which is not considered at Screening Stage) are considered possible or likely via identified source-pathway linkages: As a result, there is no obligation on the Competent Authority to carry out an Appropriate Assessment (i.e. Stage Two of the AA process) under Article 6 (3) of the Habitats Directive for this project.	

Appendix B NPWS Site Synopses

Site Name: Charleville Wood SAC

Site Code: 000571

Charleville Wood is a large woodland surrounded by estate parkland and agricultural grassland located about 3 km south-west of Tullamore in Co. Offaly. The site, which is underlain by deep glacial deposits, includes a small lake with a wooded island, and a stream runs along the western perimeter. The woodland is one of very few ancient woodlands remaining in Ireland, with some parts undisturbed for at least 200 years.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[91E0] Alluvial Forests*
[1016] Desmoulin's Whorl Snail (*Vertigo moulinsiana*)

At Charleville Wood, approximately 10% of the woodland has been under-planted with conifers and other exotic trees, but the majority is dominated by Pedunculate Oak (*Quercus robur*). There is much Ash (*Fraxinus excelsior*) and scattered Wych Elm (*Ulmus glabra*), while birch (*Betula* spp.) is a feature of the boggier margins. The shrub layer is composed largely of Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*) and Blackthorn (*Prunus spinosa*). The ground layer is varied, including damp flushed slopes with Ramsons (*Allium ursinum*) and drier, more open areas with a moss sward composed largely of *Rhytidiadelphus triquetris*. The fungal flora of the woodland is notable for the presence of several rare Myxomycete species, namely *Hemitrichia calyculata, Perichaena depressa, Amaurochaete atra, Collaria arcyrionema, Stemonitis nigrescens* and *Diderma deplanata*.

Wet alluvial forest is found around the lake. It is dominated by Grey Willow (*Salix cinerea*) with Alder (*Alnus glutinosa*) and Ash. The ground flora is dominated by Common Reed (*Phragmites australis*) with Marsh-marigold (*Caltha palustris*), sedges (*Carex* spp.), Meadowsweet (*Filipendula ulmaria*), Yellow Iris (*Iris pseudacorus*), Gipsywort (*Lycopus europaeus*) and Water Mint (*Mentha aquatica*) present.

Extensive swamps of Bulrush (*Typha latifolia*) and Bottle Sedge (*Carex rostrata*) have developed in the lake shallows. The wooded island at its centre is famed for its long history of non-disturbance. Hazel, Spindle (*Euonymus europaeus*) and Ivy (*Hedera helix*) reach remarkable sizes here.

The lake is an important wildfowl habitat - it supports populations of Mute and Whooper Swan and a number of duck species, including Teal, Wigeon, Shoveler, Pochard and Tufted Duck. A number of unusual insects have been recorded in Charleville Wood, notably *Mycetobia obscura* (Order Diptera), a species known from only one other site in Ireland. The site is also notable for the presence of a large population of the rare snail species, *Vertigo moulinsiana*.

Charleville Wood is one of the most important ancient woodland sites in Ireland. The woodland has a varied age structure and is relatively intact with areas of both closed and open canopy. The understorey and ground layers are also well-represented. Alluvial forest is a priority habitat listed on Annex I of the E.U. Habitats Directive, while the rare snail species, *Vertigo moulinsiana*, is listed on Annex II of this Directive.
The wetland areas, with their associated bird populations, rare insect and Myxomycete species, contribute further to the conservation significance of the site.
Version date: 21.01.2020

Site Name: Clara Bog SAC
Site Code: 000572

Clara Bog is situated some 2 km south of Clara village in Co. Offaly. Much of it is State-owned and designated a statutory Nature Reserve.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[6210] Orchid-rich Calcareous Grassland*
[7110] Raised Bog (Active)*
[7120] Degraded Raised Bog
[7150] *Rhynchosporion* Vegetation
[91D0] Bog Woodland*

Active raised bog comprises areas of high bog that are wet and actively peat-forming, where the percentage cover of bog mosses (*Sphagnum* spp.) is high, and where some or all of the following features occur: hummocks, pools, wet flats, *Sphagnum* lawns, flushes and soaks. Degraded raised bog corresponds to those areas of high bog where hydrology has been adversely affected by peat cutting, drainage and other land use activities, but which are capable of regeneration. The *Rhynchosporion* habitat occurs in wet depressions, pool edges and erosion channels where the vegetation includes White Beak-sedge (*Rhynchospora alba*) and/or Brown Beak-sedge (*R. fusca*), and at least some of the following associated species: Bog Asphodel (*Narthecium ossifragum*), sundews (*Drosera* spp.), Deergrass (*Scirpus cespitosus*) and Carnation Sedge (*Carex panicea*).

Clara Bog has long been regarded as one of the most important raised bogs in the country, being the largest remaining example of the true midland sub-type. It has well-developed hummock and hollow complexes, and one of the few remaining soak systems. The bog vegetation at this site has been much-studied. Variations in the proportions of bog mosses (*Sphagnum* spp.), Heather (*Calluna vulgaris*) and cottongrasses (*Eriophorum* spp.) have been related to ecological features such as pools, soaks and ridges.

Rhynchosporion vegetation is widespread at this site but is best developed in the wettest areas of active raised bog. This vegetation occurs along pool edges and on flats underlain by deep, wet and quaking peat. Typical plant species which have been recorded from the habitat at the site include the bog mosses *S. cuspidatum* and *S.auriculatum*, Bogbean (*Menyanthes trifoliata*), White Beak-sedge, Common Cottongrass (*Eriophorum angustifolium*) and the nationally scarce Brown Beak-sedge.

The largest part of the uncut high bog surface is comprised of degraded raised bog. Although the areas of degraded raised bog have a relatively well-developed raised bog flora, they are affected by water loss, to varying degrees, and thus they tend to be associated with the more marginal, sloping areas of the high bog. Common

vascular plant species of degraded raised bog areas include Heather, Bog Asphodel, Hare's-tail Cottongrass (*Eriophorum vaginatum*), Deergrass, Cross-leaved Heath (*Erica tetralix*) and Carnation Sedge. Indicator species of midland raised bog habitat, such as Bog-rosemary (*Andromeda polifolia*) and *Sphagnum magellanicum,* are present even within areas of degraded bog, however their cover is generally low. The cover of *Sphagnum* is also low (typically < 30%) due to low water levels and perhaps other factors such as burning.

Bog woodland on Clara Bog occurs in several small stands associated with flushes on the western side of the bog, the largest of which lies to the west of Shanley's Lough. There is a good example of a wet birch (*Betula* sp.) woodland which has a diverse vegetation, and the most easterly flush has open water associated with it. The transitions into calcareous woodland, to the east, and to the esker ridge, to the north, are contained within the site, and some excellent examples of esker grassland also occur. Some peripheral reclaimed farmland is also included in the site because management undertaken in these areas can affect the hydrology of the bog.

Several rare invertebrate species are associated with the soak on this bog, including the midge, *Lasiodiamesa sphagnicola* (Order Diptera), for which Clara Bog is its only known Irish site, a click beetle, *Ampedus pomorum* (Order Coleoptera), and another midge, *Parhelophilus consimilis* (Order Diptera). Marsh Fritillary (*Euphydryas aurinia,* Order Lepidoptera), a butterfly listed on Annex II of the E.U. Habitats Directive, has been recorded from the site, but in its present condition the habitat is only marginally suitable for the species and any populations present are likely to be intermittent, small and short-lived. Natural and human-induced changes are likely to make the habitat less suitable in the future. The bog is also important at the only known Irish station for the rare moss *Tetraplodon angustatus*.

Clara Bog supports breeding Merlin (1-2 pairs), a scarce species in Ireland and one that is listed on Annex I of the E.U. Birds Directive. Red Grouse also breeds, along with other common bogland species such as Meadow Pipit and Skylark.

The site has been divided into a western and an eastern section by a road. The eastern part of the site has been damaged by previous drainage works, although restoration work is in progress. Continuing peat extraction from the southern margins is also damaging and has a potential effect upon much of the internal bog, including the soak system. Ideally the whole bog should be managed as a hydrological unit.

Active raised bogs, once characteristic of central Ireland, are now rare and vulnerable, and have been recognised by the E.U. as habitats of international importance. Ireland has a special responsibility to conserve the best of its remaining bogs. Further drainage, peat extraction, burning or attempted land reclamation is not consistent with this responsibility.

Version date: 27.11.2015

Site Name: Ferbane Bog SAC
Site Code: 000575

Ferbane Bog is a relatively large, domed, raised bog located about 10 km east of Shannonbridge in Co. Offaly. It is underlain by low permeability Waulsortian limestone and clay-rich tills.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[7110] Raised Bog (Active)*
[7120] Degraded Raised Bog
[7150] *Rhynchosporion* Vegetation

Active raised bog comprises areas of high bog that are wet and actively peat-forming, where the percentage cover of bog mosses (*Sphagnum* spp.) is high, and where some or all of the following features occur: hummocks, pools, wet flats, *Sphagnum* lawns*,* flushes and soaks. Degraded raised bog corresponds to those areas of high bog where hydrology has been adversely affected by peat cutting, drainage and other land use activities, but which are capable of regeneration. The *Rhynchosporion* habitat occurs in wet depressions, pool edges and erosion channels where the vegetation includes White Beak-sedge (*Rhynchospora alba*) and/or Brown Beak-sedge (*R. fusca*), and at least some of the following associated species: Bog Asphodel (*Narthecium ossifragum*), sundews (*Drosera* spp.), Deergrass (*Scirpus cespitosus*) and Carnation Sedge (*Carex panicea*).

Much of the surface of the bog is very wet and spongy and the cover of bog mosses and lichens is generally high. A wet, quaking area to the east occurs in a depression and is characterised by a dominant growth of Hare's-tail Cottongrass (*Eriophorum vaginatum*), while another very wet quaking area on the western side of the site has well-developed inter-connecting pools. It is in these wettest portions of the high bog that Rhynchosporion vegetation is best developed. Here there are extensive lawns of *Sphagnum magellanicum* and *S. cuspidatum*, accompanied by vascular plant species such as White Beak-sedge, Common Cottongrass (*Eriophorum angustifolium*), Great Sundew (*Drosera anglica*) and Bogbean (*Menyanthes trifoliata*). Lawns of *S. magellanicum* and hummocks of *S. papillosum, S. capillifolium* and *S. imbricatum* occur in slightly drier areas surrounding these wettest zones. Carnation Sedge is present in abundance throughout the site, but particularly so on sloping areas. Purple Moor-grass (*Molinia caerulea*) and Bog-myrtle (*Myrica gale*) occur in scattered patches throughout the bog. Bog-rosemary (*Andromeda polifolia*) and Cranberry (*Vaccinum oxycoccos*) are also found. A flushed area occurs on the northern part of the site.

Degraded raised bog occurs on the drier margins of the high bog dome. The vegetation is typical of degraded raised bog habitat in Ireland, with more robust species such as Heather (*Calluna vulgaris*)*,* Deergrass*,* Carnation Sedge, Bog Asphodel and Cross-leaved Heath (*Erica tetralix*) tending to predominate. Along the driest margins of the high bog there is invasion by shrub species such as Scots Pine (*Pinus sylvestris*), Rhododendron (*Rhododendron ponticum*)*,* Downy Birch (*Betula pubescens*) and Gorse (*Ulex europaeus*). *Sphagnum* cover is

low in degraded areas of raised bog, typically covering less than 30% of the ground, and conversely the cover of lichens (*Cladonia* spp.) tends to be locally high.

The vegetation of the older cut-away areas to the west, north and east of the site is dominated by Downy Birch and Gorse, with areas of Bracken (*Pteridium aquilinum*), willow (*Salix* sp.), Bilberry (*Vaccinium myrtillus*), Scots Pine and Rhododendron also found.

Drainage is extensive at this site and has caused significant drying out. Past peat-cutting and some active peat-cutting, have also speeded up water loss. However, although the high bog has suffered some water loss, it is still in restorable condition.

Ferbane Bog is a good example of a raised bog and is of considerable conservation significance. Active raised bogs are becoming increasingly rare in Ireland, and Europe, and are listed as a priority habitat on Annex I of the E.U. Habitats Directive.

Version date: 29.08.2013

Site Name: Moyclare Bog SAC
Site Code: 000581

Moyclare Bog is a small, raised bog situated 4 km west of Ferbane in Co. Offaly. Its mean height above sea level is 54 m. On the western edge of the bog, a low peat face with no perimeter drain lies adjacent to wet peaty pasture, which has a spring-line at its junction with mineral soil. The water from this spring disappears under the peat dome of the bog. The site occurs in close proximity to a number of important raised bogs close to the floodplain of the River Shannon.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):
[7110] Raised Bog (Active)*
[7120] Degraded Raised Bog
[7150] *Rhynchosporion* Vegetation

Active raised bog comprises areas of high bog that are wet and actively peat-forming, where the percentage cover of bog mosses (*Sphagnum* spp.) is high, and where some or all of the following features occur: hummocks, pools, wet flats, *Sphagnum* lawns, flushes and soaks. Degraded raised bog corresponds to those areas of high bog whose hydrology has been adversely affected by peat cutting, drainage and other land use activities, but which are capable of regeneration. The *Rhynchosporion* habitat occurs in wet depressions, pool edges and erosion channels where the vegetation includes White Beak-sedge (*Rhynchospora alba*) and/or Brown Beak-sedge (*R. fusca*), and at least some of the following associated species, Bog Asphodel (*Narthecium ossifragum*), sundews (*Drosera* spp.), Deergrass (*Scirpus cespitosus*) and Carnation Sedge (*Carex panicea*).

Much of the bog surface is active and very wet, though not quaking, with an almost 100% cover of bog mosses beneath a sparse cover of Heather (*Calluna vulgaris*) and abundant Deergrass. Cranberry (*Vaccinium oxyccocos*) is especially abundant on lawns of the moss *Sphagnum magellanicum*. Rhynchosporion vegetation is best developed in the wettest central area of the high bog where numerous small pools occur. Typical plant species within these pool areas include the bog mosses *S. cuspidatum* and *S. auriculatum*, Great Sundew (*Drosera anglica*), Common Cottongrass (*Eriophorum angustifolium*) and Bogbean (*Menyanthes trifoliata*). There are also a number of small lawn areas on the wet bog surfaces dominated by White Beak-sedge and, locally, the rare Brown Beak-sedge. Active bog moss growth approaches unusually close to the western margin of the bog.

Degraded raised bog is largely confined to the margins of the high bog area where drainage effects are most pronounced. In common with many areas of degraded raised bog the vegetation at this site is dominated by mixtures of Heather, Hare's-tail Cottongrass (*E. vaginatum*), Deergrass, Bog Asphodel and Carnation Sedge. *Sphagnum* cover is poor, typically <20%, and there are other indicators of degradation such as the presence of Purple Moor-grass (*Molinia caerulea*) and Bog-myrtle (*Myrica gale*).

A small flushed hollow on the dome of the bog contains Soft Rush (*Juncus effusus*) and the bog moss *S. cuspidatum*. The bog becomes drier towards the northern boundary, especially north of an old track which traverses the dome. In many of the driest areas of the high bog there is invasion of Scots Pine (*Pinus sylvestris*) onto the bog surface.

As well as the rare Brown Beak-sedge, other scarce plants known from the site include Fir Clubmoss (*Huperzia selago*) and the liverwort *Pleurozia purpurea*.

Whilst relatively small, Moyclare bog is a site of high conservation value as it is relatively intact and contains examples of the Annex I habitats active raised bog, degraded raised bog and depressions on peat substrates (*Rhynchosporion*). The uncut peat dome has an unusually high proportion of active raised bog.

Version date: 2.09.2013

Site Name: Clonaslee Eskers and Derry Bog SAC
Site Code: 000859

Located approximately 5 km west of the town of Clonaslee, and largely in Co. Laois, this site consists of a series of morainic hills and esker ridges which are the legacy of the last period of glaciation. To the north-west, the Derry Hills are two isolated hills situated in a bog, which forms part of the site. The main esker ridge runs along the southern part of the site.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):
[7230] Alkaline Fens
[1013] Geyer's Whorl Snail (*Vertigo geyeri*)

An unusual assemblage of plants is found on the western part of the esker and on the Derry Hills. Calcicole species such as Mountain Everlasting (*Antennaria dioica*), Yellow-wort (*Blackstonia perfoliata*), Autumn Gentian (*Gentianella amarella*) and Carline Thistle (*Carlina vulgaris*) grow with species more typical of acid heaths. These include Tormentil (*Potentilla erecta*), Fragrant Orchid (*Gymnadenia conopsea*), Goldenrod (*Solidago virgaurea*) and Heather (*Calluna vulgaris*). Wood Vetch (*Vicia sylvatica*) and Bitter-vetch (*Lathyrus montanus*) occur in limestone heath on the Derry Hills. These species are very restricted in their distribution in Ireland. Blue Moor-grass (*Sesleria albicans*) has also been recorded, a rare occurrence of this species in a location east of the River Shannon.

Small disused gravel pits occur within the site, which are vegetated by species such as Field Madder (*Sherardia arvensis*), Common Whitlowgrass (*Erophila verna*) and Thyme-leaved Sandwort (*Arenaria serpyllifolia*).

Both the southern esker and the Derry Hills support patches of woodland. In some areas, an open canopy of Sessile Oak (*Quercus petraea*) and Silver Birch (*Betula pendula*) occurs. Beneath this, the ground flora includes Wood Anemone (*Anemone nemorosa*), Wood Sage (*Teucrium scorodonia*) and Bilberry (*Vaccinium myrtillus*). In the south-western part of the site, woodland dominated by Hazel (*Corylus avellana*) is more common. Ash (*Fraxinus excelsior*), Hawthorn (*Crataegus monogyna*) and Sycamore (*Acer pseudoplatanus*) also occur, with Sessile Oak and Downy Birch.

To the east of the road water percolates down through the glacial material of the esker ridge and emerges in a series of small, calcium-rich springs which flow into cut-away bog to the north. This has resulted in the creation of a species-rich alkaline fen. Black Bog-rush (*Schoenus nigricans*) dominates the vegetation here. Also present are Pale Butterwort (*Pinguicula lusitanica*), Meadow Thistle (*Cirsium dissectum*), Round-leaved Sundew (*Drosera rotundifolia*) and the distinctive Fly Orchid (*Ophrys insectifera*). The latter species is confined to parts of the west and midlands of Ireland, where it occurs only occasionally.

Derry Bog, which is a cut-away raised bog, lies to the north-west of the site. This supports a typical range of bog mosses (*Sphagnum* spp.) and flowering plants, such as Heather and Bog Asphodel (*Narthecium ossifragum*).

The rare whorl snail *Vertigo geyeri* was recorded from the fen area at this site in 1998. This species is a glacial relic with a disjunct European population, which is considered vulnerable due to loss of habitat, particularly through drainage.

Two plant species protected under the Flora (Protection) Order, 1999, occur within the site. Wood Bitter-vetch (*Vicia orobus*) occurs in quantity among oak/birch scrub on the Derry Hills. This species has declined due to land reclamation and has only been seen at one other location since l970. Basil Thyme (*Acinos arvensis*) occurs in a disused gravel pit and has been seen at only three other sites since l970. This species favours open gravel and has declined due to the agricultural use of herbicides. Blue Fleabane (*Erigeron acer*) had been recorded with Basil Thyme at this site. This species is rare and threatened in Ireland and is listed in the Red Data Book as a species confined mostly to open gravel habitats in central and south-eastern Ireland.

A significant land use practice within the site is the extraction of gravel. One quarry west of the road is currently being worked. This activity leads directly to destruction of the esker and irreparable damage to the site. Some of the esker grasslands (mostly at the western end) have been improved either for pasture or for arable farming.

This site is of conservation importance for the presence of alkaline fen vegetation and is considered one of the best sites in the south-east region for this habitat. Also of interest is the extremely unusual assemblage of plants associated with the esker ridges, which includes three rare plants, two of which are legally protected in Ireland. Of further conservation importance is the presence of the rare snail *Vertigo geyeri*.

Version date: 24.09.2013

SITE NAME: SLIEVE BLOOM MOUNTAINS SPA
SITE CODE: 004160

The Slieve Bloom Mountains SPA is situated on the border between Counties Offaly and Laois, and runs along a north-east/south-west aligned ridge for approximately 25 km. Much of the site is over 200 m in altitude, rising to a maximum height of 527 m at Arderin. The mountains are of Old Red Sandstone, flanked by Silurian rocks. Several important rivers rise within the site, including the Barrow, Delour and Silver.

The site has a near continuous ridge of mountain blanket bog, with wet and dry heaths also well represented. Species present in these habitats include Ling Heather (*Calluna vulgaris*), Crowberry (*Empetrum nigrum*), Bilberry (*Vaccinium myrtillus*), Cottongrasses (*Eriophorum* spp.), Deergrass (*Scirpus cespitosus*) and Bog Asphodel (*Narthecium ossifragum*). Much of the slopes are afforested, and overall coniferous plantations account for *c*. 60% of the site. The forests include first and second rotation plantations, with both pre-thicket and post-thicket stands present. Substantial areas of clear-fell are also present at any one time. The principal tree species present are Sitka Spruce (*Picea sitchensis*) and Lodgepole Pine (*Pinus contorta*). The remainder of the site is mostly rough grassland that is used for hill farming. This varies in composition and includes some wet areas with rushes (*Juncus* spp.) and some areas subject to scrub encroachment. Some stands of deciduous woodland also occur, especially within the river valleys.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for Hen Harrier.

This SPA is one of the strongholds for Hen Harrier in the country and, indeed, is the most easterly regular population. A survey in 2005 recorded eight pairs, whereas eleven pairs had been recorded in the 1998-2000 period. The numbers recorded in 2005 represent *c*. 3.7% of the all-Ireland total. The mix of forestry and open areas provides optimum habitat conditions for this rare bird, which is listed on Annex I of the E.U. Birds Directive. The early stages of new and second-rotation conifer plantations are the most frequently used nesting sites, though some pairs may still nest in tall heather of unplanted bogs and heath. Hen Harriers will forage up to *c*. 5 km from the nest site, utilising open bog and moorland, young conifer plantations and hill farmland that is not too rank. Birds will often forage in openings and gaps within forests. In Ireland, small birds and small mammals appear to be the most frequently taken prey.

The site is also a traditional site for a breeding pair of Peregrine. Several pairs of Merlin are known to breed within the site but further survey is required to determine the exact status of this small falcon. Red Grouse is found on many of the unplanted areas of bog and heath – this is a species that has declined in Ireland and is now Red-listed.

The Slieve Bloom Mountains SPA is of ornithological importance because it provides excellent nesting and foraging habitat for breeding Hen Harrier and is one of the top sites in the country for the species. The presence of three species, Hen Harrier, Merlin and Peregrine, which are listed on Annex I of the E.U. Birds Directive is of

note. The Slieve Bloom Mountains is a Ramsar Convention site and a Biogenetic Reserve. Part of the Slieve Bloom Mountains SPA is a Statutory Nature Reserve.

Version date: 20.1.2015

Site Name: River Shannon Callows SAC
Site Code: 000216

The River Shannon Callows is a long and diverse site which consists of seasonally flooded, semi-natural, lowland wet grassland, along and beside the river between the towns of Athlone and Portumna. It is approximately 50 km long and averages about 0.75 km wide (reaching 1.5 km wide in places). Along much of its length the site is bordered by raised bogs (many, but not all, of which are subject to large-scale harvesting), esker ridges and limestone-bedrock hills. The soils grade from silty-alluvial to peat. This site has a common boundary, and is closely associated, with two other sites with similar habitats, River Suck Callows and Little Brosna Callows.

The site is a Special Area of Conservation (SAC) selected for the following habitats and/or species listed on Annex I / II of the E.U. Habitats Directive (* = priority; numbers in brackets are Natura 2000 codes):

[6410] *Molinia* Meadows
[6510] Lowland Hay Meadows
[8240] Limestone Pavement*
[91E0] Alluvial Forests*
[1355] Otter (*Lutra lutra*)

The River Shannon Callows is mainly composed of lowland wet grassland. Different plant communities occur, depending on elevation, and therefore flooding patterns. Two habitats listed on Annex I of the E.U. Habitats Directive are well-represented within the site – *Molinia* meadows and lowland hay meadows. The former is characterised by the presence of the Meadow Thistle (*Cirsium dissectum*) and Purple Moor-grass (*Molinia caerulea*), while typical species in the latter include Meadow Fescue (*Festuca pratensis*), Rough Meadow-grass (*Poa trivialis*), Downy Oat-grass (*Avenula pubescens*), Common Knapweed (*Centaurea nigra*), Ribwort Plantain (*Plantago lanceolata*) and Common Sorrel (*Rumex acetosa*). In places these two habitats grade into one another.

Low-lying areas of the callows with more prolonged flooding are characterised by Floating Sweet-grass (*Glyceria fluitans*), Marsh Foxtail (*Alopecurus geniculatus*) and wetland herbs such as Yellow-cress (*Rorippa* spp.), Water Forget-me-not (*Myosotis scorpioides*) and Common Spike-rush (*Eleocharis palustris*). Most of the callows consist of a plant community characterised by Creeping Bent (*Agrostis stolonifera*), Brown Sedge (*Carex disticha*), Common Sedge (*Carex nigra*), and herbs such as Marsh-marigold (*Caltha palustris*) and Marsh Bedstraw (*Galium palustre*), while the more elevated and peaty areas are characterised by low-growing sedges, particularly Yellow Sedge (*Carex flava* agg.) and Star Sedge (*Carex echinata*). All these communities are very diverse in their total number of plant species, and include the scarce species Meadow-rue (*Thalictrum flavum*), Summer Snowflake (*Leucojum aestivum*) and Marsh Stitchwort (*Stellaria palustris*).

A further two Annex I habitats, both listed with priority status, have a minor though important presence within the site. Alluvial forest occurs on a series of alluvial islands just below the ESB weir near Meelick. Several of the

islands are dominated by well-grown woodland consisting mainly of Ash (*Fraxinus excelsior*) and Willows (*Salix* spp.). The islands are prone to regular flooding from the river.

At Clorhane, an area of limestone pavement represents the only known example in Co. Offaly. It is predominantly colonised by mature Hazel (*Corylus avellana*) woodland, with areas of open limestone and calcareous grassland interspersed. The open limestone pavement comprises bare or moss -covered rock, or rock with a very thin calcareous soil cover supporting a short grassy turf. The most notable plant in the grassy area is a substantial population of Green-winged Orchid (*Orchis morio*), which occurs with such species as Sweet Vernal-grass (*Anthoxanthum odoratum*), Quaking-grass (*Briza media*), sedges (*Carex caryophyllea, C. flacca*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Common Knapweed (*Centaurea nigra*), and Ribwort Plantain (*Plantago lanceolata*).
Ferns associated with the cracks in the pavement include *Asplenium trichomanes, A. ruta-muraria, A. adiantum-nigrum* and *Polypodium australe.* Bryophytes include *Grimmia apocarpa* and *Orthotrichum* cf. *anomalum*. Anthills are common within the open grassland. The Hazel wood is well-developed and has herbaceous species such as Primrose (*Primula vulgaris*), Common Dog-violet (*Viola riviniana*), Wood-sorrel (*Oxalis acetosella*) and Herb-Robert (*Geranium robertianum*). The wood is noted for its luxuriant growth of epiphytic mosses and liverworts, with such species as *Neckera crispa* and *Hylocomium brevirostre*. Yew (*Taxus baccata*) occurs in one area.

Other habitats of smaller area but also of importance within the site are lowland dry grassland, drainage ditches, freshwater marshes and reedbeds. The dry grassland areas, especially where they exist within hay meadows, are species-rich, and of two main types: calcareous grassland on glacial material, and dry grassland on levees of river alluvium. The former can contain many orchid species, Cowslip (*Primula veris*), abundant Adder's-tongue (*Ophioglossum vulgatum*) and Spring-sedge (*Carex caryophyllea*), and both contain an unusually wide variety of grasses, including False Oat-grass (*Arrhenatherum elatius*), Yellow Oat-grass (*Trisetum flavescens*), Meadow Foxtail (*Alopecurus pratense*), and Meadow Brome (*Bromus commutatus*). In places Summer Snowflake also occurs.

Good quality habitats on the edge of the callows included in the site are wet broadleaved semi-natural woodland dominated by both Downy Birch (*Betula pubescens*) and Alder (*Alnus glutinosa*), and dry broadleaved woodland dominated by Hazel. There are also areas of raised bog, fen on old cut-away bog with Black Bog-rush (*Schoenus nigricans*), and a 'petrifying stream' with associated species-rich calcareous flush which supports Yellow Sedge (*Carex lepidocarpa*), Blunt-flowered Rush (*Juncus subnodulosus*) and Stoneworts (*Chara* spp.).

Two species which are legally protected under the Flora (Protection) Order, 1999, occur in the site - Opposite-leaved Pondweed (*Groenlandia densa*) in drainage ditches, and Meadow Barley (*Hordeum secalinum*) on dry alluvial grassland. This is one of only two known inland sites for Meadow Barley in Ireland. The Red Data Book plant Green-winged Orchid is known from dry calcareous grasslands within the site, while the site also supports a healthy population of Marsh Pea (*Lathyrus palustris*).

