



DESIGNING AND DELIVERING
A SUSTAINABLE FUTURE

LONGFORDPASS, LITTLETON, LANESPARK AND DERRYVELLA BOGS – APPLICATION FOR SUBSTITUTE CONSENT

Remedial Environmental Impact Assessment Report

Chapter 4 –Description of Development

Prepared for:

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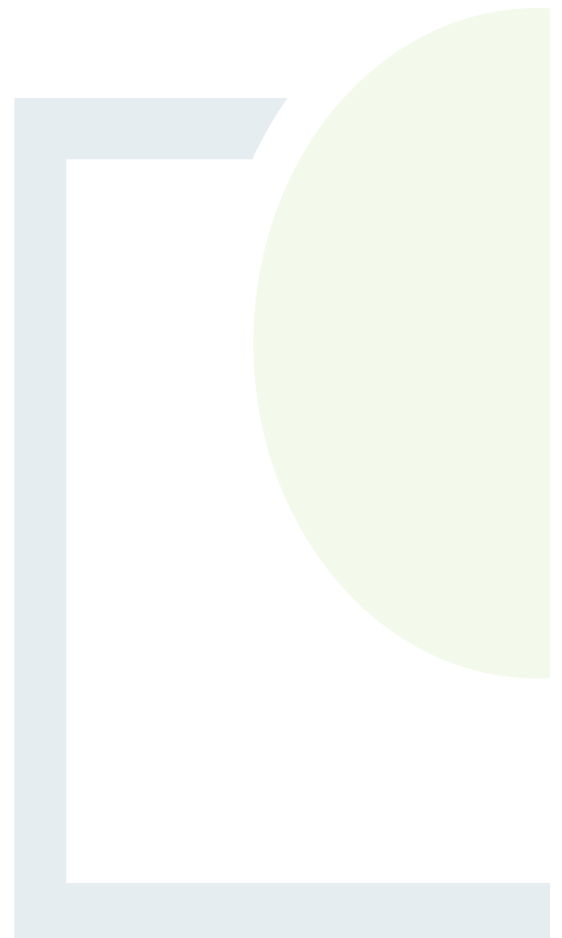


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4. DESCRIPTION OF DEVELOPMENT

4.1 Introduction

This chapter of the rEiAR provides a description of the activities at the Application Site from 1941 at the onset of site preparations up to July 1988, a description of the baseline as of July 1988, and a description of activities from 1988 to the cessation of peat extraction in 2017, the management of the Application Site since 2017 and the activities intended to be carried out at the Application Site into the future. The elements of the Project as described in this chapter are the baseline as of July 1988, the activities from July 1988 to the cessation of peat extraction in 2017, the management of Longfordpass, Littleton, Lanespark, and Derryvella bogs (hereafter known as 'the Application Site') since 2017, and the activities relating to historic peat extraction intended to be carried out into the future. As described in Chapter 1, July 1988 is taken as the baseline assessment year for this rEiAR as this is the latest date that the EIA Directive (Council Directive 85/337/EEC) was required to be transposed into Irish legislation. This approach has been taken on a precautionary basis and strictly without prejudice, as EIA may not have been a legal requirement at that time. The assessment period for the rEiAR is from July 1988 to the present day.

Section 177E of the Planning and Development Act 2000, permits an application to be made for substitute consent in respect of development which has been carried out where an Environmental Impact Assessment (EIA), screening for EIA and/or Appropriate Assessment (AA) was or is required.

Neither the EIA Directive (Directive 85/337/EEC) nor the Habitats (Directive 92/43/EC) has retrospective effect; neither Directive imposes legal requirements to have been carried out prior assessments of projects which had already commenced or been completed. There was, therefore, no legal requirement for EIA, screening for EIA or Appropriate Assessment in respect of *any* project prior to the latest dates for transposition of the Directives. In the case of the EIA Directive, the latest date for transposition was 3rd July 1988. In the case of the Habitats Directive, the latest date for transposition was 10th June 1994.

Accordingly, this application for substitute consent is, of necessity confined to the development which took place after those dates. The baseline against which the environmental effects of the development required to be assessed has therefore been identified as being the position as of July 1988 (being the earlier of the transposition dates of the relevant Directives).

However, as the Project formed part of a development which commenced many years prior to those dates, in order to facilitate as complete an assessment as is possible of the Project since July 1988, a description of the Application Site and the peat extraction and ancillary activities which took place there up to July 1988 are included in this chapter.

Although no EIA or AA can be required of development which took place prior to the latest date for transposition of the Directives, it is clear that in considering cumulative or in combination effects of development to which the Directives do apply, it is necessary to consider the effects of that development cumulatively or in combination with existing development, even development which took place before the Directives came into force: see Case C-142/16, *Commission v Germany*. Moreover, where an application for consent relates to development which is functionally interdependent on another development such that they should be considered part of the same project, it is necessary to carry out a cumulative assessment of the separate parts of that project: see *O'Grianna v An Bord Pleanála* [2014] IEHC 632; *Fitzpatrick v An Bord Pleanála* [2019] 3 IR 617.



In this case, therefore, in carrying out any EIA or AA, it will be necessary to consider the cumulative or in-combination effects of the development which has taken place since July 1988 with that which had already taken place prior to that date in order to properly consider those cumulative or in-combination effects. Since development which took place before and after that date are part of a single project, it is necessary and appropriate, therefore, that the development which took place before July 1988 is adequately described to enable that cumulative or in-combination assessment to be completed.

The activities described below include: the peat extraction processes, the construction, operation, and maintenance of supporting infrastructure and a description of ancillary activities undertaken. It also describes the current onsite activities and infrastructure as well as the proposed future remedial measures which will be implemented at the site in the form of Cutaway Bog Decommissioning and Rehabilitation Plans, subject to the agreement of the Environmental Protection Agency (EPA), and as required under Condition 10 of its Integrated Pollution Control (IPC) Licence P0499-01. Please see Appendix 4-1 for a copy of the licence.

Peat extraction is a historic activity, with a considerable number of activities and site preparation works pre-dating both the commencement of the formal Irish planning system (i.e., were first carried out prior to the establishment of the *Planning & Development Act 1963* (which was enacted on 1st October 1964)) as well as the required dates of the transposition into Irish law of the EIA and Habitats Directive in 1988 and 1994 respectively. Other infrastructure such as workshops, and storage facilities were also developed prior to the commencement of the formal planning system, while other ancillary services and infrastructure around the Application Site were previously granted their own planning consents (where required). This infrastructure is included below and considered within the overall rEIAR assessment.

4.1.1 Statement of Authority

This chapter has been prepared by Emma Cross and Margaret Gleeson and reviewed by Evan Rossiter and Jim Hughes of Fehily Timoney and Company.

Emma Cross is a Planning Programme Manager in BnM with over 8 years' experience in the environmental and planning sector. Emma has contributed to and co-ordinated the preparation of EIAs and technical reports for projects across a wide range of development including projects in the energy, natural resources, industrial and residential sectors. Emma holds a BA Natural Science awarded by Trinity College Dublin, an MSc Environmental Sustainability from University College Dublin and an Advanced Diploma in Planning and Environmental Law awarded by the Honorable Society of King's Inns.

Margaret Gleeson (BnM) holds a B.SC.Hons in Earth Sciences and an MSc in Sustainable Energy and Green Technologies from University College Dublin. She has almost 7 years' experience in the environmental and consulting sectors, predominantly as an EIA specialist, with experience in impact assessment and associated technical reporting across various projects.

Evan is a Senior Project Planner with a BSc in City Planning and Environmental Policy and a Masters in Regional and Urban Planning (MRUP) from University College Dublin. Evan has 4 years' experience and has prepared EIAR Chapters for a range of development types, including renewable energy developments, throughout Ireland.

Jim holds a BA in Public Administration from the University of Limerick, an MSc in Town Planning from Queen's University Belfast and a Higher Diploma (H.Dip) in Environmental Impact Assessment from University College Dublin and has over 20 years of experience. Jim has led major Irish projects in the planning, environmental assessment and permitting disciplines including many wind farm developments.



4.1.2 Project Description Information Sources

- Littleton Bog Group Integrated Pollution Control Licence (IPC) Licence (Ref. P0499-01) Environmental Protection Agency (included in Appendix 4-1);
- Bord na Móna Cutaway Bog Decommissioning and Rehabilitation Plans (included in Appendix 4-2);
- Cutaway Bog Decommissioning and Rehabilitation Plan Longfordpass 2026;
- Cutaway Bog Decommissioning and Rehabilitation Plan Littleton 2026;
- Lanespark, Ballybeg and Derryvella Bog Cutaway Bog Decommissioning and Rehabilitation Plan 2025;
- Bord na Móna Annual Reports which contain information relevant to the Application Site;
- Bord na Móna Living History website¹;
- Teagasc Peatlands of Ireland Map²;
- Clarke, Donal, Brown Gold, A History of Bord na Móna and the peat industry in Ireland (2010);
- IPC Licence, Annual Environmental Reports 2002-2024 (included in Appendix 4-3 (2018 to 2024 are also publicly available³));
- Inspection of production records from Littleton Works;
- Aerial Imagery from 1973, 1988, 1995, 2004 and 2018 (included in Appendix 4-4);
- Bord na Móna, *IPC Licence Environmental Code of Practice for Peat Energy Works* (included as Appendix 4-5);
- IPC Licence Compliance Training Programme (included as Appendix 4-6);
- Communications with former Bord na Móna Employees;
- Silt Committee Interim Report Recommended Measures 1976 (included in Appendix 4-7);
- Silt Committee Excavator records 1984 included in Appendix 4-8);
- Harkins, Jim, *Silt Control Report for Peat Energy Division*, (Internal Bord na Móna Report) (1991) (Appendix 4-9);
- Bord na Móna Peat Development in Ireland 1954 (included in Appendix 4-10);
- Bord na Móna, Environmental & Operational Procedures for the Protection of Surface Water (included in Appendix 4-11);
- Irish Engineers Journal Supplement 1970 (p.13-15);
- Bord na Móna, *Bord na Móna Biodiversity Action Plan 2016-2021* (2016) Brosna Press, Fermoy (included in Appendix 4-12);
- Silt Control Study No. 1 – Internal Bord na Móna Report 1983 (included in Appendix 4-13);
- Drainage Study with Particular Reference to Pumping – Internal Bord na Móna Report 1983 (included in Appendix 4-14);
- Peco Harvester Tests – Internal Bord na Móna Report 1986 (included in Appendix 4-15);

¹ Available at: <https://www.bordnamonalivinghistory.ie/>

² Available at: <https://www.teagasc.ie/media/website/environment/soil/Peatlands-of-Ireland-Map.pdf>;

³ Annual Environmental Reports 2002-2018 can be found at the following link:
<https://leap.epa.ie/licence-profile/P0499>



- Distribution and Nature of Mineral 'Ash' Material in a Milled Peat Stockpile – Internal Bord na Móna 1982 (included in Appendix 4-16);
- Regional Administration in Relation to Milled Peat Operation – Internal Bord na Móna Report 1988 (included in Appendix 4-17);
- Industrial Cutaway Bog Land-Use Studies (Clonsast) – Internal Bord na Móna Report 1978 (included in Appendix 4-18);

4.1.3 Information Required for the Description of the Project

Article 5(1) of Annex IV of Directive 2014/52/EU and amending Directive 2011/92/EU outlines the items that should be included in an EIAR when assessing the effects of certain public and private projects on the environment. Item 1 of Annex IV is reproduced in Table 4-1 and lists what should be included in the description of the Project. These items are described in detail in this chapter and associated appendices. They can also be found in more detail in their respective chapters.

Table 4-1: Information referred to in Article 5(1) Annex IV of Directive 2014/52/EU, 2011/92/EU to be included in the description of the Project.

Description of the Project, including in particular:	Relevance to application	Location In rEIAR
a) <i>a description of the location of the project;</i>	The Application Site (i.e. Longfordpass, Littleton, Lanespark, and Derryvella bogs) forms part of the Littleton Bog Group and is located in Co Tipperary, in the town lands of Kilmakill, Longfordpass North, Longfordpass East, Longfordpass South, Leigh, Bawnreagh, Clonoura, Noard, Newhill, Derryhogan, Ballybeg, Derryvella, Lanespark, and Killeen and is adjacent to the M8 motorway.	<ul style="list-style-type: none"> • Chapter 1 Introduction • Chapter 4 Description
b) <i>a description of the physical characteristics of the whole project, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;</i>	Site baseline description (as of July 1988), site preparation works pre-commencement of industrial peat extraction, drainage implementation, supporting infrastructure	<ul style="list-style-type: none"> • Chapter 4 Description • Chapters 5 to 15
c) <i>a description of the main characteristics of the operational phase of the project (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used;</i>	Peat extraction operations from July 1988 – 2017 including peat volumes extracted, peat extraction methods, machinery requirements, scale of operational areas required peat extraction methods, supporting activities Vegetation clearance, habitat removal, peat volumes extracted, energy used	<ul style="list-style-type: none"> • Chapter 4 Description • Chapter 6 Biodiversity • Chapter 7 – Land, Soils and Geology • Chapter 8 – Hydrology and Hydrogeology • Chapter 9 Air Quality • Chapter 10 Climate • Chapter 14 Material Assets • Appendix 4-3 Annual Environment Reports



Description of the Project, including in particular:	Relevance to application	Location In rEIAR
d) <i>an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases.</i>	Silt run off, waste management, noise and vibration emissions, dust and CO ₂ , CH ₄ and NO ₂ emissions	<ul style="list-style-type: none"> • Chapter 4 Description • Chapter 7 Land Soil and Geology • Chapter 8 Hydrology and Hydrogeology • Chapter 9 Air Quality • Chapter 10 Climate • Chapter 11 Noise and Vibration • Chapter 14 Material Assets • Appendix 4-3 Annual Environment Reports

4.2 Project Description

This rEIAR is prepared in support of an application for substitute consent for peat extraction and ancillary activities carried out by Bord na Móna on lands at the Application Site since July 1988. The Application Site, comprising an approximate area of 1,616 ha, is located in north County Tipperary, c. 3km from Littleton village, as outlined in Plate 4-1 Site Location Map.

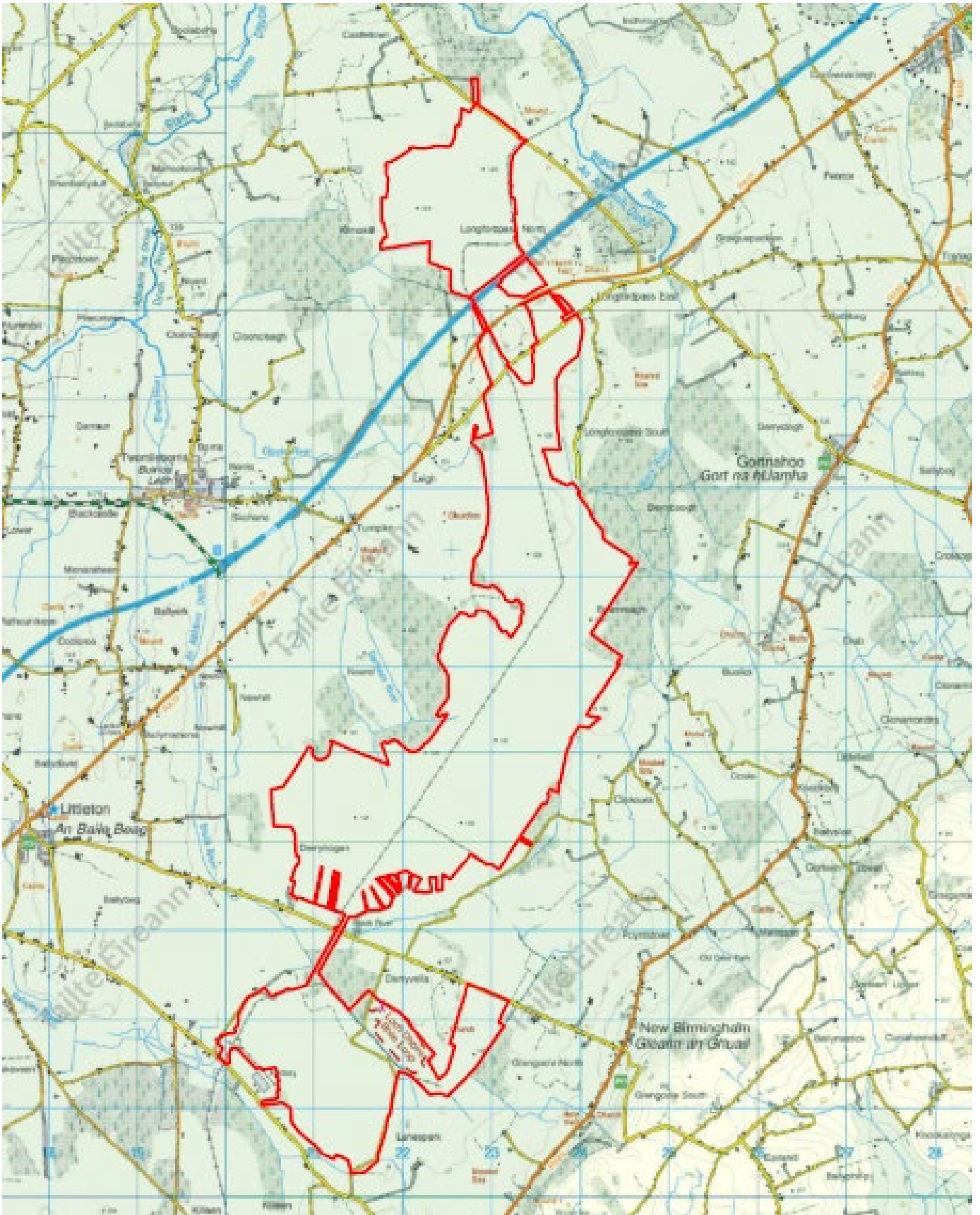


Plate 4-1: Site Location Map



Peat extraction and ancillary activities undertaken at the Application Site since 1988, which comprise the development for which substitute consent is being sought, and the Project for which this rEIAR has been prepared, consists of the following:

- Installation of surface water drainage infrastructure at the Application Site to facilitate peat extraction activities from 1988 to present day;
- Vegetation clearance to facilitate peat extraction activity from 1988 to 2017;
- Industrial scale peat extraction (milled peat) at the Application Site from 1988 to 2017;
- Use and maintenance of pre-existing ancillary supporting infrastructure and services to facilitate peat extraction (e.g. railway infrastructure, drainage (drains, silt ponds, pumps), etc.), from 1988 to present day;
- Control Measures associated with the above, inclusive of the IPC Licence measures (Ref. P0499-01) which commenced from August 2001 onwards to the present day; and
- All associated site development and ancillary works.