The site is of international importance for wintering waterfowl as numbers regularly exceed the 20,000 threshold (mean of 34,985 for five winters 1994/94-1998/99). Of particular note is an internationally important population of Whooper Swans (287). A further five species have populations of national importance (all figures are means for five winters 1995/96-1999/00): Mute Swan (349), Wigeon (2972), Golden Plover (4254), Lapwing (11578) and Black-tailed Godwit (388). Species which occur in numbers of regional or local importance include Bewick's Swan, Tufted Duck, Dunlin, Curlew and Redshank. The population of Dunlin is notable as it is one of the few regular inland flocks in Ireland. Small flocks of Greenland White-fronted Goose use the Shannon Callows; these are generally associated with larger flocks which occur on the adjacent Little Brosna Callows and River Suck Callows.

Shoveler (an estimated 12 pairs in 1987) and Black-tailed Godwit (Icelandic race) (one or two pairs in 1987) breed within this site. These species are listed in the Red Data Book as being threatened in Ireland. The scarce bird Quail is also known to breed within the area. The callows has at times held over 40% of the Irish population of the globally endangered Corncrake, although numbers have declined in recent years. A total of 66 calling birds were recorded in 1999, but numbers have dropped significantly since then. The total population of breeding waders (Lapwing, Redshank, Snipe and Curlew) in 1987 was one of three major concentrations in Ireland and Britain. The population of breeding Redshank in the site was estimated to be 10% of the Irish population, making it nationally significant. Also, the Annex I species Merlin and Hen Harrier are regularly reported hunting over the callows during the breeding season and in autumn and winter.

This site holds a population of Otter, a species listed on Annex II of the E.U. Habitats Directive, while the Irish Hare, which is listed in the Irish Red Data Book, is a common sight on the callows.
The Shannon Callows are used for summer dry-stock grazing (mostly cattle, with some sheep and a few horses), and permanent hay meadow. About 30 ha is a nature reserve owned by voluntary conservation bodies.

The River Shannon is used increasingly for recreational purposes with coarse angling and boating accounting for much of the visitor numbers. Intermittent and scattered damage to the habitats has occurred due to over-deepening of drains and peat silt deposition, water-skiing, ploughing and neglect of hay meadow (or reversion to pasture). However, none of these damaging activities can yet be said to be having a serious impact. Threats to the quality of the site may come from the siting of boating marinas in areas away from centres of population, fertilising of botanically-rich fields, the use of herbicides, reversion of hay meadow to pasture, neglect of pasture and hay meadow, disturbance of birds by boaters, anglers, birdwatchers and the general tourist. The maintenance of generally high water levels in winter and spring benefits all aspects of the flora and fauna, but in this regard, summer flooding is a threat to breeding birds, and may cause neglect of farming.

The Shannon Callows has by far the largest area of lowland semi-natural grassland and associated aquatic habitats in Ireland, and one in which there is least disturbance of natural wetland processes. Botanically, it is extremely diverse with two legally protected species of plants and many scarce species. Excellent examples of two habitats listed on Annex I of the E.U. Habitats Directive occur within the site – *Molinia* meadows and lowland hay meadows with good examples of a further two Annex habitats (both with priority status). In winter

the site is internationally important for numbers and species of waterfowl. In spring it feeds large numbers of birds on migration, and in summer it holds very large numbers of breeding waders, rare breeding birds and the endangered Corncrake, as well as a very wide variety of more common grassland and wetland birds. The presence of Otter, an Annex II species, adds further importance to the site.

Version date: 12.08.2013

SITE NAME: MIDDLE SHANNON CALLOWS SPA
SITE CODE: 004096

The Middle Shannon Callows SPA is a long and diverse site which extends for approximately 50 km from the town of Athlone to the town of Portumna; it lies within Counties Galway, Roscommon, Westmeath, Offaly and Tipperary. The site averages about 0.75 km in width though in places is up to 1.5 km wide. Water levels on the site are greatly influenced by the very small fall between Athlone and Portumna and by the weir at Meelick. The site has extensive areas of callow, or seasonally flooded, semi-natural, lowland wet grassland, along both sides of the river. The callows are mainly too soft for intensive farming but are used for hay or silage or for summer grazing. Other habitats of smaller area which occur alongside the river include lowland dry grassland, freshwater marshes, reedbeds and wet woodland. The diversity of semi-natural habitats present and the sheer size of the site attract an excellent diversity of bird species, including significant populations of several.

The site is a Special Protection Area (SPA) under the E.U. Birds Directive, of special conservation interest for the following species: Whooper Swan, Wigeon, Corncrake, Golden Plover, Lapwing, Black-tailed Godwit and Black-Headed Gull. It is also of special conservation interest for holding an assemblage of over 20,000 wintering waterbirds. The E.U. Birds Directive pays particular attention to wetlands and, as these form part of this SPA, the site and its associated waterbirds are of special conservation interest for Wetland & Waterbirds.

The Middle Shannon Callows qualifies as a site of international importance as it regularly supports in excess of 20,000 wintering waterbirds (23,656 – four year mean peak for four of the winters between 1995/96 and 1999/2000). The site also supports internationally important populations of Whooper Swan (305 – five year mean peak for the period 1995/96 to 1999/2000) and Black-tailed Godwit (485 – four year mean peak for four of the winters between 1995/96 and 1999/2000). Four further species of wintering waterbird occur in numbers of national importance, i.e. Wigeon (3,059), Golden Plover (4,133) , Lapwing (13,240) and Black-headed Gull (1,209) – all figures are four year mean peaks for four of the winters between 1995/96 and 1999/2000.

The Shannon Callows is the largest site monitored as part of I-WeBS and many parts of it are inaccessible on the ground. Annual monitoring of the wintering waterbirds of the Shannon Callows is undertaken by aerial surveys in January/February with some areas also covered by ground counts. The importance of the site for some species may have been underestimated if count coverage missed the brief spring peaks for these species, e.g. peak counts of Lapwing (23,409) and Black-tailed Godwit (1,096) recorded in the baseline period (1995/96 to 1999/2000) have been considerably higher than the four year means. A wide range of other species occurs within the site, including Mute Swan (407), Teal (88), Tufted Duck (41), Dunlin (335), Curlew (162) and Redshank (39). Small numbers of Greenland White-fronted Goose use the Shannon Callows (peak 55 in 1998/99) and these are generally associated with larger flocks which occur on the adjacent Little Brosna Callows and River Suck Callows. The callow grasslands provide optimum feeding grounds for these various species of waterfowl, while many of the birds also roost or rest within the site.

The Shannon Callows is also an important site for breeding waders with the total population on the Shannon and Little Brosna Callows being one of three major concentrations in Ireland and Britain in 1987. Numbers of some species have declined since then but a survey of the Shannon Callows in 2002 recorded the following breeding waders - Lapwing (63 pairs), Redshank (116 pairs), Snipe (139 drumming birds) and Curlew (8 pairs). Black-tailed Godwit, a very rare breeding species in Ireland, nests or attempts to nest in small numbers each year within the site. A further scarce breeding species, Shoveler, also nests in small numbers each year (an estimated 12 pairs in 1987).

The Middle Shannon Callows SPA supports a breeding population of Corncrake (19 pairs - five year mean peak between 2003 and 2007, based on records of calling males). Corncrake winter in southern and eastern Africa, migrating northwards to arrive on their breeding grounds from early April onwards, departing again in August and September. They require the cover of tall vegetation throughout their breeding cycle and are strongly associated with meadows which are harvested annually, where they nest and feed.
Annual cutting of these meadows creates a sward which is easy for the birds to move through. Other habitats, which can provide cover for Corncrake in the early and late stages of the breeding season, are also important for this species.

Corncrake is listed on the 2010 International Union for Conservation of Nature (IUCN) Red List of Threatened Species. This is due to population and range declines of more than 50% in the last 25 years across significant parts of its range.

Quail, a related, scarce species, is also known to breed within the callow grasslands.
A good variety of other bird species are attracted to the site. Birds of prey, including scarce species such as Merlin and wintering Hen Harrier have been recorded hunting over the callows. A range of passerine species associated with grassland and swamp vegetation breed, including Sedge Warbler, Grasshopper Warbler, Skylark and Reed Bunting. Kingfisher is also known to occur within the site. Whinchat, an uncommon breeding species, occurs in small numbers.

The Middle Shannon Callows SPA is an internationally important site that supports an assemblage of over 20,000 wintering waterbirds. It holds internationally important populations of two species - Whooper Swan and Black-tailed Godwit. In addition, there are four species that have wintering populations of national importance. The site also supports a nationally important breeding population of Corncrake. Of particular note is that several of the species which occur regularly are listed on Annex I of the E.U. Birds Directive, i.e. Whooper Swan, Corncrake and Golden Plover.

Version date: 10.1.2012

Appendix C Oughter Bog: Cutaway Bog Decommissioning and Rehabilitation Plan 2021

Appendix D Methodology Drawings PCAS-0100-001

Oughter Bog

Cutaway Bog Decommissioning and Rehabilitation Plan 2021

This document seeks to address the requirements of Condition 10.2 of IPC License Ref. P0500-01:

> "*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 Oughter 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 permanently ceased at Oughter Bog.

In addition, to preparing this document to comply with Condition 10 of IPC Licence Ref. P0500-01, due regard was also given to the proposed 'Peatlands Climate Action Scheme' 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 Oughter 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 Oughter Bog as environmental stabilisation, re-wetting and setting the bog on a trajectory towards development of naturally functioning peatland habitats.

Any consideration of any other future after-uses for Oughter 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.

Document Control Sheet	
Document Name:	Oughter Bog Rehabilitation Plan 2020
Document File Path:	G:\Ecology Team\EPA draft rehab plans 2017 word docs\Boora ref.500\Oughter
Document Status:	Draft

This document comprises:	DCS	TOC	Text (Body)	References	Maps	No. of Appendices
	1	2	31	3	(8)	10

Rev. 1.1	Author(s):	Checked By:	Approved By:
Name(s):	CC	MMC	MMC
Date:	08/09/2020	29/09/2020	29/09/2020

Rev. 1.2	Author(s):	Checked By:	Approved By:
Name(s):	MMC	MMC	MMC
Date:	17/12/2020	17/12/2020	17/12/2020
Rev. 1.3	**Author(s):**	**Checked By:**	**Approved By:**
Name(s):	SD	MMC	MMC
Date:	18/03/2021	23/03/2021	23/03/2021

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SUMMARY

Name of bog: Oughter **Area:** 358 ha

Site description:

- Oughter Bog was drained and developed for industrial peat production in the 1960s. Industrial peat production ceased in 2012.
- The former peat production footprint now comprises bare peat along with mosaics of pioneering vegetation. Active drainage channels are present and there are areas where drainage is breaking down naturally.
- Peat depths are limited on site with most peat depths at 0.5-2.5m. Oughter is considered a **shallow peat** cutover bog.
- Oughter bog lies to the south of the River Brosna and is drained by a number of its tributaries. The Grand Canal is located to the north of Oughter.
- Part of the southern portion of Oughter Bog cutaway has been developed as The Midlands National Shooting Centre of Ireland.

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
- Carrying out enhanced rehabilitation with the application of enhanced peat rehabilitation measures to re-wet peat and slow water movement across the site.
- Optimising hydrological conditions for **climate action benefits as part of PCAS.** This will be achieved via **the development of wetlands, fen, Reed Swamp and wet woodland on shallow cutaway peat**, and eventually naturally functioning wetland/peatland habitats.
- Stabilisation or improvement in water quality parameters (e.g. suspended solids).
- Environmental stabilisation.
- Rehabilitation will support the National Policies on Climate Action and GHG mitigation by maintaining and enhancing the current condition peat storage capacity of the bog (locking the carbon into the ground). In time, it is expected that the bog will develop its carbon sink function, in part, as *Sphagnum*-rich communities develop across the bog. It will also support Ireland's commitments towards Water Framework Directive and the National River Basin Management Plan 2018-2021.

Scope of rehabilitation

The principal scope of this rehabilitation plan is defined by:

- The area of Oughter Bog.
- EPA IPC Licence - Ref. P0500-01. 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 and optimising **climate action benefits**.
- The local environmental conditions of this bog.
- The key goals and outcomes of rehabilitation at this bog outlined above.
- Minimising potential impacts on neighbouring land. Some boundary drains around Oughter Bog will be left unblocked as blocking boundary drains could affect adjacent land – in particular the adjacent Native Woodland Scheme and Midlands Rifle Range.

Criteria for successful rehabilitation:

The Criteria for successful rehabilitation for IPC Licence validation and for climate action verification have been defined as:

- Rewetting of peat in the former area of industrial peat production to slow water movement across the site to retain silt, accelerating the development of vegetation cover via natural colonisation, and reducing the area of bare exposed peat (IPC Licence validation) through the creation of compatible fen, Reed swamp and other wetland and peatland habitats.
- Stabilising or reducing key emissions to water (e.g. silt-run-off) (IPC Licence validation).
- Reducing pressure from peat production on the local river catchment (WFD) (IPC Licence validation).
- Optimising the extent of suitable hydrological conditions to optimise climate action (Climate action verification).
- Reduction in carbon emissions (Climate action verification).
- Setting the site on a trajectory towards establishment of a mosaic of compatible habitats including fen, Reed swamp, heath, scrub, Birch woodland and peatland communities, where conditions are suitable, and towards a reduced carbon source (Climate action verification). These habitats will generally establish initially as pioneer vegetation. It will take some time for stable naturally functioning habitats to fully develop at Oughter Bog.
- Improvement in biodiversity and ecosystem services. (Climate action verification).

Meeting climate action verification criteria and monitoring of these criteria is dependent on support from the Climate Action Fund or other sources of funding.

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 drainage management appraisal.
- Carry out an ecological appraisal of the potential impacts of the planned rehabilitation.
- Carry out proposed measures, which will be a combination of targeted drain blocking, peat field re-profiling, blocking outfalls, water level management.
- Phase 2 measures may include fertiliser application targeting bare peat on headlands, high fields and other areas, and further water level management.
- Silt ponds will continue to be maintained during the rehabilitation and decommissioning schedule.
- 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. 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 Oughter Bog, as required to meet Condition 10 of the IPC Licence, 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, assess 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 any additional rehabilitation.
- **Water quality monitoring** will be established. Monitoring of key water quality parameters will include: Ammonia, Phosphorous, Suspended solids (silt), 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.
- Decommissioning of silt-ponds will be assessed and carried out, where needed.

Additional Monitoring:

- The monitoring and validation of re-vegetation via natural colonisation and changes in bog condition will be carried out using an aerial 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.
- 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.
- Monitoring as part of Climate Action Verification is dependent on support from the Climate Action Fund or other external funding.

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.
- 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 Boora bog group (Ref. P0500-01). As part of Condition 10.2 of this license, a rehabilitation plan must be prepared for permanent rehabilitation of the cutaway boglands within the licensed area. The bog is part of the Boora bog group (see Appendix II for details of the bog areas within the Boora Bog Group). Oughter Bog is located in Co. Offaly.

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 on peatlands previously used for energy production. Note this proposal is also known colloquially as the 'Peatlands Climate Action Scheme' (PCAS). 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 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 improvements 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 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. These will develop other habitats). 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 embryonic bog 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.

1.1 Constraints and Limitations

This document seeks to address the requirements of Condition 10.2 of IPC License Ref. P0500-01:

> "*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.*"

It also seeks to outline measures to optimise climate action and other ecosystem services benefits, mainly through hydrological management.

This document only covers the area of Oughter Bog.

Industrial peat extraction at Oughter Bog ceased in 2012.

Bord na Móna will continue to review the future after-use of its land-bank. Any consideration of any other future after-uses for Oughter 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.

Currently the former peat production area comprises both bare peat and re-vegetated areas. The combination of active rehabilitation measures and natural colonisation will quickly establish and/or increase the extent of pioneer vegetation and will be planned to accelerate environmental stabilisation. Nevertheless, it will take some time (30-50 years) for naturally functioning peatland ecosystems to fully re-establish.

Some parts of Oughter 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 the margins of Oughter 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.

The area of Oughter Bog leased to The Midlands National Shooting Centre of Ireland is not considered part of the scope of this rehabilitation plan.

Rehabilitation in other areas of the bog may also be constrained due to other property issues or issues such as rights of way. For example, there is a grazing agreement covering a small part of the site.

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 rehabilitation plan 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 Oughter 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.
- Barry, T.A. et al (1973). A survey of cutover peats and underlying mineral soils. Soil Survey Bulletin No. 30. Dublin, Bord na Móna and An Foras Taluntais.
- 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:

- Boora Integrated Pollution Control Licence;
- Boora 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);
- 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 Oughter Bog was originally surveyed in September of 2009, and re-surveyed in July of 2013. Additional ecological walk-over surveys and visits have taken place at Oughter Bog between 2012-2020 to inform rehabilitation planning and habitat maps have been updated, where required. The latest confirmatory visit took place in September of 2020 (date 16/09/2020). This rehabilitation plan is informed by the original baseline survey as well as subsequent 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 baseline survey report for Oughter Bog is contained in Appendix II.

3. SITE DESCRIPTION

Oughter Bog is located adjacent to the R357 in Co. Offaly, circa 3km to the west of Blueball (see Figure 3.1 &3.2).

The surrounding landscape is a mosaic primarily consists of low-lying agricultural land (pasture) interspersed with other raised bogs, many of which have also been managed by Bord na Móna for peat production with some areas utilised for domestic turf-cutting. Lough Boora Discovery Park is ca.2km south west of Oughter.

Oughter bog lies to the south of the River Brosna and is drained by a number of its tributaries. The Grand Canal is located to the north of Oughter. Oughter is linked to the adjacent Turraun Bog (also owned by Bord na Móna) to the northwest by a railway line and machinery travel path, which provides the main access also to Oughter. Within the bog, the railway line broadly divides Oughter into two main sections.

Industrial peat production ceased at Oughter Bog in 2012. The majority of the bog is developing a suite of pioneer habitats (Figure 3.1 & 8.1).

A portion of the original site has been taken up with a Native Woodland Scheme and is no longer in the ownership of BNM – this area is now outside of the Oughter Bog boundary. Part of the southern portion of Oughter Bog has previously been developed as The Midlands National Shooting Centre of Ireland.

There is a small tea centre in the south west of the bog, ca.200m along an access track from the R357. A telecommunications mast (Vodaphone) is also present ca.60m from the R357 with access from the same location.

There are several other adjacent BNM bogs nearby including Pollagh/Cornalaur, Boora, Derries, the aforementioned Turraun and Killaranny. Killaranny, which is due north east of Oughter is connected via a machinery travel path and rail line.

3.1 Status and Situation

3.1.1 Site history

Oughter Bog has not been in peat production since 2012. It formerly provided peat for use in the Derrinlough Briquette factory and also as fuel peat for West Offaly Power (WOP) in Shannonbridge, Offaly. The existing east-west rail line through Oughter is still in use however and has been utilised as recently as 2020 to transport peat-from adjacent sites.

3.1.2 Current land-use

Industrial peat production has now permanently ceased at Oughter Bog. Biodiversity and ecosystem services have been identified as the current primary land use at Oughter Bog by Bord na Móna. Part of the southern portion of Oughter Bog has previously been developed as The Midlands National Shooting Centre of Ireland and ownership of some cutaway was transferred. Existing structures and site infrastructure is mapped in Figure 3.6.

No known right of ways exist on this bog. A grazing agreement is in place for a small portion of cutaway at the northern end of the bog.

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.

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.

In respect of Oughter Bog, jobs included in the above study would have included those to facilitate extraction of peat at this site, and associated processing and transfer to the relevant power station.

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."

These job numbers have now declined with the cessation of peat extraction at this bog. 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 Oughter Bog is limestone (Visean Limestones (Undifferentiated) with some Waulsortian Limestones also) [1]. The underlying soils and sub-soils are classed as 'Cutover/Cutaway Peat'.

3.2.2 Peat type and depths

Commercial peat extraction was undertaken at Oughter Bog up until 2012. As a result, peat depths are limited on site with most peat depths at 0.5-2.5m. The majority of the site is shallow cutaway bog (Figure 8.1). The peat on site was used as fuel peat recently supplying West Offaly Power and Derrinlough Brickette Factory.

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

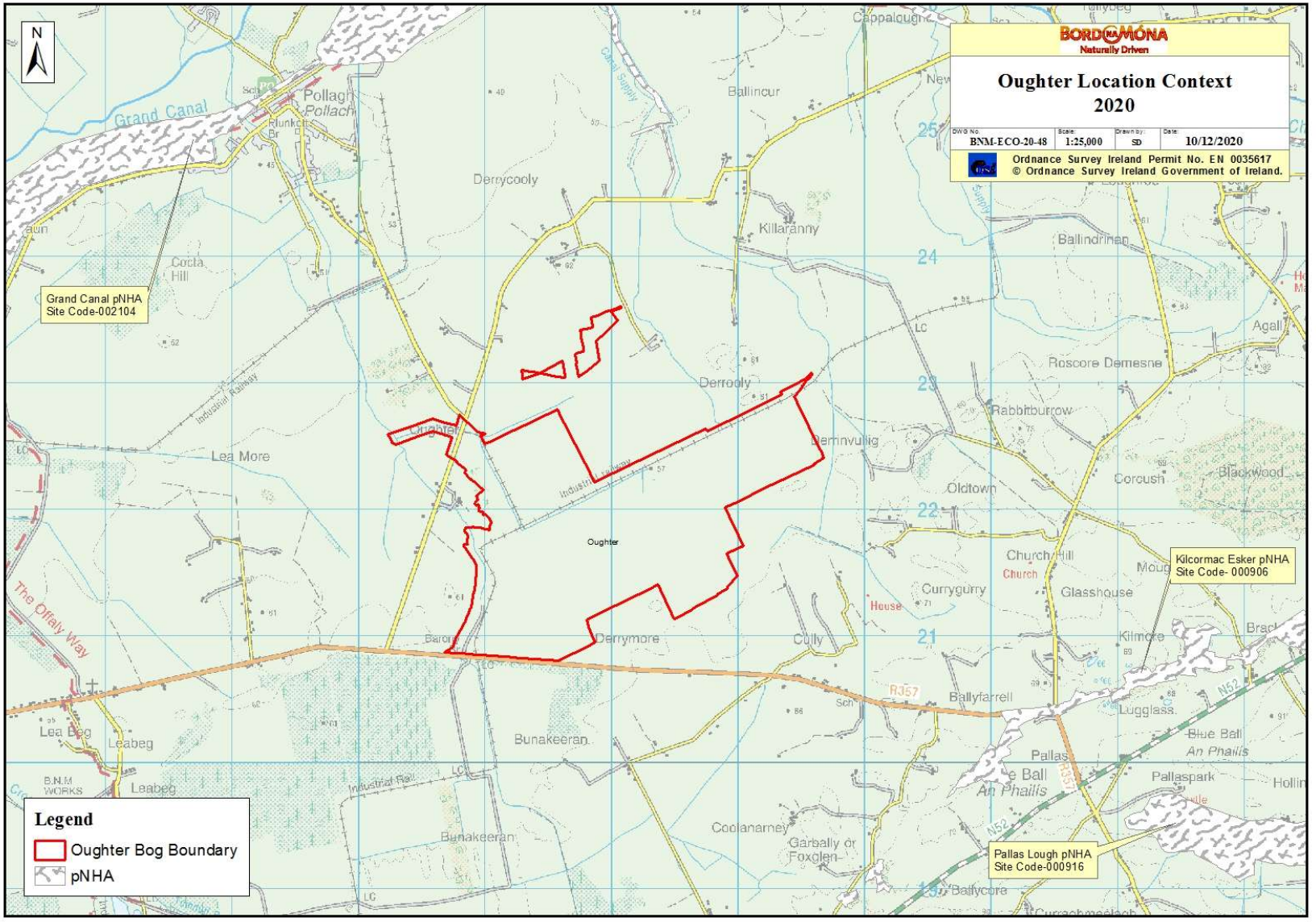

Figure 3.1 Location of Oughter in context to the surrounding area and conservation designated sites.

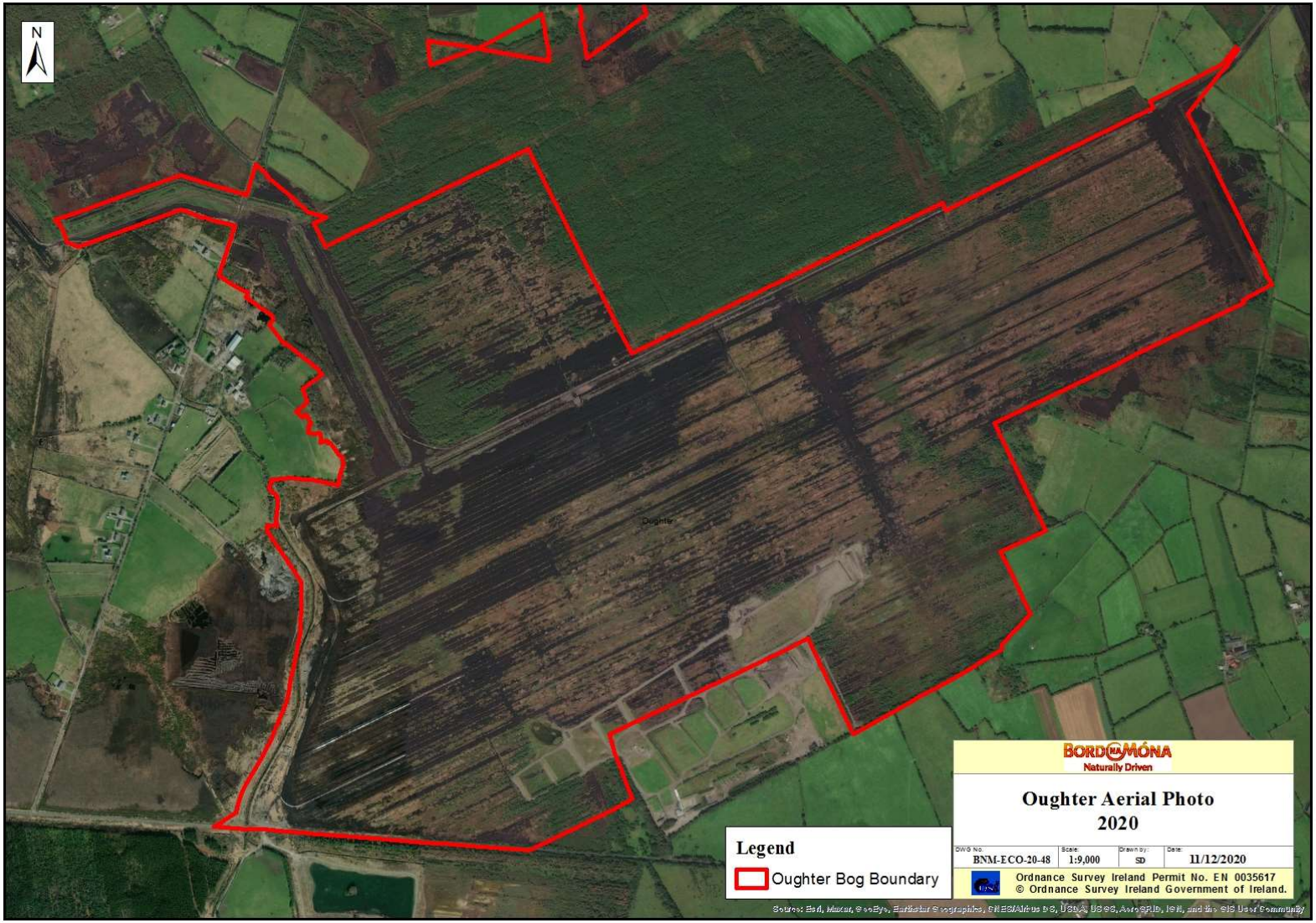

Figure 3.2. Aerial photo of Oughter Bog. The majority of the bog is pioneer wetland vegetation.

3.3 Key Biodiversity Features of Interest

The bog is currently developing pioneer cutaway habitats (production-related cutaway) and is primarily divided into two main sections by a rail-line orientated NE-SW.

3.3.1 Current habitats

The site contains a significant areas of pioneer Poor Fen vegetation dominated by Bog Cotton and Marsh Arrowgrass. There are also some patches of Birch-dominated scrub to the east. There was some open water present but it was minor in extent and some of this habitat may be transient. Some small mounds and ridges along the western margin contain dry grassland and disturbed vegetation communities. The oldest area out of production is located adjacent to the east side of the shooting range. This area has almost completely re-vegetated and contains a diverse mosaic of vegetation communities including some indicators of Rich Fen (PF1).

The majority of the area north of the rail-line has been classified as cutaway and a large part of it has been taken over by a private Native Woodland Scheme with ownership now transferred from Bord na Móna. Habitats associated with the Native Woodland Scheme include pioneer Soft Rush-dominated vegetation and Birch scrub. A range of tree species were planted in 2008 including Scot's Pine, Birch and Alder.

A habitat map of Oughter Bog is shown in Figure 3.5, illustrative figures are shown overleaf in respect of a sample of habitats present at Oughter.

Figure 3.3. View of the revegetating milled peat surface (2020) with existing drainage across Oughter bog.