4.2.1 Project Phases

As detailed in Section 1.1.1, for the purposes of this rEIAR, the Project is defined under three different timeframes termed 'Phases':

- **'Peat Extraction Phase'**: peat extraction and ancillary activities at the Application Site from July 1988 to the cessation of peat extraction in 2017 (July 1988 – 2017). The Peat Extraction Phase is described in detail in **Sections 4.4 to Section 4.7**.
- **'Current Phase'**: the management of the Application Site since 2017 to present day including decommissioning works and Rehabilitation Phase 1 works. The Current Phase is described in detail in **Section 4.7 and Section 4.8**.
- **'Remedial Phase'**: the activities intended to be carried out at the Application Site into the future (Rehabilitation Phase 2 works). The Remedial Phase is described in detail in **Section 4.9**.

Rehabilitation Phase 1 works were carried out at the Application Site in accordance with the Cutaway Bog Decommissioning and Rehabilitation Plans (2018) (See Section 4.7 and Section 4.8 for further details). Rehabilitation Phase 2 works include works which will be carried out at the Application Site in accordance with Decommissioning and Rehabilitation Plan 2025 (See Section 4.9 for further details).

- Initial opening of drains:
 - Drains were first opened by a plough pulled by a Bord na Móna tractor at a slow speed (approx. ½ to 1 mile per hour (0.8km/h – 1.6km/h)); and
 - The drain depth at the plough stage was 20" (0.51m). Drains had a trapezoidal section with a top width of approximately 30" (0.76m) and a bottom width of 12" (0.3m) bottom width.
- Deepening of drains:
 - Following their initial opening, drains were deepened by rotating disc machines operating at speeds of 200-600 yards per hour (approx. 180-550m/hour);
 - Rotating disc machines could deepen the drains to a maximum depth of approximately 60" (approx.1.5m), with a bottom width of approximately 12" (approx. 0.3m); and



- Whether further deepening of drains was required depended on the purpose of the drain was achieved by smaller-type bucket excavators and peat cutting machinery, by drag lines specially tracked to Bord na Móna's design, by several other excavator types, or by hand where it was desired that the drain should conform to certain maximum dimensions.

Arterial drainage works were not always adequate to achieve the levels of drainage required to allow the extraction of peat deposit to the bog floor. Pumping of whole bog areas or certain portions of bog areas arose where gravity drainage was impossible or achievable only at prohibitive cost. In these instances, the pumps favoured were the Archimedean screw type or the Axial flow type electrically powered, and electrode controlled.

Once drained, the upper acrotelm layer (which comprises the biologically active component of the bog) was removed to facilitate peat extraction activities, all ancillary works and the drying of peat. The acrotelm is one of two distinct layers in undisturbed peat bogs. It overlies the catotelm. The boundary between the two layers is defined by the transition from peat containing living plants (acrotelm) to peat containing dead plant material (catotelm).

The machinery involved in drainage work on the Application Site is described in Section 4.2.2.1.1 below.

4.2.1.1.1 Drainage and Bog Preparation Machinery

Dragline/Shovel Excavator: Types 287 CU. Metres and 478 CU. Metres

These machines excavated the main outfalls for the bog drainage system in the early development stages and maintained main outfalls during the production life of the bog. While these excavators were generally of conventional design and were suitable to be mounted with dragline attachments, back and front acting shovels, and pile driving attachments, they were used mainly with the dragline attachment. The machines were powered by a diesel engine. All drives were mechanical with friction clutches and brake control of winches and turntables, while the track drives and steering were controlled by a claw clutch and brake arrangement.

In 1958, a new underframe for the dragline was designed to minimise surface pressure and peat compaction, thereby eliminating the need for the use of timber mats. The increased mobility and reliability of the machine resulting from the new underframe allowed the machines to move rapidly over the bog to do relatively small jobs which would earlier have been done by hand, owing to the slowness and difficulty of moving the dragline over timber mats. Additionally, the elimination of the timber mats meant that groundsmen were no longer required to move the timber mats. This meant that draglines could be operated by the driver only, with no support staff required. The 287-model excavator had caterpillar-type tracks with timber sleepers, which provide the necessary bearing area for operation on bog, without using mats. The 478-model excavator, while equipped with caterpillar track chains, was not fitted with track sleepers but was supported on timber mats where necessary.

When excavating bog these machines were fitted with a special dragline bucket of light design with a capacity of 750L. Plate 4-2 below is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-2: Dragline/Shovel Excavator (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/draglineshovel-excavator/>)

Drainage Machine Type – Klassmann

The Klassmann drainage machine was designed and developed for operation on sod moss production bogs. The machine was supplied with a variety of attachments to suit specific duties. For Bord na Móna's applications it was fitted with a slit drainer, a drain cleaner and a levelling screw. The tractor was of light construction with the chassis fabricated from folded steel sections supported on two tracks each comprising two chains carrying steel swamp shoes, running on end sprockets and frictionless bearing mounted intermediate support rollers. The power unit was an air-cooled diesel engine and the transmission consisted of an over-centre single plate clutch, vee belt drive, specially designed four speed gearbox, and chain drives which powered both tracks and the Power Take Off (PTO) for attachments. Additional sprockets were supplied to give a variety of forward speeds to suit specific attachments. Steering was assisted by coil clutch and brake bands. The machine was fitted with a hydraulic system to control the transmission of power to the various attachments. All controls were centralised in an enclosed cab.

The slit drainage attachment was used to open initial drains in virgin bog. It comprised a cutting boom of small buckets carried on special chains and sprockets. The content of the buckets was discharged mechanically into a vane-type spinner which threw the spoil clear of the drain. The drain cleaner attachment was similar to the slit drainer but cut a wider drain and was used to deepen and maintain drains after the first sod cut was made. The screw leveller attachment was used for the preparation of fields on moss peat bogs to remove the vegetation and level the surface to facilitate the performance of cutting machines and the stability of the sod walls formed by these machines. The attachment had the ability to camber surfaces if required.



Drainage Machine Type – M.P. Field Slitter

This machine was developed to cut slit drains in milled peat fields to accelerate drainage in the poorer quality areas. The drains cut to a definite pattern comprising three longitudinal slits, one central and one on either side, with cross drains giving exit to the ditches at regular intervals. The machine comprised a tractor on full tracks with a chain saw cutting attachment similar to the chain saw machine. The tractor had a special transmission to give the correct forward travel speeds in second and third gear. The modification involved the replacement of the gearbox primary gear train and the differential crown wheel and pinion, in addition to the insertion of a special reduction gearbox. The tracks comprised flat metal cleats carried on two chains and run on the standard tractor tyre wheels with an additional jockey wheel. The attachment was carried at the rear of the tractor, pivoted on the centre of a standard power-take-off bevel box output shaft and is raised and lowered about this pivot by a hydraulic ram operated from the driving position. The cutting element was a standard transmission chain with cutting teeth secured to it by welding, running over a top driven sprocket and a bottom driven sprocket whose shaft carries a cutting impeller on either side outside the support bearings. These impellers, in conjunction with the cutting chain, excavated a tunnel of rectangular section at the bottom of the slit drain cut by the chain only. The machine had a cab with toughened glass windows, allowing good vision for manoeuvring and observing the behaviour of the attachment. Plate 4-3 below is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-3: Drainage Machine Type – M.P. Field Slitter.
(Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/drainage-machine/>)



Ditching Attachment – Milled Peat Type – Disc

The purpose of this attachment was to cut the drains separating the milled peat fields in development bogs and deepen existing drains in production bogs. The attachment consisted of a rotating cutting disc set at an angle to the line of travel, carried on an arm from the tractor unit. The arm and disc were controlled and supported by wire ropes and a hydraulic ram passing over a mast on the tractor unit and anchored to a projecting ballast box on the other side of the tractor unit. The disc was driven by the tractor main gearbox PTO shaft via a bevel gear reduction box and universal propeller shaft. On other machines a chain drive reduction was inserted between the bevel gearbox and universal propeller shaft to achieve a slower disc speed. The disc had cutting blades and a stationary shield which deflected the flying spoil away from the machine and spread it evenly over the adjacent field.

Drain Cutting Attachment – Cross Drain

The purpose of this attachment was to cut small drains in milled peat fields from the centre of the field to the ditches separating the fields. The attachment consisted of a cutting boom which was mounted on the rear of the H.D. Tractor Type II on radius arms, controlled for height and level by hydraulic rams. To cut the drain, the tractor stopped, and the cutting boom started, trimmed for level if necessary and lowered into the bog, discharging the spoil to the centre of the field. The boom was of light construction using standard steel sections. The chain was carried on sprockets at the ends of the boom while it ran in a guide with the aid of welded-on cleats along the bottom horizontal portion of the boom. The drive is taken from the P.T.O. shaft of the tractor main gearbox via chain drivers and universal jointed propeller shaft. Plate 4-4 below is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-4: Drain Cutting Attachment – Cross Drain.
Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/drain-cutting-attachment-cross-drain/>



Drain Cleaner – Screw

This attachment was used to remove slurry from the bottom of milled peat field ditches and dispose of it by spreading it on the adjacent field. The attachment was a screw elevator with radial blades fitted at the top to eject the spoil through an outlet in the casing in a predetermined direction. The attachment was mounted on a cantilevered bracket from the tractor on a pivot arrangement so that the screw casing could be lifted and lowered as required by winch rope. In the working position the screw elevator is lowered into the ditch and scoops the slurry from the bottom of the ditch as the tractor advances. As the tractor progresses along the ditch or drain it accumulates the slurry; the screw elevates it into the discharge chamber and the radial blades eject it through the outlet onto the peat field. Plate 4-5 below is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-5: Drain Cleaner Screw. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/drain-cleaner-screw/>)

Stripping Machine Type – I & II

The purpose of this machine was to cut away the top layer of bog from the section which was to be cut. This layer varied in depth from 305 mm to 762 mm and was deposited at the bottom of the face bank prior to reuse on the adjacent spread grounds. The machine had a lightly constructed main frame mounted on caterpillar type tracks and the spiral cutting/conveyor unit was carried in an off-set position at the rear. The spiral cutter/conveyor unit was pivoted to the main frame and suspended on an overhung mast on which it was raised or lowered as required. A separate trimming control, in the form of a hydraulic ram, was fitted at the cutting end.



The Type I machine was powered by diesel engine and transmission of standard manufacture incorporating a differential brake/gear steering arrangement as used on a levelling machine. There were 8 forward speeds and 4 reverse speeds available through gearbox and change sprockets.

The Type II machine was powered by a diesel engine driving through an over-centre type clutch, a 'V' rope drive special worm and spur gear reduction box, and chain drives. The machine was steered by coil clutches on the track final drives. There were 6 forward speeds available using change sprockets. Plate 4-6 below is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-6: Stripping Machine. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/stripping-machine/>)

Levelling Machine Type – Scraper

The purpose of this machine was to prepare the surface of the high bog and cutaway for the efficient operation of all other machines, by levelling it. The machine consisted of a large tractor unit carrying a leveller boom in front. As the machine advanced on its long tracks, the boom cut away the high areas, losing the spoil in the hollows. The tractor unit had a rigid main frame supported on caterpillar type power driven tracks and was powered by diesel engine and gear transmission of standard manufacture. The boom had a light framework made up of standard steel sections, around which was driven two conveyor-type chains running on sprockets at each end and in guides along the bottom and top. Across these two chains, arms were fitted, projecting beyond the front of the boom. The projecting portion of the arm had a cutting knife and scraper palm. The boom was controlled for height and level by hydraulic rams. Plate 4-7 below is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-7: Levelling Machine Type – Scraper. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/levelling-machine/>)

4.2.1.2 Peat Extraction Process

Two distinct peat products were extracted at the Application Site: sod peat and milled peat. The methods by which these products were extracted varied, and each process is described in detail in the sections below. A description of the machinery used for peat extraction and ancillary activities at the Application Site is provided in Section 4.2.1.3.

4.2.1.2.1 Sod Peat Extraction

Sod peat was extracted at the Application Site from 1952 to 1984.

Sod peat, also sometimes referred to as ‘machine turf’ or ‘turf’, was extracted utilising technologies which were initially developed between 1910 and 1920. Once the drainage was installed and the bog sufficiently dry for machinery, the surface was prepared using levelling and stripping machines such as those described in Section 4.4.2. Sod peat extraction was subsequently carried out by a range of different bagger/sod peat excavator machines. The German word for both excavator and dredger is ‘*Bagger*’ and this was the word adopted in Ireland for machines which mixed the peat from different depths of the bog and then macerated it. Baggers are shown in Plates 4-20 and 4-21.



In the case of sod peat extraction, large open drainage ditches known as “trenches” were opened at widths of approximately every 240 metres across the entire width of the extraction area. These trenches served as the beginning of the face bank from which sod peat was ultimately extracted. Baggers cut a trench with a width of 2 meters and a depth of 3 to 4 meters. A chain of buckets on the bagger was then inserted into the trench which extracted peat from all strata of peat in the trench. The extracted peat was then deposited into a macerator which pulped and mixed it. Maceration improved the quality of the sods of peat produced, as by thoroughly mixing peat from each strata of the bagger trench, the density and uniformity of the sod was increased. The macerated peat pulp was then extruded through a narrow double mouthpiece which formed it into two rows of continuous sods each of approximately 5 inches (approx. 13cm) wide x 3 ¾ inches (approx. 9.5cm) high. As they were extruded, the rows of peat were deposited on to a continuously moving chain of spreader plates, which when the spreader arm was fully loaded, tripped automatically and deposited the rows of turf onto the bog surface. Trailing discs then cut the rows into 15 inch (approx. 38cm) long sods. The standard length of the spread arm was 54 metres. The bagger/sod peat excavator machine spread the sod peat on the large area between the trenches which allowed sufficient room to dry the sod peat.

After about two weeks on the surface of the bog, the sods were turned by a sod turning machine to allow the other side of the sod to dry. When the sods were fully dried, the density and uniform texture resulting from the maceration process made them very impervious to rewetting. The dried sod peat was then collected from the surface of the bog using a sod collector. This machine was used to collect the sod peat from the sod rows into stockpiles which were often referred to as ‘ricks’. A permanent 3 ft. gauge railway serviced all bog areas and facilitated connectivity to the various works centres, workshops, and fuel depots across the Bord na Móna landbank. When it was decided to move a stockpile, a temporary railway track was laid alongside from the permanent railway line. On completion of loading, the temporary track was lifted and re-laid along another stockpile as required. Please see Figure 4-2 for a Flow Chart of the Sod Peat Extraction Process produced by Bord na Móna.

Typically, sod peat fields were between 800 to 2,000 yards long (approx. 700m to 1,800m) discharging normally to the end of the large drainage trenches. Small, piped outfalls were installed perpendicular to the drains where needed to drain low areas that formed along the sod peat field. The pipes used were either concrete or clay pipes with a small diameter of between 150mm to 300mm.

These bogs utilised pumps where levels did not allow for gravity drainage. As the sod peat machine (bagger) was electrically powered a power supply for the pumps was easily obtained from the existing internal distribution network.

The large drainage trenches were continuously developed and have a width of between 3 to 8 metres typically and a depth of around 2-5 metres. They were maintained using mechanical excavators or draglines and were continuously deepened as sod peat was extracted from the bog to lower the drainage level.

Please see Figure 4-2 for a Flow Chart of the Sod and Milled Peat Extraction Process, produced by Bord na Móna.

4.2.1.2.2 Milled Peat Extraction

Milled peat was extracted at the Application Site from 1978. Between 1984 and 2017, milled peat was the only form of peat extracted at the Application Site, and this was transported to Littleton Briquette Factory via the bog railway. The methods by which milled peat was extracted are described in detail below.



In the case of milled peat extraction, parallel open drains were cut at 50 ft. (approx. 15.2m) centres which divided the peat extraction area into fields 45 ft. (13.7m) wide. Typically, the field drains were from 800 to 2,000 yards (approx. 700 to 1,800m) long, discharging at either end into piped outfalls which ran at 90° to the open drains and which themselves discharged into the nearest natural outfall. Beyond the piped outfall was left a headland or turning ground 70 to 100 ft. (21 to 30m) wide which ran parallel to the piped outfall to enable extraction machines to turn from one field into another. When fully developed, the open field drains had a depth of approx. 4' 6" (approx. 1.4m) and a top width of approx. 5' 0" (approx. 1.52m). The field drains were excavated and initially maintained by machines called disc ditchers. The disc ditcher consisted of a cutting disc which was mounted on an arm offset from a tractor unit. Tractors were powered by a diesel engine, and they were mounted with timber and swamp shoes and front rollers.

Drainage channels were maintained using mechanical excavators or draglines and were continuously deepened as milled peat was extracted from the bog to lower the drainage level.

Milled peat extraction requires good solar/wind drying conditions and so commenced any time from mid-April onwards, and usually ran until mid-August, once suitable drying conditions prevailed. Following drainage, there were four stages to the extraction of milled peat outlined as follows:

Milling - During the milling process, the top 10-15mm of the surface of each field was broken into peat crumbs by powered milling drums towed behind agricultural tractors (Plate 4-9). This layer of crumbed or milled peat/moss is called a crop and would have had a moisture content of about 80% when milled;

Harrowing - After milling, the peat crop was dried. To assist in this drying, the loose peat was harrowed, or turned over. The harrow consisted of a series of spoons which were towed behind an agricultural tractor (Plate 4-9). The spoons on the harrow were fitted with special base plates which prevented the scraping of wet particles from below the milled peat layer. Harrowing was usually required 2 to 5 times per peat crop, depending on drying conditions, the water table level in the peat extraction fields, the initial moisture content of the peat at milling, and peat quality. If rain interrupted the drying process, more harrowing may have been needed;

Ridging - When the milled material was dried to a moisture content of between 45% and 55%, it was gathered into ridges in the centre of each peat extraction field. The ridger consisted of a pair of blades towed in an open V behind an agricultural tractor. The open V blades rest on the bog and channel the loose crop into a triangular ridge in the centre of each peat extraction field. (Plate 4-10 and 4-11);

Harvesting - Harvesting was the final stage of the extraction process. Each individual ridge was lifted mechanically, by a machine called a harvester, transferred and dropped on top of the adjoining field's ridge, until five ridges had been accumulated into a single large ridge. This large ridge formed the final lift into the peat storage stockpile (Plate 4-12 and 4-13).