3.3.2 Species of conservation interest

Oughter Bog attracts breeding wildfowl including Northern Lapwing *Vanellus vanellus* (now Red-listed on the Birds of Conservation Concern in Ireland list[2] and highlighted as a conservation priority in the Government's

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

Prioritised Action Framework 2014-2020[3]). Up to five breeding pairs have been recorded. Common Ringed Plover *Charadrius hiaticula* (up to 5 breeding pairs) and Common Snipe *Gallinago gallinago* (Amber listed) (potentially up to 20 pairs) have also been recorded. Territorial or 'Roding' Woodcock *Scolopax rusticola* (Amber listed) have previously been recorded in suitable habitat immediately adjacent to the west of Oughter and this species is considered a possible breeder at Oughter. Black-headed Gull *Chroicocephalus ridibundus* (Red listed for breeding birds) has bred at Oughter, in the area north of the railway line in the past and a small colony has existed in the SW of Oughter. Both Whimbrel *Numenius phaeopus* and Black-tailed Godwit *Limosa limosa* have been recorded overflying Oughter Bog on Spring passage. Wheatear *Oenanthe oenanthe* occurs on Autumn passage.

Figure 3.4 Pioneering, Cladium dominated vegetation at Oughter Bog (September 2020)

Grey Partridge Pe*rdix perdix* (Red listed) occurs at Oughter given the bogs' proximity to the conservation programme for this species at nearby Lough Boora. Other breeding birds in the area include Kestrel *Falco tinnunculus* (Amber listed) and Meadow Pipit *Anthus pratensis* (Red listed), whilst Sand Martin *Riparia riparia* (Amber listed) have been observed nesting in the face banks of nearby cutaway high bog. Four Common Buzzard *Buteo buteo* were present in September 2020. Eurasian Jay *Garrulus glandarius* has been recorded in the adjacent Native Woodland Scheme woodland.

Part of Oughter becomes wet during the winter and attracts Whooper Swan *Cygnus cygnus* (Amber listed in Ireland and also on Annex I of the EU Birds Directive) along with other species of waterfowl such as Greylag Geese *Anser anser* and Golden Plover *Pluvialis apricaria.* Whooper Swan, Greylag Geese may also overfly Oughter at dawn and dusk when commuting between the various feeding and roosting areas present in the locale (such as Boora and Turraun). In addition to utilising inundated areas within Oughter bog, wintering Whooper Swan are known to have used a number of fields in the past outside but immediately adjacent to the north-east corner of Oughter at Derrinvullig.

[3] https://www.npws.ie/sites/default/files/general/PAF-IE-2014.pdf

Merlin *Falco columbarius* (Amber listed) has previously been recorded at Oughter (C.Cullen, personal observation) during the winter months and wintering individuals continue to utilise Oughter into early Spring.

Hen Harrier *Circus cyaneus* (Amber listed) is known to roost communally at a number of locations in the hinterland of Oughter, and whilst no roosting has been confirmed at Oughter itself, individuals of this species have been observed commuting through Oughter at dawn or dusk whilst *en route* to or from nearby communal roosts.

A review of available Biodiversity records from the National Biodiversity Data Centre (hereafter NBDC) on the 4 no. tetrads (N22A, N22B,N22G,N22F) which overlap Oughter Bog found further bird records for species such as Common Kingfisher *Alcedo atthis* (recorded from N22A during the winter period of the 2007-2011 Bird Atlas), and Common Raven *Corvus corax* and Water Rail *Rallus aquaticus* (also recorded in N22A during the winter period of the 2007-2011 Bird Atlas).

Along with Birds, nineteen species of Butterfly, have been recorded in the same four tetrads, including Brimstone *Gonepteryx rhamni*, Dingy Skipper *Erynnis tages,* Large Heath *Coenonympha tullia,* Small Heath *Coenonympha pamphilus*, Wall *Lasiommata megera* and Wood White *Leptidea sp.* Fifteen species of dragonfly are also noted. At Oughter itself, prior to 2020, two species of Butterfly, Painted lady *Vanessa cardui* and Speckled Wood *Pararge aegeria* have been recorded within the bog boundary, however site visits in 2020 to inform the current plan also recorded Large White *Pieris brassicae*, Red Admiral *Vanessa atalanta* and Small Tortoiseshell *Aglais urticae*. Emperor Dragonfly *Anax imperator* was recorded at Oughter Bog in September 2020.

Regarding mammals BNM ecologists have recorded evidence of Rabbit *Oryctolagus cuniculus*, Irish Hare *Lepus timidus hibernicus,* Pine Marten *Martes martes*, Badger *Meles meles* and Red Fox *Vulpes vulpes* at Oughter. Lesser Noctule *Nyctalus leisleri*, Pipistrelle *Pipistrellus pipistrellus sensu lato* and Soprano Pipistrelle *Pipistrellus pygmaeus* bats have been recorded in tetrad N22A and may utilise suitable habitats within Oughter.

3.3.3 Invasive species

Invasive alien species known to occur at the subject bog (or desktop review suggests presence is likely), and for which reasonably foreseeable source impact pathways for dispersal may result from the proposed PCAS are described here. There are no such instances in the case of Oughter bog.

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.

3.4 Statutory Nature Conservation Designations

There are no European Sites (SAC or SPA) located within 5km of Oughter Bog (Figure 3.1). Due to its location within the Lower River Shannon catchment, Oughter is hydrologically connected to at least two downstream European Sites namely the Middle Shannon Callows SPA (Site Code 004096 -17km due west as the crow flies), and the River Little Brosna Callows SPA (Site Code 004086 - ca.22km south west as the crow flies). Both Sites would be further via hydrological links.

The nearest SAC is Clara Bog (Site Code 000572), which is ca.6km to the north east. Charleville Wood SAC (Site Code 000571) is ca.7km to the east of Oughter. T

The Grand Canal pNHA (Site Code 002104) is <2km to the North of Oughter at its closest, whilst Kilcormac Esker pNHA (Site Code 000906) is ca.2.5km to the south east.

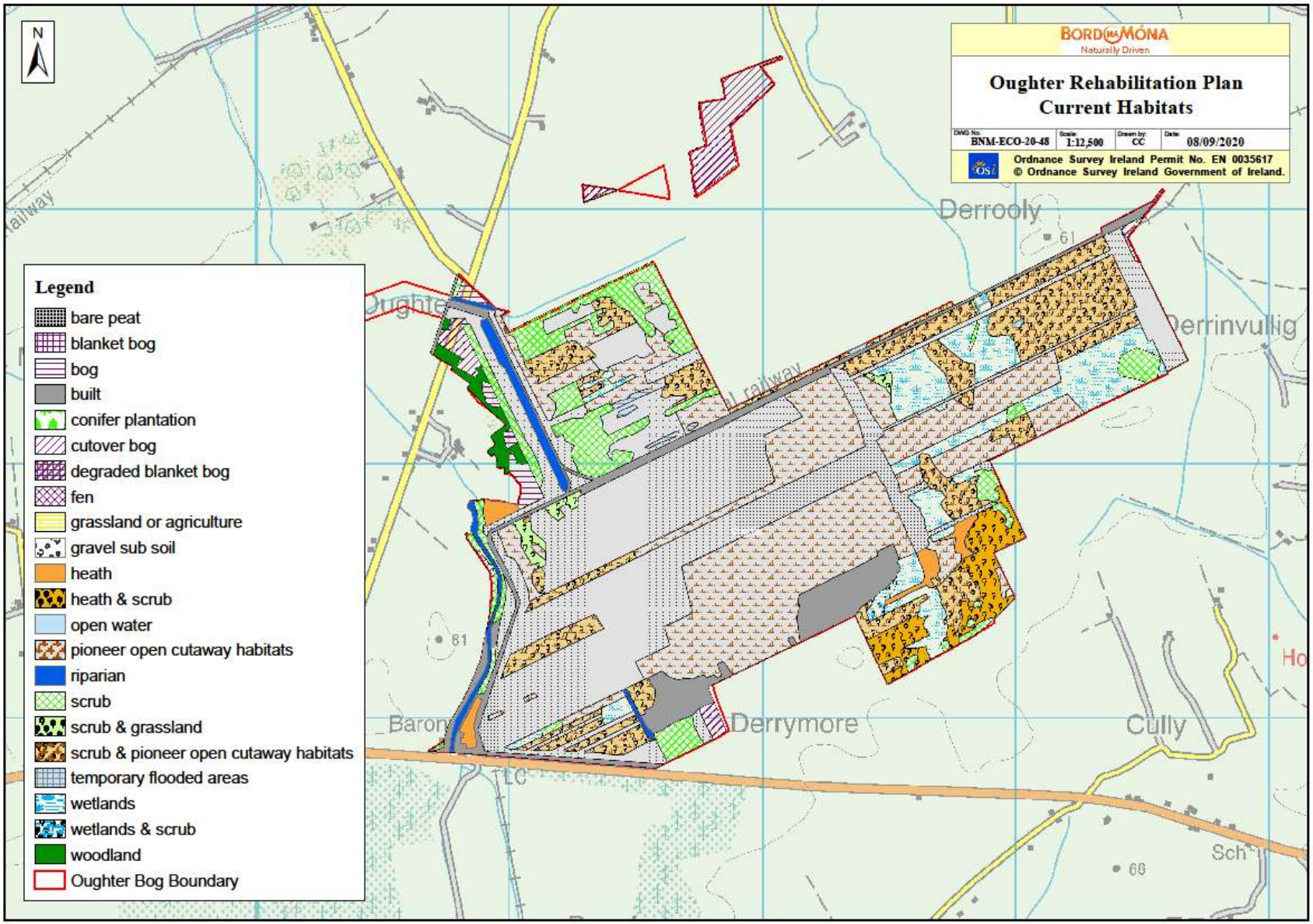

Figure 3.5. *Habitat map of Oughter Bog showing Bord na Móna habitat categorisation (November 2018*

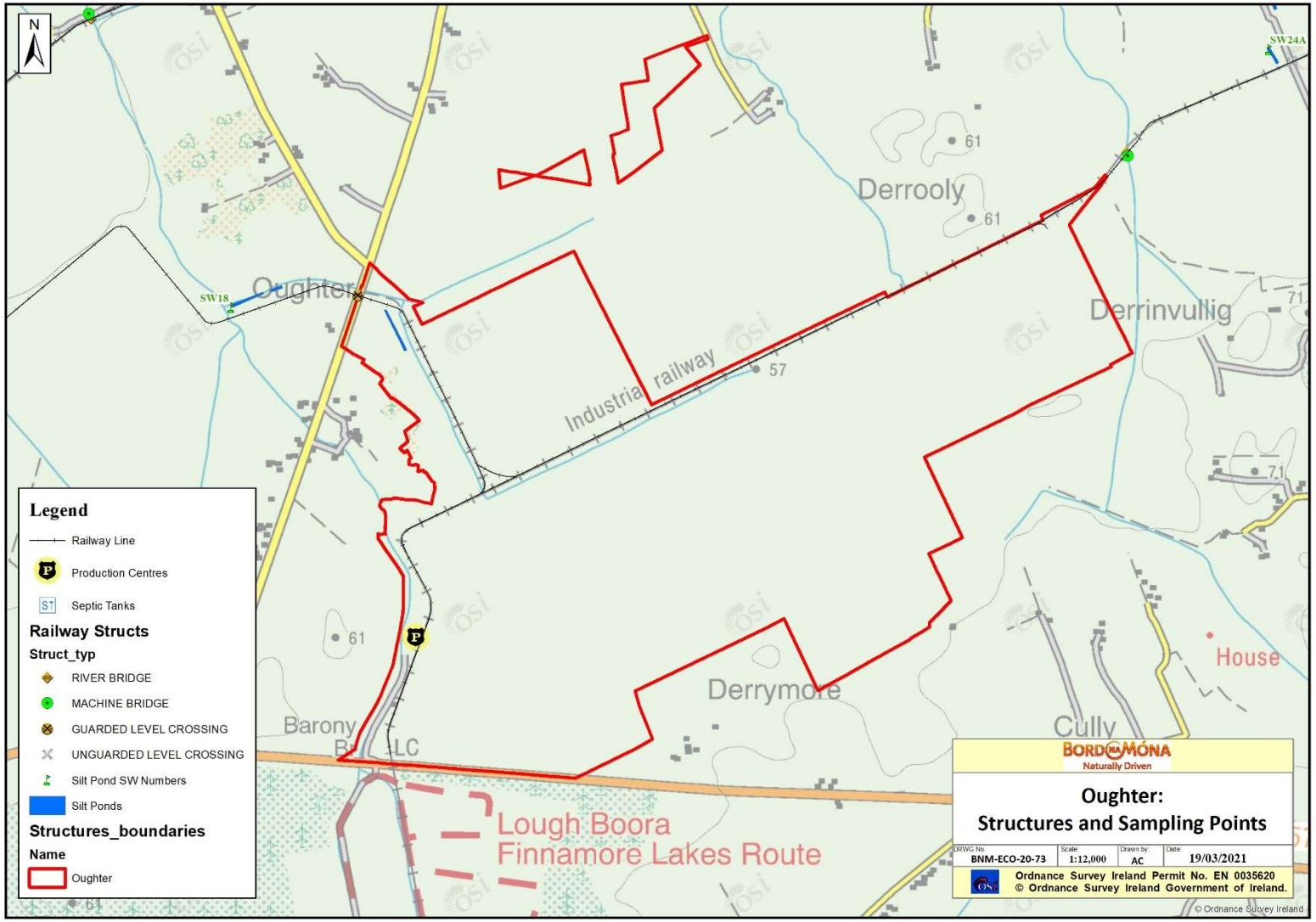

Figure 3.6. *Map of Oughter Bog displaying structures, silt ponds and discharge points.*

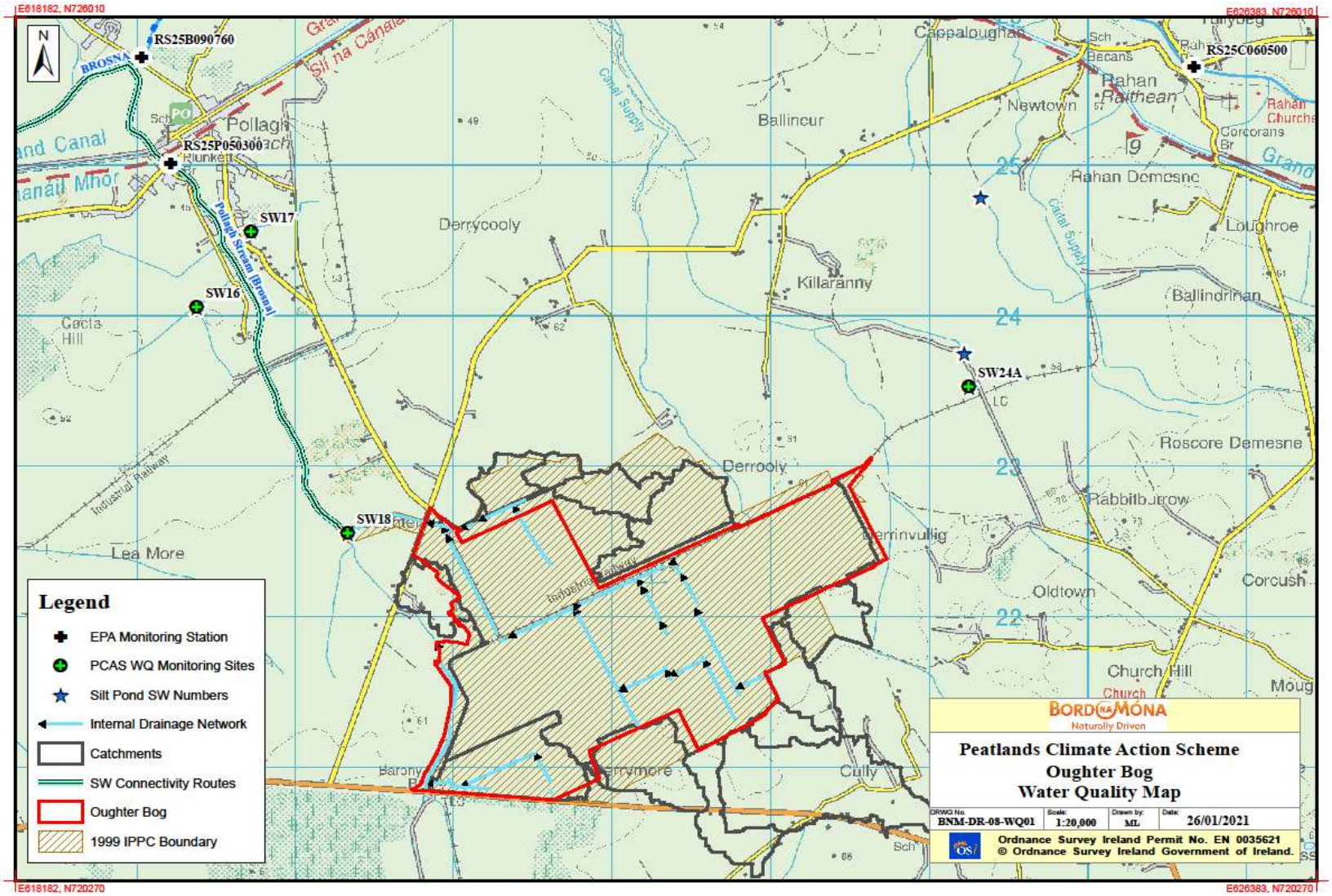

Figure 3.7. Map of Oughter Bog showing water management features and water quality monitoring points.

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 Oughter Bog (i.e. within 3km) The closest Ramsar Sites to Oughter Bog include Mongan Bog, Clara Bog, and Raheenmore Bog.

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

3.5 Hydrology and Hydrogeology

Oughter Bog is a gravity-drained bog. Hydrological modelling (Figure 8.3 & 8.4) indicates that the majority of bog is a natural basin with significant potential for re-wetting. Anecdotally, Oughter Bog has always had a significant spring influence and was difficult to drain in places. There are also significant ecological indicators (rich fen species) that there is a strong alkaline influence on the water chemistry of the ground water of this site. The main basin also contains low-lying areas of peat that are still quaky.

Oughter Bog is located in the Lower River Shannon Catchment (Shannon_Lwr). It is mainly drained to the west by the Derrooly Stream (EPA Code 25D91) and the Oughter stream (EPA Code 25012), which converge west of Oughter to form the Pollagh Stream (EPA Code 25P05). The Pollagh Stream proceeds to flow northwards to join the Brosna River (EPA Code 25B09) just outside Pollagh Village.

The eastern extremity of Oughter is drained by both the Derrycooley Stream (EPA Code25D13) and the Killaranny Stream (EPA Code 25Q16), the latter converges with the Derrycooley north of Oughter from whence it then flows northwards into the Clodiagh (Tullamore) (EPA Code 25C06) which in turn flows into the Brosna shortly thereafter- however onsite gravity drainage directs the former peat extraction area towards the Pollagh Stream.

Silt ponds (3 no.) are present in the west of Oughter to manage discharges into the Pollagh Stream and in turn the Brosna. The bog has field drains running in a general north-northwest to south-southeast orientation.

The bog is located in an area with a regionally important (karstified (diffuse)) bedrock aquifer. 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. Locally important aquifers are capable of supplying locally important abstractions (e.g. smaller public water supplies, group schemes), or good yields (100-400 m3/d). This data gives an indication of sub-surface deposits (bedrock and unconsolidated materials) in terms of their groundwater resource potential and dominant groundwater flow type.

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 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). Lacustrine deposits in the site generally consist of shell marl. The bog water table across the site is expected to be high when bog drains are locked, and perched above the underlying regional groundwater table. The ability of the shallow peat water to interact with the underlying regional groundwater flows is limited by the permeability of the underlying glacial deposits. As such the potential for bog rehabilitation to interact or impact on underlying groundwater is very low.

3.6 Emissions to surface-water and water-courses

3.6.1 Oughter Bog Drainage

Oughter bog has one surface water outlet to the Pollagh Stream which then flows to the Brosna river IE_SH_25B090761. Peat extraction was identified as a pressure in the second cycle of the river basin management plan but is not indicated as remaining so in the third cycle, currently under preparation, in relation to both the Pollagh Stream and Brosna River.

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 in Figure 3.10..

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 3.7 mg/l and COD 100mg/l.

From an analysis of any monitoring over the past no of yrs. of the IPC licence environmental monitoring of some of the discharges from this bog indicate that results were under the ELV for SS and trigger level for ammonia and COD.

Bog	SW	Monitoring	Sampled	pH	SS	TS	Ammonia	TP	COD	Colour
Oughter	SW-18	Q3 19	10/09/2019	7.1	<2	424	0.188	<0.05	36	110
Oughter	SW-18	Q4 17	13/12/2017	7.4	8	288	0.46	0.05	64	223

3.6.2 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 three year cycle will not be sufficient 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 in the WQ map in Figure 3.10.

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 up to 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 quarterly 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.

3.6.3 Success criteria:

The key water quality success criteria associated with this enhanced rehabilitation are as follow:

- That there is a stabilizing/improving concentration of suspended solids and ammonia in discharges from Bord na Móna sites, associated with the measures undertaken to stabilize the peat surface by the blocking of the internal drainage system and the maximized 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 Longfordpass bog in Littleton over 3 yrs, post cessation of peat extraction with ongoing rehabilitation, were considered. These are indicating a downward trend in Ammonia concentrations.

Similarly monitoring of surface water ammonia emissions from a Corlea bog in Mountdillon over the past 3 yrs. post cessation of peat extraction with ongoing rehabilitation, indicate downward trends.

As the monthly monitoring program at Oughter 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.

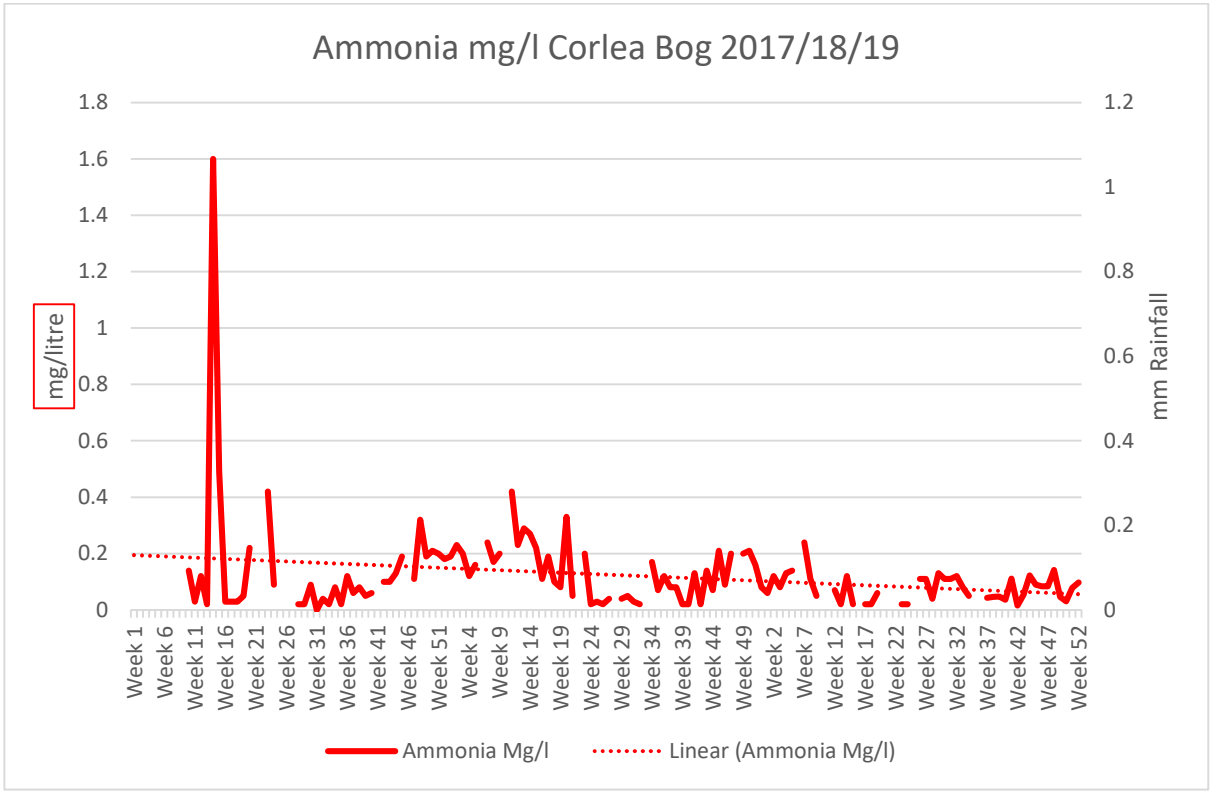

Figure 3.8 Ammonia emissions graph for Corlea Bog 2015 - 2018

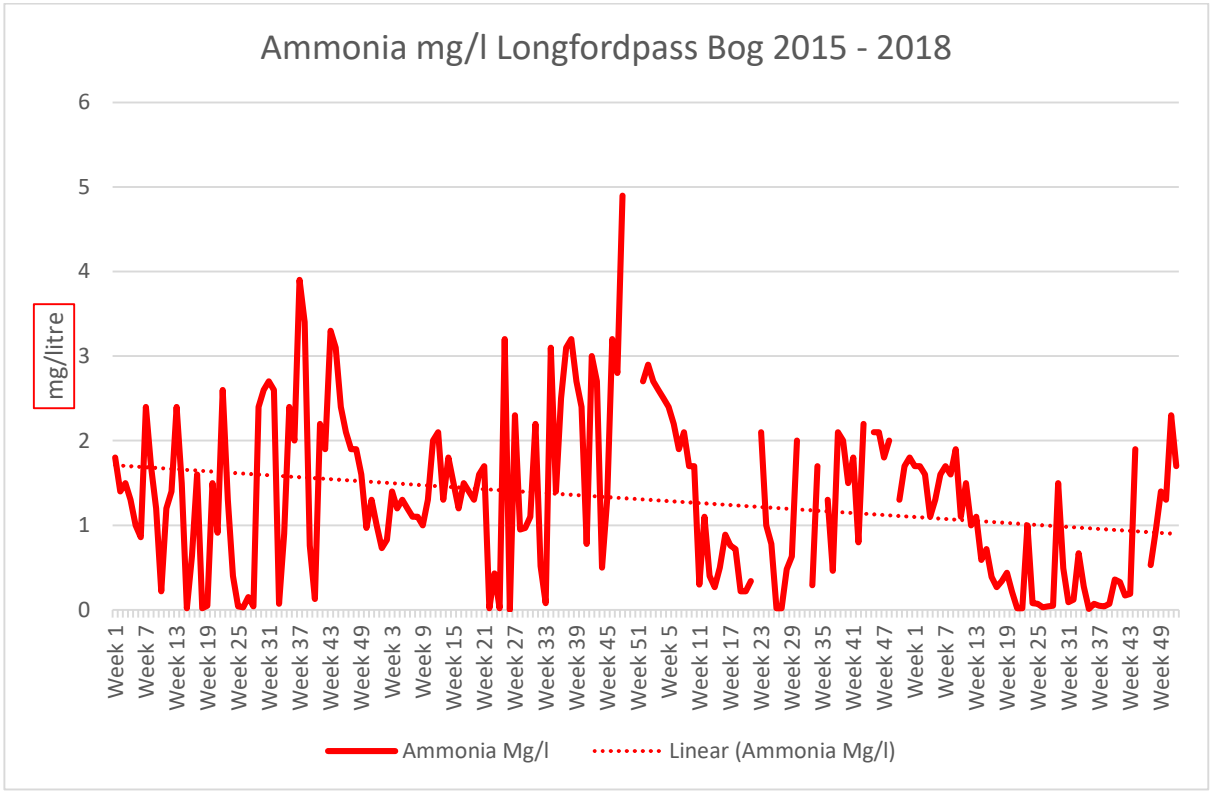

Figure 3.9 Ammonia emissions graph for Longfordpass Bog 2015 - 2018

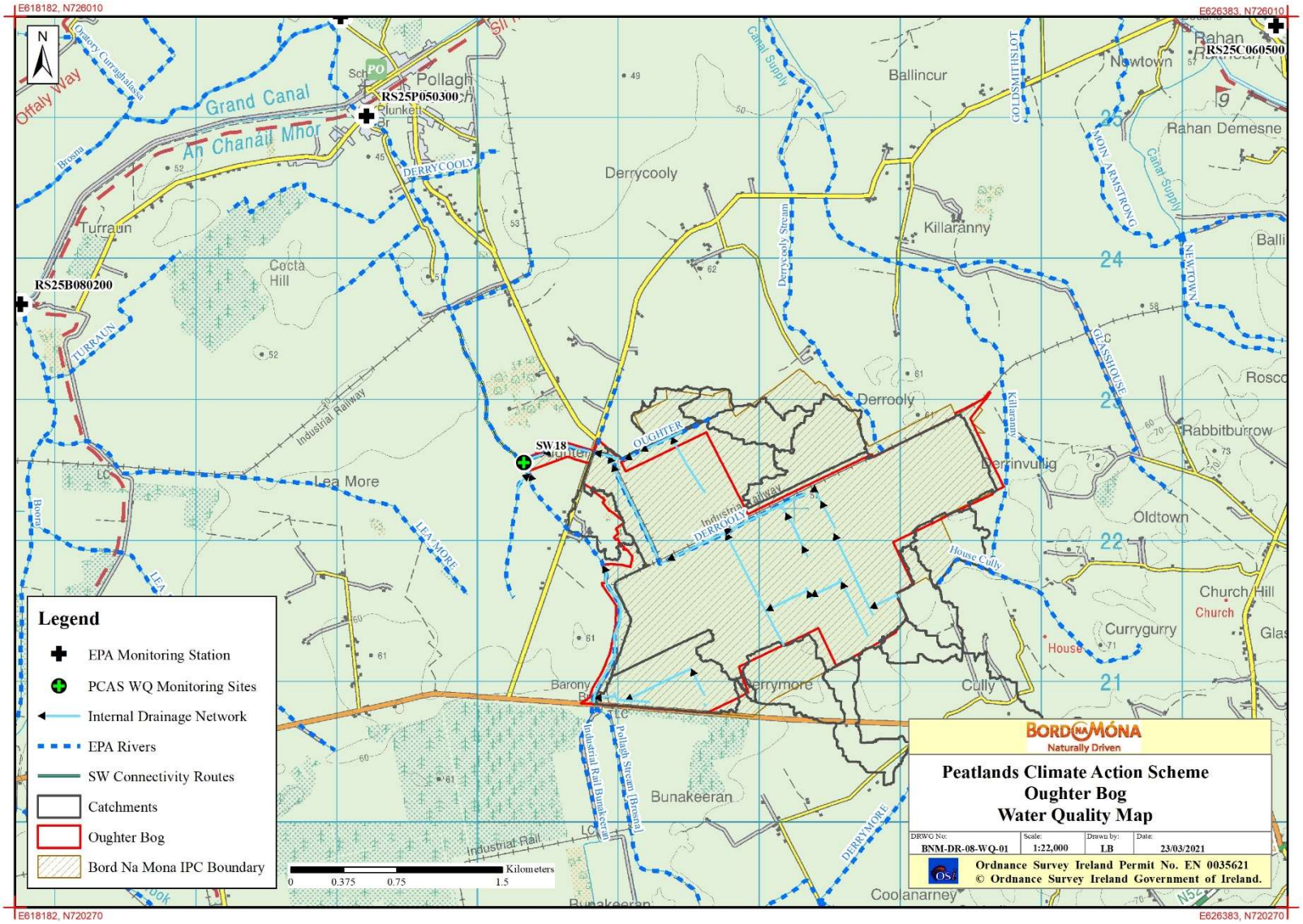

Figure 3.10. Water quality map for Oughter Bog.