Typically, every 11th field was used to stockpile the peat from the output of five fields either side; this is referred to as the 'Peco' method and the peat in these stockpiles was removed by rail. The Peco method was used at the Application Site. Weather permitting, the miller followed the harvester and the production cycle recommenced in the emptied fields. The extraction stockpiling cycle is referred to as a 'harvest' and each group of eleven fields generally produced 12 No. harvests per year. When the extraction season was over, the stockpiles were covered to keep the peat dry unless the peat was scheduled for immediate transportation from the site. Peat was stored in these stockpiles (up to 25 m wide, 10-15 m high) until required for use. Once stockpiles of milled peat were established, they were rolled and covered with polythene sheeting. The purpose of the polythene covering was to keep stock dry, to protect it against wind erosion, and to inhibit spontaneous combustion in certain types of peat by the exclusion of as much air as possible. A reel of polythene sheeting would be mounted on a single bale spike-type attachment on an excavator. The excavator would drive alongside the stockpile, and the polythene would be unrolled across it. There were generally 8 no. workers on the ground outside the excavator to undertake the work of unrolling the polythene and laying it across the stockpile (4 no. workers each side of the stockpile). Once the polythene sheet was laid in place, a layer of high-moisture-content milled peat was distributed over the polythene to fix it in place. This was done in three passes along a stockpile by a milled peat harvester; on the first pass, a milled peat harvester which was fitted with a split cowl at the end of the jib distributed an even layer of peat across the top and sides of the stockpile (the split cowl allowed for both faces of the surface of the stockpile to be covered in the one pass). The second and third passes of the milled peat harvester facilitated the deposition of peat along the bottom edges of the stockpile, effectively anchoring the polythene sheeting to the ground, preventing the lifting of the edges in the wind. (see Plate 4-14 and 4-15 below).

When it was decided to move a milled peat stockpile, the polythene sheet covering the stockpile was removed. A trained staff member would walk along the apex of the milled peat stockpile and bisect the polythene sheet at the peak of the apex with a blade. Starting at the end of the stockpile, one side of the bisected polythene sheet was fed into the eye of an implement known as a polywrapper, which was mounted on the three-point linkage of a tractor. The eye of the polywrapper was attached to a pendulous swivel arm, which, as the tractor moved forward, oscillated from left to right to ensure that the polythene being collected was being dispensed evenly across a metal shaft on the polywrapper. This ensured an even spool of polythene was collected. Once the spool was at capacity, one side of the polywrapper was opened, which allowed the metal shaft to be removed and replaced with a plastic one. The entire spool was then removed, and sent for appropriate disposal/recycling. The metal shaft was reinserted into the polywrapper, the side closed, and the process began again until the stockpile was fully uncovered and all polythene collected.

A permanent 3 ft. gauge railway serviced all bog areas and facilitated connectivity to the various works centres, workshops, and fuel depots across the Bord na Móna landbank. As in the case of sod peat stockpiles, when it was decided to move a stockpile of milled peat, a temporary railway track was laid alongside from the permanent railway line. On completion of loading, the temporary track was lifted and re-laid along another stockpile as required.

Please see Plate 4-8 for a Flow Chart of the Sod and Milled Peat Extraction Process, produced by Bord na Móna.

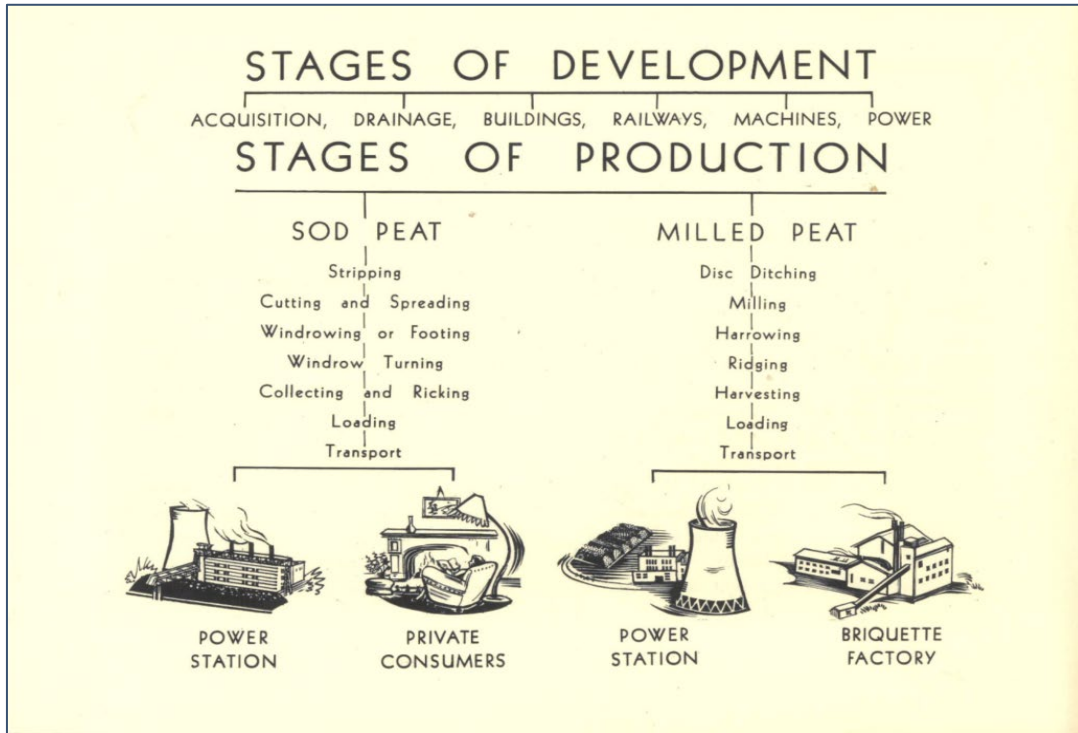


Plate 4-8: Flow Chart of the Sod and Milled Peat Extraction Process produced by Bord na Móna in 1954



Plate 4-9: Milling process. Image: Bord na Móna



Plate 4-10: Ridging process. Image: Bord na Móna



Plate 4-11: Ridging process. Image: Bord na Móna



Plate 4-12: Harvesting – Peco method. Image: Bord na Móna



Plate 4-13: Harvesting – Peco method. Image: Bord na Móna



Plate 4-14: Polythene covering of stockpiles



Plate 4-15: Process of Stock Protection, showing a layer of milled peat being spread over polythene sheeting to anchor the sheeting in place (source: Bord na Móna)



4.2.1.3 Peat Extraction Machinery

The following machinery was used in the extraction process once the bogs had been cleared of vegetation and drains inserted. The type of machinery used at any given time would vary depending on machine availability, bog conditions, the type of peat being extracted (i.e. milled or sod,) and operator preference.

4.2.1.3.1 Tractors

A variety of tractors have been used throughout the history of peat extraction and ancillary activities on the Application Site. As with all machinery used during peat extraction activities and all ancillary works, the choice of tractor used for any given activity would have been based on availability, bog conditions, and activity type (which would dictate the mechanical requirements of the tractor in terms of power output drivetrain, weight, wheelbase dimensions, tyre type, PTO specifications, hydraulic requirements etc.). Throughout the decades as improvements in tractor design were made, newer, more powerful and efficient tractors were employed on the Application Site. A non-exhaustive overview of the types of tractors used is provided below.

H.D. Tractor II

The H.D. Tractor II was a half-track tractor specially designed for harvesting and ditching operations in the Peco system of milled peat. The machine consisted of a robust main frame supported on caterpillar type tracks, which are exceptionally high to accommodate the attachments within them, and on large steering rollers in front. The tractor was powered by a diesel engine fitted with automotive-type clutch. The transmission consisted of a main gearbox, an auxiliary gearbox, a worm drive bevel gear differential unit and a spur gear reduction final drive contained within the back axle casting. The tracks comprised a special cast steel link type chain, with swamp shoes or sleepers bolted on, which ran on track rollers suitably spaced on the track frame. The driving sprockets were built up from steel plate discs with steel rollers between, to register with the track chain. The idler sprocket had the steel disc, with distance pieces, allowing the track link driving spuds to pass between them. Both the driver and idler sprockets are fitted with wear resisting cast steel pads where the track link driving spuds make contact with the sprocket plates. The front rollers were steel rimmed with spokes from a central cast hub. A circumferential steel angle section was fitted to obtain steering adhesion. The rollers were mounted on a swinging axle. The steering was manual through a wormbox, operating winding drums with wire ropes to the axle. The driver's platform was spacious, located at a high level over the main gearbox. For ditching operations, a protective cab was fitted over this platform to protect the driver from ditching spray and the elements. On some tractors on ditching operation, a simple hydraulic steering system was fitted. Plate 4-16 is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-16: H.D. Tractor II. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/h-d-tractor-ii-2/>)

LHT Tractor II

This tractor was designed to operate miller and ridger attachments in accordance with the Peco system of winning milled peat. This machine consisted of a simple main frame with caterpillar-type tracks and front steering rollers. It was powered by a diesel engine fitted with an automotive type clutch. The transmission was a special speed change gearbox with P.T.O. shaft, and a worm-driven bevel gear differential unit housed in a conventional back axle. The half shafts from the differential unit are coupled to the track drive sprockets direct.

The main frame accommodated either of two engines, the size depending on the attachment to be used with the tractor. Steering was manual by hand wheel through a worm reduction gearbox, draglink and track rod. The front axle swung in the vertical plane to avoid undue distortion of the tractor frame. The front rollers were fitted with a circumferential ring of steel angle section to obtain steering adhesion. Plate 4-17 is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-17: LHT Tractor II. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/lht-tractor/>)

LHT Tractor III

This tractor, fitted with attachment, is used for ridging the milled peat into the centre of the field. The tractor is the half-track type with front steering rollers. The main frame is fabricated from standard steel angle and channel sections. The tracks are single chain cast link type with timber swamp shoes bolted on and runs on cast sprockets and intermediate supporting rollers. The front steering rollers are spoked with fabricated steel rims and cast-iron hub and are mounted on stub axles on a pivoted axle beam which swings in the vertical plane. Steering is effected manually through worm reduction gearbox, drag link and track rod. The tractor is powered by a water-cooled diesel engine fitted with automotive type clutch. The transmission consists of a speed step-up primary gearbox of special design, a standard agricultural tractor change speed gearbox and differential assembly with a chain reduction final drive between the standard transmission unit half shaft and the track sprockets. Since this tractor is used only for ridging operations during daylight hours no electric generator is fitted and the engine is hand started. A hydraulic pump assembly is incorporated in the standard agricultural transmission unit and this is used to actuate the attachment hydraulic system.



Ridger Tractor (LHT IV)

A tractor specially designed to perform the milled peat ridging operation at more than twice the speed of the L.H.T. II & III. The chassis is fabricated from standard rolled steel sections mounted on half-tracks which incorporate our manganese track links and sprockets with intermediate support rollers. Timber swamp shoes are bolted to the track links. The power unit is a diesel engine with automotive type clutch, and it drives through a heavy-duty automotive type gear box and cardan shaft – the differential unit of a standard heavy duty truck back axle with epicyclic gear reduction between half shaft and wheel hubs. The track sprockets are bolted directly to the axle hubs. The tractor is carried on front rollers of generous proportions carried on stub axles and steering is powered by hydraulics. The engine is fitted with two hydraulic pumps, one for power steering and the other for the attachment hydraulic system. The attachment consists of double blades similar to the single ridger attachment, one blade on either side of the tractor converging at the rear. The blades are supported by sturdy spars which radiate from the tractor chassis. Adjustment of the sole-plate of the blade relative to these spars is provided. The attachment is lifted and lowered hydraulically through a multi-guy rope system over the top of a central mast on the tractor. Plate 4-18 below is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-18: Ridger Tractor. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/ridger-tractor/>)

Massey Ferguson 35

The Massey Ferguson (MF) 35 would have been used from the 1960s and 1970s. It has a rated engine power of approx. 37 horsepower (hp). The tractor is powered by a diesel engine. It is commonly equipped with a 6-speed or 12-speed gearbox, depending on the model and design. It has a hydraulic system with a variable capacity. The tractor's weight is approx. 1,500kg.



Ford TW15

The Ford TW15 was used from the 1980s. It has a rated engine power of approx. 140hp, with a PTO output of approx. 120hp. The TW15 was available in both 2WD and 4WD configurations. The tractor is powered by a diesel engine. It has a hydraulic system with a variable capacity. The tractor's weight is approx. 5,000kg.

Landini 5830

The Landini 5830 was used from the 1980s. It has a rated engine power of approx. 50hp, with a PTO output of approx. 42hp. The 5830 was available in both 2WD and 4WD configurations. The tractor is powered by a diesel engine. It has a hydraulic system with a variable capacity. The tractor's weight is approx. 2,500kg.

Ford F4630

The Ford F4630 was used from the 1990s. It has a rated engine power of approx. 60hp, with a PTO output of approx. 56hp. The F4630 was available in both 2WD and 4WD configurations. The tractor is powered by a diesel engine. It has a hydraulic system with a variable capacity. The tractor's weight is between 2,350kg and 2,750kg, depending on the drivetrain.

New Holland TL70/TL70a

The New Holland TL70 was used from the late 1990s. It has a rated engine power of approx. 65hp, with a PTO output of approx. 56hp. The TL70 was available in both 2WD and 4WD configurations. The tractor is powered by a diesel engine. It has a hydraulic system with a variable capacity. The tractor's weight is between 2,700kg and 3,200kg, depending on the drivetrain and cab specifications. The New Holland TL70a was a variation of the TL70 which was used from the early 2000s. It had a higher rated engine power than the TL70, of approx. 70hp. Powered by a diesel engine, it weighed between 3,550kg and 3,850kg, depending on the drivetrain.

New Holland TM150

The New Holland TM150 was used from the late 1990s/early 2000s. It has a rated engine power of approx. 150hp, with a PTO output of approx. 120hp. The TM150 was available in both 2WD and 4WD configurations. The tractor is powered by a diesel engine. It has a hydraulic system with a variable capacity. The tractor's weight is between 4,750kg and 5,250kg, depending on the drivetrain.

New Holland TM165

The New Holland TM165 was used from the late 1990s/early 2000s. It has a rated engine power of approx. 165hp, with a PTO output of approx. 135hp. The TM165 was available in both 2WD and 4WD configurations. The tractor is powered by a diesel engine. It has a hydraulic system with a variable capacity. The tractor's weight is between 5,000kg and 5,500kg, depending on the drivetrain.

New Holland TM140

The New Holland TM140 was used from the early 2000s. It has a rated engine power of approx. 140hp, with a PTO output of approx. 115hp. The TM140 was available in both 2WD and 4WD configurations. The tractor is powered by a diesel engine. It has a hydraulic system with a variable capacity. The tractor's weight is between 5,150kg and 5,410kg, depending on the drivetrain.



John Deere 5070M

The John Deere 5070M was used from approx. 2010. It has a rated engine power of approx. 140hp, with an independent PTO. The 5070M was available in both 2WD and 4WD. The tractor is powered by a diesel engine. It has a hydraulic system with a variable capacity. The tractor's weight is approx. 3,700kg.

John Deere 6830

The John Deere 6830 was used from approx. 2010. It is a 4-wheel drive tractor manufactured by John Deere from 2006 to 2012. It has a weight of 5.7 tons and is powered by an engine with a power output of 125 kW. The tractor has a transport length of 4.76 meters and can travel at a speed of 40 km/h.

4.2.1.3.2 Sod Peat Machinery

Windrow Machine

The purpose of the machine is to pick up the partly dried sods from the spread ground and form them into windrows to accelerate drying. The machine consists of a tractor unit propelling large diameter spiked drums in front of it and carrying chain/bar conveyors extending from the pick-up drums to the rear of the tractor unit. The tractor unit is supported on caterpillar type, power driven tracks and steered by coil clutch and brake arrangement. The power unit is an air cooled diesel engine. The pick-up drums (8off) are independently supported and free to follow the bog surface. As they pass over the spread, the spikes penetrate the sods and lift them to the level of the conveyors, where fingers force them off the spikes and are carried away by the conveyors. The sods are discharged at the rear of the machine in windrow form, ½ metres apart.

Sod Turning Machine

This machine does the same work as the Single Turning Machine but has greater output. The elevator mechanism is exactly the same as the single machine and the components are interchangeable. These elevator units are located in front of the tractor tracks and they discharge either into a cross conveyor, rubber belt type, or two return conveyors, rubber belt type, positioned over the tracks. The cross conveyor is reversible and moveable to either side of the machine. The tractor unit consists of a strong main frame mounted on caterpillar type tracks suitable for high idle travel speeds. It is powered by a standard diesel engine and transmission gearbox which is fitted with a proprietary clutch and brake steering equipment. A standard hydraulic pump is also built into this transmission and is used to operate the hydraulic lift of the elevators for idle travel. A special chain reduction drive is inserted between the half shaft of the standard tractor transmission and the track drive sprocket. The drive to the elevators and conveyors are taken off from the standard power take-off shaft of the transmission unit. Plate 4-19 is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-19: Sod turning machine. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/sod-turning-machine/>)

Sod Peat Bagger/Excavator

The purpose of the machine, and the various versions of it, is to excavate, macerate and spread turf for the production of sod peat. This is necessary as the high spread ground area diminishes to the point where it will not take a full spread. The machine consists of a sturdy main frame, supported on power driven caterpillar tracks, which carries the various units and their transmission drives, and to which is attached a spreader arm. The turf is excavated by a multi-bucket type digger boom which is retractable to facilitate operation at varying depths and is pivoted on the main machine so that it can be stowed for idle travel. The boom cuts a face bank at 60° to the horizontal. The turf is discharged from boom buckets into a scraper conveyor, and in turn, into a screw conveyor and twin-screw macerator. The macerator extrudes the turf onto the spreader plate chain which carries the extrusion for a distance of 54 metres, when it is discharged to the bog surface. Cutting discs trailing behind the spreader arm, marks the extrusion into sods as the machine advances. The machine is powered by electricity, and friction clutches are fitted to all motor drives for starting up. All unit drives are protected by shear pins. The machine is fitted with lights for night work and equipped with a short-wave radio transmitting /receiving set. Plate 4-20 and Plate 4-21 show this type of machinery operating on a Bord na Móna bog.



Plate 4-20: Sod Peat Bagger/Excavator. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/sod-peat-baggerexcavator/>)



Plate 4-21: Sod Peat Bagger/Excavator. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/sod-peat-baggerexcavator/>)

Cutaway Boom Attachment

The attachment comprised a short boom complete with a catchment conveyor overhung from the main machine by wishbone frames.

The boom had a lightweight framework fabricated in square hollow steel sections, within which the motor, gearbox, and chain drive, common to the original boom, were housed. The boom supporting wishbones were fabricated in square hollow steel sections of generous proportions, the pivots of which were arranged to maintain the same angle of the boom relative to the bank for various depths of cut. The upper wishbone frame was supported on a hydraulic ram from the side of the main machine, which was operated by a valve from the driver's cab, providing convenient control of cutting depths and lift for idle travel. The pivots of the lower wishbone frame were carried on arms from the main machine and were hydraulically adjustable to alter the slope of the bank cut.

The catchment conveyor, supported from the boom frame, was a rubber/canvas conveyor belt running on conventional driver, end roller, and troughing idlers. The section of the belt receiving the turf from the buckets was supported on a series of slides of self-lubricating nylon to prevent deflection of the belt and ensure more efficient sealing. The conveyor had an independent motor/gearbox drive. The catchment conveyor discharged into the original scraper conveyor of the main machine.

The attachment could be readily fitted to or removed from the machine by five pins. Plate 4-22 is an image of this type of machinery operation on a Bord na Móna bog.



Plate 4-22: Cutaway Boom Attachment. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/cutaway-boom-attachment/>)

Sod Peat Loading Machine

The purpose of this machine was to load sod peat from bog ricks into railway wagons on one side of the rick only. The machine consisted of a lightly constructed mainframe mounted on caterpillar-type power driven tracks and carried a short scraper elevator in front, extending over the width of the tracks, and a low-level cross conveyor which elevated as it projected from the side of the machine. These loading machines were either diesel or electric-powered and would be fitted with either a diesel engine or electric motor as required. Plate 4-23 below is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-23: Sod Peat Loading Machine. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/loading-machine/>)

Fóidín Machine

The fóidín machine originated from an experiment, the 'short cycle harvesting project' conducted at Oweninny bog Co. Mayo in 1965. The aim of the experiment was to produce fast drying peat sods from the surface of milled peat fields that were easy to crush in power stations, this led to the development of the fóidín machine in 1966. It came in two sections: the towing unit, which cut the peat, and the towed unit, which would macerate, extrude and spread the sods. Each of these sections was powered by its own diesel engine. It was steered by coil clutch and all other controls were operable from a cab which overlooked the working parts of the machine. The collection and stockpiling of the sods could be carried out with a combination of existing sod and milled peat machinery, modified in some cases. Fóidín production was suspended in most areas in 1972 and was abruptly terminated in 1973 due to several reasons, mainly that the yield from the fóidín system was small and insignificant compared to that of milled peat, complications arose burning crushed sods at ESB stations due to the higher calorific content of fóidín peat, and the cost of production was high relative to other peat extraction methods. Out of the 25 fóidín machines owned by Bord na Móna, one was sold to the Finnish State Fuel Supply Department, four were retained, and 20 sold as scrap.



Plate 4-24: Sod Peat Loading Machine. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/loading-machine/>)

Chain Saw Excavator

A machine of compact, sturdy construction with a high output for its size was used in Bord na Móna primarily for drainage with turf production as a secondary feature. The tractor unit was powered by a diesel engine, had proprietary transmission gearboxes, and final chain drive to caterpillar-type tracks.

The excavator, macerator, and spreading equipment were carried on the rear of the tractor unit, while a guide roller was carried on the front. All this equipment was lifted and lowered by hydraulics. The turf was excavated by a high-speed chain sword carrying cast steel teeth and discharged by centrifugal force at the upper sprocket into a screw/conveyor/macerator unit. This unit extruded the turf through a fan-tail spout, with an adjustable outlet, onto the spread ground. A series of cutting discs and a marking frame divided the layer of turf into the required sod size.

After the first cut was made, using the clutch and brake steering on the tractor unit, the front guide roller could be lowered into the excavation made to steer the machine for subsequent cuts.

A pair of loaded rollers were trailed behind the cutting sword to close the top of the excavation just made, preparing the spread ground for the next run of the machine. In this way, all available bog could be covered with spread turf, leaving only nominal spaces between the extrusions. Plate 4-25 below is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-25: Chain Saw Extractor. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/chain-saw-excavator/>)

4.2.1.3.3 Milled Peat Machinery

Miller Attachment

Miller attachments were used to break the surface of the bog into fine, milled crumbs which were left on the surface of the bog to be dried by the wind and sun. Milling attachments initially comprised single or triple units. Both single and triple units worked in the same way, with the difference between the two being the number of milling drums, and thus the output (which was approximately 2.25 times higher with the triple unit). Miller attachments were mounted on the rear of tractors and drew power from the tractor's PTO. The single and triple miller unit attachments were later replaced by an offset miller attachment known as a 'Type - I'.

Single Miller Attachment

Single miller attachments consisted of a simple but strong tubular steel frame, the main members of which extended to, and were pivoted, at the mid-position of the tractor tracks. Rigidly mounted on the underside of the frame was a pin-type milling drum which was driven from the tractor PTO shaft through a bevel gearbox and chain drive. The single miller attachment was supported by a ground roller, through springs, located immediately in front of the milling drum and by a depth control castor a few feet behind the milling drum. For idle travel, the single miller attachment was lifted by hydraulic ram so that the pin milling drum is clear of the bog surface. This attachment, by virtue of the sprung main supporting roller, caused the milling drum to cut deeper on the hills and shallower in the hollows, thus having a levelling effect on the bog surface. The drive to the milling drum is protected by a tension bolt safety device. Plate 4-26 is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-26: Single miller attachment. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/miller-attachment/>)

Triple Miller Attachment

As mentioned above, the triple miller attachment operated in much the same manner as the single miller attachment, but with a higher output.

The triple miller attachment consisted of units similar to the single attachment, ganged together. The front centre unit was attached to the tractor drawbar, while the two side rear units were drawn by brackets from the side of the front centre unit frame. These brackets were pivoted, and the level of the front of the side unit frame was controlled by roller castors running on the bog surface. The drives to the three milling drums were by universal jointed propeller shafts with splined slip sleeves, two bevel gearboxes and final chain drives. The milling drum speed was lower than the single unit, but in all other respects the behaviour of the individual units is the same as the single miller attachment. For idle travel the units were lifted on hydraulic rams incorporated in the rear castor roller assemblies. Depth of cut was also adjusted by these rams from the driving seat. The drive to each of the three units was protected by a tension bolt safety device. Plate 4-27 below is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-27: Triple miller attachment. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/miller-attachment/>)

Offset Miller Attachment (Type-I)

This attachment was used to form a bevel on the edges of milled peat fields, to assist surface drainage. The attachment was a miller drum, projecting from the rear of the tractor unit on a casing arm which is pivoted at a central position on the rear of the tractor main frame and extended to carry a ballast weight. The drive was taken from the tractor PTO shaft, through a bevel gearbox which formed the pivot assembly of the arm and a universally jointed propeller shaft extended to the actual milling drum. The milling drum was set backwards as it extended from the tractor so that the spoil was thrown back towards the centre of the milled peat field, where it could be harvested. A supporting trolley fixed to a projecting bracket at the centre of the tractor track and supported on a roller behind the drum, carried the drum arm on an adjustable suspension. The trolley, complete with extension arm and drum could be lifted by a winch rope passing over a mast frame mounted on the tractor. For bogs in early development a bladed drum was used, while a pin drum was used on production bogs. Plate 4-28 below is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-28: Offset (Type-I) Miller attachment. (Source: Bord na Móna site personnel)

Harrow

The attachment was made up of four spoon frames, each supported on steel wheels with brass bushings inserted and mounted onto steel shafts held on with a collar and split pin. The main towing frame had 2no. sets of twin steel wheels which pivoted when turning. Each frame behind that had 2no. sets of twin steel wheels fixed. The spoon frames were made of steel tubes and were triangular in shape, with two spars projecting at 45 degrees from the base of the triangle at the rear, each to carry a bank of spoons. The spoon was a curved plate, the base of which was a straight line, set at an angle to the line of travel, and while the front was curved back from its base, the rear was curved forward. The actual spoon was welded to an arm made of spring steel, which was pin jointed to the 45-degree spar to allow movement in the vertical plane. These spoons were pitched to ensure that all the peat was turned.

The four spoon frames were each free to follow the bog surface on their supporting wheels but were connected to each other by a pin-jointed link to facilitate turning. The supporting wheels of the towing frame were located in line with the towing points of the rear frames and were free to move laterally to facilitate turning.

Plate 4-29 below is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-29: Harrow. (Source: Bord na Móna site personnel)

Harvester

The purpose of this machine is to harvest milled peat from the bog fields in exactly the same way as the Type II harvester attachment on the HD Tractor. The tractor was a full track unit comprising a lightly constructed mainframe mounted on caterpillar-type tracks; on one side of the tracks returned at a high level to accept the harvesting attachment. The track chain was the cast link type running on cast sprockets and intermediate rollers. It was powered by a diesel engine, and the transmission consisted of a primary gearbox of special design, with a PTO shaft, and increased the transmission RPM through a standard automobile change-speed gearbox and a standard agricultural tractor transmission unit. The final drive reduction between the rear transmission half shaft and track sprocket was by a special spur gear reduction box.

The tractor was steered by a clutch and brake system of proprietary manufacture, which was built into the rear transmission unit. A driver's cab of generous proportions was fitted, with sliding doors and safety glass panels all around. Some of these cabs were of fiberglass construction, and others were of steel.

The attachment consisted of a single or double spiral unit and a single belt conveyor, articulated at two points.

The spiral unit was a steel sheet casing suitably stiffened with standard steel sections, capable of housing one or two spirals. The front and rear of the casing were open. The peat ridge was allowed to enter on the front side as the machine advanced, while the rear opening was blanked off by a trailing board, which was raised and lowered in guides as required, and when in the lowered position, was free to move in these guides as the surface of the bog demanded. The spiral or spirals were supported in this rigid casing by a bearing at each end of the shaft. The revolving spiral or spirals conveyed the peat along the bog surface and trailing board and up a sloping plate of the casing, discharging it onto the belt conveyor.

The spiral unit was supported on two inner and two outer rollers, each pair arranged so that each roller was free to follow the surface of the bog while carrying its share of the load.

The drive to the spiral or spirals was by a double universally jointed propeller shaft, and the casing was pin-jointed to a structural frame, which in turn was pin-jointed to the tractor unit, allowing complete flexibility of the spiral unit to follow the contour of the bog.



The belt conveyor was partly constructed on the structural framework connecting the spiral unit and tractor unit, including the conveyor drive pulley, and partly on the tractor unit, and the remainder formed the jib, projecting from the machine. While flat carrying idlers were used for the receiving end of the belt, flexible shaft type troughing idlers were used over the articulated portion, and conventional type troughing idlers on the jib. At the discharge end of the jib, a moveable deflector was fitted to control the trajectory of the peat.

The attachment was carried on the tractor unit, and a mast on the tractor unit was braced back to the spiral casing by a wire rope, while a multiple rope system actuated by a hydraulic ram on the mast was passed over the top of the mast and connected to the projecting conveyor jib. The top of the mast was also controlled relative to the tractor unit by a wire rope and hydraulic ram.

The driver of the machine could raise or lower the jib and the trailing boards and raise the spiral casing completely off the bog surface by hydraulics and control the jib deflector by a simple rope winch. Plate 4-30 below is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-30: Harvester. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/harvester/>)



Milled Peat Loading Machine

The purpose of this machine was to load milled peat from peat stockpiles into railway wagons. The machine consisted of a tractor unit carrying a ground spiral on the front, extending either side of the bottom shaft was a bucket elevator which sloped back over the tractor unit. As the buckets overtopped the top sprockets of the elevator, they discharged onto a rubber belt conveyor which discharged into the railway wagons. Plate 4-31 below is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-31: Milled Peat Loading Machine. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/loading-machine/>)

Polywrapper

A polywrapper was used in the uncovering of milled peat stockpiles. The polywrapper was mounted on the three-point linkage of a tractor (see Plates 4-32 and 4-33 below). The eye of the polywrapper was attached to a pendulous swivel arm, which, as the tractor moved forward, oscillated from left to right to ensure that the polythene being collected was being dispensed evenly across a metal shaft, which was internally fitted with a plastic pipe, on the polywrapper. This ensured an even spool of polythene was collected. Once the spool was at capacity, one side of the polywrapper was opened (see Plate 4-33 below), which allowed the metal shaft to be removed leaving just the plastic pipe in the roll of polythene. The entire spool was then removed, and sent for appropriate disposal/recycling. The metal shaft was reinserted into the polywrapper, fitted with a new plastic pipe internally, the side closed, and the process began again until the stockpile was fully uncovered and all the polythene collected.



Plate 4-32: Polywrapper



Plate 4-33: Polywrapper with the frame opened to allow access to the collected bale of polythene



4.2.2 Ancillary Services and Infrastructure

There are a number of ancillary structures and infrastructure associated with peat extraction and ancillary activities at the Application Site. These include:

- Littleton Works;
- Works offices;
- Local holding areas; and,
- Railway infrastructure.

Except for railway infrastructure and local holding areas, the remaining ancillary infrastructure has been removed from the Application Site boundary and as such substitute consent is not being sought in respect of this ancillary infrastructure. Nonetheless, in order to provide as detailed a description as possible of the Project, all of the ancillary infrastructure is described below.

4.2.2.1 *Littleton Works*

Littleton Works, also referred to as 'the Works', is located along the southern boundary of Littleton Bog, on the L2111. Littleton Works provided a central location for support and management services to the Application Site and includes workshops, offices and welfare facilities such as toilets, a canteen, staff parking and the Littleton Briquette Factory. The workshops and offices at Littleton Works were originally constructed prior to the enactment of the *Planning and Development Act 1963* (i.e. 1st of October 1964) as described in Section 4.1 and Chapter 1 - Introduction, Volume 2 of this rEIAR and are not included as part of this Substitute Consent application.

The Works was sold to a third party in 2020, and has not supported activities at the Application Site since its sale.

During the Peat Extraction Phase, bog workers would return to where their machines were parked overnight (e.g. at local holding areas or the Works) and then mobilise out into the peat extraction fields. At the end of the peat extraction season (i.e. from approximately October each year), machinery was brought to the Works for overhaul/service in preparation for the new peat extraction season to commence in the following March. Concrete bunds and oil interceptors were provided to prevent release of fuels to the ground or surface water bodies. All tanks and drums were stored in bunded areas. These standard practices were in place prior to the implementation of the IPC Licence in 2001. The workshops were mainly used to carry out repairs and maintenance on machinery which was brought in from the peat extraction areas.

A machine and wheel wash facility were also located at Littleton Works. Machine washings generated due to the cleaning of various plant machinery (using a power steam wash system when machinery left the bogs) at wash bays drained into the adjacent peatlands drainage system. Please see Plate 4-34 below for the location of Littleton Works.

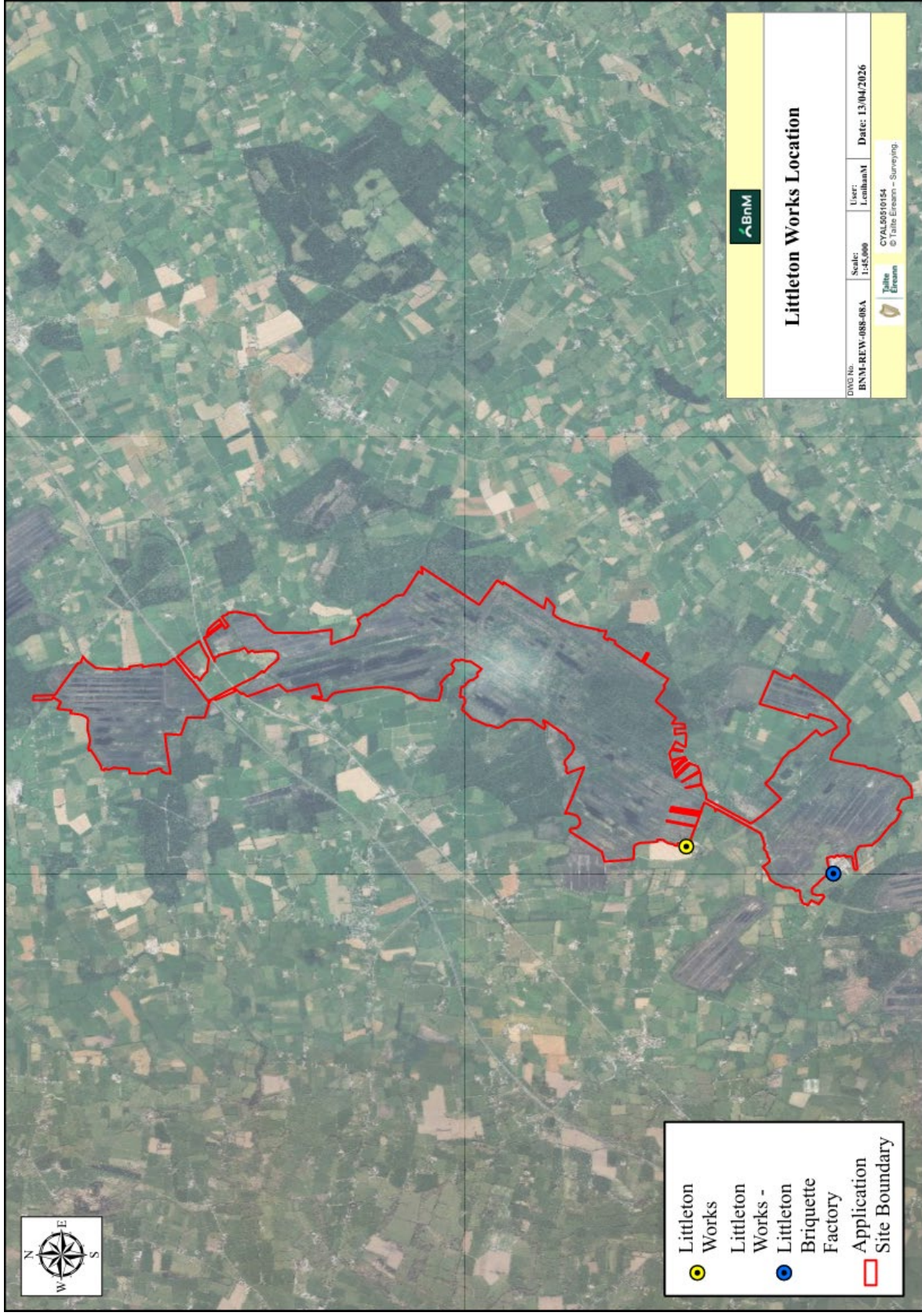


Plate 4-34: Location of Littleton Works



4.2.2.2 Works Offices

The offices at Littleton Works provided an administration centre for the Application Site. Permanent administration staff were employed throughout the Peat Extraction Phase from the time of construction of these buildings.