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 currently active drainage, which facilitates the oxidation of peat. Peat extraction generally transforms a natural raised bog 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 Oughter Bog can become a reduced carbon source with some sections having potential to develop as a carbon sink (albeit in the longer term) following rehabilitation. The potential of any cutaway site to develop as a reduced carbon source/carbon sink in the longer-term depends on the success of the rehabilitation measures, the extent of development of any *Sphagnum*-rich or other peat-forming habitats, the balance of carbon fluxes from different cutaway habitats and future climatic conditions. This bog is expected to develop a mosaic of fen, Reed swamp, wet woodland, scrub and is known to have strong alkaline spring influence on the ground-water. Birch woodland is expected to develop on the drier mounds and peripheral headlands.

3.9 Current ecological rating

(Following NRA (2009) Evaluation Criteria)

The majority of the site can be rated as having a **low-high local ecological value (E).** Bare peat and other intensively managed areas are assessed as having a low local ecological value (although some bare peat and wet areas attract breeding waders).

Some sections of cutaway have developed areas of poor fen and scrub and can be rated as having **Moderate value, locally important (D).**

The area to the west of the rifle range has developed an area that, potentially develop rich fen (PF1). This area can be rated as having a **High value, locally important (D).**

It is expected that the overall ecological value of this site will increase in the future as the site re-vegetates, matures and forms semi-natural habitats, such as more extensive areas of fen and Reed swamp.

3.10 Oughter Bog Characterisation Summary

Oughter Bog has been in commercial peat production since the 1960s, with all commercial peat extraction ceasing in 2012. The bog comprises a range of cutover habitats including shallow cutaway that has started to revegetate naturally with pioneer cutaway vegetation communities.

The bog can be broadly divided into several categories:

1) Shallow Cutaway Bog modelled as wetland; These areas are predicted to develop wetland habitats such as reedbeds. This habitat is predicted to form in the areas of shallow topographical depressions. Rehabilitation will facilitate the development and establishment of wetland vegetation.
2) Shallow Cutaway bog modelled as deeper water; These areas are predicted to develop deep open water habitats. This habitat is predicted for the deep topographical basin in the central area of the site. A few smaller basins are present throughout the rest of the former production area also. An open water body (2-3m depth) will develop in these areas.
3) Shallow Cutaway Bog modelled as dry; These areas are modelled as dry and are predicted to develop dry cutaway vegetation communities such as birch and heath scrub.
4) Marginal areas, including headlands and high fields are likely to remain relatively dry. Drain-blocking and some fertiliser application is proposed on these area, where Birch woodland and other drier habitats are expected to develop.

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 Boora group bogs including Oughter 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.
- 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).
- The development of Lough Boora Discovery Park (Offaly County Council);
- Bird surveys carried out by Birdwatch Ireland for Bord na Móna
- Development of the Midlands National Shooting Centre of Ireland.

Consultation was carried out in 2019 on an earlier draft of this plan and additional consultation was carried out in 2020/2021.

To inform the current Plan, both national and local stakeholders, including neighbours whose land adjoins Oughter 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 Oughter Bog (see Appendix X).

All correspondence received will be acknowledged and evaluated against the rehabilitation work proposed here, and the final draft of the Oughters Bog Rehabilitation Plan will contain a review of the consultation.

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 Oughter Bog – these are summarised below.

4.2.1 Assessments of rehabilitation

Queries on general pre-rehabilitation assessments were raised by NPWS and Offaly County Councils, the National Museum of Ireland and a number of local residents 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 storage/sequestration and biodiversity objectives.

4.2.3 Monitoring

Further details on monitoring of ecological metrics, including water quality, carbon sequestration and biodiversity, and how and where reporting on this monitoring would take place, was raised by the IPCC, Offaly County Council and Trinity College Dublin. 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, ICMSA and a number of local landowners and residents 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 and the Pollagh Community Residents also raised the issue of Health and Safety in relation to raising water levels as well as possible impacts on land and property prices. Local landowners and residents raised the issue of risks to pets and livestock.

4.2.5 Other potential impacts arising from rehabilitation

A local resident raised concerns over habitat loss for Grey Partridge arising from PCAS.

4.2.6 Land Management

The ICMSA and local landowners and residents queried the long-term management of the Bord na Móna's estate, particularly in relation to maintenance of boundary fencing to exclude livestock from the bogs and maintenance of drainage.

The NARGC suggested that heather be established on large area of the cutaway in general 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.

A number of stakeholders including the Pollagh Residents Group, Fianna Fáil Councillors and Erin Rovers GAA Club expressed concern over the potential rise in anti-social activity (e.g. dumping) and fire risk as a result of PCAS.

4.2.7 Other issues (including amenity)

A number of stakeholders including; local residents and landowners, trinity college, Fianna Fáil Councillors and Erin Rovers GAA club expressed concern regarding the "short duration" of the consultation period concerning PCAS at Oughter Bog.

Opportunities to develop amenities on the bog to support local communities was raised by a number of consultees, including the Oughter residents Group, IPC and Fianna Fáil Councillors.

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

One local resident suggested that BnM consider pursuit of designation of the bog as a Dark Skies astronomy reserve.

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 X.

4.3 Bord na Móna response to issues raised during consultation

4.3.1 Assessments of rehabilitation

AA screening will be undertaken on all the bogs as part of PCAS and this is currently being undertaken by external consultants for Oughter 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 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.

4.3.2 Restoration scope

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

Bord na Móna will not be entering or carrying work out work on any private third party lands.

There are no proposals to designate Oughter Bog as a conservation area in the short-term. It should be noted that any nature conservation designation is a decision for the Government and not Bord na Móna.

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 Oughter 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 Oughter Bog. The re-colonisation of species such as Large Heath is likely to take a longer timeframe.

Water monitoring is undertaken as part of Bord na Móna's IPC licence obligations, and this will continue until such a time as the licence can be surrendered.

4.3.4 Flooding of 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 including adjoining private turf banks.

External consultants have been appointed to carry out a hydrological assessment, to identify any potential impacts to neighbouring lands and, where required, the rehab design will be amended to prevent any identified impact. Please note that climate change is considered in the hydrological assessment. Information on these hydrological assessments will be made available through our website.

The rehabilitation measures 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 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.

4.3.5 Other potential impacts arising from rehabilitation

In relation to the ecological value of Oughter Bog, Bord na Móna have a team of very experienced Ecologists who are qualified to assess the existing and future ecology and habitats of the bog. Re-wetting of the bog will increase the biodiversity on the bog and will not displace wildlife currently living there. While Grey Partridge are known to occur around Oughter Bog, the amount of suitable habitat on site lost as a result of PCAS is considered negligible given the availability of high quality habitat nearby.

4.3.6 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 the overall 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, grassland and Heather-dominated vegetation, will develop. However, it is expected that as naturally functioning peatland ecosystems develop that are analogous to fen, these will colonise with some Heather and other ericoid species in time. Fens and other wet peatland habitats in good condition are known to support species such as Curlew and in time these sites could regain this potential.

Rehabilitation through PCAS aims to re-wet the bog and so should reduce Fire Risk at all PCAS sites in the mid to long term. However, BnM are cognisant of fire risk across the estate and will continue to apply best practice in relation to fire safety at all sites, to continue to minimise fire risk and react accordingly if a fire incident arises.

4.3.7 Other issues (including amenity)

BnM acknowledges that the initial consultation period for Oughter Bog was short in duration. However, the initial deadline of 24/01/2021 was pushed back to 22/02/2021 to provide further opportunity for interested parties to make a submission and receive a response. Also, numerous virtual presentations and meetings were held for stakeholders, to both provide information on PCAS and address stakeholder concerns. Furthermore, to ensure transparent progress on the PCAS scheme, Bord na Móna will continue to engage with stakeholders beyond the current deadline, the purpose of which was to enable preliminary consultation to be captured within this rehabilitation plan.

Creating amenity such as walking tracks is not part of the direct scope of PCAS. However, PCAS will enable and support future amenity development. Future amenity proposals can be positively aligned and integrated to after-use plans following the completion of the proposed rehabilitation at Oughter Bog. Rehabilitation measures proposed for Oughter 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.

Other issues, including after-use and management issues outside the boundary of Oughter Bog, are acknowledged but are specifically outside the scope of this rehabilitation plan. This includes reference to the cessation of turf-cutting on private lands. Bord na Móna rehabilitation proposals will not impact on private turf-cutting and will have no impact on private turf-cutting outside Bord na Móna boundaries.

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).
- Optimising hydrological conditions for **climate action benefits as part of PCAS**. Optimising hydrological conditions for the development of Reed Swamp and fen on shallow more alkaline peat and other subsoils, and eventually naturally functioning and peatland habitats.
- 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 Oughter 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.
- 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.

6. SCOPE OF REHABILITATION

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

- The area of Oughter Bog (Figure 3.1).
- EPA IPC Licence - Ref. P0500-01. 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 proposed rehabilitation is designed to exceed the requirements as defined by the IPC Licence. PCAS is designed to enhance the ecosystem services of Oughter 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 Oughter Bog identify wetland rehabilitation as the most suitable rehabilitation approach for the majority of this site.
- 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 Oughter Bog **as environmental stabilisation and optimising deep peat re-wetting, and setting the site on a trajectory towards the development of Reed Swamp and fen on shallow more alkaline peat and other subsoils.**
- Rehabilitation of Oughter 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 along the western margins. Generally, these bog remnants are narrow, or are subject to turbary, and do not have positive bog restoration prospects.

6.1 Key constraints

- **Potential Future Land-use.** Any future use at Oughter Bog would be considered by Bord na Móna in the context of the land bank status. In the event that Bord na Móna make the decision to support any proposed project, it is likely that the rehabilitation measures proposed in this plan will be compatible with the any potential future development of a peatlands park that has key objectives of amenity and biodiversity. Amenity could be integrated with the post-rehabilitated peatland landscape.
- **Bog conditions.** Rehabilitation outcomes of sites are constrained by the environmental characteristics of these particular areas. For example, much of the peat mass has been removed at many sites, 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). On parts of Oughter Bog, only a certain proportion of peat has been removed leaving a largely un-vegetated surface over deep peat deposits whilst on other areas almost all the peat layer has been removed, with subsoil visible. There are local factors that will influence the future trajectory of this site (underlying alkaline sub-soil) 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 will be taken that no active rehabilitation management is carried out that could negatively and knowingly impact on surrounding land. This includes the hydrology of neighbouring farmland and neighbouring turbary or turf-banks. It is anticipated that the

work proposed here (blocking drains and re-wetting cutaway peatlands) will not have any flooding impacts on adjacent land. In general, marginal drains will **not be blocked**.

- **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.
- **Archaeology**. The discovery of monuments or archaeological objects during peatland rehabilitation may potentially constrain the rehabilitation measures proposed for a particular area. If this occurs, rehabilitation measures will be reviewed and adapted. An archaeological impact appraisal of the proposed rehabilitation at Oughter Bog is being carried out (Appendix XI). The recommendations of this appraisal will be incorporated into the rehabilitation plan to minimise impacts on known archaeology.

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 Oughter 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 Oughter 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 key criteria/targets will be used to mark the achievement of the rehabilitation goals and outcomes and validate the completion of the rehabilitation.

A key objective of this 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. silt run-off).

In addition, Bord na Móna wish to optimise climate action and other ecosystem service benefits via enhanced rehabilitation measures.

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

- Rewetting of deep 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 through a combination of rehabilitation measures, and reducing the area of bare exposed peat. 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 stabilizing/improving concentration of suspended solids and ammonia in discharges from Bord na Móna sites, associated with the measures undertaken to stabilize the peat surface by the blocking of the internal drainage system and the maximized 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.

(See Table 7.1 for a summary of the criteria for successful rehabilitation and associated monitoring.)

7.1.1 Additional criteria for successful rehabilitation for the optimisation of climate action and other ecosystem service benefits:

- Optimising the extent of suitable hydrological conditions to optimise climate action and other ecosystem service benefits (optimising residual peat re-wetting). This will be measured and demonstrated by site monitoring (updated aerial photography) to measure the extent of suitable hydrological conditions.
- Accelerating the trajectory of the site towards becoming 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).
- 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.

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 of the drained high bog area	Delivery of planned rehabilitation measures. This will be a combination of drain blocking, bunding and re-profiling	Aerial photography after rehabilitation has been completed – to demonstrate measures (drain-blocking)	2021-2024
IPC validation	Key water quality parameters Ammonia, Phosphorous, Suspended solids, pH and conductivity	Stabilization Improvement of key water quality parameters	Water quality monitoring. Started in advance of the proposed rehabilitation.	2021-2023
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	Optimal extent of suitable hydrological conditions Indicators of establishment of	Aerial photography, Cutaway bog condition map and Habitat mapping to	2021-2025

	optimise climate action and setting the site on a trajectory towards establishment of a mosaic of compatible peatland habitats	compatible cutaway habitats	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.	
Climate action verification	Biodiversity and ecosystem services. Habitat establishment Presence of key species – Sphagnum Breeding and wintering birds Pollinators	Improvement in biodiversity and ecosystem services.	Metrics that relate to selected biodiversity and ecosystem services Presence of key species – Sphagnum – Walkover survey 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.	2021-2024

Meeting climate action verification criteria and monitoring of these criteria after the proposed 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. 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.

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 8.4) 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 Oughter Bog will include**:**

- Blocking drains in targeted existing pioneering vegetation mosaics, to accelerate re-wetting, and/or manage water levels to the correct height to accelerate the current trajectory towards Reed swamp and fen, using a dozer/excavator.
- Targeted fertiliser applications to accelerate vegetation establishment on headlands and high fields. (It is noted that the application of fertiliser may need additional assessment and approval as per the IPC Licence).
- Modifying water levels at outfalls, as it may be desirable to change and control water levels at the site over time, e.g. to increase water levels as the site becomes increasingly vegetated. This will further slow the movement of water through and out of Oughter Bog. It may be desirable to change and control water levels at the site over time, e.g. to increase water levels as the site becomes increasingly vegetated.
- Re-wetting residual peat areas on the bog using berms. This measure seeks to create large (c. 45m x 60m) generally 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.
- Re-alignment of piped drainage.
- 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).
- Seedling of vegetation is not required at this site as natural colonisation and the development of pioneer habitats is already significantly progressed.

Table 8.1: Types of and areas for enhanced rehabilitation measures at Oughter Bog.

Type	Code	Enhanced Rehabilitation Measure	Extent (Ha)
Dry cutaway	DCT1	Blocking outfalls and managing water levels with overflow pipes	15.25
Dry cutaway	DCT2	Regular drain blocking (max 3/100 m) + blocking outfalls and managing water levels with overflow pipes + targeted fertiliser treatment	44.12
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	35.43
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	22.94
Wetland	WLT4	More intensive drain blocking (max 7/100 m), + blocking outfalls and managing overflows + transplanting Reeds and other rhizomes	123.06
Marginal land	MLT1	No work required (Marginal land including Silt Ponds)	40.45
Constrained areas		Rehabilitation aligned to constraints	71.63
Silt ponds		Silt ponds	0.35
Total			353.22

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 PCAS) will be applied to Oughter 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 assessment 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 remaining milled peat stocks;
- Carry out a review of issues that may constrain rehabilitation such as known rights of way, turbary and existing land agreements. A known right of way exists along across one of the Bord na Móna margins.

- 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.

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 drain blocking, peat field re-profiling, cell-bunding and fertiliser applications targeting headlands, high fields and other areas (where required). 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 silt run-off from the site during the rehabilitation phase; and
- Submit an *ex post* report to the Scheme regulator to verify the eligible works 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;
- Evaluate opportunity for conservation grazing option post re-wetting including available resources for management and husbandry;
- 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;
- 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 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.

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).

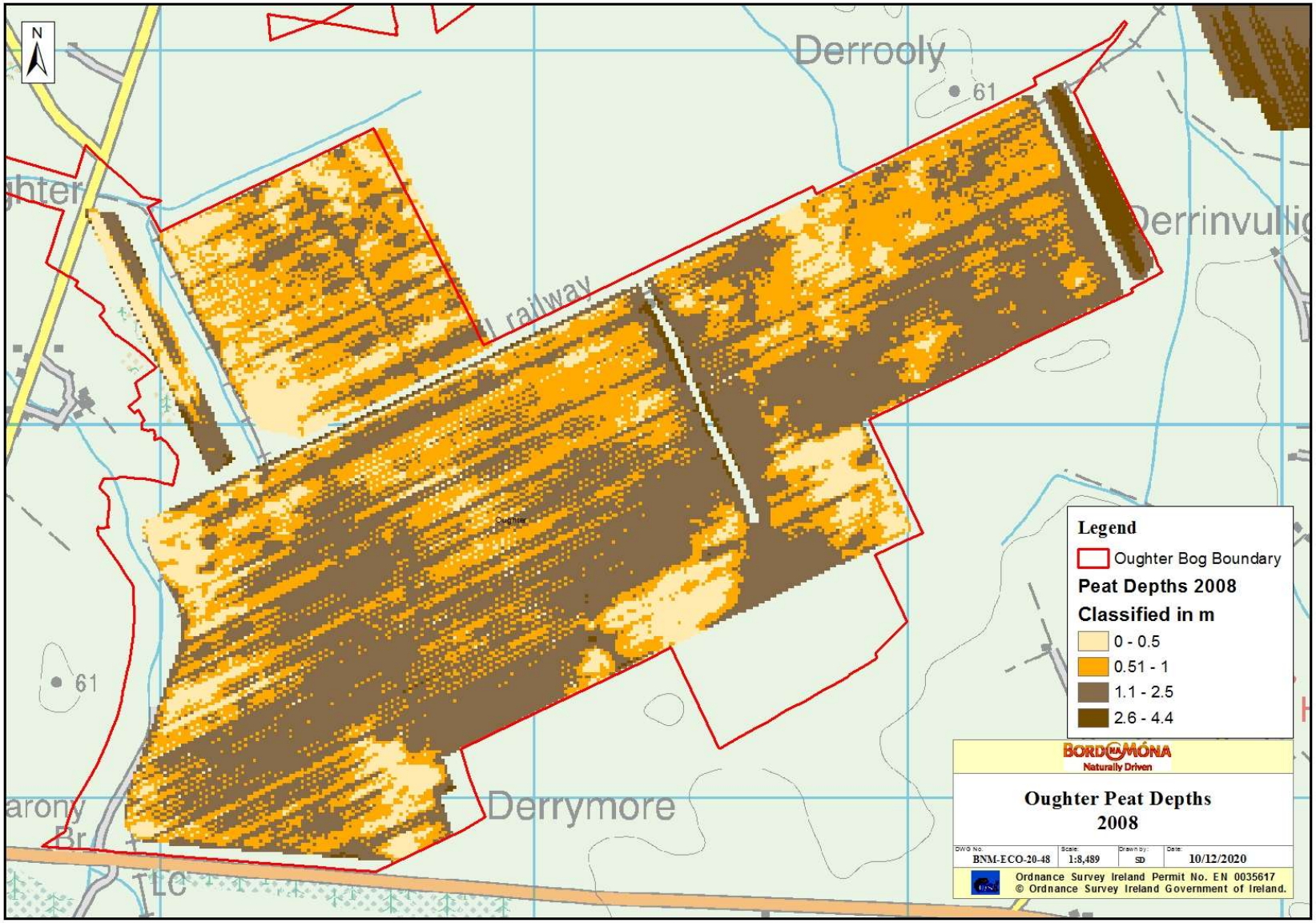

Figure 8.2. Peat Depth Map for Oughter Bog. The majority of the bog is cutaway.

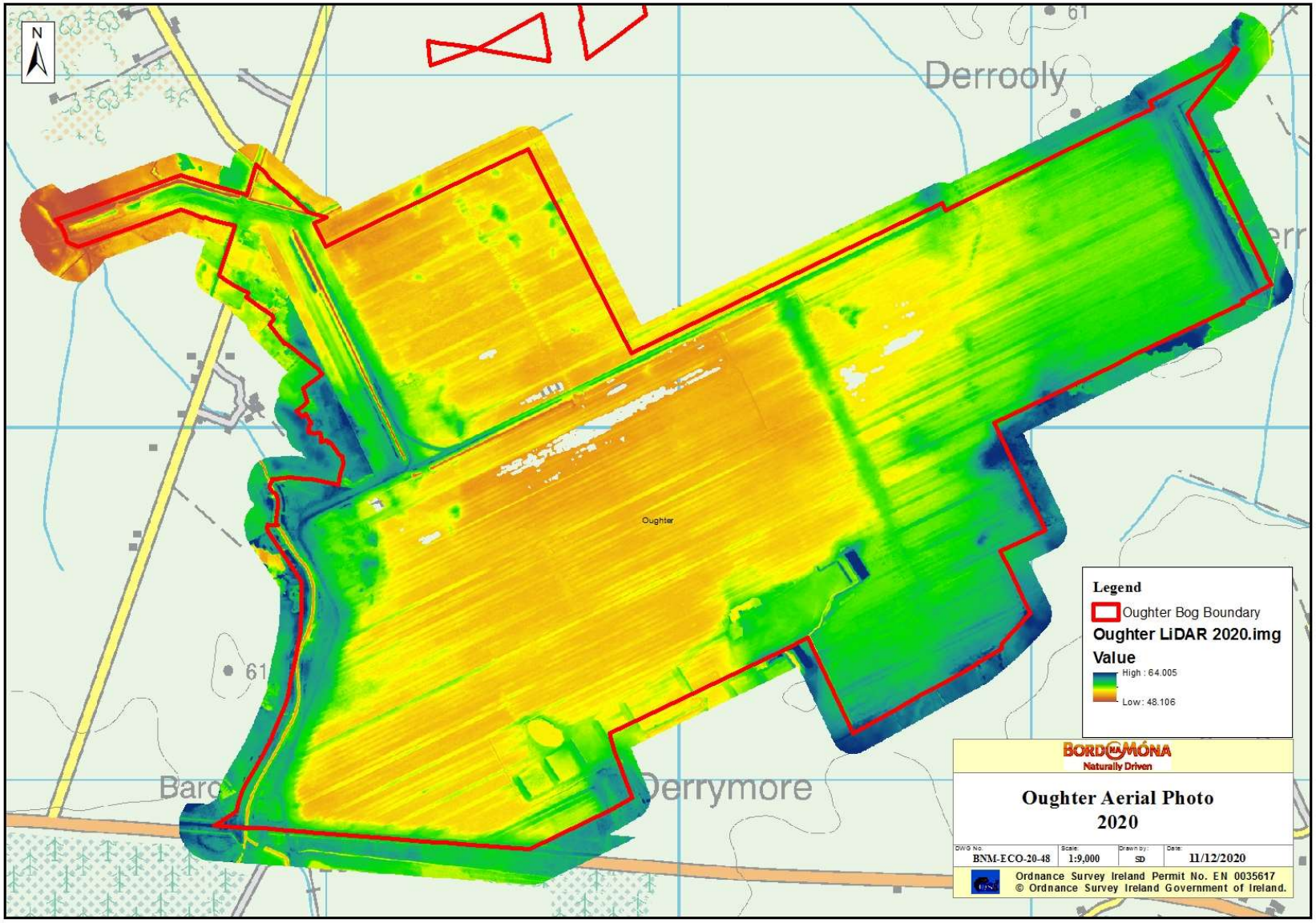

Figure 8.3. LIDAR topography map of Oughter Bog. Low areas and basins are orange-yellow, more elevated areas are blue-green.

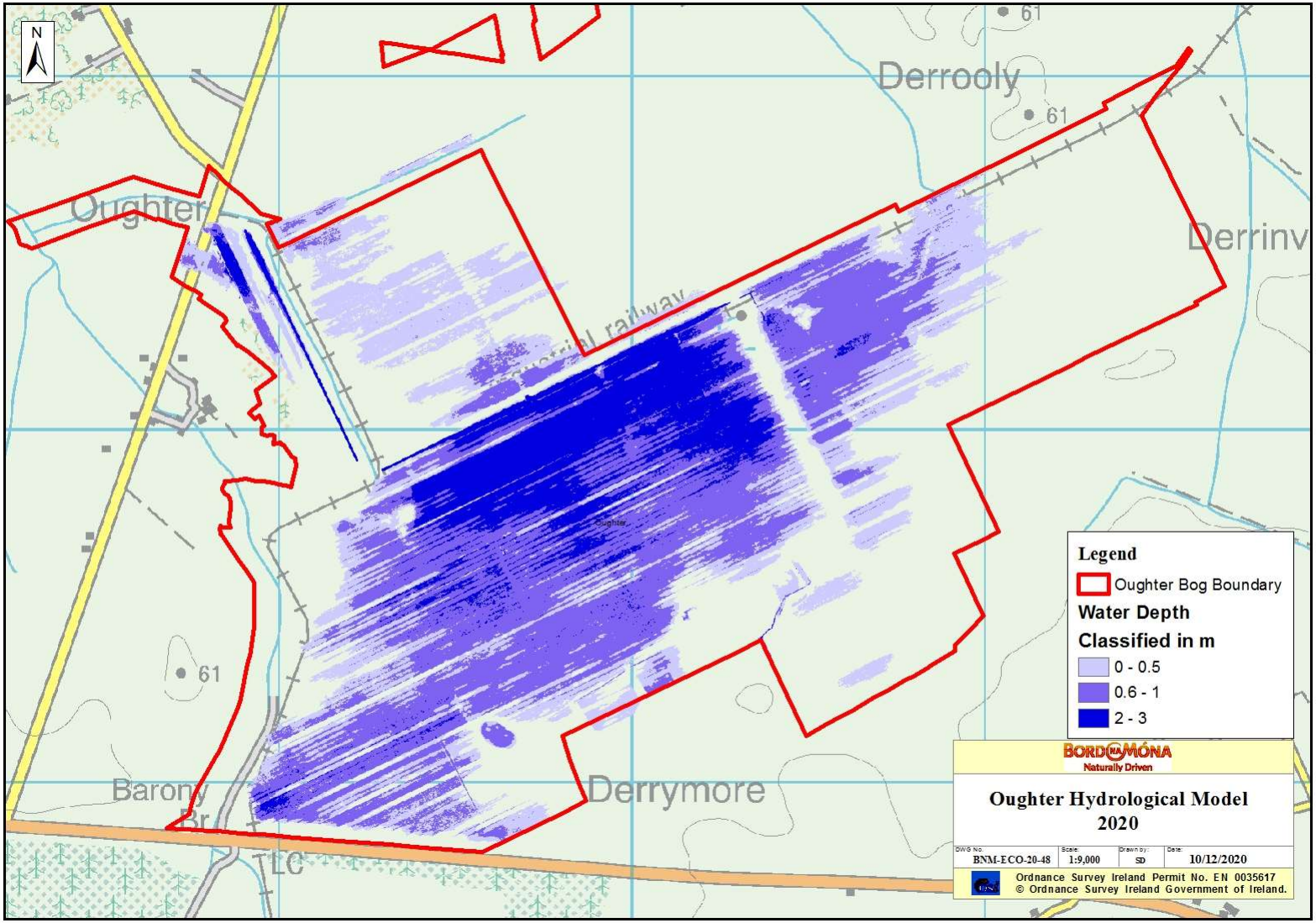

Figure 8.4. Hydrological modelling for Oughter Bog showing range of expected water depths based on current topography and key flow-paths. The model shows that the main area south of the railway has significant potential for re-wetting. Water levels can be managed by outfall pipes at appropriate levels.