4.2.2.3 Fuel Storage

Fuel was stored within above ground tanks alongside the main workshop at the Littleton Works. The fuel tanks were bunded to contain any potential fuel spills or leaks. The practice of bunding at the Works and for mobile refuelling units was introduced in the 1970s. Refuelling procedures were subsequently upgraded to standard bunding specifications to comply with IPC Licence requirements in 2001 (refer to Appendix 4.1, Volume 3 for details). Refuelling of vehicles and machinery was primarily carried out at Littleton Works, but in some circumstances where machinery could not be tracked back to the Works buildings, refuelling was also carried out on the bogs at designated areas, away from drains or rivers, as required. Service trains/railcars with a bunded fuel dispensing unit, travelled from the Works to the designated bog area to refuel the machine in question. This occurred at a frequency of up to three times a week during peak times of the Peat Extraction Phase. This frequency was significantly reduced outside peak peat extraction.

The filling of tanks from the fuel supplier took place at the main fixed tanks at Littleton Works. These fixed tanks are now decommissioned. The service trains were filled from the main tanks at Littleton Works and travelled by rail to refill the plant machinery on the bog.

4.2.2.1 Local Holding Areas

There are 3 no. local holding areas associated with peat extraction at the Application Site, 1no. local holding area is located in Longfordpass Bog and 2 no. local holding areas are located in Littleton Bog. The locations of the local holding areas are presented in Planning Drawings P23-035-0101-0001, P23-035-0101-0004 and P23-035-0101-0006 as submitted as part of this Application..

Local holding areas were areas in which peat extraction machinery was parked at the end of the working day. Given the size of the Application Site, it wasn't necessarily sensible to track machinery back to Littleton Works each evening, and back to the active areas of peat extraction in the morning, as this would require significant time, given the speed of the machines, and result in unnecessary fuel use. As such, informal local holding areas were established by workers on the bog. These areas were proximate to road networks to allow staff easy and safe access without tracking over bog, and essentially comprised flat areas which were suitable for machines to park on.

4.2.2.2 Railway Infrastructure

Peat extraction areas were served by a network of permanent and temporary narrow-gauge rail tracks, (approximately 1m in width and with track lengths of approximately 9m), the majority of which was constructed in the 1950s and 1960s. During the early years of peat extraction activities and all ancillary works, the lifting and laying of rail was done by hand before equipment was designed for that purpose.

As discussed in Section 4.2.2.7, the track sleepers were approx. 1.8m in length and 0.76m apart. The total length of permanent track at the Application Site is 9.5km approximately, see Figure 4-1, Volume 4.



There are 4. no rail underpasses proximate to the Application Site. The first rail underpass is located between Longfordpass Bog and Littleton Bog. It is located on the R639 between Littleton and Uringford, (Tipperary Planning Ref. 6586). The second rail underpass bridge for a double-line railway is located in Longfordpass North at the M8, (Tipperary Planning Ref. 6848). There is a third rail underpass located within Littleton Bog on a local road which cuts through the northern section of Littleton Bog, approximately 500m to the southeast of the underpass on the R639. There is a fourth rail underpass located along the southern boundary of Littleton Bog on the L2111 in proximity to the location of the former Littleton Works.

The Bord na Móna railway infrastructure was designed to be moveable, supporting infrastructure that was laid to facilitate the transportation of peat off the bog. Once peat stocks were exhausted from one area, the temporary tracks were taken up and re-laid in new areas of bog which had entered production. Thus, over the decades the railway line layout changed shape regularly. Furthermore, as areas fell out of permanent production, some railway lines were taken up completely.

The railway wagons were pulled by diesel powered locomotives, examples of which are shown in Plate 4-35.



Plate 4-35: Example of railway locomotive and wagons hauling milled peat to the power plant (source: Bord na Móna)



Railway Equipment

The equipment which facilitated the installation and maintenance of the railway tracks, as well as the equipment used to transport peat on the railway lines, are described below. A map of the railway network at the Application Site is presented in Figure 4-2, Volume 4 above.

Rail Shifter

A rail shifter was an attachment fitted on to tractors which was used to lift temporary railway tracks in sections and build them onto bolster bogies for transport to a new area. The rail lifter consisted of a lightly constructed main frame supported on two bogies and an overhead lattice work beam supported from the main frame to allow the passage of the rail sections through the machine. When seven sections were built on the bolster bogies, they were hauled away by a locomotive. Plate 4-37 below is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-37: Rail Shifter. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/rail-shifter/>)

Rail Moving Attachment

The purpose of the rail moving attachment was to lift and lay temporary railway track along sod peat ricks and milled peat piles. The attachment was fitted to a tractor and consisted of an A-frame jib pivoted on a bracket secured to the track frame of the tractor and braced back at the top by wire rope to a projected ballast box on the other side of the tractor. A short jib was used for sod peat operations while a longer and a longer jib was used for milled peat operations. Plate 4-38 below is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-38: Rail Moving Attachment to lift and lay temporary railway track, along Sod Peat ricks and milled peat piles. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/rail-moving-attachment/>)

Locomotive 80HP (Wagonmaster)

The locomotive hauled peat from the stockpiles across the Application Site to the Littleton Works for processing. The locomotive was powered by a water-cooled diesel engine driving through a fluid coupling, automotive type clutch, standard automobile change speed gearbox, a special reversing bevel/spur reduction gearbox and drive and coupling rods to the wheels. The main frame was fabricated steel plate. The axles ran in self-aligning double row roller bearings in cast steel housings sliding in horn guides with manganese steel wearing faces. A cab of generous size was included, with a tumbling-type seat to facilitate driving in both directions. The clutch control pedal was duplicated for the two driving positions. The braking system was mechanical hand operated. The locomotive was fitted with beam lighting, electric windscreen wipers and driving mirrors for both directions of travel. Plate 4-39 below is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-39: Locomotive with wagons. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/diesel-locomotive/>)

Wagons

Wagons had a capacity of 16 cubic metres and were designed with two diamond bogies for sod and milled peat haulage. One bogie of each wagon was free to float 152mm in any direction to prevent derailment on uneven temporary track. The diamond bogie with its centre springs gave great flexibility and prevented axle failures. The wagon bearings were taper roller bearings which were grease-packed and fitted in the wheel hubs.

The use of aluminium to fabricate the sides and floor of milled peat wagons reduced the unladen weight of the wagon when compared to heavier materials such as wood and steel, and therefore facilitated a greater payload (i.e. a greater amount of peat) to be transported per train. Furthermore, the use of aluminium resulted in considerable reduction in the maintenance and painting costs.

Rail Car

Rail cars were used by the Manager or authorised members of his staff, to make inspection tours of the bog. Rail cars were equipped with first-aid equipment and also worked as a bog ambulance if needed. Rail cars were fitted with a water-cooled petrol engine, the power from which was transferred through an automotive clutch to a gearbox, and then transferred to each axle via a chain drive. Beam lights and electric windscreen wipers were fitted at each end of the rail car and a short-wave radio transmitting and receiving set enabled the occupants to keep contact with the Works and the larger machines that were fitted with radio units on the bog. Plate 4-40 below is an image of this type of machinery operating on a Bord na Móna bog.



Plate 4-40: Rail Car. (Source: <https://www.bordnamonalivinghistory.ie/equipment-detail/rail-car/>)

4.2.3 Site Services

Water consumption across the Application Site is primarily at the Littleton Works for domestic use. The potable water supply at Littleton Works is from a local authority water supply mains located on the L4101. Water supply to the Briquette Factory sited at the Works was from the River Breagagh, located south of the Works and outside the Application Site boundary. Water from the river was supplied to the Briquette Factory via a pump house.

Wastewater from the welfare facilities at Littleton Works receives primary treatment in one of three septic tanks at the Works, with the effluent discharging to ground via soakpits. The septic tanks are visually inspected and cleaned bi-annually by a licenced waste permit holder to ensure the treatment system is working optimally.

Electricity supply to Littleton Works buildings and workshops, and also to the drainage pump stations, are powered by mains electricity from the national grid connected to overhead electrical power lines.

Compressed air (oxygen and acetylene) was used mainly at the Littleton Works for welding and cutting purposes to maintain plant and equipment.

In addition to the above, other materials consumed as part of the historical peat extraction and ancillary activities would have been polythene sheeting for covering stockpiled peat, timber and steel for the rail lines, gravel for the rail beds etc.



4.3 1941 to 1988 – Initial Development & Peat Extraction (Pre EIA-Directive)

4.3.1 Site Description 1941 (Pre-Extraction)

Prior to the commencement of drainage, which first occurred on the Application Site in 1941, the Application Site was covered by an active raised bog, with the surface being wet, acidic and deficient in plant nutrients, with open Sphagnum-dominated vegetation. Raised bogs are accumulations of deep acid peat where peat can range from 3-12m deep. The “raised bog” name is derived from the elevated dome which develops as the bog grows due to the accumulation of peat. Pre-development topographies would have been higher (in the ranges of 123-133mOD) than those observed today, with the remnant areas of high bog located along the western boundary of the Application Site.

Water in a raised bog is continuously circulating, and pre-development, the Application Site would have been nutrient-poor and waterlogged on the surface. The principal supply of water to the Application Site would have been from rainfall. Water would have been lost from the Application Site from surface water runoff particularly during the winter months when the storage capacity of the bog would have been fulfilled due to higher levels of seasonal precipitation. Water may also have been lost through the lower levels of the peat deposits, especially where the bog is underlain by gravels or sands without underlying low permeability lacustrine deposits (i.e., clay layer). The pre-development water table at the Application Site was likely very stable with only minor fluctuations and remaining within a few centimetres of the bog’s surface.

The primary land-use change associated with peat extraction and ancillary activities occurs during the initial drainage of the bog in advance of peat extraction. Constructed drainage ditches drain the upper surface of the bog by lowering the local peat water table. After the Application Site was drained, vegetation was removed from the bog surface, leaving only bare peat fields between the drains. Around this time and in the years that followed, ancillary features were also constructed including railway lines, and workshops..

Prior to 1988, all four bogs within the Application Site (i.e. Longfordpass, Littleton,– Lanespark, and Derryvella) were fully drained and all four bogs were subject to peat extraction.

During the Peat Extraction Phase of the Project, only minimal land-use change occurred which predominantly related to minor annual topographic changes caused by ongoing peat extraction and ancillary activities. While peat extraction was ongoing it was not possible to rehabilitate the underlying peatland.

4.3.2 Drainage and Peat Extraction

The timing of the installation of drainage and initiation of peat extraction varied across the Application Site. Littleton Bog was the first bog to commence clearance and drainage in 1941 and would have experienced a relatively abrupt change in land cover with the commencement of peat extraction in 1952. Sod peat extraction commenced in Littleton Bog in 1952, which assisted with the overall drainage of the bog by removing the acrotelm (see Section 4.4.1 above for description on process of removal of acrotelm/top layer of bog). Clearance and drainage works on Longfordpass bog commenced in 1947 and Lanespark, and Derryvella bogs commenced in 1968 respectively.



The earliest aerial imagery available (1973) confirms that at that time, drainage to facilitate peat extraction was already inserted at Longfordpass, Littleton, Lanespark and Derryvella bogs. The Application Site was mapped as potential industrial areas/machine turf in the Peatland Map of Ireland produced by the National Soil Survey in 1978⁴. Plate 4-40 below presents the extent of peat extraction at the Application Site in 1973, which has been deduced from the earliest available aerial imagery for the Application Site (i.e. 1973). All aerial imagery available for the Application Site is included in Appendix 4.4, Volume 3.

As outlined above, the Application Site commenced clearance and drainage in 1941 and would have experienced a relatively abrupt change in land cover with the commencement of peat extraction in 1952.

⁴ <https://www.teagasc.ie/media/website/environment/soil/Peatlands-of-Ireland-Map.pdf>

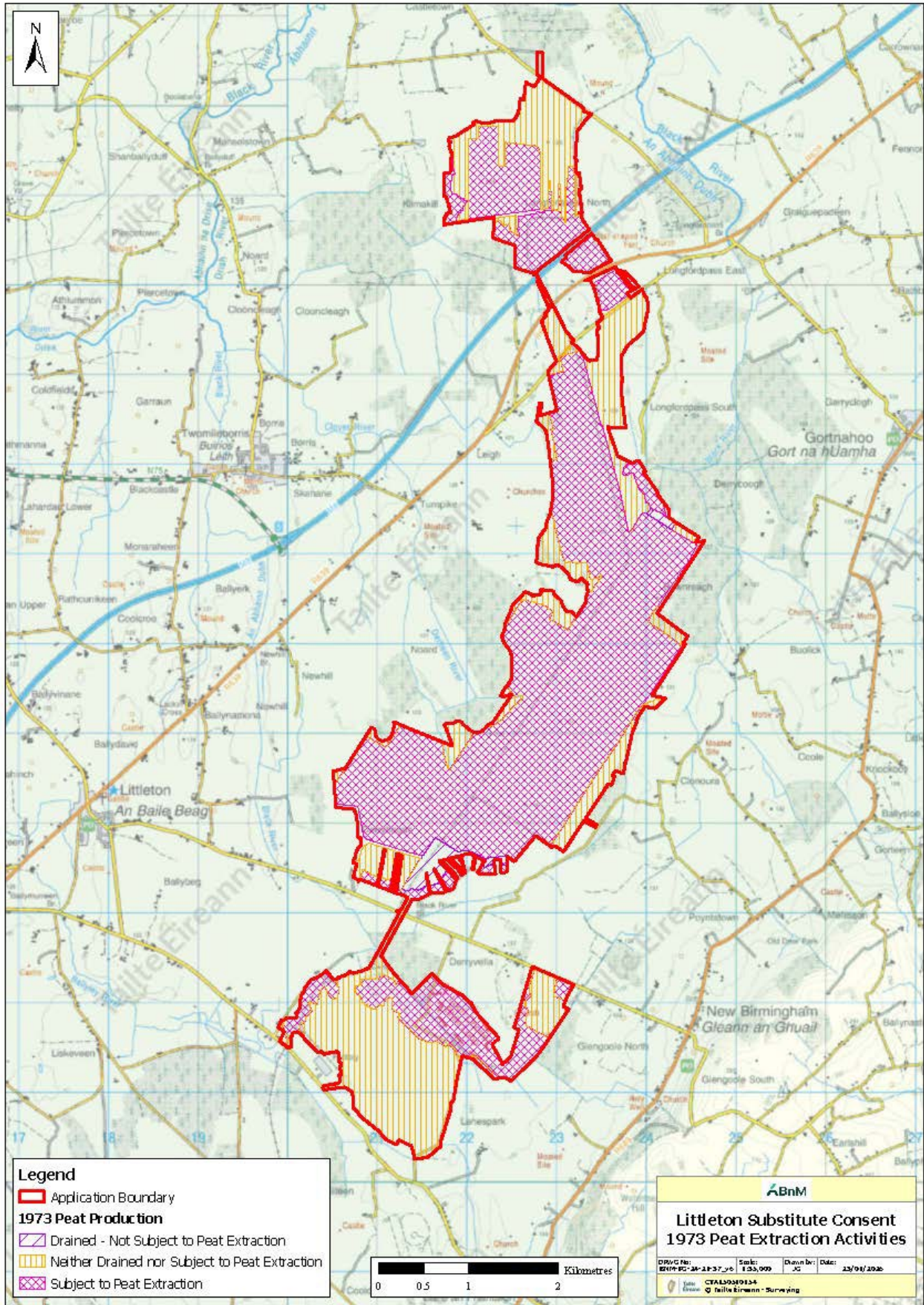


Plate 4-41: 1973 Peat Extraction Activities at the Application Site



As discussed above, drainage ditches to drain the upper surface of the bogs by lowering the local water table were inserted across the Application Site at different stages throughout the decades (please see Table 4-2 below and Section 4.2.2 for details on drainage construction methods practiced at the Application Site). After the bogs were drained, vegetation clearance was undertaken. It is estimated that in 1973, approximately 1,052ha across the Application Site were cleared, drained and subjected to peat extraction. In 1988 this increased to approximately 1,353ha across the Application Site being cleared, drained, and subject to peat extraction, and a total of approximately 110ha were drained but not subject to peat extraction. Approximately 144 hectares were out of peat extraction in 1988.

The topography of the Application Site prior to the commencement of peat extraction and ancillary activities is estimated to have been 123-133 mOD. This is deduced from the relatively uniform low-lying nature of the Application Site and surrounding landscape, and the presence of benchmarks noted on historical 25" OSI mapping (1897-1913 and) Cassini 6" (1940s) of the area. It is assumed that prior to the installation of drainage to facilitate peat extraction, the Application Site was virgin bog and was therefore an active raised bog.

The primary and greatest land-use change associated with peat extraction and ancillary activities on the Application Site occurred during the initial drainage and vegetation removal of the bogs in advance of peat extraction. This impact would have predominantly occurred in advance of 1988 at the Application Site. A photographic accompaniment illustrating the types of activities described below can be found in Appendix 4-10 *Bord na Móna: Peat Development in Ireland 1954*.

Table 4-2: Operational history of the Application Site (Source: Bord na Móna Annual Reports and sources listed in Section 4.1.2)

Bog Unit	Commencement of Site Preparation Works (vegetation clearance and drainage insertion)	Extraction Commenced	Extraction Ceased
Longfordpass Bog	1947	1952	2017
Littleton Bog	1941	1952	2017
Lanespark Bog	1968	1973*	2017
Derryvella Bog	1968	1973*	2017

*Aerial imagery of the Application Site shows peat extraction had commenced by 1973.

The following table describes the general activities within the Application Site over a calendar year during each of the four quarters from 1952 when peat extraction commenced to July 1988. Some drain maintenance was carried out during the full year, but it was mainly restricted to outside the peat extraction season. Fuel handling and refuelling would have increased significantly during the peat extraction season due to the increased activity of the peat extraction machinery.



Table 4-3: Annual Peat Extraction Activities 1952 - 1988

Calendar Quarter	Activities
January to March	Drain/Machinery/Pump/Silt Pond maintenance, Stockpile removal, peat transportation
April to June	Peat extraction, Stockpile development/removal, peat transportation
July to September	Peat extraction, Stockpile development/protection/removal, peat transportation
October to December	Drain/Machinery/Pump/Silt Pond maintenance, Stockpile removal, peat transportation

4.3.3 Drainage Design

As part of the development of the Application Site for peat extraction, parallel surface water drains as per the methodology outlined in Section 4.2.2 were created by machine excavators at specific intervals, depending on whether milled or sod peat was being extracted. The strips of bog between these drains were retained to form peat extraction ‘fields’. By 1988 drainage channels, silt ponds, outfalls and pumps were extant at the Application Site. The Planning Drawing Pack shows the detailed drainage features across the Application Site.

4.3.3.1 *Longfordpass Bog*

Drainage works first commenced in Longfordpass Bog by 1947. The earliest available aerial imagery dating from 1973 shows sod peat drainage inserted at Longfordpass Bog. By 1988, there was one pump, and 3 no. silt ponds installed on Longfordpass Bog.

4.3.3.2 *Littleton Bog*

Drainage works first commenced in Littleton Bog by 1941 according to Bord na Móna Annual Reports. The earliest available aerial imagery dating from 1973 shows sod peat drainage inserted at Littleton Bog. By 1988, there were 12no. pumps installed on Littleton Bog.

4.3.3.3 *Lanespark Bog*

Drainage works first commenced in Lanespark Bog by 1968. The earliest available aerial imagery dating from 1973 shows drainage inserted at the periphery of Lanespark Bog. By 1988 the bog was fully drained for industrial scale peat extraction, and there were no pumps, and 4 no. silt ponds installed on Lanespark Bog.

4.3.3.4 *Derryvella Bog*

Drainage works first commenced in Derryvella Bog by 1968. The earliest available aerial imagery dating from 1973 shows drainage inserted at the periphery of Derryvella Bog. By 1988 the bog was fully drained for industrial scale peat extraction, and, there were no pumps, and 1 no. silt ponds installed on Derryvella Bog.



4.3.4 Peat Extraction Pre-1988

4.3.4.1 *Background*

As discussed in the Planning Statement, the Turf Development Board had begun the preliminary development of certain bogs in 1941 with a view to the production of machine-won turf. These bogs included the Application Site and also Attymon (Galway), Barna and Carrigcannon (Kerry), Derraghan (Longford), Derrycashel and Mountdillon (Roscommon), Derryounce and Derrylea (Offaly), and Coolnagun, (Westmeath). In early 1946, the White Paper was issued by the Government, later known as the First Development Programme, setting out ‘a comprehensive plan for the development of the country’s peat resources by mechanical methods’ which entailed the development of 24 no. bogs, including the Application Site. Peat extraction commenced in the form of sod peat extraction at the Application Site in 1952.

4.3.4.2 *Sod Peat Extraction 1952 to 1984*

As noted in Section 4.5.2, sod peat extraction began at the Application Site in Littleton and Longfordpass Bog in 1952 in the form of sod peat. Sod peat was extracted for domestic sale and to supply fuel to the Southern Health Board for use in hospitals and other public health facilities. The processes and machinery associated with sod peat extraction are described in Section 4.2.2.2.1

Sod peat extraction at the Application Site ceased in 1984. Following the cessation of sod peat extraction, the areas of sod peat extraction were converted to milled peat extraction (i.e. the drainage infrastructure was amended to facilitate milled peat extraction).

4.3.4.3 *Milled Peat Extraction 1978 to 1988*

Milled peat extraction commenced at the Application Site in 1978. From 1978 to 1984 milled peat was stockpiled on site for future use in the Littleton Briquette Factory. From 1984, milled peat from the Application Site was sent to the Briquette Factory. The processes and machinery associated with milled peat extraction are described in Section 4.2.2.2.2.

In 1984 sod peat extraction ceased at the Application Site and during the period from 1984 to the July 1988 baseline milled peat was the only form of peat extraction ongoing throughout the Application Site. Figure 4-9 shows a map of the peat extraction areas at the Application Site in 1988, illustrating areas that were subject to peat extraction and areas where peat extraction had not yet commenced.

Appendix 4.4, Volume 3 includes available aerial imagery from 1973, 1988, 1995, 2004, and 2018. Labels are added to the imagery to identify the three bogs within the Application Site as well as neighbouring bogs.

4.3.3 Peat Extraction Volumes 1952 – June 1988

An estimate of the volumes extracted during the period 1952— end of June 1988 was determined based on extraction volumes taken from the Bord na Móna Annual Reports and an average calculated from available records of extraction tonnages over the period from 1963 - 1972 and the period from 1978 – 1988.

The volumes of peat removed from the Application Site varied from year to year with a general and gradual increase with time as more of the Application Site was developed and became available for peat extraction. Fluctuations in peat extraction volumes are generally attributable to weather conditions in any given year, with wetter weather resulting in lower volumes of peat extraction due to poorer ground conditions for operating machinery, and poorer peat drying conditions; conversely, drier weather usually resulted in higher volumes of peat extraction due to better ground and drying conditions.



From 1952 to 1978, the volume of peat extracted was an average of 50,000 – 60,000 tonnes per year. Preparation for the extraction of milled peat began in 1975 and extraction of milled peat commenced in 1978.

From 1978 to 1984, both sod and milled peat extraction were being carried out at the Application Site where an average of 179,543 tonnes of peat was extracted per year during this period. The extraction of milled peat increased from c. 5,317 tonnes in 1979 to c. 246,833 tonnes in 1987. As part of Bord na Móna’s Third Development Programme (see Chapter 2), plans were made to construct a briquette factory at Littleton. Littleton Briquette Factory received planning consent in July 1977 (Tipperary Reg Ref. 4576) and was opened in 1982 to meet the national growing demand for briquettes. Littleton Briquette Factory produced peat briquettes from milled peat received from a number of bogs, including the Application Site, as well as other consumer retail products such as firelighters.

Table 4-4 below and Plate 4-41 show the annual peat extraction volumes over the period 1952 to June 1988.

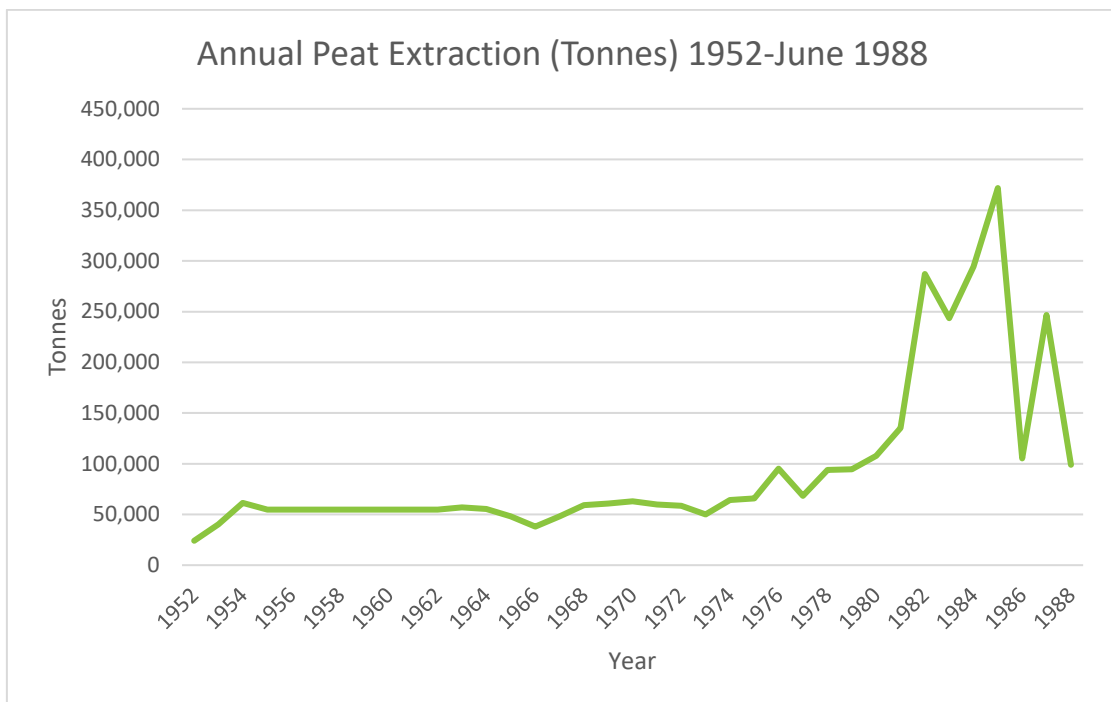


Plate 4-42: Annual Peat Extraction (Tonnes) 1952 to June 1988



Table 4-4: Peat Extraction (Tonnes) 1952 to June 1988

Year	Tonnes (c.)	Year	Tonnes (c.)
1952	24,083	1971	59,804
1953	40,400	1972	58,448
1954	61,284	1973	49,892
1955	54,757*	1974	64,114
1956	54,757*	1975	65,853
1957	54,757*	1976	95,030
1958	54,757*	1977	68,436
1959	54,757*	1978	93,957
1960	54,757*	1979	94,537
1961	54,757*	1980	107,738
1962	54,757*	1981	135,274
1963	56,920	1982	287,186
1964	55,257	1983	243,681
1965	48,251	1984	294,430
1966	37,900	1985	371,839
1967	48,174	1986	105,129
1968	59,070	1987	246,833
1969	60,689	January – June 1988	99,030**
1970	63,060		

* average of peat extraction volumes from 1963-1972

** average of peat extraction volumes from 1988-1997 (half of 1988 presented in above table)

Before the commencement of milled peat extraction in 1978, sod peat was supplied to hauliers for distribution to customers for domestic use, and to a variety of large-scale end users, including hospitals. From 1982, milled peat extracted at the Application Site was delivered to Littleton Briquette Factory to facilitate the manufacture of peat briquettes up to the closure of the Briquette Factory in 2018. Peat extraction ceased at the Application Site in 2017. Following the cessation of peat extraction, any remaining peat stockpiles were delivered to Shannonbridge Power Station and Derrinlough Briquette Factory with the last stockpile being sent here in mid 2019.



4.3.5 Control Measures pre-1988

With the exception of silt control (which from 1974 was subject to a formal management program as discussed in Section 4.3.5.9 below), formal documentation outlining dedicated measures referred to as control measures practised on site from 1941 - July 1988 are not available. However, based on personal communication with a retired Bord na Móna personnel, the following measures below were enacted at all Bord na Móna bogs, and thus the Application Site, as part of daily, monthly, and annual bog management and operations and were outlined in the 2001 IPC licence.

4.3.5.1 *Peat Extraction Machinery – Maintenance Programmes and Storage*

1. All peat extraction machinery listed above in Section 4.2.2 were stored at Littleton Works or at local storage areas at the end of the workday;
2. All machinery were regularly inspected serviced and maintained;
3. All machinery was regularly cleaned via power steam wash system at a wash bay and drained into an interceptor tank and associated gravel soak pit. The interceptor unit facilitated the removal of any floatable oil/grease components. This was done to minimise dust and particle release; and,
4. Self-contained machine parts washer was located at the Works.

4.3.5.2 *Refuelling Facilities*

Refuelling and maintenance of all vehicles were undertaken at Littleton Works, or at local holding areas in Longfordpass and Littleton bogs. When machinery required refuelling on the Application Site, it was carried out by a mobile (rail or tractor-transported) fuelling unit which travelled out from Littleton Works to the bogs where the machinery was located. Refuelling procedures were upgraded to standard bunding specifications to comply with IPC Licence requirements in 2001 (refer to Section 4.6 & 4.7 for details)

The following emergency action procedure was implemented at the Application Site prior to IPC licencing (pre-2001) and was recorded as part of the IPC Licence process:

1. When a spill occurred, the General Manager was immediately informed of the incident;
2. The spill was required to be assessed by the General Manager for potential risk to the health and safety of employees and the potential environmental consequences;
3. If there was a risk of explosion, all personnel in the area were required to be evacuated from the area;
4. The spill was sourced, isolated and contained with polystyrene booms or dry peat (moisture content of 10%);
5. All effort was made to prevent the spill from entering a storm drain or nearest outfall;
6. Once the spill had been contained, a suitable absorbent (dry peat) was to be used to soak the spillage;
7. All possible ignition sources such as electrical equipment, naked lights, machinery were removed from the area. Any combustibles in the spill area were removed;
8. Follow up action measures taken includes the implementation of appropriate remedial work to prevent such a spillage recurring in the future; and,
9. In the event of a significant spillage, the General Manager was required to notify the local authority.



4.3.5.3 Fire Safety

1. Annual training provided for bog fires crew and factory personnel and all general staff was provided with a minimum of 2 hours training in fire prevention;
2. All fire exits were designated. These doors were required to be fitted with push-bar mechanisms only and lighted from independent sources. They were required to be unobstructed inside and outside at all times and open outwards;
3. Each canteen/office were required to be equipped with a fire blanket and fire extinguisher;
4. There were required to be at least 1 fire point at all office premises;
5. Petrol and other oils were required to be stored in designated oil stores;
6. Batteries were not charged in working areas unless suitable protection was provided;
7. Training was provided for Oxygen cylinder storage and use;
8. Fire Wagons: wagons were provided for fire prevention which contain: hoses, shovels, fire beaters, baskets, buckets, breathing apparatus, first aid kit, drums of foam and foam making machine, Flootation Pumps also extinguishers etc.;
9. Stockpiles were covered with polythene film gauge sheets and secured in position by spreading an even layer of high moisture content milled peat. This prevented spontaneous combustion of certain peat types by excluding air as much as possible; and,
10. Fire Safety Audits undertaken at six monthly intervals along with random audits. Yearly assessments were undertaken of all audits completed.

4.3.5.4 Dust Management at Bog Boundaries and Headlands

Dust emissions were higher from the milled peat extraction process than the sod peat extraction process. Tree cover along the fringes of bogs minimised the amount of dust that would travel off-site. In 1976 Bord na Móna established a policy to preserve the vegetation and tree cover on all bog fringes and on any mineral islands⁵. In addition, the following measures were undertaken at a minimum to minimise dust emissions and later expanded under IPC licence.

1. Stockpiles were compacted on either side by large rollers drawn by tractors;
2. Stockpiles were covered with polythene film gauge sheets and secured in position by spreading an even layer of high moisture content milled peat;
3. Peat extraction during windy weather was to be avoided;
4. The headlands were to be kept clean and loose peat removed;;
5. Drivers were required to drive slow along dusty headlands; and,
6. All road crossing points were to be maintained clean.

4.3.5.5 Internal Rail Network Maintenance

Railway tracks and railway locomotives underwent continuous inspection and maintenance to prevent derailments, fires, accidents and fuel leaks. The locomotives were fitted with beam lighting and electric windscreen wipers for both directions of travel.

⁵ 4 Brown Gold 'A History of Bord na Móna and the Irish Peat Industry', 2010 Clarke, Donal, Chapter 10 Pg 206



4.3.5.6 *Surface Water Management*

Surface water run-off from Littleton Works and hard standing areas drained via onsite surface water drainage systems, which were installed as part of the construction of buildings and hardstand areas over the decades, into the adjacent peatland surface water drainage network.

All machinery was regularly inspected and serviced. All machinery was cleaned at the end of the season via a compressed air wash system at a wash bay located at Littleton Works. There are two interceptor units which facilitated the removal of any oil/grease components at the Works. This was done to minimise dust and particle release. Formal silt control measures adopted in 1974 are outlined in Section 4.7 below.

4.3.5.7 *Maintenance Programme for Internal Drains*

The internal drains were cleaned on a regular basis in suitable weather, mainly prior to and post the peat extraction season (i.e. between October and March). This was necessary to remove sludge from the bottom of drains and dispose of it by spreading it on the adjacent field. Drain maintenance was carried out using ditchers. These works were programmed to ensure that the drains servicing the peat extraction areas were fit for purpose. Drain maintenance was carried out mainly prior to and post the peat extraction season (i.e. between October and March).

4.3.5.8 *Maintenance of Onsite Surface Water Pumps*

The following procedure was followed with respect to ensuring that the onsite pumps were maintained in good working order:

1. Visual inspection of pumps daily;
2. Operational check of pumps biweekly; and,
3. Service of pumps monthly.

4.3.5.9 *Silt Management*

As part of the Third Development Programme in the 1970s (which is discussed in further detail in Chapter 2), Bord na Móna decided in 1974 to control all effluent by means of specially designed and constructed silt ponds, thereby trapping more than 90% of the suspended solids present in the drainage water. A silt committee was set up in October 1975 to study the feasibility of removing silt from the bog effluents. Recommendations of an interim report prepared by the committee in 1975/1976 were as follows:

1. Provision of silt ponds should be a basic feature of new bog development for milled peat and their construction should be planned for all outlet systems;
2. Ideally, silt ponds should be located in cutaway bog;
3. Sufficient area should be acquired at the initial stage to provide for silt ponds;
4. In production bogs, existing large catchments should be broken up into manageable proportions and ponds constructed to accord with local topography;
5. Revision of drainage techniques should be considered such as arranging flatter gradients in external and internal outfalls and extending their width and length in the lower reaches to encourage settlement of silt;



6. Initial drainage effluent should be allowed to spill over face banks (where practicable) until adequate silt ponds have been provided. This should be applied to all new bog development immediately. Similarly, growth and vegetation should not be removed from external outfalls until interference with drainage and/or complaints force us [Bord na Móna] to act;
7. It is recommended that catchments to be protected by silt ponds should not be greater than 500 acres;
8. Ponds should be designed for maximum run-off of 1 cubic foot per minute per acre and run-off controlled by provision of small diameter culverts, weirs or sluices;
9. For milled peat, 50 square foot of pond per acre of catchment. For 500 acres, 45-foot wide x 555-foot long x 7-foot deep, i.e., 6-foot maximum of silt and 1 foot minimum of water;
10. Ponds should be provided in pairs each sufficient for the catchment protected;
11. Ponds should be cleaned out at regular intervals as required but at least four times a year using dragline or Hymac retained permanently for this purpose. Investigations to be made into the suitability of pumping units; and,
12. Second parallel pond should be used during excessively large water flow (storm water).