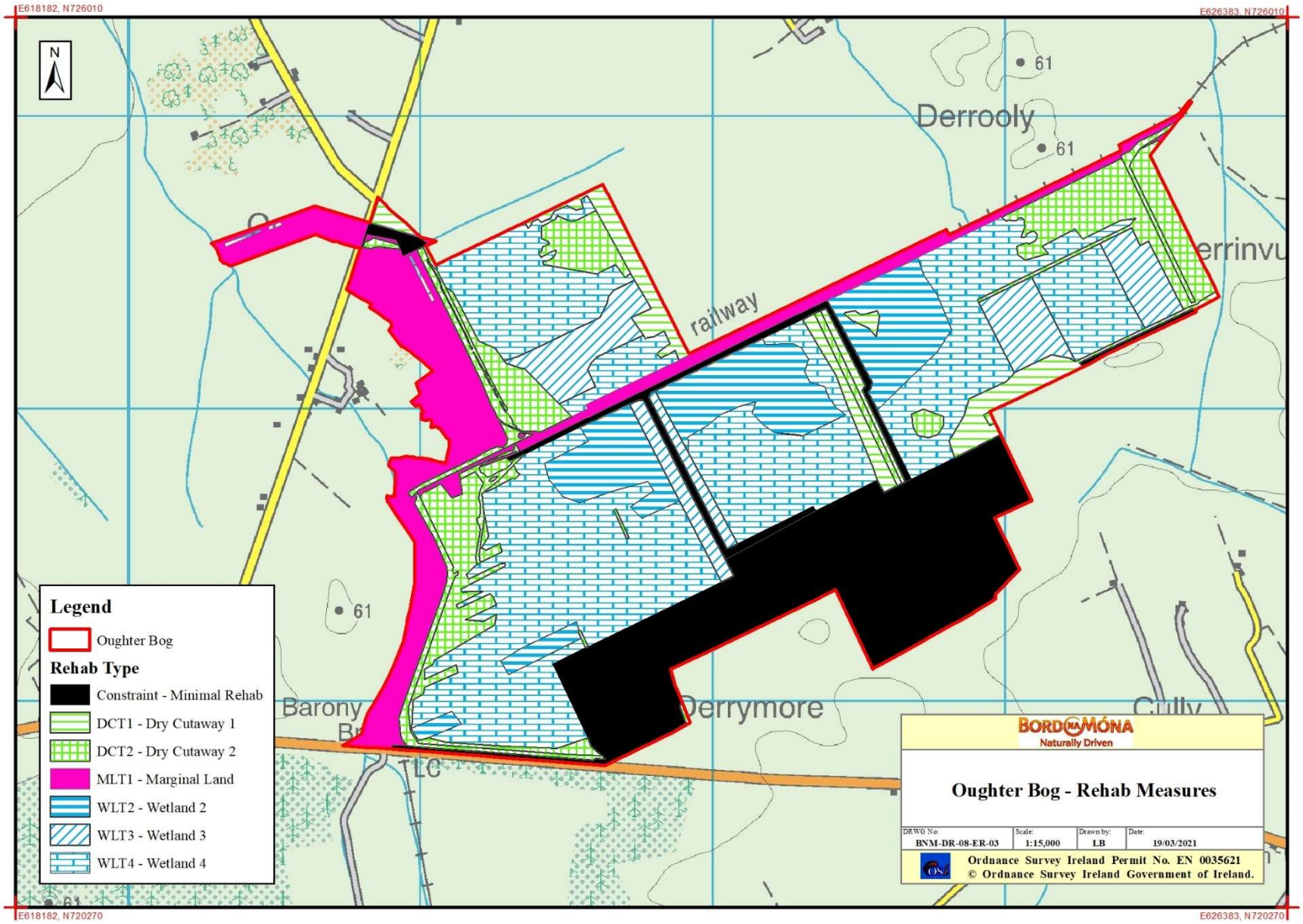

Figure 8.5. Enhanced Rehabilitation Plan *Note that the types of rehab and areas of rehab may change in response to stakeholder consultation and* refinement of the enhanced rehabilitation measures.

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 required.
- **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 up to 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, Flow, 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 enhanced rehabilitation. These proposed monitoring measures will be funded by the proposed Climate Action Fund 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:

- EPA IPC Licence - Ref. P0500-01. 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. Oughter bog is part of the Boora Bog group.
- A key objective of rehabilitation, as defined by this licence, is **environmental stabilisation** of the bog.
- The area of former industrial peat production at Oughter Bog as defined by Figure 3.1. Industrial peat production has now permanently ceased at Oughter Bog.
- Minimising potential impacts on neighbouring land. Some boundary drains around Oughter Bog will be left unblocked as blocking boundary drains could affect adjacent land.

Rehabilitation goals and outcomes

The key rehabilitation goal and outcome for Oughter Bog is environmental stabilisation of the site via 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 peatland 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 indicators

- Demonstrating the delivery of the rehabilitation through site visits and through updated aerial photography (indicating presence of peat barriers, elevated water levels and re-wetting).
- Stabilising potential emissions from the site (silt run-off). The target will be developing a stable or downward trajectory of water quality indicators (suspended solids and ammonia).

Rehabilitation measures: (see Figure Ap-1)

- Blocking field drains in the former industrial production area using a dozer to create regular peat barriers (three barriers per 100 m) along each field drain.
- Re-alignment of piped drainage.
- Realignment of gravity outfalls (where needed).
- Fertiliser treatment of high fields and headlands (typically slow to naturally re-colonise) to encourage natural colonisation, if needed. (It is noted that the application of fertiliser may need additional assessment and approval as per the IPC Licence).
- No measures are planned for the surrounding marginal peatland habitats.
- Silt ponds will continue to be maintained during the rehabilitation and decommissioning.
- 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 with dozer/excavator.
- 2021. 2nd phase. Further realignment of piped drainage and other re-wetting measures dependent on success of 1st phase re-wetting, as determined by 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.
- 2023-2024. Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary.
- 2023-2024. Decommission silt-ponds, if necessary.

Table AP-1. Rehabilitation measures and target area.

Type	Code	Description	Area (Ha)
Dry Cutaway	DCT1	Limited drain blocking, Blocking outfalls and managing water levels with overflow pipes	63.7
Wetland	WLT1	Turn off or reduce pumping to re-wet cutaway + blocking outfalls and managing water levels with overflow pipes	186.0
Marginal land	MLT1	No work required	59.7
Silt ponds		Silt-ponds	
Total			**357.9**

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 any 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, Flow, 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.
- The water quality monitoring demonstrates that water quality of discharge is stabilising or improving.
- The site has been environmentally stabilised.

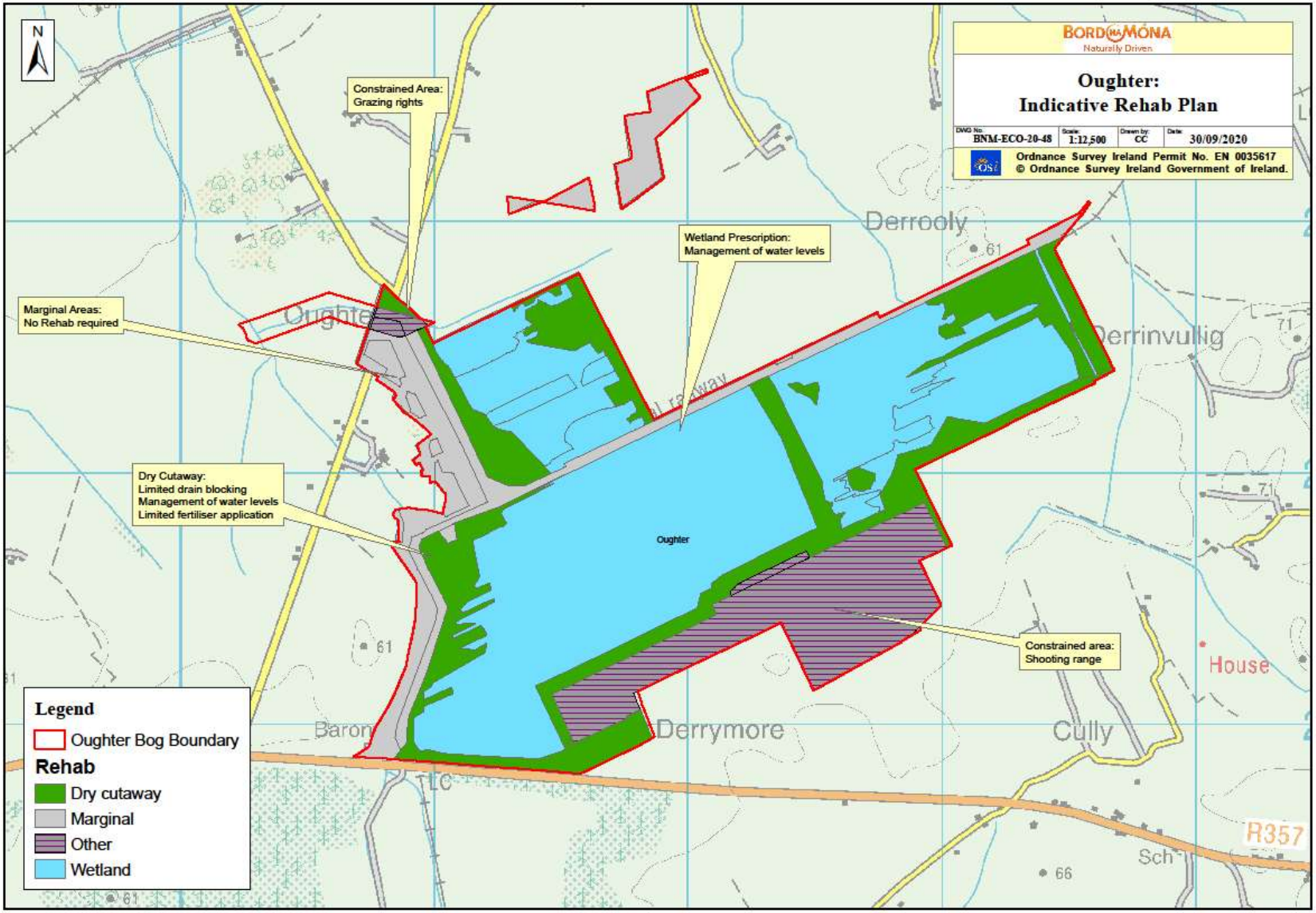


Figure Ap-1. Indicative standard rehabilitation plan for Oughter Bog.

APPENDIX II: BOG GROUP CONTEXT

The Boora group of bogs are sited between Killeigh (Offaly) in the East to Banagher (Offaly) in the West and between Kinnitty (Offaly) in the south and Clara (Offaly) in the North. The River Shannon is the major river catchment for the area with a smaller area lying within the Barrow catchment.

The Boora Group is one of the oldest bog groups in Ireland. Bord na Móna was set up in 1946 and it commenced the development of the Boora Bogs in 1946 with milled peat production commencing in 1955. Milled peat was produced in the Boora Bog for the supply of fuel peat to the power station in Ferbane which commenced power generation in 1957 and closed in 2001. The Boora bogs were also developed for the supply of milled peat to the Derrinlough Briquette factory, which commenced production in 1957.

Much of the Boora Bog complex became cutaway as it was in peat production at an early stage. A number of rehabilitation measures comprising naturalisation and development of alternative after-uses have been already explored at the Boora Bog Group, including coniferous forestry, biomass, agricultural grassland, amenity use, rare species conservation management (specifically Grey Partridge) and wetland creation. Some of this was carried out in the 1980s While agricultural fields and coniferous forestry have been developed successfully on the cutaway bogs at Boora, it was found that these require financial investment that at this time exceeds any potential commercial output value. The Lough Boora Discovery Park encompasses all areas relating to amenity and biodiversity. www.loughboora.com.

The bogs in The Boora Bog Group have been used in the past to supply milled peat for the horticultural market, local power stations (Ferbane, Shannonbridge and West Offaly Power) and Derrinlough Briquette factory.

A breakdown of the component bog areas for the Boora Bog Group IPC License Ref. PO500-01, and current, indicative Peat Production Status, is outlined in Table Ap-2. These areas are also outlined on Figure AI-2 (Map of the Boora Bog Group).

Table Ap-2: Boora Bog Group names, area and indicative status

Bog	Area (Ha)	Stage of development	Land-Use and History	Peat Production Cessation	Rehab Plan Status
Killaun	359.5	Cutover Bog Industrial peat production commenced at Killaun Bog in 1996 and ceased in 2020. Only the upper most layers of peat have been harvested. Deep peat reserves remain on site. Killaun is considered a deep peat cutover bog.	Killaun Bog formerly supplied a range of commercial customers including; horticultural peat and fuel peat. Most of the former production area is bare peat.	2020	Draft 2017
Boora	1,842.4	Cutaway Harvested since the 1950's resulting in the exhaustion of the commercially viable peat resource at the bog. The majority of Boora Bog is considered a shallow peat cutaway bog. Some areas of deep peat persist at this site.	The majority of Boora bog has already been rehabilitated. A significant area of cutaway bog has been re-wetted, developed as conifer forestry (Coillte) and developed as farmland (1980s). This site now forms the core of Lough Boora Discovery Park.	2020	Finalised 2021

Pollagh/ Cornalaur	280.8	Cutaway At Pollagh Bog, industrial peat production began in 2004 and ceased in 2020. Peat reserves of variable depth remain on site. Some deep peat areas remain. Pollagh is considered a cutover bog with variable peat depths.	Pioneer emergent peatland vegetation communities are developing throughout the bog. The adjacent Cornalaur Bog was never developed for peat production.	2020	Finalised 2021
Noggusboy	917.4	Cutaway Bog Industrial peat production commenced at Noggusboy during the 1950's and ceased in 2020. Long-term peat extraction has exhausted commercially viable peat reserves on this bog. Noggusboy is considered a shallow peat cutaway bog.	Part of the site was developed for conifer forestry by Coillte. Part of the site was developed as Cloghan Lake, as part of Lough Boora Discovery Park, in 1999. There is some emerging naturally colonising cutaway.	2020	Draft 2017
Drinagh	1,339.1	Cutaway Bog Industrial peat production commenced at Drinagh during the 1950's and ceased in 2020. Some small pockets of deep peat reserves remain in parts of Drinagh Bog but most of the commercially viable peat reserves have been exhausted. Drinagh is considered a shallow peat, cutaway bog.	Drinagh East is cutaway and has been extensively rehabilitated as wetland. This part of the site has extensive development of naturally functioning peatland habitats. Some Coillte conifer forestry is also present. There is some emerging naturally colonising cutaway in Drinagh West.	2020	Draft 2017
Killaranny	242.8	Cutover Bog Industrial peat production commenced at Kilaranny during the 1980's. Deep peat reserves remain on much of the bog. Kilaranny is considered a deep peat cutover bog.	Kilaranny Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat. A portion of the site is leased by NPWS since 2011 as a re-location area for turf cutters from nearby Clara Bog SAC.	2020	Draft 2017
Oughter	352.9	Cutaway Development of Oughter Bog commenced in the 1960's. Industrial peat production ceased in 2012. Shallow peat depths remain over much of the former production bog area. Oughter is considered a shallow peat cutaway bog.	The site has naturally been re-wetting and there is already significant natural colonisation. Part of the site has been developed as the Midlands National Shooting Centre of Ireland.	2012	Finalised 2021
Galros	191.5	Cutover Bog Industrial peat production commenced at Galros during the 1980's and ceased in 2020. Some areas of deep peat remain on the former production area. Galros is considered a cutover bog of variable peat depth.	Galros Bog formerly supplied a range of commercial customers including; horticultural peat and fuel peat. Some naturally emerging cutaway habitats are developing in part of the site.	2020	Draft 2017
Clongawny More	987.2	Industrial peat production commenced at Clongawny More during the 1950's and ceased in 2020. Some pockets of deep peat persist, particularly in the south-	Part of the site rehabilitated, as part of Lough Boora Discovery Park, in 1999.	2020	Draft 2017

		western portion of the former production area. Clongawny More is considered a cutover bog with variable peat depths throughout the site.	Some Coillte conifer forestry is also present. The site has naturally been re-wetting and there is already significant natural colonisation. BnM currently have submitted an application for renewable energy development on this bog.		
Derrinboy	305.7	Cutover Bog Derrinboy was first developed by BnM in the 1980's. Peat production ceased at Derrinboy in 2020. This bog was used to supply horticultural peat. Only the upper layers of peat have been harvested. Derrinboy is considered a deep peat cutover bog.	Derrinboy Bog formerly supplied a range of commercial customers including; horticultural peat and fuel peat.	2020	Draft 2017
Moneitta	707.5	Cutover Bog Moneitta was first developed by BnM in the 1970's. Peat production ceased at Monietta in 2020. This bog was used to supply horticultural peat. Only the upper layers of peat were harvested. Moneitta is considered a deep peat cutover bog.	Moneitta Bog formerly supplied a range of commercial customers including; horticultural peat and fuel peat.	2020	Draft 2017
Boora Lemanaghan Rail_Link	6.9	N/A	Not applicable	N/A	N/A
Derries	368.2	Cutaway Bog Development of The Derries Bog commenced in the 1960's. Industrial peat production ceased in 2005. Shallow peat depths remain over much of the former production bog area. The Derries Bog is considered a shallow peat cutaway bog.	Wetland rehabilitation carried out over part of site in 1999. Amenity trackway development in 2015. Part of the Lough Boora Discovery Park. The site has now been extensively naturally colonised and is a mosaic of wetland and Birch woodland habitats.	2005	Finalised 2021
Turraun	534.5	Cutaway Bog Development of Turraun Bog commenced in the 1950's. Industrial peat production ceased in 2018. Turraun is considered a shallow peat cutaway bog.	Wetland rehabilitation carried out over part of area in 1999 as part of the Lough Boora Discovery Park. This section of the site has now been extensively naturally colonised and is a mosaic of wetland and Birch woodland habitats.	2018	Finalised 2021
Derryclure	327.6	Cutover Bog Derryclure was first developed by BnM in the 1980's. Peat production ceased at Derryclure in 2020. This bog was used to supply horticultural peat. Only the upper layers of peat were harvested. Derryclure is considered a deep peat cutover bog.	Derryclure Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat.	2020	Draft 2021
Lemanaghan	1,253.7	Cutover Bog Industrial peat production commenced at Lemanaghan during the 1950's and ceased in 2019. Varied peat depths across the site. Deep peat reserves remain on	Lemanaghan Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat.	2020	Draft 2017

		much of the former production area of Lemanaghan Bog. It is considered a cutover bog.	There are some naturally emerging cutaway habitats.		
Belair North	565.7	Cutover Bog Belair North was first developed by BnM in the 1960's. TPeat production ceased at Belair North in 2020. This bog was used to supply horticultural peat. Only the upper layers of peat were harvested. Belair North is considered a deep peat cutover bog.	Belair North Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat.	2020	Draft 2017
Derrybrat	171.6	Cutaway Bog Industrial peat production commenced at Derrybrat during the 1950's and ceased in 2016. Derrybrat has shallow peat depths across the site. It is considered a shallow peat cutaway bog.	The site has been partially rehabilitated and there is already significant natural colonisation. Some conifer forestry has been developed by Coilte on the site.	2016	Finalised 2021
Belair South	228.8	Cutover Bog Belair South was first developed by BnM in the 1970's. Peat production ceased at Belair South in 2020. This bog was used to supply horticultural peat. As a result, only the upper layers of peat were harvested. Belair South is considered a deep peat cutover bog.	Belair South Bog formerly supplied a range of commercial functions including; horticultural peat and fuel peat.	2020	Draft 2017
Boora Bog Group Total	**10,983.7**				

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:	**Oughter**	**Area (ha):**	357ha
Works Name:	Boora	**County:**	Offaly
Recorder(s):	MMC & DF	**Survey Date(s):**	16-17/09/2009/ 16/09/2020

Habitats present (in order of dominance)

Habitats present on the industrial cutaway include:

- Bare peat (BP), pioneer Poor Fen communities (pJeff, pEang, pTrig, pJbulb) and *Betula pubescens*-dominated scrub (eBir, cBir). There are fragmented and minor patches of Open water (OW), Reedbeds (pTyp, pPhrag), Dry Heath (dHeath), dry grassland (gCal,) & dry disturbed/pioneer communities (DisCF, DisWill) around the site. A small section adjacent to the shooting range has developed some Rich fen indicators (pCladium).
- There is some built land (BL3) with paths accessing works areas and a mobile phone mast along the eastern side. Rail-lines crossing the site can also be classified as BL3. A large drain (FW4) and associated riparian zone in a deep trench follows the railway and flows north. Spoil dug from this drain forms two ridges on either side of the trench and has not revegetated yet (ED3). This spoil is a mixture of glacial material, limestone and marl.
- Other fringe habitats around the margins of the bog include Scrub (*Betula pubescens* dominated and *Ulex europaeus* dominated), Birch woodland (WN7) and Cutover Bog (active and abandoned). There are also several drainage ditches around the margins of the site (FW4).

Description of site

Oughter Bog is located adjacent to the Blueball-Cloghan Road and the majority of the bog is still in active production. The bog is primarily divided into two main sections by a rail-line orientated NE-SW. Part of the bog formerly owned by BnM has been developed into a shooting range.

Southern section

The majority of the area south of the railway is in active production or is classified as production-related cutaway. A large part of this area, particularly the active fields, is bare peat. This area also contains some young pioneer Poor Fen vegetation (mainly pEang and pJeff) spreading from the drains. Large sections are re-vegetating rather quickly and there are also some patches of Birch-dominated scrub (eBir). There was some open water present but it was minor in extent and some of this habitat may be transient. Some small mounds and ridges contain dry grassland and disturbed vegetation communities (gCal & disCF). (Codes refer to BnM classification of pioneer vegetation of industrial cutaway areas).

The western boundary of the bog is marked by a small stream. This western margin contains a mosaic of habitats and is used for access and as a Works area. It is relatively quite disturbed and contains a range of habitats including Birch scrub (eBir) and Bramble developed on old spoil heaps, some patches of Bracken (dPter), some diverse wet grassland (pMol) and some dry grassland (gCal).

The south-east section contains a small area of cutover bog (PB4) and improved grassland (GA1) adjacent to the BnM boundary. This area is fenced off and managed as private land.

The oldest area out of production (classified as production-related on the land use map) is located adjacent to the east side of the shooting range. This area has almost completely re-vegetated and contains a diverse mosaic of vegetation communities including some indicators of Rich Fen (PF1). The main habitats are Birch scrub (eBir), pioneer Bottle Sedge -dominated vegetation (pRos), pioneer Bog Cotton-dominated vegetation (pEang), some

Soft Rush-dominated vegetation (pJeff) some Ling heather –dominated vegetation (dHeath) and a minor amount of open water (OW) associated with small pools that that developed along the drains in this section.

Northern Section

The majority of the area north of the rail-line has been classified as cutaway and a large part of it has been taken over by a private Native Woodland Scheme. The majority of the area within the Native Woodland Scheme contains pioneer Soft Rush-dominated vegetation, emergent Birch scrub and some closed Birch scrub. Some drier sections still contain Bare Peat, pioneer dry grassland communities or disturbed vegetation communities. A range of tree species were planted in 2008 including Scot's Pine, Birch and Alder. Some sections contain young trees that are now overwhelmed by Soft Rush. There is also some naturally regenerated emergent and closed Birch scrub developing in this area.

The area outside the Native Woodland Scheme contains similar habitats. Of note is a relatively large pool of open water that has developed adjacent to the railway and contains a small patch of Common Reed. Overall Common Reed was rare on this site.

A railway also branches off the main line and accesses the north-east corner of the site (N-S orientation). Fields on both sides are still in production and a large drain in a deep trench is also located adjacent to the railway.

Some Birch woodland (WN7) and Birch scrub (WS1) have developed along the western margin of this section and there is a small area of intact Raised bog (PB1) being encroached upon by these habitats.

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

None

Adjacent habitats and land-Use

Habitats and land-use around the site include cutover bog with active peat-cutting (PB4), the use of improved grassland (GA1) for grazing livestock and growing fodder, a rifle range on a section of built land and former production bog containing scrub and other habitats and some minor semi-natural habitats such as scrub and remnant patches of raised bog (PB1) and old cutover bog around the margins of the site that have developed a range of habitats including scrub (WS1) and some Birch woodland (WN7).

Watercourses (major water features on/off site)

A small stream is located along the west boundary of the site. This drains north and is part of the River Brosna catchment. A large drain flows though the northern half of the site through a deep trench and runs adjacent to the rail-line. This drain may have been a natural drainage features that was channelised and deepened during the development of the bog. This drain also connects to the stream flowing north. There is also a second drain flowing along part of the eastern boundary that connects to a second stream flowing north.

Fauna biodiversity

- Several birds were noted around the site. Wren (2) in scrub around site, Robin (4) in scrub, Meadow Pipit (5-10) using a variety of habitats on site, Mallard (2) in the deep drain, Snipe (4) in some of the wetter pioneer grassland, Hooded Crows (5-10) flying over site and roosting.

- Signs of Rabbits are widespread and common around the site.
- Signs of Hares also noted.
- Some signs of Deer activity (tracks) but not recent and relatively few.
- Pine Marten droppings noted in north-west section and tracks noted in south-east section.
- Signs of Badger activity in the Birch woodland along the north-western boundary.
- Fox droppings recorded at several locations.
- Frogs recorded at several locations on the site.
- One Painted Lady noted, associated with some of the dry grassland and scrub. One Speckled Wood noted in the Birch woodland along the western margin of the site.

Fungal biodiversity

Fungal species noted on the site included *Lactarius uvidus*, *Lycoperdon perlatum* and *Leccinum scabrum*.

HABITAT DESCRIPTIONS

(See Habitat Descriptions Document for detailed description of each vegetation community not described in this section.)

Habitats developed on industrial cutaway

Pioneer Poor Fen communities (pJeff)

This vegetation community is quite widespread around the site and appears in various stages of development.

This habitat is one of the most common vegetation types to initially colonise the bare peat fields. The initial community is quite open and may contain a significant portion of bare peat. Species present at the ends of fields are also typical of disturbed vegetation and include *Juncus effusus*, *Epilobium* spp., *Chamaerion angustifolium*, *Anthoxanthum odoratum*, *Leontodon* sp*., Cirsium vulgare, Cerastium fontanum, Polytrichum* sp., *Rubus fruticosus*, *Cirsium arvense*, *Pteridium aquilinum*, *Molinia caerulea*, *Tussilago farfara*, *Centaurea nigra* and *Dryopteris dilatata*. Some *Betula pubescens* and *Salix aurita* is found along the drains. The species composition varies with the underlying environmental conditions and species more typical of wetter conditions are found in other sections.

This vegetation type is more established in the production related area adjacent to the shooting range. The vegetation cover is higher and the species composition is similar to that recorded above, although there is a greater amount of young scrub species. Other species present in this area include *Triglochin palustris*, *Hypnum* sp., *Mentha aquatica*, *Lythrum salicaria, Eriophorum angustifolium*, *Achillea millefolium*, *Sonchus oleraceus*, *Juncus articulatus, Dactylis glomerata*, *Galium palustre*, *Holcus lanatus, Lotus corniculatis* and *Salix aurita*. Occasional *Pinus contorta* and *Picea sitchensis* seedlings and young saplings are present. There is also a greater amount of standing water in the drains and the extent of *Typha latifolia* is also greater in these drains. *Schoenoplectus lacustris* is also present in some of the drains but is minor in extent.

This habitat is more established in the Native Woodland Area and forms a mosaic with the eBir and pEang in this area. The pJeff is dominated by dense *Juncus effusus*. Other species present includes *Triglochin palustris, Dactylis glomerata, Juncus bulbosus, Rumex acetosa, Cirsium vulgare, Taraxacum sp., Phalaris arundinacea and Holcus lanatus.* The rushes are spread up and around the young *Pinus sylvestris*, *Betula pubescens* and *Alnus glutinosa* trees planted in this area and the trees do not seem to be healthy. There are some sections where dense thickets of *Rubus fruticosus* and *Chamaerion angustifolium* are developing. Some sections are still quite open with bare peat and the young saplings have not been overwhelmed by the vegetation. Overall it is relatively dry and there are no indicators of wetland complexes present such as *Phragmites australis* and *Typha latifolia*, although the latter species is present (but not common) in some of the drains. The drains mainly contain pJeff type vegetation.