A copy of a memo sent to Littleton Works from the Bord na Móna Production Manager in March 1976 setting out the recommendations of the silt committee is included in Appendix 4.9. It is understood that this memo was sent to the Managers of all Bord na Móna Works sites including Littleton Works as the memo directs that *“At all milled peat bogs in production, works should carry out surveys and select sites for silt ponds as recommended”*. On the basis of this direction, staff at Littleton Works would have commenced the selection of sites for the establishment of silt ponds at the Application Site around this time. Further Bord na Móna records show that silt pond measures were introduced across all Bord na Móna bogs in the early to mid-1980s in response to the 1977 Water Pollution Act. A number of silt ponds were installed at the Application Site pre-1988 to reduce sediment discharge from the extraction works. Silt ponds were installed to trap and reduce the emission of suspended solids to surface water bodies originating from activities associated with peat extraction, such as suspended peat particles generated from the extraction fields and collected in the bog drainage network as well as run-off from workshop areas.

Silt ponds were designed and constructed, primarily, with a width of 8m, however, in some cases, silt ponds of up to 12m in width were constructed. The larger silt ponds up to 12m wide are only provided in areas where access is available to both sides of the silt ponds for cleaning. The length of the silt pond varies depending on the capacity required (i.e., the length is proportional to the area of catchment being drained). In some locations, baffles (i.e., obstructing panels or vanes) have been installed within the ponds to reduce the energy in the flow and elongate the pond thereby increasing residence time and aiding settlement. Silt ponds are generally excavated to a depth of 1.5m below the pipe invert level, however in some locations, due to restricted space, the silt pond depth is greater than this. Low-velocity flow through the silt pond is generally controlled by inlet and outlet pipes at the silt ponds or upstream of the silt pond. These pipes control the velocity of the flow into and out of the silt ponds so that the velocity within the silt pond itself is less than 0.1 m/sec. This slow flow through the pond allows suspended sediment (mainly peat) particles to fall out of suspension and build up on the base of the pond, thereby reducing the sediment loading of the outflow from the pond. The principle behind the design of the silt ponds is an application of Stoke's Law. Stokes' Law describes how small solid particles move through a viscous fluid, stating that the drag force on these particles is directly proportional to their size, velocity, and the fluid's viscosity. The silt ponds are cleaned twice a year and are all located hydraulically upgradient of discharge/outfall points to the adjacent surface watercourse. Access to the silt ponds is via headlands and machine passes which were created to facilitate vehicle movements within the Application Site. The silt pond design, as submitted to the EPA with the IPC Licence Application in 1999, is shown in Plate 4-43.

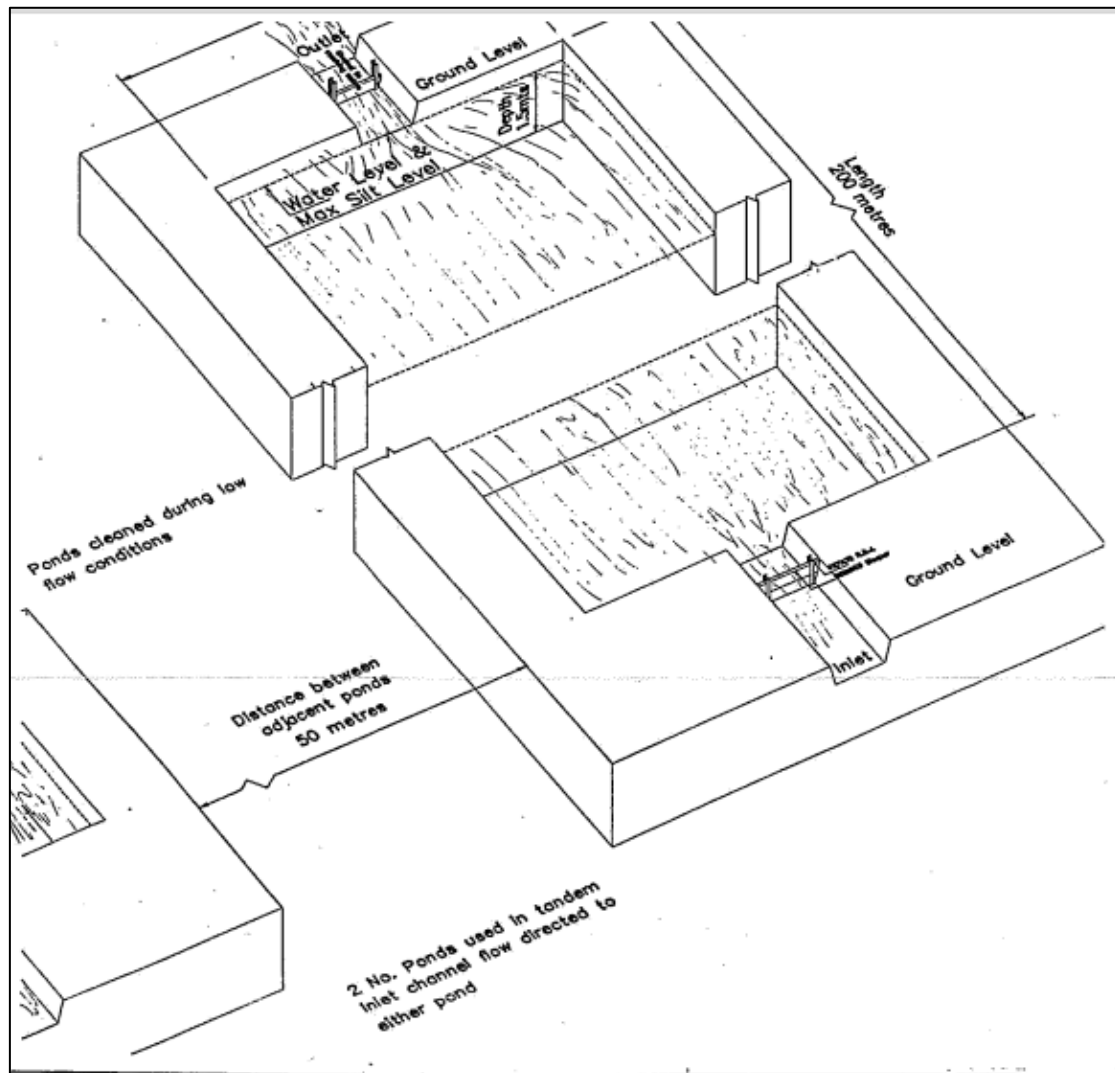


Plate 4-43: Typical Silt Pond Design Implemented at the Application Site.

Other records of Silt Committee meetings in April 1984 (which are included in Appendix 4-8, Volume 3) set out acceptable standards of effluent and note a decision from ACP on a licence for effluent from the Littleton Briquette Factory in County Tipperary, which set an upper limit of 100mg/l for suspended solids. The records note that *“although the legalities regarding obligation to treat bog effluent and briquette factory effluent may be dissimilar the waste involved is similar. It would, therefore, seem reasonable to assume that a target value of 100mg/l in the case of bog effluent would satisfy potential complainants whose complaints are based on genuine dissatisfaction with the present standard of our [Bord na Móna] effluents”*.

These records are evidence of early control measures implemented across the Bord na Móna landbank, including the Application Site, to control sediment levels in effluent.

4.3.5.10 Waste Management

The following measures were carried out with respect to management of waste:

1. Waste oils and brake fluids drained from machinery during servicing were collected in drums and emptied to a designated waste oil storage tank;
2. Waste oil storage tank contents transported off-site by a licenced waste disposal contractor;
3. Oil and fuel filters changed at vehicle service intervals;



4. Spent filters collected and disposed of through a waste disposal contractor;
5. Used batteries are collected by battery collection contractor;
6. Off-washings from the self-contained machine parts washer was collected within a sludge tank at the Works;
7. Ash from the onsite boiler was stored in a skip onsite and collected by a licenced contractor and taken to landfill;
8. Waste polythene removed from stockpiles was collected at the roadside by a plastic recycling company; and,
9. Workshop waste and general refuse from canteens/offices was historically burned on site or disposed into waste disposal areas at the Works. This practice changed to the use of skips which were then collected by licenced contractors.

4.3.5.11 Archaeological Disturbance

As part of peat extraction training, all employees hired to work on the bogs were required to read and adhere to the recommendations set out in the Department of Education publication entitled, *Ancient Objects in Irish Bogs and Farmlands: A Guide for Finders* (1942).

Workers were required to stop all works and report to the Bog Manager if archaeological finds were encountered. If materials thought to be of archaeological interest were encountered, the Bog Manager was required to report the findings to the Garda Síochána within seven days. The Gardai would then contact the Commissioner of Public Works. A record of archaeological finds and observations within the Application Site can be found in Chapter 12: Cultural Heritage of this rEiAR.

4.4 July 1988 - rEiAR Baseline

As described in Chapter 1 - Introduction, Volume 2 and in Section 4.1, the application for substitute consent, and therefore this rEiAR covers the period from July 1988, the timeframe for when the EIA Directive was required to be transposed into Irish Law, to present day.

As such the activities carried out as of July 1988 form the initial baseline date for the description of the existing Application Site and combined with the activities from July 1988 onwards form the Project. The remedial environmental impact assessments are presented in the subsequent specialist chapters.

Table 4-5 details the operations and activities carried out on the Application Site in each quarter of the 1988 calendar year. Plate 4-44 (and Figure 4-9, Volume 4) below illustrates the areas drained, undrained and undergoing peat extraction in 1988.

Between 1952 and 1988, approximately 3,534,355 tonnes of sod and milled peat were extracted at the Application Site, while the exact tonnage of peat extracted in 1988 is unknown, the average from the period of 1978 to 1987 (i.e. approximately 198,060 tonnes per annum) has been applied to determine the 1988 baseline for the purposes of this assessment.

The estimated topography of the Application Site in July 1988 is based on an average depth of milled peat extraction of 0.1m per year over a 29-year period, which has been worked back from the 2017 topography. As the Application Site was subject to milled peat extraction, this approach is considered to be the most robust in determining the peat height in 1988.



4.4.1 Site and Activity Description –1988 rEiAR Baseline

By July 1988, the land use at the Application Site was well established as industrial peat extraction. The Application Site was fully drained, milled peat extraction was underway throughout the site and railway infrastructure was in place. The main access point to the Application Site was via the local road the L2201 running from southeast to northwest adjacent to Lanespark Bog, into Briquette Factory, which was built in 1981. Littleton Works, which comprised a canteen, storage sheds, maintenance buildings and the Briquette Factory was located in the south of the Application Site. The following ancillary infrastructure was established at the Application Site by 3rd July 1988:

- Railway infrastructure; and,
- Silt ponds, pumps and drains.

4.4.1.1 *Longfordpass Bog*

Investigation of satellite imagery and annual reports indicate that by 1988, approximately 226ha of Longfordpass Bog was subject to peat extraction. Thus, the main landcover type at this time was cutover peat. Drainage was already installed, predominantly in a north-south orientation as described above. Railway infrastructure was laid in the bog. In 1988, there was one pump, and 3 no. silt ponds installed on Longfordpass Bog.

4.4.1.2 *Littleton Bog*

Investigation of satellite imagery and annual reports indicate that by 1988, approximately 795ha of Littleton Bog was subject to peat extraction. Thus, the main landcover type at this time was cutover peat. In 1988, there were 12no. pumps installed on Littleton Bog.

4.4.1.3 *Lanespark Bog*

Investigation of satellite imagery and annual reports indicate that by 1988, approximately 239ha of Lanespark Bog were subject to peat extraction. Thus, the main landcover type at this time was cutover peat. Drainage was already installed, predominantly in a north-south orientation as describe above Railway infrastructure was laid in the bog. In 1988, there were no pumps, and 4 no. silt ponds installed on Lanespark Bog.

4.4.1.4 *Derrylvella Bog*

Investigation of satellite imagery and annual reports indicate that by 1988, approximately 92ha of Derrylvella Bog were subject to peat extraction. Thus, the main landcover type at this time was cutover peat. Drainage was already installed, predominantly in a north-south orientation as describe above. Railway infrastructure was laid in the bog. In 1988, there were no pumps, and 1 no. silt ponds installed on Derrylvella Bog.

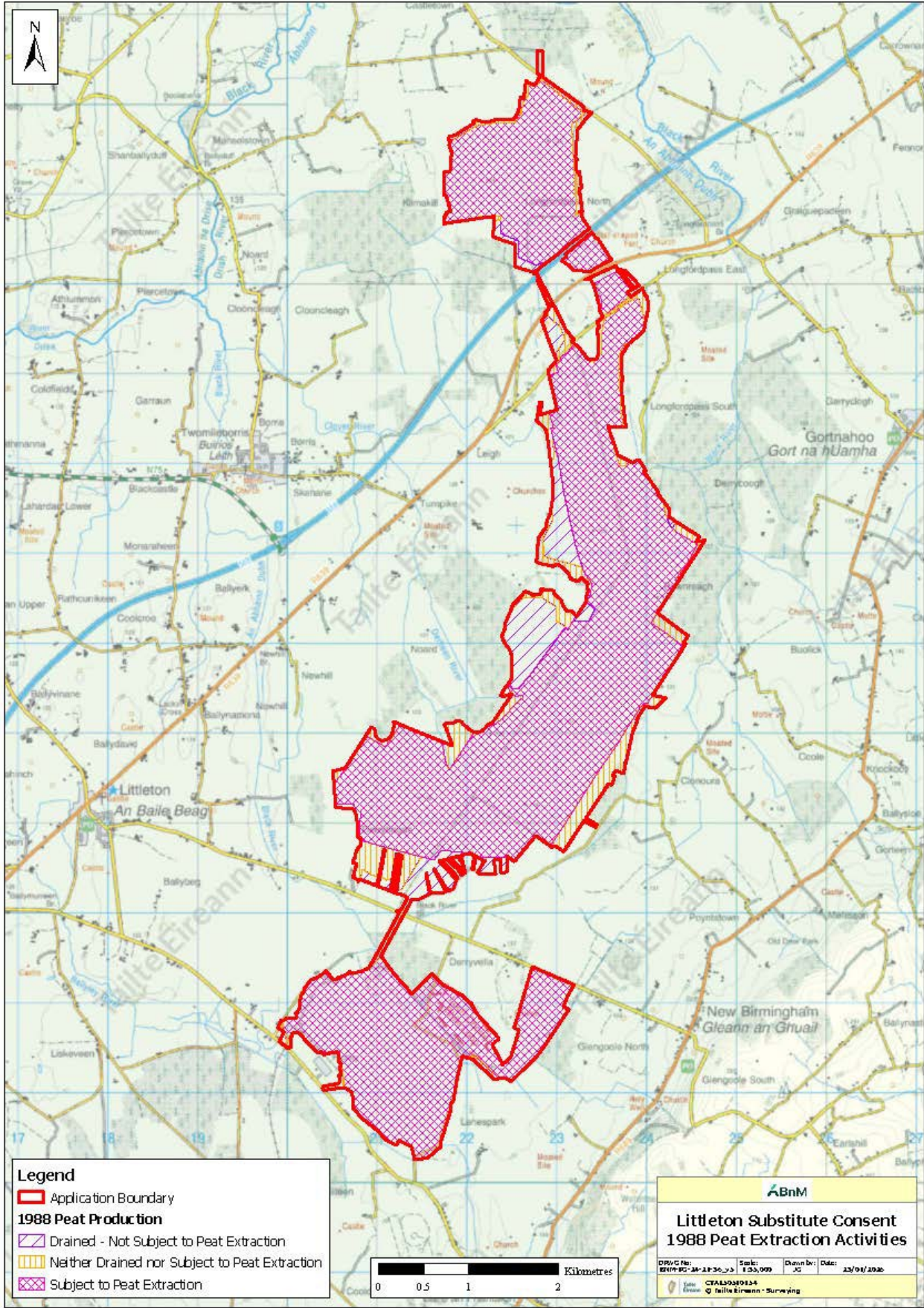


Plate 4-44: 1988 Peat Extraction Map



4.4.2 1988 Peat Extraction Activities

Table 4-5 below describes the general activities within the Application Site over a calendar year during each of the four quarters in 1988. Some drain maintenance was carried out during the full year, but it was mainly restricted to outside the peat extraction season (i.e. from October to March). Fuel handling and refuelling would have increased significantly during the peat extraction season due to the activity of the peat extraction machinery. Rail network maintenance continued in 1988 with temporary rail tracks added and removed alongside peat stockpiles as required.

Table 4-5: 1988 Peat Extraction Activities

Calendar Quarter	Activities
January to March	Drain/Machinery/Pump maintenance, stockpile removal, peat transportation, silt pond maintenance
April to June	Peat extraction, stockpile development/removal, peat transportation
July to September	Peat extraction, stockpile development/removal, peat transportation
October to December	Drain/Machinery/Pump maintenance, stockpile removal, peat transportation, silt pond maintenance

4.5 Peat Extraction Phase 1988 to 2017 (Drainage, Peat Extraction & Associated Activities)

As demonstrated above, by 1988 peat extraction was well established at the Application Site. Drainage was installed in all bogs and railway infrastructure was laid on all bogs as required.

Drainage construction methodologies are described above in Section 4.2.2.1.1.

4.5.1 Drainage Design

After 1988, peat extraction and ancillary activities were well underway at the Application Site. The deepening and maintenance of the drains continued beyond 1988, up until the cessation of peat extraction in 2017. As the areas subject to peat extraction from 1988 to 2017 reduced in their extent (refer to Figures 4-9 to 4-13) and the depth of peat available was reduced after each harvest, the extent and number of drains requiring deepening and maintenance reduced accordingly.

Machinery used for drainage works would have been largely the same as that described in Section 4.2.2 with ever-improving engine efficiency in tractors and excavators.

4.5.1.1 Longfordpass Bog

In 1988, peat extraction was at its peak across the Longfordpass bog i.e. c. 226ha were subject to peat extraction. Between 1988 and 2017, the extent of peat extraction gradually decreased. In 1995, c. 173ha were subject to peat extraction. Cessation of peat extraction had occurred by 2017.



4.5.1.2 *Littleton Bog*

In 1988, peat extraction was being carried out across the majority of Littleton Bog. c.795ha were subject to peat extraction, while c.99ha were drained (but not subject to peat extraction).

In 1995, there was a significant reduction in peat extraction at Littleton Bog. c.134ha were subject to peat extraction, c.760ha were drained (but not subject to peat extraction). A gradual and consistent reduction in peat extraction activity can be seen in both Littleton North and Littleton South from 2004 onwards. Cessation of all peat extraction activity had occurred by 2017.