Pioneer Poor Fen communities (pEang)

This community appears in mosaic with the pJeff in places and is quite extensive, dominating some large areas of inactive production fields. The vegetation is dominated by Eriophorum angustifolium and this species may form a mono-dominant sward in places. Other species present include *Triglochin palustris*, *Juncus articulatus*, *Hydrocotyle vulgaris*, *Mentha aquatica*, *Betula pubescens, Carex rostrata*, *Epilobium palustre*, and *Juncus bulbosus*.

This habitat is also associated with some standing water in some lower fields along the south-west boundary. It is forming a mosaic with pJeff and eBir in this area. These areas also contain *Utricularia* sp.

Pioneer Poor Fen communities (pRos)

This habitat is found in a production-related area north-east of the shooting range and in mosaic with pJeff, pEang, EBir, DHeath and some patches of Rich Fen. This area is quite diverse and the vegetation is well-established.

The pRos is typically dominated by *Carex rostrata* and also contains *C echinata, C. demissa*, *C. panicea, Eriophorum angustifolium*, *Mentha aquatica*, *Hydrocotyle vulgaris*, *Juncus articulatus, Anagallis tenella, Epilobium brunnescens* and *Filipendula ulmaria.* There may be some standing water within this vegetation type and small pools have also formed along the drains that are in the process of infilling. *Utricularia* sp. and *Chara* sp. were both found in some of

the shallow standing water in association with this vegetation type. Mosses associated with this vegetation type include *Calliergonella cuspidata*, *Fissidens adianthoides*, *Campylium stellatum* and *Drepanocladus* spp.

Pioneer Poor Fen communities (pPhrag, pTyph)

These habitats are not extensive on the site. Dense stands of *Phragmites australis* are quite rare with the only extensive area found north of the railway associated with the large open pool. This species is also spreading on the south side of the railway adjacent to this area. *Typha latifolia* is rarely extensive but it is much more widely distributed around the site.

There are also several small stands of *Schoenoplectus lacustris* in the Rich fen mosaic area.

Rich Fen mosaic area

This area is found in a production-related area north-east of the shooting range and is a mosaic of several habitats including pRos, pEang, pJeff, eBir and dHeath. This area is quite diverse and the vegetation is well-established in the wetter sections, although the drier fields may still have some sections dominated by bare peat. Some *Typha latifolia* is found in the drains and there is also some *Phragmites australis*, but its extent is very minor.

This area is of particular note due to the presence of several Rich Fen indicators in the area. These include small clumps of *Cladium mariscus* scattered through the area . Some the shallow open water frequently has dense *Chara* sp. and there are also signs of tufa precipitating out of the water in places. This area is likely to be fed by a series of springs. There are also indications of springs in the area such as iron flushes in some of the bare peat. *Sphagnum* sp. was recorded in this area in a vegetating zone along the edge of a drain . A small patch with *Schoenus nigricans* was also found close to the outer boundary of this area. This species was only found in one location in this area. Mosses associated with this vegetation type include *Calliergonella cuspidata*, *Fissidens adianthoides*, *Campylium stellatum* and *Drepanocladus* spp.

Open Water complexes (OW, pTyp, pPhrag)

Overall the amount of open water on this site is quite low. There are several small shallow pools north of the railway in the Native Woodland Scheme that are likely to be temporary, as there is no typical wetland vegetation associated with them. There are several other small pools in the production area south of the railway. Some of these may be temporary as there is no extensive wetland vegetation, although this may also be due to the limited amount of time since the fields were inactive. These pools are associated with pEang and pJeff vegetation.

The largest pool is found north of the railway. This large pool ahs some fringing Reedbeds with patches of *Typha latifolia* but the most common emergent habitat is pJeff. There is a large stand of *Phragmites australis* at the western end of this pool and this is the largest stand of this species on the site.

***Betula pubescens* Scrub (eBir, oBir)**

Small patches of emergent scrub dominated by *Salix cinerea* appear on some of the small mineral mounds within the production area. This scrub is quite open and also includes some *Betula pubescens*, *Rubus fruticosus* and *Calluna vulgaris.* The ground vegetation of these areas is typical of disturbed areas and this scrub is emerging from vegetation dominated by *Tussilago farfara* or *Campylopus introflexus* (DisCF).

Emergent scrub dominated by *Betula pubescens* and *Salix aurita* is a common part of most areas with established vegetation. This scrub has generally developed from pJeff or pEang vegetation and contains many of the ground cover species associated with these habitats.

The open scrub (oBir) is denser and dominated by *Betula pubescens*. Other species present include *Salix* sp. The ground cover contains many of the species associated with pEang and pJeff. This habitat is found adjacent to the shooting range and is found in mosaic with eBir and pJeff. The max height of this scrub is 8 m.

***Calluna vulgaris*-dominated community (dHeath)**

This habitat is present on the site but is only found in very small portions along the boundaries and on drier, more elevated areas. It was noted around the margin of the shooting range. *Calluna vulgaris* is the main colonising species, although it may be quite sparse in places. Other species present include *Campylopus introflexus*, *Rubus fruticosus* and *Chamaerion angustifolium*.

The dHeath within the Rich fen mosaic area is relatively sparse and dominated by colonising *Calluna vulgaris* along a ridge with a N-S orientation. Other species present include young *Pinus* spp. trees and saplings, *Salix aurita*, *Betula pubescens, Potentilla erecta, Deschampsia flexuosa, Carex panicea, Carex demissa, Erica tetralix, Succisa pratensis, Salix repens, Molinia caerulea, Campylopus introflexus*, Dryopteris dilatata, *Anthoxanthum odoratum*,

Hypericum sp., *Mentha aquatica* and *Epilobium sp.* Small patches of this habitat extend along some of the drier fields. Mosses associated with this area include *Hylocomium splendens*, *Polytrichum* sp. and *Hypnum* sp.

This community is also found associated with the cutover area along the south-east boundary of the site. Other species found in this area include *Euphrasia officinalis* agg., *Rumex acetosa*, *Carex demissa* and *Rosa canina*.

Dry grassland communities (gCal)

There are small patches of this vegetation community found around the margins of the site on drier ground that has been left undisturbed. Some of this grassland has developed along the bank of the railway and is quite species-rich. Parts are dominated by *Centaurea nigra* and *Filipendula ulmaria*. Other species present include *Lotus corniculatis*, *Hypericum pulchrum*, *Molinia caerulea*, *Holcus lanatus*, *Plantago lanceolata*, *Festuca rubra*, *Carex flacca*, *Achillea millefolium*, *Anthoxanthum odoratum*, *Rubus fruticosus*, *Leucanthemum vulgare*, *Mentha aquatica*, *Daucus carota*, *Sonchus oleraceus*, *Agrostis* sp., *Fragaria vesca*, *Dactylis glomerata*, *Hypericum tetrapterum*, *Potentilla erecta*, *Potentilla anserina*, *Pteridium aquilinum* and *Succisa pratensis*.

Some of this grassland is quite minor in extent and only covers a band about 10 m wide. Some *Ulex europaeus* bushes are spreading into the grassland.

Some patches of gCall on mounds close to the shooting range also contain Carlina acaulis, Senecio jacobaea, *Betula pubescens*, *Epilobium* sp., *Polygala serpyllifolia*, *Cirsium arvense*, *C. vulgare*, *Equisetum* sp. and *Calluna vulgaris.* This habitat forms a mosaic with DisCF and pCamp in this area.

Dry Disturbed/Pioneer communities (DisCF, DisWill)

Dry disturbed vegetation (DisCF) is found frequently on the small mineral mounds of sub-soil made up of glacial deposits that are found around the production area. It is frequently associated with emergent scrub (eBir) and dry grassland (gCal), which also are found on these mounds. This vegetation is dominated by *Tussilago farfara* and also contains *Rubus fruticosus*, *Molinia caerulea*, *Potentilla anserina*, *Daucus carota*, *Taraxacum* sp., *Agrostis* sp., *Carex flacca*, *Bellis perennis*, *Briza media*, *Equisetum* sp., *Dactylorhiza* sp., *Cirsium arvense*, *Cirsium palustre*, *Salix aurita*, *Leucanthemum vulgare*, *Hypochoeris radicata* and *Centaurium erythraea.*

Wet grassland communities (gMol)

Some species-rich grassland dominated by *Molinia caerulea* is found around the fringes of the production area, on drier sections and at the south-west corner. This grassland contains several other species including *Achillea millefolium*, *Triglochin maritimum*, *Centaurea nigra*, *Briza media*, *Rumex crispus*, *Vicia cracca*, *Leucanthemum vulgare*, *Cirsium palustre*, *Daucus carota*, *Plantago lanceolata*, *Filipendula ulmaria*, *Medicago lupulina*, *Hieracium pilosella*, *Carex panicea*, *Lotus corniculatis*, *Agrostis* sp., *Lythrum salicaria*, *Dactylorhiza* sp., *Carex demissa*, *Succisa pratensis*, *Tussilago farfara* and *Ulex europaeus*.

Some of this grassland is disturbed by production activity. Some of the grassland is transitional to disturbed vegetation (DisCF) in places where there has been some recent disturbance and vegetation re-colonisation.

Production areas (BP)

The majority of this bog is in active production. There are extensive fields of bare peat around the site that have been recently milled and are divided by drains devoid of vegetation.

Some vegetation is spreading into other fields where there has been less recent activity although vegetation re-colonisation is at various stages. The vegetation is most typically pJeff and it is spreading from the drains into the fields. The drains in these sections are generally completely vegetated and also contain some emergent *Betula pubescens*-dominated scrub (eBir).

There is some encroachment of vegetation from the sides of the drains including pJeff pEang, pTrig, and eBir.

Drain (FW4) + riparian zone

A large drain is found in a deep trench in the northern part of the site. This trench runs along-side the railway. The drain links to the small stream flowing north along the edge of the bog. This drain may have been a natural drainage feature that was channelized during the development of the bog, although there is no drainage feature mapped on the old OSI 6 inch map along this route. Parts of the drain take on the appearance of a stream and the channel bed is colonised by species such as *Agrostis stolonifera*, *Apium nodiflorum* and other unidentified aquatic species. The banks of the trench are quite steep and are re-vegetating, and a significant portion is still exposed sub-soil, with the most common plant community being DisCF. Some *Betula pubescens*, *Ulex europaeus* and *Salix aurita* scrub is

appearing along these banks, as are patches of *Pteridium aquilinum*. There is a line of spoil dug from the trench on both sides of the trench that is also revegetating.

Other Habitats (around the fringe of the bog)

Birch woodland (WN7)

This habitat is found on some intact high bog along the western boundary. The woodland is dominated by a *Betula pubescens* canopy, which varies in height and development according to age. The woodland transitions to dense scrub dominated by young trees in places and is spreading into raised bog and cutover bog (PB4) dominated by *Calluna vulgaris*. *Sorbus aucuparia* is also present. The shrub layer is poorly developed with some patches of *Rubus fruticosus* present. The ground cover is dominated by *Molinia caerulea* and leaf litter. Other species present in the ground cover include *Calluna vulgaris*, *Phragmites australis*, *Narthecium ossifragum*, *Empetrum nigrum*, *Hypericum tetrapterum*, Eriophorum vaginatum, *Polytrichum commune*, *Hylocomium splendens, Holcus lanatus*, *Pteridium aquilinum* and *Hedera helix.* Cattle are grazing this wood.

Raised Bog (PB1)

A very small patch of this habitat is found associated with the bog woodland along the western boundary of the site. This area is intact and has not been cut for peat. It is surrounded by Birch woodland and *Betula pubescens* scrub. The vegetation is typical of sub-marginal raised bog and species present include *Calluna vulgaris*, *Erica tetralix*, *Eriophorum vaginatum*, *E. angustifolium*, *Trichophorum cespitosum*, *Cladonia portentosa*, *Carex panicea* and *Rhynchospora alba*. There are some dried pools present and some hummocks of *Sphagnum capillifolium* and *S. papillosum*. Other moss species present included *Hypnum* sp., and *Polytrichum* sp.

Cutover Bog (PB4)

This habitat is found in a number of locations around the site. Some of it (land within the BnM boundary is fenced off and is managed as private land).

A small pocket is located along the western boundary (north of the railway). This area has been cut privately by sausage machines in the past and is now re-vegetating. The bog is dominated by *Calluna vulgaris* with extensive *Campylopus introflexus* and bare peat cover. Other species present include *Molinia caerulea*, *Eriophorum angustifolium*, *E. vaginatum*, *Betula pubescens* and *Erica tetralix*. This section of bog is quite species poor and dried out. There are also signs of cattle grazing in this area.

Cutover bog found adjacent to the shooting range is somewhat different in species composition and also contains *Succisa pratensis*, *Rubus fruticosus*, *Chamaerion angustifolium*, *Anthoxanthum odoratum*, *Hypericum pulchrum*, *Lotus corniculatis*, *Pedicularis sylvatica*, *Filipendula ulmaria*, *Salix aurita*, *Galium saxatile*, *Viola* sp., *Agrostis* sp., *Tussilago farfara*, *Holcus lanatus, Plantago lanceolata*, *Hypochoeris radicata* and *Centaurea nigra*. There are some thickets of *Rubus fruticosus* and *Betula pubescens* developing in this area. This area is a hotspot for *Succisa pratensis*.

This habitat is also found along the south-east boundary of the site. There are a range of vegetation types in this area on the cutover, ranging from active peat-cutting on the surface, active face-back cutting with associated standing water in drains, abandoned cut sections now re-vegetating, some gMol type grassland, some dHeath dominated by *Calluna vulgaris*, and some typical emergent scrub with *Chamaerion angustifolium*, *Pteridium aquilinum*, *Rubus fruticosus*, *Ulex europaeus* and *Betula pubescens.* There is some dumping in this area.

Improved grassland (GA1)

This habitat is found within the BnM boundary along the south-east boundary of the site. It is managed as private land and adjacent fields (outside the boundary) have also been reclaimed. These fields were used for grazing cattle and producing fodder (hay).

Scrub (WS1)

This habitat appears along the fringes of the production area, mainly along the boundaries. Several different communities are present.

Part of the western boundary is marked by a band of dense *Ulex europaeus*. This *Ulex* dominated scrub has developed on some un-disturbed high bog that was left uncut and also on some ridges of spoil that were piled up in the past. Other species present include *Salix cinerea*, *Salix aurita*, *Alnus glutinosa*, *Rubus fruticosus*, *Pteridium aquilinum*, *Crataegus monogyna* and *Betula pubescens*. This habitat forms a mosaic with Dense Bracken (HD1) along parts of the western boundary.

Stream (FW2)

A stream marks part of the western boundary of the site. This stream is part of the River Brosna catchment and flows north. It is found in a deep trench adjacent to the track to the mobile phone mast and the banks and riparian zone are somewhat disturbed from the recent development of this track. . Semi-aquatic species found along the stream channel include *Typha latifolia*, *Cirsium palustre*, *Mentha aquatica*, *Agrostis stolonifera*, *Nasturtium officinale, Apium nodiflorum, Epilobium hirsutum*, Lolium perenne and *Filipendula ulmaria.* The eastern bank is quite disturbed and is revegetating, while the western bank is vegetated with *Ulex*-dominated scrub.

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 increasing risks of siltation, 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 plant species have been recorded at Oughter 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 works 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[4] will be adhered with throughout all rehabilitation measures and activities.

[4] 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 Boora Bog Group (Ref. P0500-01). 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 Boora 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 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.

Oughter Bog is located in an area zoned by Offaly County Council as open countryside.

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 XII). The recommendations of this assessment will be 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.

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 Móna's 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 Oughter 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. Bord na Móna have now announced the complete cessation of industrial peat production across its estate (January 2021). 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 2021 (Draft)

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 license 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	Oughter 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	Decommission and Removal of Porto-cabin tea centre and materials store
5	Decommissioning Fuel Tanks and associated facilities	Decommissioning and De-Gassing Mobile Fuel Tanks
6	Decommissioning and Removal of Bog Pump Sites	Not Applicable
7	Decommissioning or Removal of Septic Tanks	Not Applicable

In addition, condition 7 of the license 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 license 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.

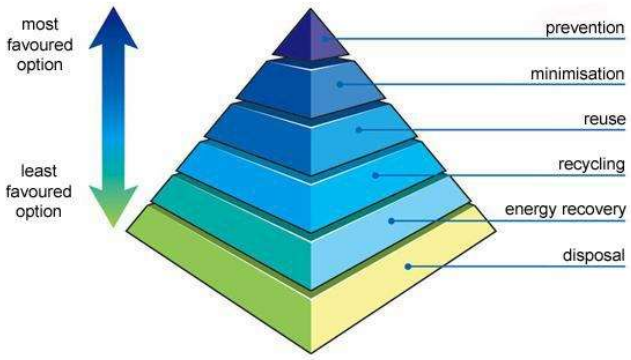
7.3.5 The tonnages and EWC Code for the waste materials listed in *Schedule 2(i) Hazardous Wastes for Disposal/Recovery* and *Schedule 2(ii) Other Wastes for Disposal/Recovery* sent off-site for disposal/recovery.

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 license, 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 license.

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 license. 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	Oughter Decommissioning Plan
1	Removal of Railway Lines	Removal of Railway Lines
2	Decommissioning Bridges and Underpasses	Where feasible
3	Decommissioning Railway Level Crossing	Decommissioning Railway Level Crossing
4	Restricting Access (bog 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.*

Environmental stabilisation: The key objective of peatland rehabilitation is **environmental stabilisation** of the former industrial peat production areas and the stabilisation of any potential emissions from the bog that related to the former industrial peat extraction activities.

Environmental stabilisation is defined as:

- Carrying out planned peatland rehabilitation.

- Setting former bare peat industrial peat production areas on a trajectory towards naturally functioning peatland habitats, via planned peatland rehabilitation, the restoration of wetter hydrological conditions and encouragement of natural colonisation.
- Stabilisation or downward trajectory of key water quality parameters (e.g. suspended solids, ammonia),
- Meeting IPC Licence conditions.

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 may also 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 P0500-01, Boora Group of Bogs in County Offaly.

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 Boora 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 P0500-01 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 Boora 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 Boora IPPC Licence P0500-01.

APPENDIX X. CONSULTATION SUMMARIES

Table APXI -1 Consultees contacted

Bog Name	Contact Organisation	Contact Name	Date of Issue	Communication Format	Date Response Received	Response format
Pollagh/Oughter	Offaly County Council - Chief Executive	Anne-Marie Delaney	08/01/2021	E-mail		
Pollagh/Oughter	Offaly County Council - Senior Planner	Andrew Murray	04/01/2021	E-mail		
Pollagh/Oughter	Offaly County Council - Heritage Officer	Amanda Pedlow	04/01/2021	E-mail		
Pollagh/Oughter	Offaly County Councillors - Birr District	Cllr. John Carroll	04/01/2021	E-mail		
Pollagh/Oughter	Offaly County Councillors - Birr District	Cllr. John Clendennon	04/01/2021	E-mail		
Pollagh/Oughter	Offaly County Councillors - Birr District	Cllr. Eamonn Dooley	04/01/2021	E-mail		
Pollagh/Oughter	Offaly County Councillors - Birr District	Cllr. John Leahy	04/01/2021	E-mail		
Pollagh/Oughter	Offaly County Councillors - Birr District	Cllr. Clare Claffey	04/01/2021	E-mail		
Pollagh/Oughter	Offaly County Councillors - Birr District	Cllr. Peter Ormond	04/01/2021	E-mail	24/01/2021	E-mail
Pollagh/Oughter	Offaly County Councillors - Tullamore District	Cllr. Neil Feighery	04/01/2021	E-mail		
Pollagh/Oughter	Offaly County Councillors - Tullamore District	Cllr. Tony McCormack	04/01/2021	E-mail		
Pollagh/Oughter	Offaly County Councillors - Tullamore District	Cllr. Declan Harvey	04/01/2021	E-mail		
Pollagh/Oughter	Offaly County Councillors - Tullamore District	Cllr. Sean O'Brien	04/01/2021	E-mail		

Pollagh/Oughter	Offaly County Councillors - Tullamore District	Cllr. Ken Smollen	04/01/2021	E-mail		
Pollagh/Oughter	Offaly County Councillors - Tullamore District	Cllr. Frank Moran	04/01/2021	E-mail		
Pollagh/Oughter	Offaly County Councillors - Tullamore District	Cllr Danny Owens	04/01/2021	E-mail		
Pollagh/Oughter	TD Laois/Offaly	Barry Cowen	04/01/2021	E-mail		
Pollagh/Oughter	TD Laois/Offaly	Charlie Flanagan	04/01/2021	E-mail		
Pollagh/Oughter	TD Laois/Offaly	Sean Fleming	04/01/2021	E-mail		
Pollagh/Oughter	TD Laois/Offaly	Carol Nolan	04/01/2021	E-mail	25/01/2021	E-mail
Pollagh/Oughter	TD Laois/Offaly	Brian Stanley	04/01/2021	E-mail		
Pollagh/Oughter	Eastern and Midland Regional Assembly		04/01/2021	E-mail		
Pollagh/Oughter	Environmental Protection Agency	Brian Meeney	04/01/2021	E-mail		
Pollagh/Oughter	National Parks and Wildlife Service	Brian Lucas	04/01/2021	E-mail		
Pollagh/Oughter	NPWS Regional Network	District Conservation Officer	12/01/2021	E-mail		
Pollagh/Oughter	Dept of the Housing Local Government and Heritage	Malcom Noonan (Minister of State at the Department of Housing, Local Government and Heritage)	06/01/2021	E-mail		
Pollagh/Oughter	National Monuments Service	Margaret Keane	04/01/2021	E-mail		
Pollagh/Oughter	National Museum of Ireland (Irish Antiquities Division)	Isabella Mulhall	04/01/2021	E-mail		
Pollagh/Oughter	Minister for Environment, Climate and Communications	Minister - Eamon Ryan	06/01/2021	E-mail		
Pollagh/Oughter	Minister of state for Agriculture with responsibility for Land use and Biodiversity	Pippa Hackett Minister of State for Land Use and Biodiversity	06/01/2021	E-mail		
Pollagh/Oughter	Inland Fisheries Ireland	General e-mail contact	04/01/2021	E-mail		
Pollagh/Oughter	Waterways Ireland	General e-mail contact	04/01/2021	E-mail	24/01/2021	E-mail
Pollagh/Oughter	The Heritage Council	Lorcán Scott	04/01/2021	E-mail	04/01/2021	E-mail

Pollagh/Oughter	An Forum Uisce (The Water Forum)	General e-mail contact	04/01/2021	E-mail		
Pollagh/Oughter	An Taisce	General e-mail contact	04/01/2021	E-mail		
Pollagh/Oughter	Friends of the Earth	Oisin Coughlan	04/01/2021	E-mail		
Pollagh/Oughter	Friends of the Irish Environment	General e-mail contact	04/01/2021	E-mail		
Pollagh/Oughter	Birdwatch Ireland	General e-mail contact	04/01/2021	E-mail		
Pollagh/Oughter	Irish Peatlands Conservation Council	General e-mail contact	04/01/2021	E-mail	25/01/2021	E-mail
Pollagh/Oughter	Irish Wildlife Trust	General e-mail contact	04/01/2021	E-mail		
Pollagh/Oughter	Bat Conservation Ireland	General e-mail contact	04/01/2021	E-mail		
Pollagh/Oughter	Woodlands of Ireland	General e-mail contact	04/01/2021	E-mail		
Pollagh/Oughter	Butterfly Conservation Ireland	Jesmond Harding/info email	04/01/2021	E-mail	12/01/2021	E-mail
Pollagh/Oughter	Community Wetlands Forum (part of Irish Rurallink)	General e-mail contact	04/01/2021	E-mail		
Pollagh/Oughter	Turf Cutters and Contractors Association	Postal Address	15/01/2021	Post		
Pollagh/Oughter	Offaly Public Participation Network (PPN)	General e-mail contact	04/01/2021	E-mail		
Pollagh/Oughter	Sustainable Water Action Network (SWAN)	http://www.swanireland.ie/	04/01/2021	E-mail		
Pollagh/Oughter	Irish Farmers Association (Laois Offaly and Westmeath Office)	General e-mail contact	04/01/2021	E-mail	23/01/2021	E-mail
Pollagh/Oughter	Irish Farmers Association (Head Office)	General e-mail contact	04/01/2021	E-mail	23/01/2021	E-mail
Pollagh/Oughter	National Association of Regional Game Councils	Email - nargc@nargc.ie	04/01/2021	E-mail		
Pollagh/Oughter	Midlands National Shooting centre	General e-mail contact	04/01/2021	E-mail	24/01/2021	E-mail
Pollagh/Oughter	ICMSA (Irish Creamery Milk Suppliers Association)	General e-mail contact	04/01/2021	E-mail		
Pollagh/Oughter	ICSA (Irish Cattle and Sheep Farmers Association	General e-mail contact	04/01/2021	E-mail		
Pollagh/Oughter	Midlands & East Regional WFD Operational Committee	Ray Spain Co-ordinator Local Authority Water Programme	04/01/2021	E-mail		

Pollagh/Oughter	Shannon Flood Risk State Agency Co-ordination Working Group	Jackie Stewart - Flood Risk management Policy	04/01/2021	E-mail		
Pollagh/Oughter	CARO (Climate Action Regional Office) Eastern and Midlands	Alan Dunney	04/01/2021	E-mail		
Pollagh/Oughter	Ferbane Tidy Towns	General e-mail contact	04/01/2021	E-mail		
Pollagh/Oughter	Tullamore Tidy towns	General e-mail contact	04/01/2021	E-mail		
Pollagh/Oughter	Dr. Catherine Farrell Trinity College	General e-mail contact	Contact Initiated by Stakeholder		22/01/2021	E-mail
Pollagh/Oughter	Erin Rovers GAA Club	General e-mail contact	Contact Initiated by Stakeholder		25/01/2021	E-mail
Pollagh/Oughter	Francis Kenna OPW	General e-mail contact	Contact Initiated by Stakeholder		22-23/01/2021	E-mail
Pollagh/Oughter	Dr. John Connolly Trinity College	General e-mail contact	15/01/2021	E-mail and virtual meeting	24/01/2021	E-mail
Pollagh/Oughter	Just Forests	Tom Roche	04/01/2021	E-mail	04/01/2021	E-mail
Pollagh/Oughter	Pollagh Residents Development Association	Caitriona Devery	Contact Initiated by Stakeholder		24/01/2021	E-mail
Pollagh/Oughter	Thomas Joseph Donnellan- Local Resident		Contact Initiated by Stakeholder		07/01/2021	E-mail
Pollagh/Oughter	Tullamore Tribune	Gearoid Keegan	Contact Initiated by Stakeholder		04/01/2021	E-mail
Pollagh/Oughter	Matthew English- Local resident		Contact Initiated by Stakeholder		12/02/2021	E-mail
Pollagh/Oughter	Kieran Keenaghan- Local resident		Contact Initiated by Stakeholder		05/01/2021	E-mail

Pollagh/Oughter	Christina Buckley - Local resident		Contact Initiated by Stakeholder		06/01/2021	E-mail
Pollagh/Oughter	Marie Regazzoli - Local resident		Contact Initiated by Stakeholder		07/01/2021	E-mail
Pollagh/Oughter	Oliver Buckley- Local resident		Contact Initiated by Stakeholder		07/01/2021	E-mail
Pollagh/Oughter	Caitriona Hilliard- Local resident		Contact Initiated by Stakeholder		24/01/2021	E-mail

Table APXI -2 Response summary from Consultees contacted

Organisation	Summary of Response by Stakeholder	BnM Response
Offaly County Councillors - Birr District	Cllr. Peter Ormond contacted BnM to make submission on the rehabilitation of Pollagh/Oughter on behalf of Fianna Fáil councillors on Offaly County Council. A number of concerns were raised in the submission; 1) Advised that the Fianna Fáil council members are concerned at the short notice period prior to the end of the consultation process for PCAS 2) Request for details on the consultation process by BnM to date 3) Advised that PCAS should be considerate of the social, cultural, economic, industrial and ecclesiastical history of the region in which it takes place 4) Expressed interest and support for comments regarding natural capital by BnM staff during interviews with The Irish Times 5) A number of specific questions were asked of BnM including; • What is the acreage of each of the bogs covered by this submission and what percentage of that total area will be re-wetted or regenerated? • Given that peat production has long ceased in Derries, Oughter and Pollagh bogs are we correct in assuming that re-wetting of these two bogs is the only option • Please clarify what amenity opportunities exists for these three bogs • What opportunities have been examined and have any plans been considered • Will the swing bridge over the Grand Canal at Turraun and the Bridge north of that bridge over the river Brosna linking Lemonaghan bog to Boora bog remain in place? • How is the stewardship of the cutaways going to be addressed • Will there be a risk assessment carried out in relation to Outfalls, Deep Drains, and Silt Ponds • Will fire breaks be provided in each of the bogs • What plans are being put in place to protect the environment from fire risks? • The need to enforce litter control cannot be overstated.	Response 26/01/2021, acknowledgement, all concerns addressed in future drafts of rehab plans and that stakeholder engagement had been increased by 3 weeks.

Offaly County Council	Request for all draft rehabilitation plans in Co. Offaly.	BnM provided the requested documents. A virtual meeting, including a general PCAS presentation, was held for Offaly County Council on 10/02/2021
Offaly County Council	Offaly County Council e-mailed a submission to outline potential for integration of PCAS with opportunities regarding the Offaly County Council Inaugural Digital Strategy 2020-2022.	A meeting on Offaly's digital strategy was held between BnM and Offaly County Council on 04/03/2021.
Offaly County Council	Submission provided on behalf on Offaly County Council on a number of PCAS bogs including Oughter on 22/02/2021. Key points raised were; 1) Requested that details of security fencing to be identified and detailed on plans. 2) Long term rehabilitation plan to be provided addressing above areas of consideration post 2024 if required. 3) Public Rights of Way access locations are to be maintained with relevant stakeholders and marked on drawings. 4) A number of technical issues with draft rehabilitation plans. 5) Advised BnM to carefully consider after use of bogs as part of PCAS 6) Request that the impact of PCAS on surrounding roads be considered as part of rehabilitation plans. 7) Advised that long term management (post 2024) is considered by BnM. 8) Advised that Appropriate assessment and the habitats directive are taken into account by BnM. 9) Advised that BnM consider management of flooding & water pollution, fire risk, invasive species and waste management as part of PCAS.	A virtual meeting/general presentation on PCAS to between BnM and Offaly Councillors and OCC personnel was conducted on 10/02/2021. BnM provided further PCAS documentation on request, via e-mail on 27/01/2021. Refer to Section 4 for response on issues raised. Dialogue with Offaly County Council is ongoing.
Irish Peatlands Conservation Council	"Responded to consultation regarding Pollagh/Oughter and the PCAS project at large to express support for the project and list a number of comments on how the project might be improved; 1) Potential for inclusion of local environmental groups in species specific conservation plans 2) Requested that a map of potentially suitable areas for such projects should be included in rehab plans 3) Promoted the idea of creating a biodiversity action plan that considers the use of site by all relevant stakeholders 4) Recommended following the NPWS community engagement strategy as it was largely successful in bring local communities along with restoration projects	"BnM responded 25/01/2021, all issues raised will be taken into account in future drafts of plan. Also advised that; 1) We have included DOC as an additional parameter on our suite of water monitoring analysis. 2) BnM are working with Lawco and WFD to align the BNM monitoring programme with the EPA's 2021 Monitoring programme 3) BnM have an extensive community consultation process ongoing with a dedicated Community Liaison Officer communicating to affected and interested parties

NPWS Regional Network	NPWS responded through e-mail thread on the 02, 03,07,09/12/2020 in relation to all PCAS bogs. The main points discussed were to advise of the requirement to investigate if assessment under the SEA and Birds directives for each site.	BnM acknowledged via e-mail to address queries on 09/12/2021. Also, a phone conversation with local NPWS Conservation Ranger on 11/01/2021 discussed biodiversity and rehabilitation measures on PCAS bogs including Oughter.
National Museum of Ireland (Irish Antiquities Division)	Responded through e-mail 28/12/2020 in relation to all PCAS bogs. 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 on 28/12/2020 to assure BnM will give due cognisance to all points within all rehabilitation plans for Oughter Bog. A virtual meeting on PCAS between BnM and NMI was held on 18/01/2021
Irish Farmers Association	Responded to consultation regarding Oughter and the PCAS project at large on multiple dates throughout ongoing discourse. Specific submission on Oughter Bog received from Westmeath, Offaly and Laois 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 4) Reiterated the desire of the IFA that people who have been cutting turf on bogs should retain this right.	A working group has been established at a high level between BnM and IFA on various issues including PCAS. A meeting was held between BnM and IFA representatives on 18/02/2021 to present details on PCAS. Dialogue is ongoing.
LS (The Heritage Council)	Responded to consultation via e-mail on 04/01/2021 asking for more information on PCAS in general and looking to be involved in any seminar or information events.	BnM responded via phone conversation on 11/01/2021. Dialogue is ongoing.
Dept. of Agriculture, Food & the Marine (DAFM)	Submission by e-mail to express support for PCAS in general. Submission 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 on 02/03/2021to assure that all points raised within the submission will be considered. A virtual meeting/PCAS presentation was held for DAFM on 11/12/2020.

Erin Rovers GAA Club	"Erin Rovers GAA club contacted BnM to make submission on the rehabilitation of Pollagh/Oughter. A number of concerns were raised in the submission. 1) The social impact (including job loss) involved in industrial closure of bog sites 2) The increase in anti-social activity (e.g. fly tipping) involved in under managed sites 3) Re-iterated the responsibility of BnM to communities in the area as an employer 4) Request for funding aide to club as gesture of good will to community	BnM acknowledged and will give due cognisance to all points within the rehabilitation plan for Pollagh/Oughter Bogs. BnM raised responded via e-mail.
OPW	"A flood relief engineer for OPW contacted BnM to request rehab plans for Pollagh/Oughter. A submission on the rehabilitation of Pollagh/Oughter on behalf of several un-named concerned members of the Pollagh community was then made 23/01/2021. A number of concerns were raised in the submission; 1) The residents are unhappy with the low level of consultation undertaken by BnM for the project. 2) The perceived risks associated with altering the hydrological regime of the bog was highlighted and a request for detailed hydrological assessment was made 3) Request for details on the drainage management plans for the bog 4) Health and safety concerns were raised regarding high water levels on the rehabilitated bog 5) Request for clarification on post PCAS amenity use of bogs was made	BnM acknowledged and will give due cognisance to all points within the rehabilitation plan for Pollagh/Oughter Bogs. BnM raised responded via e-mail.
Trinity College	"A researcher at Trinity College, Dublin, made a submission by e-mail 24/01/2021. The following points were raised; 1) Advised that the consultation phase of the project should be given more time 2) Advised that there is little evidence of pre-project and post-project measurement 3) Advised that further community engagement with local stakeholders and research based stakeholders would benefit the project	BnM acknowledged and will give due cognisance to all points within the rehabilitation plan for Pollagh/Oughter Bogs. BnM raised responded via e-mail.
Just Forests	Submission requesting information on the PCAS consultation phase.	BnM acknowledged and will give due cognisance to all points within the rehabilitation plan for Pollagh/Oughter Bogs. BnM raised responded via e-mail.

Pollagh Residents Development Association	"The Pullough Residents Development Association made a submission on Pollagh/Oughter bogs by e-mail 24/01/2021. A number of issue were raised, including; 1) Advised that the consultation process was too short for meaningful engagement 2) Request for clarification on how local community groups can be actively involved in future use of site 3) Support and endorse the commitment from BnM to minimise impacts of PCAS on adjacent landowners 4) Request for clarification on the future ownership/maintenance of the bog post PCAS 5) Advised that there is large potential for environmental recreation and amenity development at site and request that PRDA are involved in any consultation or plans for after use of the bog 6) Advise that a holistic approach must be taken to bog rehabilitation with each plan developed with the surrounding bogs, communities and landscapes in mind 7) Advise that BnM should strive to employ local people where possible to alleviate impact of job loss brought about by industrially peat harvest cessation	BnM acknowledged and will give due cognisance to all points within the rehabilitation plan for Pollagh/Oughter Bogs. BnM raised responded via e-mail.
Local Resident A	A local resident (A) made a submission by e-mail 07/01/2021 to request draft rehab plans and query drain blocking locations with a view to acquiring reassurance that his land would not flood as a result of PCAS.	BnM responded via e-mail to provide plans and assure Mr. Donnellan that BnM would take all precautions to avoid adverese impacts on adjoining lands during PCAS.
Tullamore Tribune	E-mail request for draft rehabilitation plans for Pollagh/Oughter bogs.	BnM responded via e-mail to make Mr. Keegan aware that further information and plans would be made available as soon as possible
Local resident B	"A local resident (B) made a submission by e-mail 12/02/2021. A number of concerns were raised including; 1) Perceived increase in flood risk 2) Expressed concern for the conservation of Grey Partridge and potential habitat loss as a result of PCAS	BnM contacted through community liaison officer.
Local resident C	A local resident (C) made a submission by e-mail to request information on PCAS	BnM responded via e-mail to provide the requested information on PCAS
Local resident D	A local resident (D) made a submission by e-mail to request information on PCAS	BnM responded via e-mail to provide the requested information on PCAS
Local resident E	A local resident (E) made a submission by e-mail to request information on PCAS	BnM responded via e-mail to provide the requested information on PCAS

Local resident F	A local resident (F) made a submission by e-mail to express concerns regarding the potential increased risk of flooding as a result of PCAS	
Local resident G	A local resident (G) made a submission by e-mail in which the following points were raised; 1) Amenity nature walks and facilities are considered as part of PCAS works 2) The consideration of wild camping as a potential revenue source 3) Consider pursuit of designation for area as a dark skies astronomy reserve 4) Advised that the post industrialised bogs should be considered for biomass hydrogen production facilities	BnM acknowledged and will give due cognisance to all points within the rehabilitation plan for Pollagh/Oughter Bogs. BnM raised responded via e-mail.

APPENDIX XI. ARCHAEOLOGY

Archaeological Impact Assessment of Proposed Bog Rehabilitation at Oughter Bog, Co. Offaly. Dr. Charles Mount. Nov 2020.

Archaeological Impact Assessment of Proposed Bog Decommissioning and Rehabilitation at Oughter Bog, Co. Offaly

Report For

Bord Na Móna Energy Ltd.

Author

Dr. Charles Mount

Bord Na Móna Project Archaeologist

Introduction

This archaeological impact assessment report was prepared by Dr. Charles Mount for Bord na Móna Energy Ltd. It represents the results of a desk-based assessment of the impact of proposed bog rehabilitation on c.358 hectares at Oughter Bog, Co. Offaly on the known archaeological heritage of the bog. The proposed rehabilitation actions will be a combination of measures to re-wet peat as outlined in the draft Methodology Paper (EDRRS). These enhanced measures for Oughter Bog will include:

- Re-wetting residual peat areas on the bog using berms and field re-profiling. This 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.
- In some areas, a cut-and-fill cell bunding technique is proposed. The cut and fill cell bunding approach aims to create 'saucers' or flat bunded areas (cells) on peat with berms to hold shallow water at appropriate levels.
- Re-wetting some areas of the bog through regular field drain blocking using a dozer/excavator to create three peat barriers every 100 m along each field drain.
- Re-alignment of piped drainage.
- Blocking drains in targeted existing pioneering vegetation mosaics, to accelerate re-wetting, and/or manage water levels to the correct height to accelerate the current trajectory towards Reed swamp and fen, using a dozer/excavator.
- Targeted fertiliser applications to accelerate vegetation establishment on headlands and high fields. (It is noted that the application of fertiliser may need additional assessment and approval as per the IPC Licence).
- Modifying water levels at outfalls, as it may be desirable to change and control water levels at the site over time, e.g. to increase water levels as the site becomes increasingly vegetated. This will further slow the movement of water through and out of Oughter Bog. It may be desirable to change and control water levels at the site over time, e.g. to increase water levels as the site becomes increasingly vegetated.
- 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).
- Seedling of vegetation is not required at this site as natural colonisation and the development of pioneer habitats is already significantly progressed.

Oughter Bog is located c. 4km northwest of Blueball, Co. Offaly. The R357 road runs along the southern extent of the bog. The bog occupies the townlands of Derrycooly, Derryooly, Derrinvullig, Oughter, Derrymore and Cully on OS 6 inch sheets Offaly 15, 16, 23 and 24.

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 Oughter Bog. The extent of the rehabilitation is indicated in Fig. 1. This area was examined using information from the:

- The Bord na Móna Peatland 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

Recorded Monuments

The Record of Monuments and Places (RMP) for Co. Offaly which was established under Section 12 of the National Monuments (Amendment) Act, 1994 was examined as part of the assessment (DAHGI 1995). This Record was published by the Minister in 1995 and includes sites and monuments that were known in Oughter Bog before that date. This review established that there are no RMPs situated in the proposed rehabilitation area or vicinity (see Fig. 1). The closest RMP to the rehabilitation area OF024-002---- the present location of an Inscribed stone in Derrymore townland, is located more than c.0.9km south of the rehabilitation area.

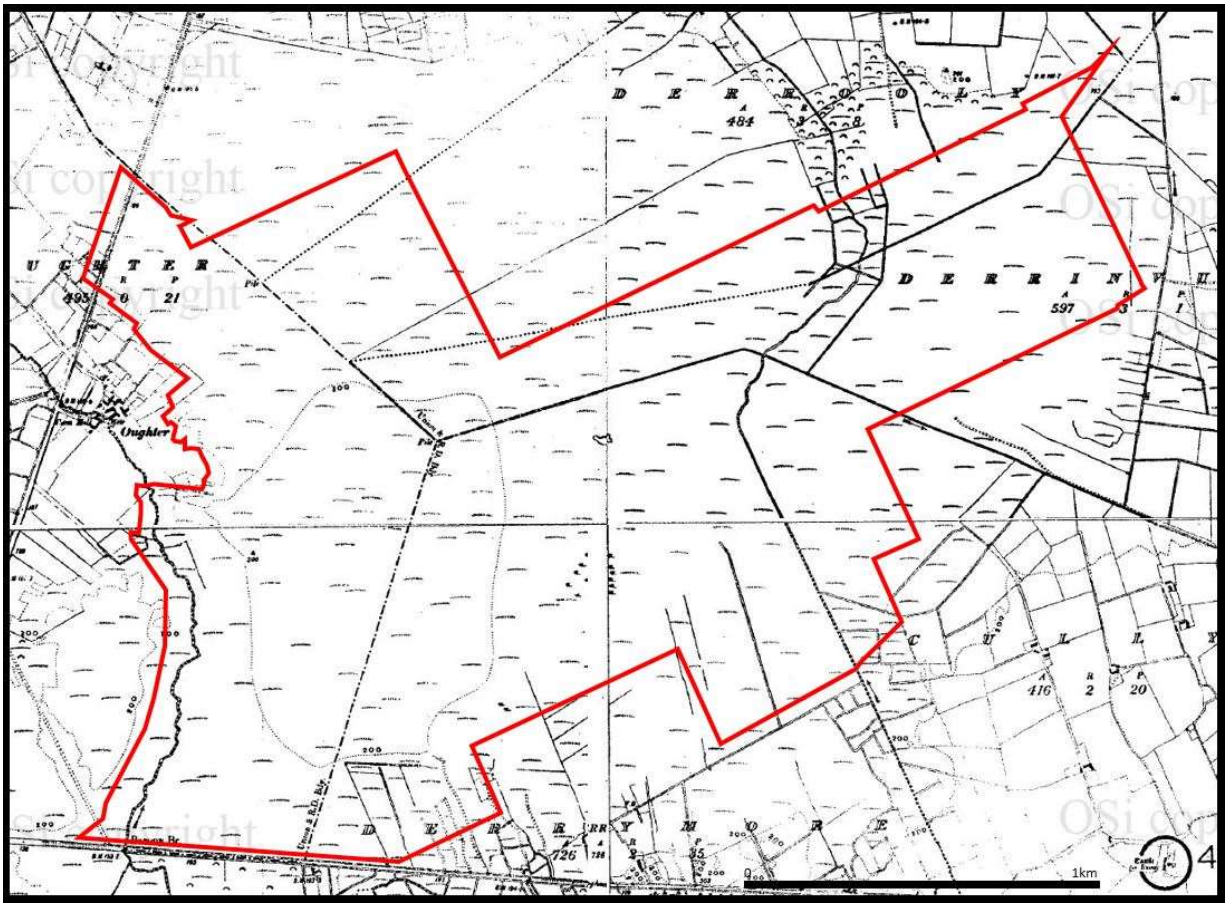


Fig. 1. Oughter Bog, Co. Offaly, detail of the Record of Monuments and Places map sheets No. 15, 16, 23 and 24. The proposed rehabilitation area is outlined with the red line. There are no Recorded Monuments in the area.

Peatland survey

Oughter Bog was surveyed by the Irish Archaeological Wetland Unit in 1993 as part of the Archaeological Survey of Ireland Peatland Survey. There were no archaeological sites recorded during the survey. No further archaeological work has taken place in the bog since 1993.

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 3rd of November 2020. The SMR consists of records included in the RMP and sites and monuments notified to the Dept. since the

publication of the RMP. This review established that there are no monuments entered in the SMR in the proposed rehabilitation area (See Fig. 2).

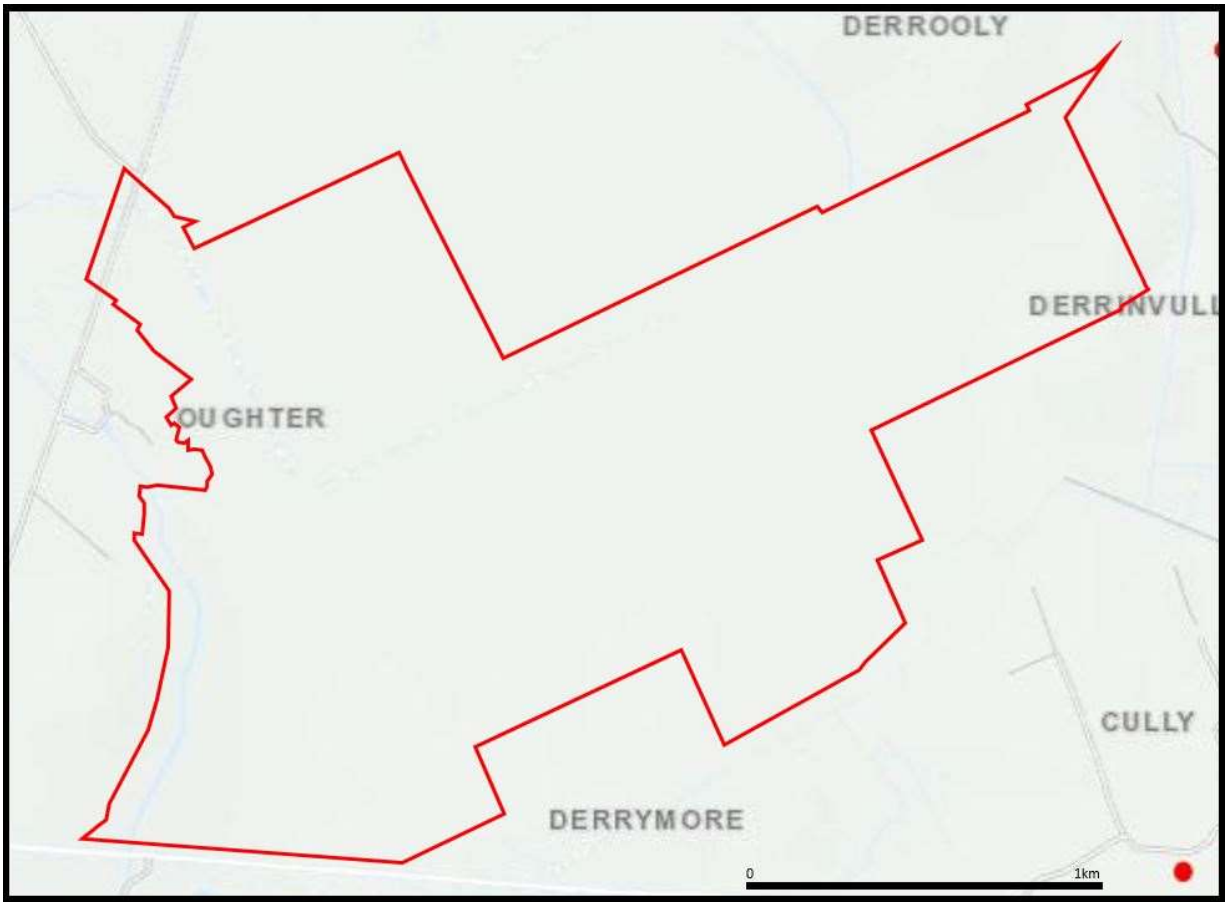


Fig. 2. Oughter Bog, Co. Offaly, detail of the Sites and Monuments Record. The proposed rehabilitation area is outlined with the redline. There are no SMRs in the area.

Archaeological investigations

Reports of archaeological excavations and licensed monitoring in the study area listed in the excavations database at excvations.ie were examined as part of the assessment. There are no reports of archaeological investigations carried out in the rehabilitation area.

Reported finds

No reports of archaeological finds from Oughter Bog are recorded in the topographical files of the National Museum of Ireland.

Previous assessments

Oughter bog has been the subject of an Environmental Impact Assessment Report caried out by Irish Archaeological Consultancy Limited in 2018 for Bord na Móna Energy Limited in relation to IPC Licence P0500-01. The assessment identified no extant archaeological material in the rehabilitation area but concluded that:

Wetlands and Peatlands are considered as Areas of Archaeological Potential for their potential to contain archaeological organic preserved remains. Wetlands also provide a significant resource for environmental analysis. It must be considered therefore that there remains a moderate potential for additional buried features to be uncovered during the course of any future development works in Oughter Bog.

Impact assessment

There are no known items of archaeological heritage in the rehabilitation area. The proposed rehabilitation will have no impact on any known archaeological material in the application area or the vicinity. In the worst-case scenario works affecting the surface and sub-surface of the bog might disturb previously unknown archaeological deposits or artefacts without preservation by record taking place.

Recommendations

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.

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 are no known items of archaeological heritage in the rehabilitation area. 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 the Bord na Móna Archaeological Liaison Officer and the National Museum of Ireland.

References

DAHGI 1995. Recorded Monuments Protected under Section 12 of the National Monuments (Amendment) Act, 1994. County Offaly.

Mackin *et al.* 2017. Best practice in raised bog restoration in Ireland. Irish Wildlife Manuals, No. 99. National Parks and Wildlife Service,

Dr. Charles Mount
19 November 2020

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

22

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 ……

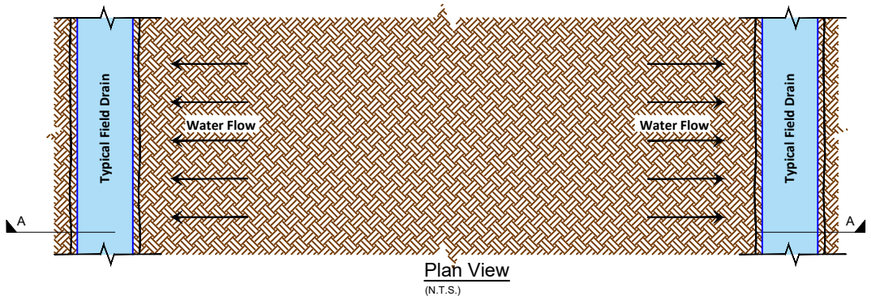
3) Records

Revision Index			
Revision	Date	Description of change	Approved
1	13/09/2020	First release	EMcD
2			

Appendix D Methodology Drawings PCAS-0100-001

Existing Layout:

Typical existing bare peat fields are cambered (higher) in the centre and lower towards the drains, helping drainage of the fields but limiting the re-wetting of the central area.
The concept of drain blocking is to raise the water levels in the drains to re-wet the cutaway and slow the water movement through the bog.



Plan View
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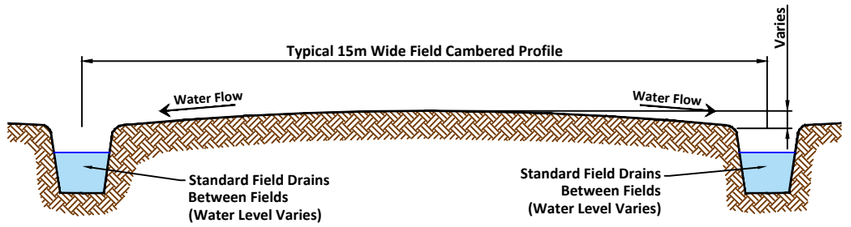
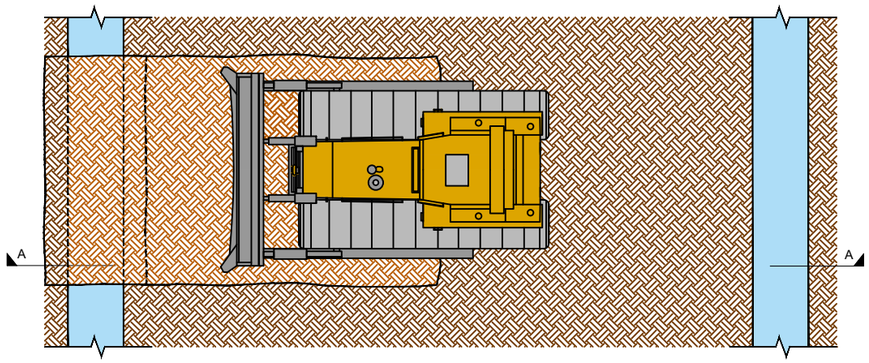


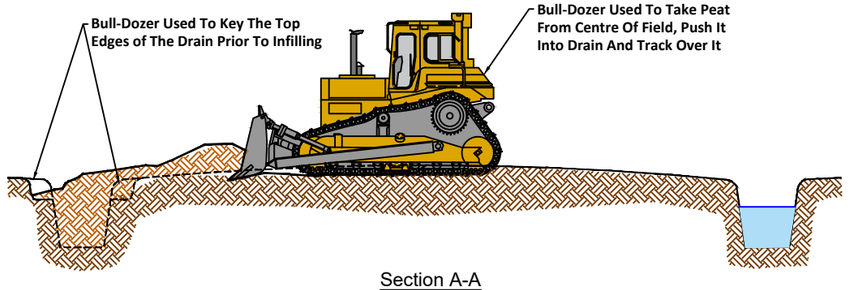
Section A-A
(N.T.S.)

Phase 1
Forming 'Speed Bump'

The Bull-dozer is used to create a 5m Length key along both edges of the drain, approximately 500mm Wide x 500mm Deep.
Next a strip of peat is taken from the central camber of the field, pushed into the drain and compacted by the bull-dozer tracking over the drain block, to form an approximately 5m Wide 'Speed Bump'.



Plan View

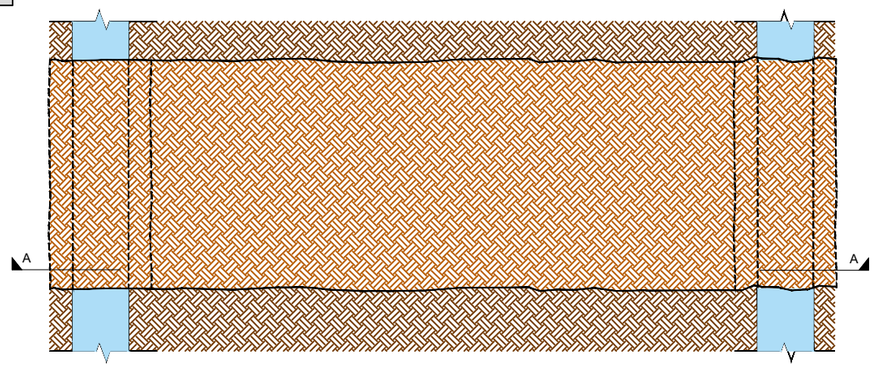


Section A-A
(N.T.S.)

Plan View
(N.T.S.)

Complete Fields With Speed Bump (3 Per 100m)

Drain Blocks are built up at least 300mm-500mm above the existing ground level to allow for peat subsidence and to prevent water from flowing over the drain block and eroding it before it becomes stabilised.



Plan View
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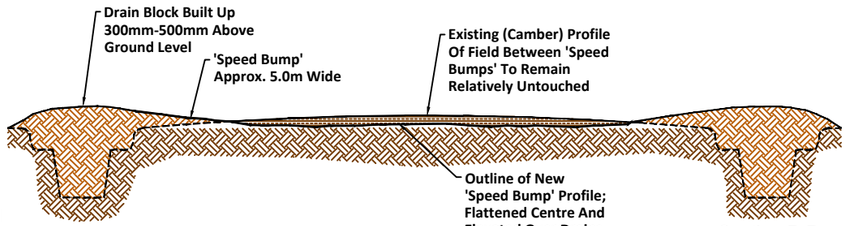

Section A-A
(N.T.S.)

Section B-B
(N.T.S.)

NOTES:

1. FIGURED DIMENSIONS ONLY TO BE TAKEN FROM THIS DRAWING
2. REFER TO RELEVANT SITE PLAN TO ENSURE SPECIFIC DRAIN BLOCKS HAVE BEEN INSTALLED DOWNSTREAM PRIOR TO COMMENCING ANY RE-PROFILING WORKS, TO RETAIN ANY SILT THAT MAY ENTER THE DRAINS.
3. REFER TO RELEVANT SITE PLAN FOR No. OF DRAIN BLOCKS SPECIFIED PER 100M DRAIN LENGTH.
4. REFER TO RELEVANT SITE PLAN FOR SPECIFIC FINISHED GROUND LEVELS TO BE ACHIEVED.
5. ALL DETAILS TO BE AGREED WITH BORD NA MONA OPERATIONS PRIOR TO CONSTRUCTION.
6. OPERATORS TO CONFORM WITH ALL STANDARD OPERATING PROCEDURES.
7. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE SPECIFICATION FOR THE PARTICULAR BOG AND WITH THE REQUIREMENTS OF THE REHABILITATION PLAN, ANY NATURA IMPACT STATEMENT RECOMMENDED MEASURES IF APPLICABLE, ARCHAEOLOGY REPORTS AND ANY OTHER SPECIFIC ECOLOGICAL MEASURES OR ENVIRONMENTAL REPORTS FOR THIS BOG.

STATUS

Rev	Description	Issued By	Date
.		.	.
.		.	.
c	For Approval	P.K.	03/03/21
b	'Key' Added To Top Edges Of Drain at Drain Block Locations	P.K.	09/02/21
a	Issued For Information	P.K.	29/01/21

BORD NA MÓNA
Naturally Driven
Bord Na Móna Engineering Department
LEABEG, TULLAMORE CO. OFFALY
Tel. 057 9345900
Fax. 057 9345160

PROJECT:
Peatland Climate Action Scheme
PCAS

TITLE:
Rehabilitation Method DCT 2
'Speed Bump' Peat Drain Block

Drawn By:		Checked By:		Approved:
CAD	Designer	Discip. Lead	Design Lead	Design Manager
P.K.	-	D.K.	P.N.	P.N.
Date: 13/01/21		Scale : Not to Scale	A3	Stage: For Approval
Drawing No.: PCAS-0100-008				Rev: c

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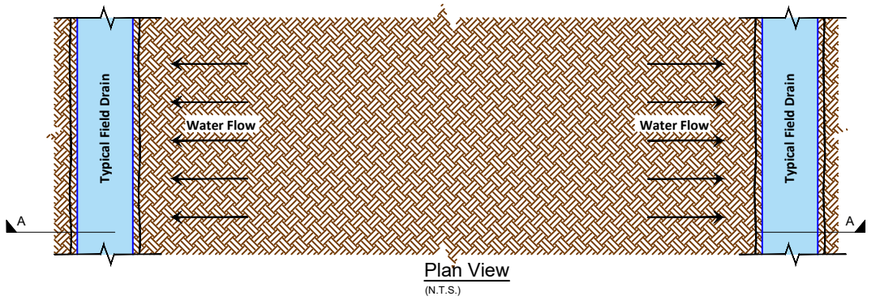
Existing Layout:

Typical existing bare peat fields are cambered (higher) in the centre and lower towards the drains, helping drainage of the fields but limiting the re-wetting of the central area.
The concept of Cross berms is to slow the water movement through the bog.



Plan View
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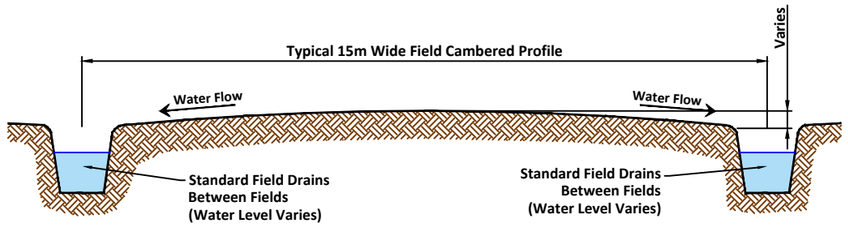

Section A-A
(N.T.S.)

NOTES:

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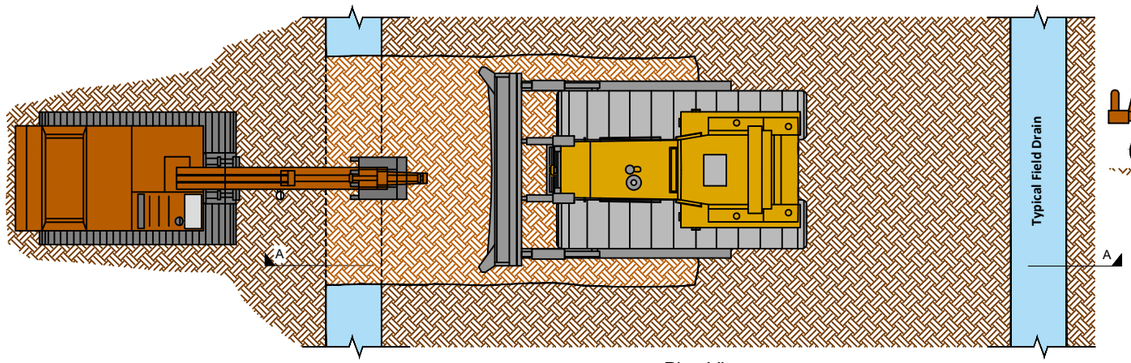
2. REFER TO RELEVANT SITE PLAN TO ENSURE SPECIFIC DRAIN BLOCKS HAVE BEEN INSTALLED DOWNSTREAM PRIOR TO COMMENCING ANY RE-PROFILING WORKS, TO RETAIN ANY SILT THAT MAY ENTER THE DRAINS.
3. REFER TO RELEVANT SITE PLAN FOR No. OF DRAIN BLOCKS SPECIFIED PER 100M DRAIN LENGTH.
4. REFER TO RELEVANT SITE PLAN FOR SPECIFIC FINISHED GROUND LEVELS TO BE ACHIEVED.
5. ALL DETAILS TO BE AGREED WITH BORD NA MONA OPERATIONS PRIOR TO CONSTRUCTION.
6. OPERATORS TO CONFORM WITH ALL STANDARD OPERATING PROCEDURES.
7. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE SPECIFICATION FOR THE PARTICULAR BOG AND WITH THE REQUIREMENTS OF THE REHABILITATION PLAN, ANY NATURA IMPACT STATEMENT RECOMMENDED MEASURES IF APPLICABLE, ARCHAEOLOGY REPORTS AND ANY OTHER SPECIFIC ECOLOGICAL MEASURES OR ENVIRONMENTAL REPORTS FOR THIS BOG.

Phase 1
Forming Peat Berm

An Excavator is used to form a key in the drain where the berm crosses.
A strip of peat is taken from the central camber of the field, pushed into the drain and compacted by the bull-dozer tracking over the drain block.



Plan View
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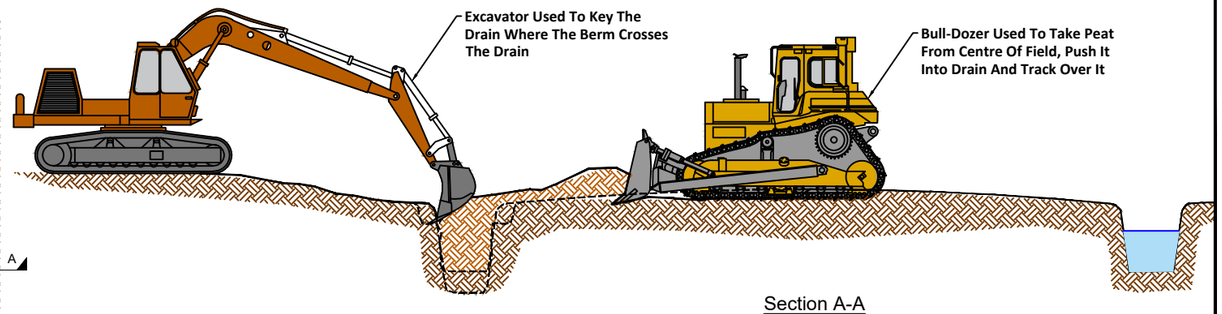

Section A-A
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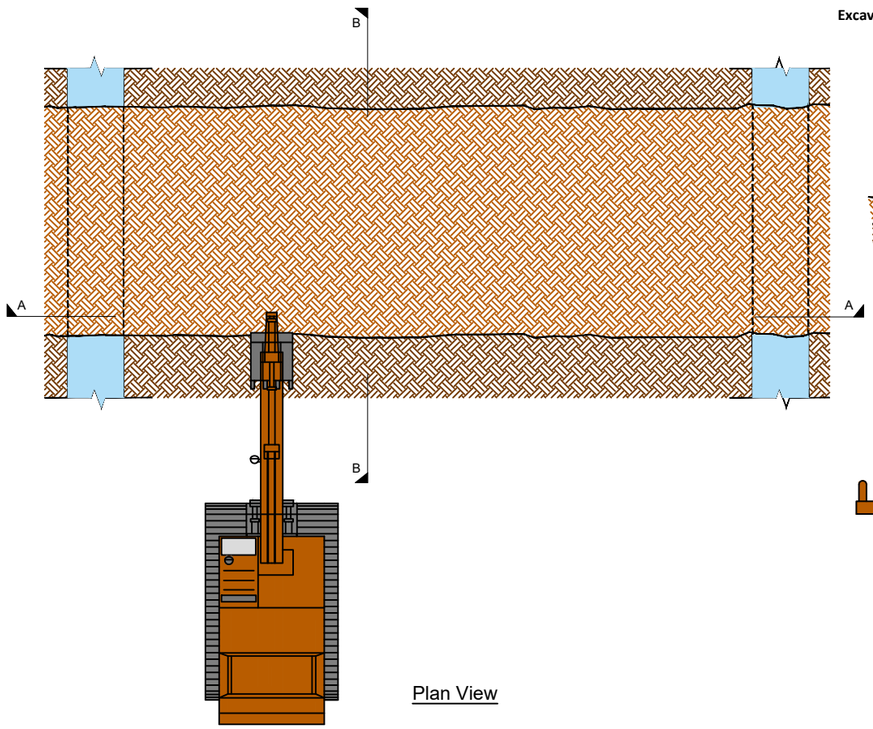
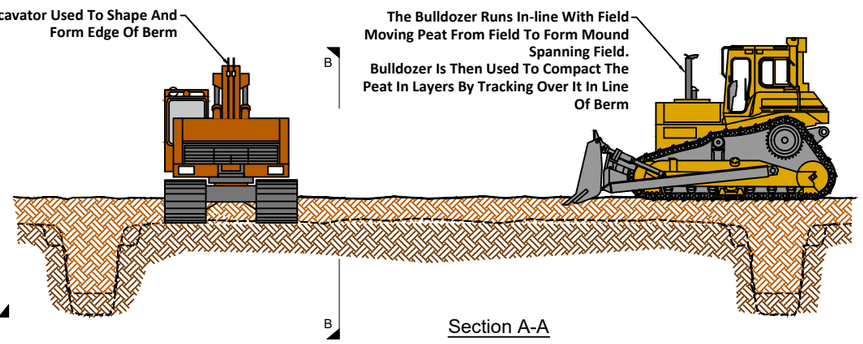
Phase 2
Forming Peat Berm

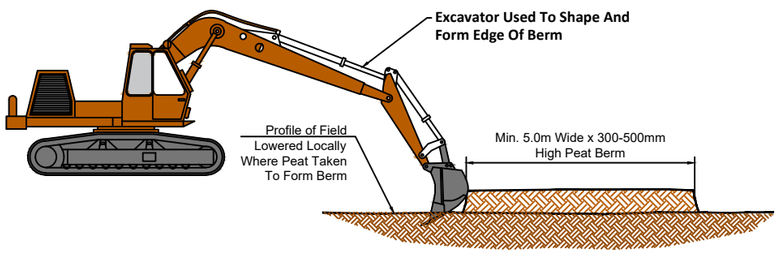
Next the bull-dozer is used to complete the central cross section of Berm by taking peat from the centre of the field and pushing it in line with the field to form a minimum 5m Wide x 300-500mm High Cross Berm.
The peat material in the berm is compacted in layers by the dozer tracking over it.
The excavator bucket is used to form and shape the edges of the compacted berm.



Plan View



Section A-A



Section B-B

STATUS

Rev	Description	Issued By	Date
.		.	.
.		.	.
c	Berm Dimensions And Details Revised	P.K.	11/03/21
b	Berm Height Increased And Trench Detail Added	P.K.	25/02/21
a	Issued For Information	P.K.	29/01/21

BORD NA MÓNA
Naturally Driven
Bord Na Móna Engineering Department
LEABEG, TULLAMORE CO. OFFALY
Tel. 057 9345900
Fax. 057 9345160

PROJECT:
Peatland Climate Action Scheme
PCAS

TITLE:
Rehabilitation Method WLT 3
Peat Berm

Drawn By:		Checked By:		Approved:
CAD	Designer	Discip. Lead	Design Lead	Design Manager
P.K.	-	D.K.	P.N.	P.N.

Date: 28/01/21 | Scale : Not to Scale A3 | Stage: Information
Drawing No.: PCAS-0100-010 | Rev: c

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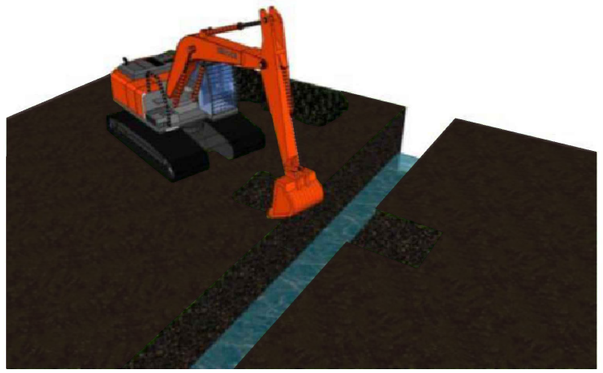
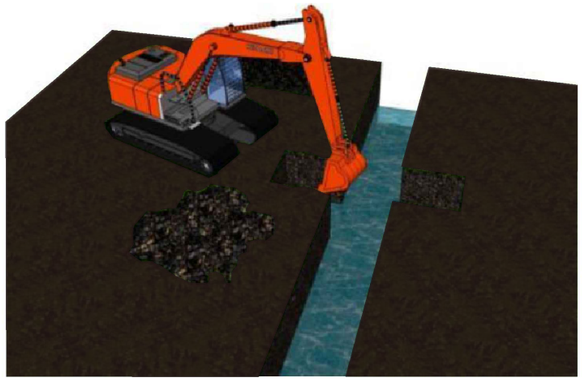
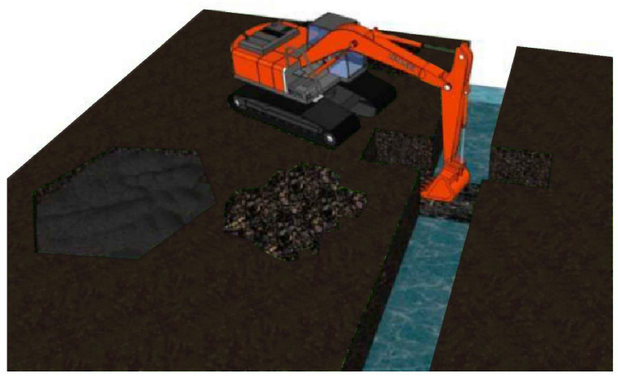
1. Before building of drain blocks, the sides and bottom of the ditch is cleaned using the excavator to remove dry degraded peat, to ensure a good peat-to-peat contact.
(If any vegetation present, it should be carefully removed and left aside for replacement at the end of the process.)

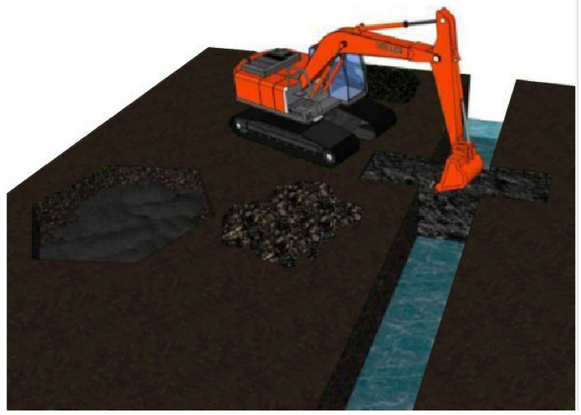




2. Cut key in either side of the drain approximately 500mm deep, and ensure that it is wider than the actual drain.
Remove 500mm of peat from bottom of the drain also and place behind the machine for replacement later.

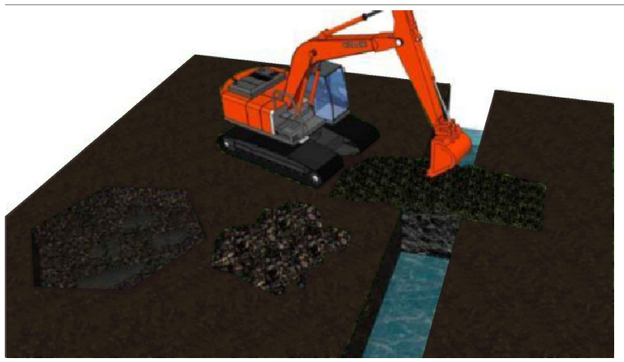
3. Open an area behind machine to be used as a borrow pit. Avoid using the surface layer of peat (top 100-200mm) which is likely to be very permeable. Only use the deeper, more compacted peat to build the drain block.
(If any vegetation present, it should be carefully removed and left aside for replacement at the end of the process.)

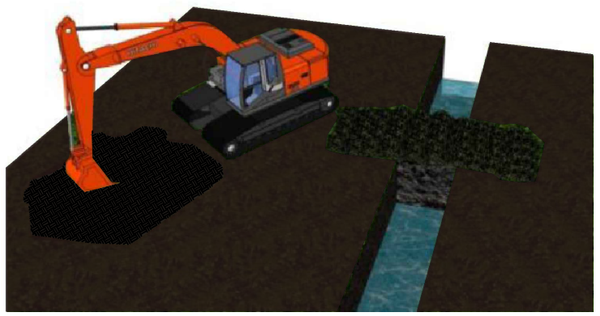




4. Dig out peat from the borrow pit and place into the drain compacting in 300mm layers. Compact the peat firmly using the excavator bucket before laying more peat from the borrow pit.

5. Build the drain block up at least 300mm-500mm above the ground level of the bog to allow for subsequent shrinkage of the peat as it dries.
(Take any vegetation removed in step 1 and step 3 and place on the top of the drain block, to help bind and stabilise the drain block.)





6. Backfill the borrow pit with the peat extracted from the bottom of the drain in step 2. Press down on the sides of the peat borrow hole with the excavator bucket to grade the sides of the borrow pit.

This enhanced measure's main objective is to block drains with peat drain blocks to raise water levels, re-wetting peat and slowing water movements through the bog.

NOTES:

1. FIGURED DIMS ONLY TO BE TAKEN FROM THIS DRAWING.
2. REFER TO RELEVANT SITE PLAN TO ENSURE SPECIFIC DRAIN BLOCKS HAVE BEEN INSTALLED DOWNSTREAM PRIOR TO COMMENCING ANY RE-PROFILING WORKS, TO RETAIN ANY SILT THAT MAY ENTER THE DRAINS.
3. REFER TO RELEVANT SITE PLAN FOR No. OF DRAIN BLOCKS SPECIFIED PER 100M DRAIN LENGTH.
4. REFER TO RELEVANT SITE PLAN FOR SPECIFIC FINISHED GROUND LEVELS TO BE ACHIEVED.
5. ALL DETAILS TO BE AGREED WITH BORD NA MONA OPERATIONS PRIOR TO CONSTRUCTION.
6. OPERATORS TO CONFORM WITH ALL STANDARD OPERATING PROCEDURES.
7. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE SPECIFICATION FOR THE PARTICULAR BOG AND WITH THE REQUIREMENTS OF THE REHABILITATION PLAN, ANY NATURA IMPACT STATEMENT RECOMMENDED MEASURES IF APPLICABLE, ARCHAEOLOGY REPORTS AND ANY OTHER SPECIFIC ECOLOGICAL MEASURES OR ENVIRONMENTAL REPORTS FOR THIS BOG.

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STATUS

Rev	Description	Issued By	Date
b	For Approval	P.K.	25/02/21
a	Issued for Information	P.K.	29/01/21

PROJECT:
Peatland Climate Action Scheme
PCAS

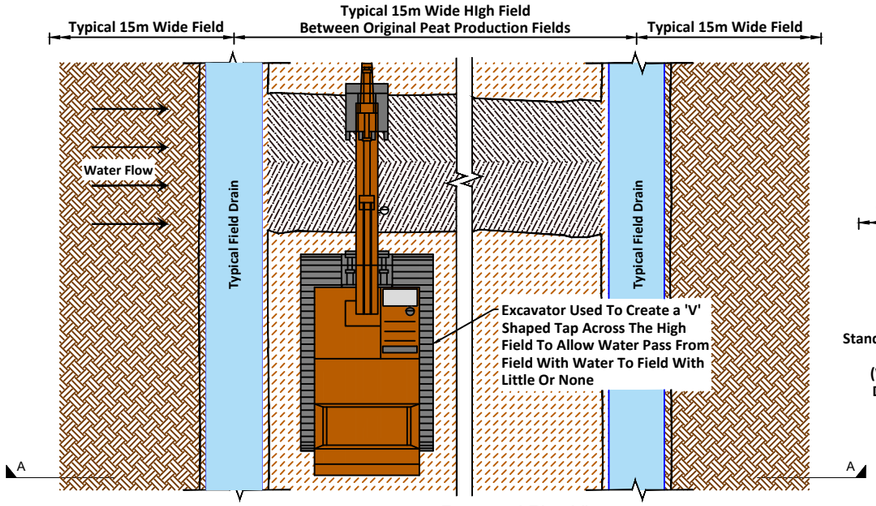
TITLE:
Rehabilitation Method WLT 4
Peat Drain Blocking

Drawn By:		Checked By:		Approved:
CAD	Designer	Discip. Lead	Design Lead	Design Manager
P.K.		D.K.	P.N.	P.N.

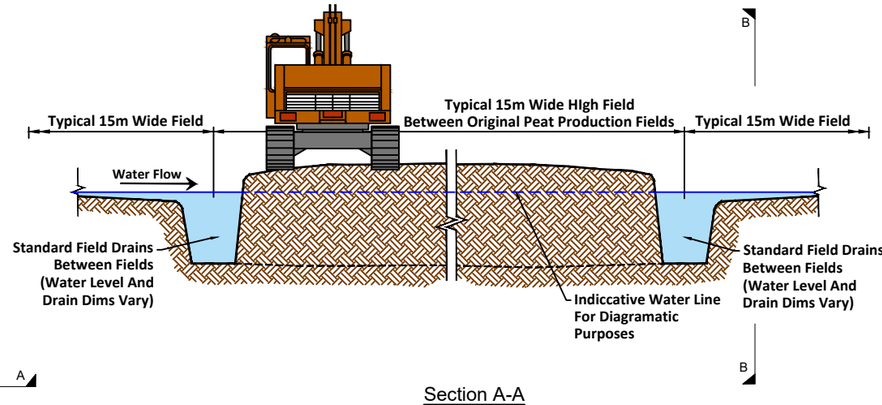
Date: 13/01/21 Scale : N.T.S. A3 Stage: For Approval

Drawing No.: PCAS-0100-011 Rev: b

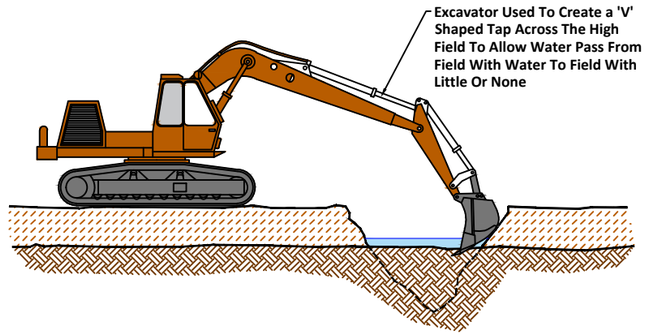
'V' Tap Across High Field To Control Water Levels



Proposed Plan View
(N.T.S.)



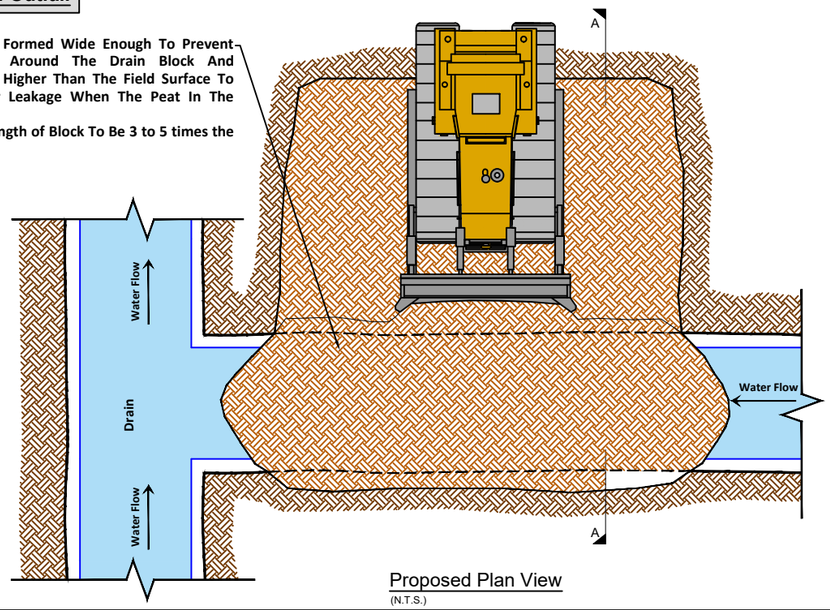
Section A-A
(N.T.S.)



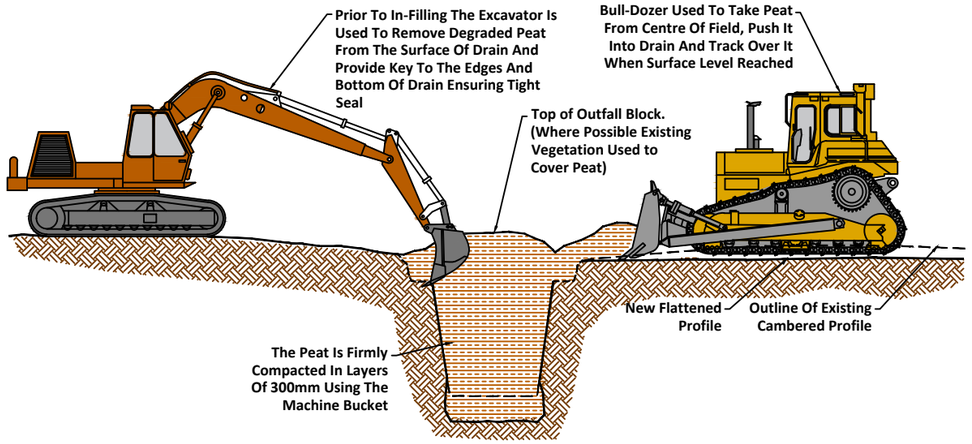
Section B-B
(N.T.S.)

Blocking Of Outfall

The Blocks Are Formed Wide Enough To Prevent Water Moving Around The Drain Block And 300mm-500mm Higher Than The Field Surface To Prevent Further Leakage When The Peat In The Blocks Subsides.
Approximate Length of Block To Be 3 to 5 times the Width Of Drain

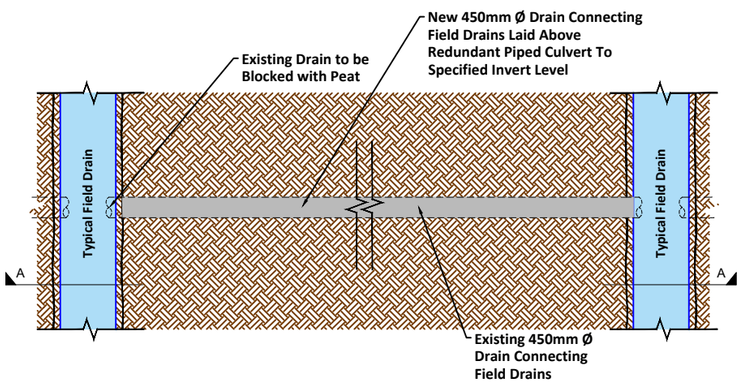


Proposed Plan View
(N.T.S.)

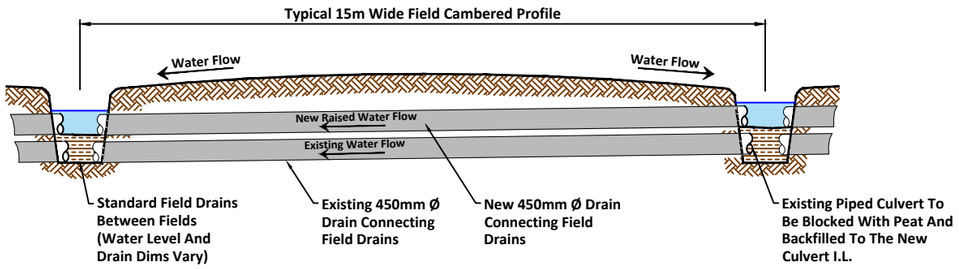


Section A-A
(N.T.S.)

Raise Piped Culverts To Control Water Levels



Proposed Plan View
(N.T.S.)



Section A-A
(N.T.S.)

NOTES:

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STATUS

Rev	Description	Issued By	Date
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.		.	.
c	'Key' Added to Base Of Drain For Blocking Of Outfall Control Measure	P.K.	03/03/21
b	For Approval	P.K.	25/02/21
a	Issued For Information	P.K.	29/01/21

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PROJECT:
Peatland Climate Action Scheme
PCAS

TITLE:
Modifying of Outfalls
& Managing Water Levels

Drawn By:		Checked By:		Approved:
CAD	Designer	Discip. Lead	Design Lead	Design Manager
P.K.	-	D.K.	P.N.	P.N.

Date: 20/01/21 | Scale : Not to Scale A3 | Stage: For Approval
Drawing No.: PCAS-0100-014 | Rev: c

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