There is 1 no. silt pond on the western boundary of Littleton Bog. There are 4no. pump sites at Littleton bog. None of the 4no. pumps are active today.

4.5.1.3 *Lanespark Bog*

In 1988, peat extraction was at its peak across Lanespark bog (c.239ha was subject to peat extraction), occupying the majority of the central portion with some undeveloped land along the northeastern and southwestern boundaries. Between 1988 and 2017, the extent of peat extraction reduced. In 1995, c.201ha were subject to peat extraction. In 2004, c.65ha were subject to peat extraction. Cessation of all peat extraction occurred by 2017.

There are no pumps in Lanespark bog. There are 4no. silt ponds i.e. 2no. along the northern boundary of Lanespark bog and 2no. along the southern boundary.

4.5.1.4 *Derryvella*

In 1988, peat extraction was at its peak across Derryvella bog (c.92ha in subject to peat extraction). Between 1988 and 2017, the extent of peat extraction reduced. In 1995, c.44ha were subject to peat extraction. In 2004, c.30ha were subject to peat extraction. Cessation of all peat extraction occurred by 2017.

There are no pumps in Derryvella bog. There is 1no. silt ponds. along the western boundary.

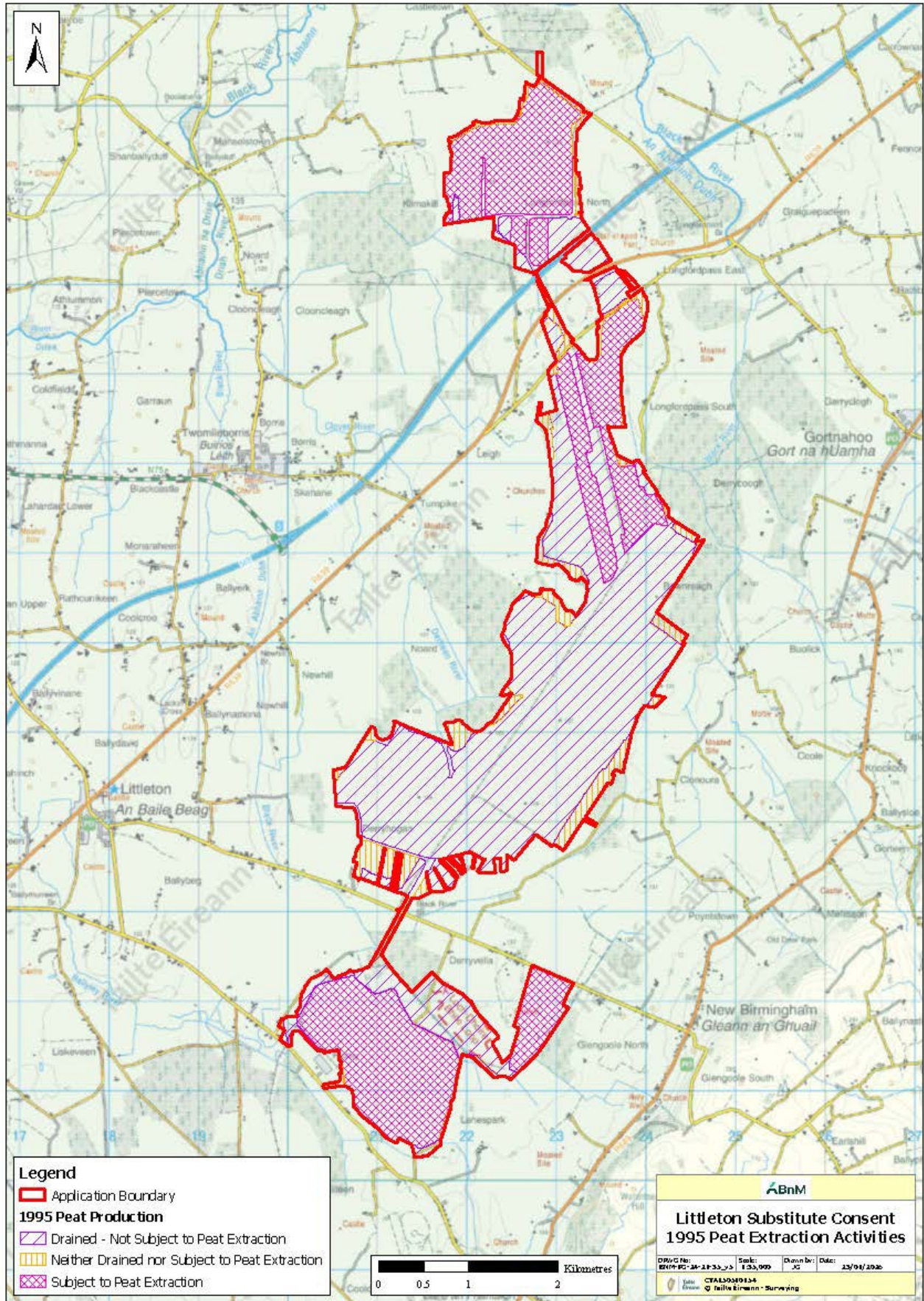


Plate 4-45: Peat Extraction Map 1995

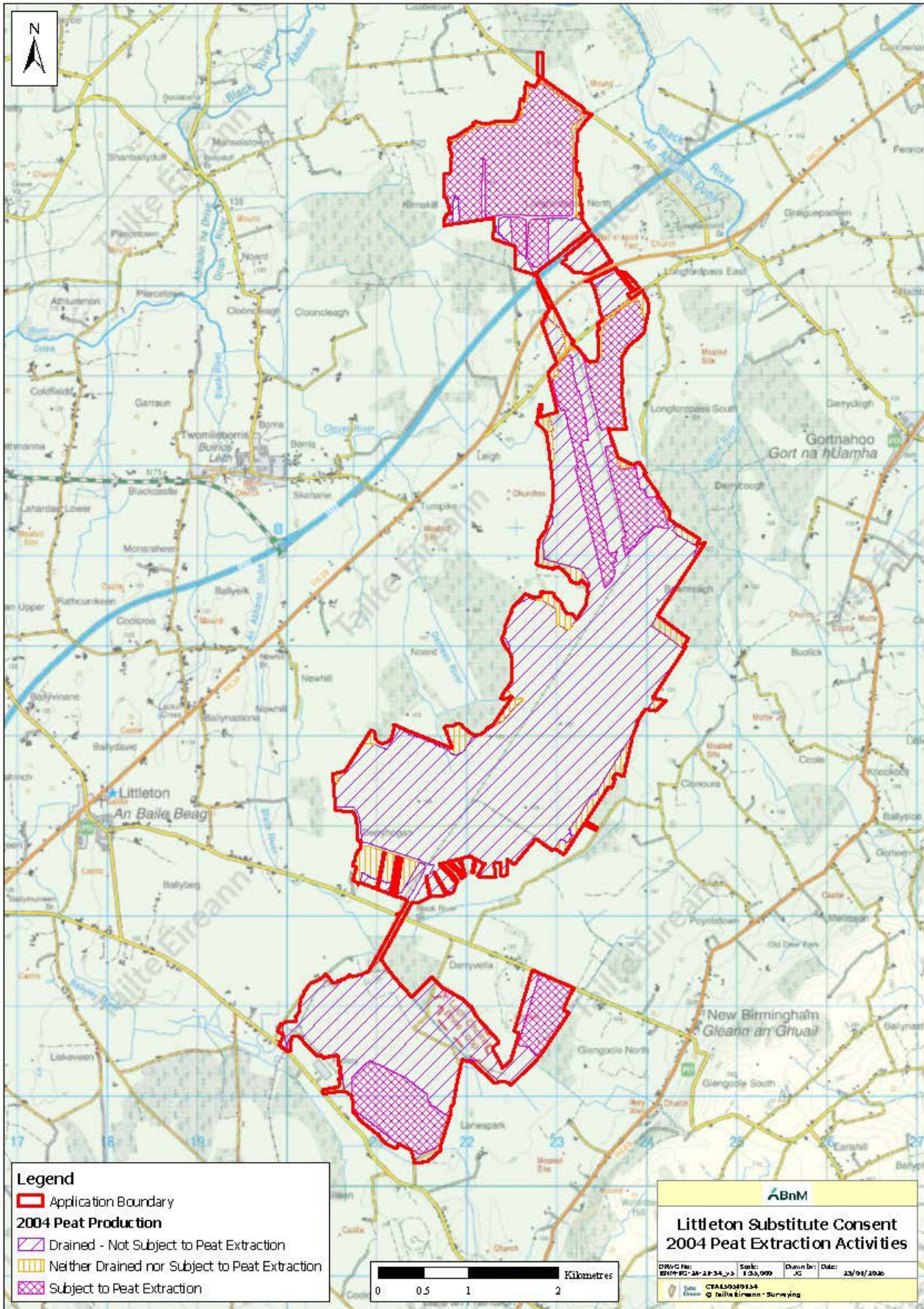


Plate 4-46: Peat Extraction Map 2004

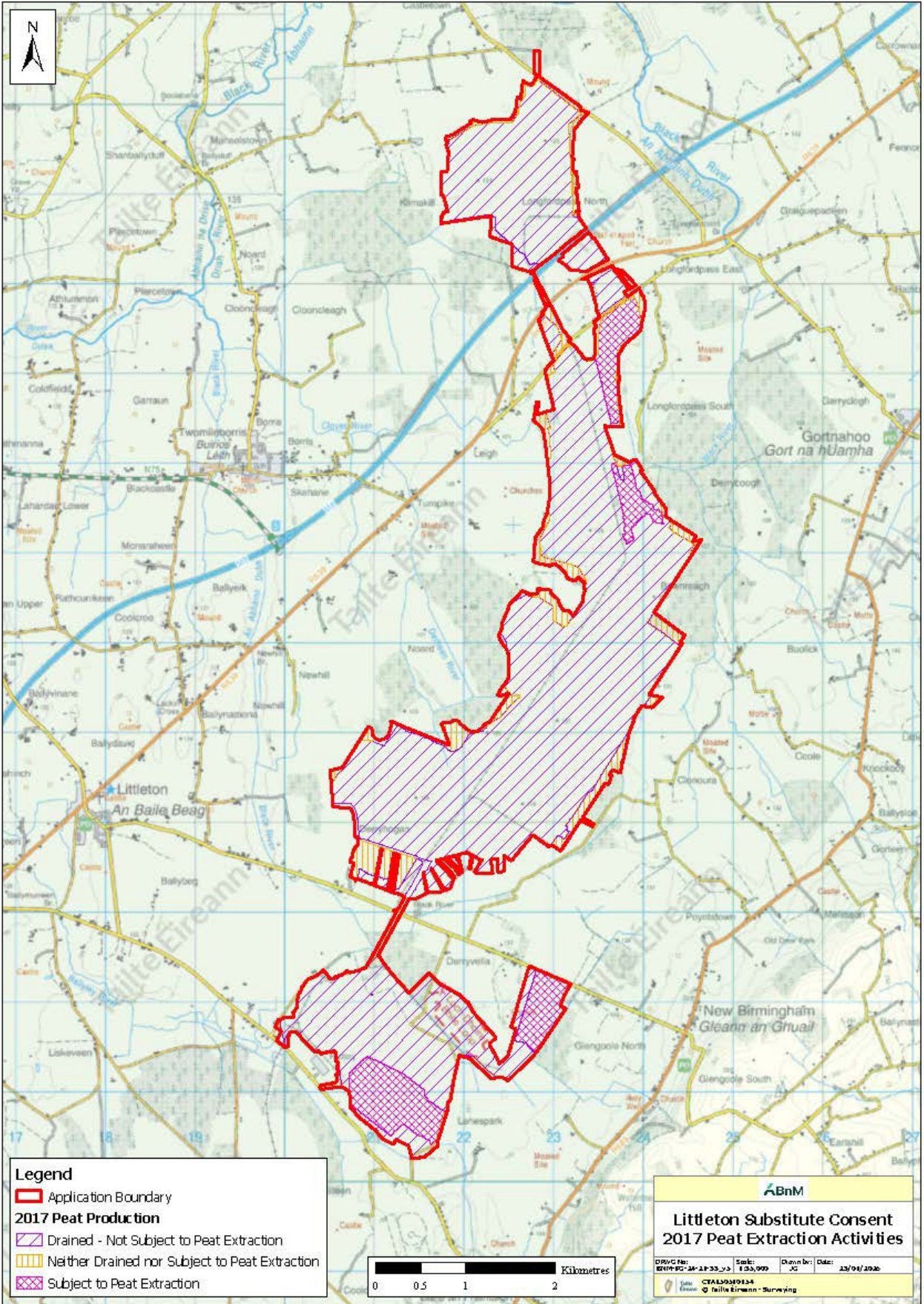


Plate 4-47: Peat Extraction Map 2017



4.5.2 Peat Extraction

Milled peat extraction, under the same processes described in Section 4.2.2 and 4.3.3 above, continued at the Application Site from 1988 until 2017 when peat extraction permanently ceased across the Application Site. Improvements and modernisation of machinery occurred between 1988 and 2017 which increased the efficiency and speed of operations over this time period. There were significant developments in diesel-powered engines which would have resulted in the use of more fuel-efficient tractors on the bogs with significantly cleaner exhaust emissions compared to the baseline year of 1988 or pre-1988.

During the latter part of the 1988 to 2017 period (i.e., from late 1990s/2000 onwards) peat extraction gradually slowed down and then ceased permanently in 2017 across the Application Site with the related reduction in fuel handling/refuelling, machinery maintenance and stockpile development.

Peat extraction maps for the years 1995, 2004 and 2017 are presented in Plates 4-44 to 4-48 and illustrate the activity on the Application Site over time and the increasing areas of lands which were no longer subject to peat extraction. Aerial images for the years 1995, 2004, and 2018 are included in Figures 4-3 to 4-7 of Volume 4.



4.5.3 Extraction Volumes July 1988- 2017

Between July 1988 and 2017, an average of 170,593 tonnes of peat were extracted each year, with a total of approximately 5,117,798 tonnes extracted between July 1988 and the cessation of peat extraction in 2017.

The volumes of peat removed from the Application Site varied from year to year and were mainly influenced by weather conditions. The tonnages of peat extracted are outlined in Figure 4-9 and Table 4-6 below.

An estimate of the volumes produced during the period July 1988—2017 was determined based on production volumes taken from the Bord na Móna Annual Reports and Accounts, site production records and an average of production tonnages over the period from 1978 – 1987 when annual quantities were unavailable.

The volumes of peat removed from the Application Site varied from year to year with a general and gradual decrease with time as more of the Application Site became exhausted thus reducing the area available for peat extraction. Fluctuations in peat extraction volumes are generally attributable to weather conditions in any given year, with wetter weather resulting in lower volumes of peat extraction due to poorer ground conditions for operating machinery, and poorer peat drying conditions; conversely, drier weather usually resulted in higher volumes of peat extraction due to better ground and drying conditions.

By July 1988, the extraction of sod peat had ceased and milled peat production had increased significantly e.g. from c. 5,317 tonnes in 1978 to c.246,833 tonnes in 1987. The average volume of milled peat extracted per year during the period July 1988—2017 was approximately 170,593 tonnes. The milled peat was supplied to Littleton Briquette Factory from the year it opened i.e. 1982 to the year in which the factory closed i.e. 21st of March 2018.

Table 4-6 below and Plate 4-48 show the annual peat extraction volumes over the period July 1988 to 2017.

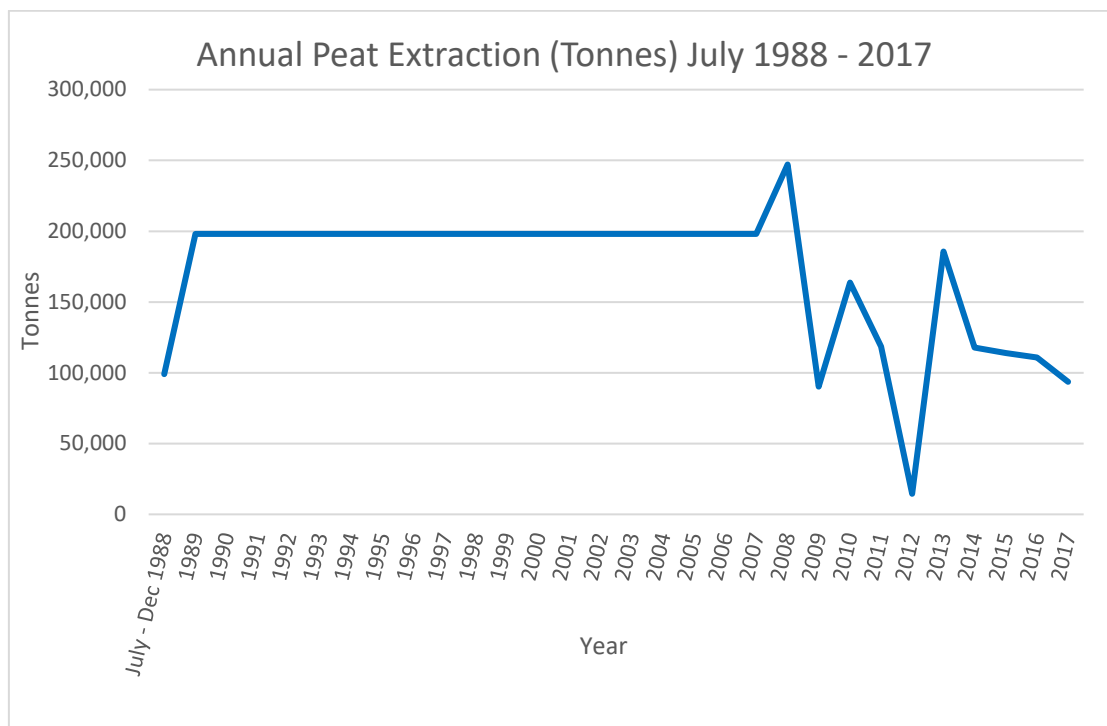


Plate 4-48: Annual Peat Extraction (Tonnes) July 1988 to 2017

Table 4-6: Peat Extraction July 1988—2017 (Tonnes)

Year	Tonnes	Year	Tonnes
July - December 1988	99,030*	2003	198,060*
1989	198,060*	2004	198,060*
1990	198,060*	2005	198,060*
1991	198,060*	2006	198,060*
1992	198,060*	2007	198,060*
1993	198,060*	2008	247,123
1994	198,060*	2009	90,113
1995	198,060*	2010	163,810
1996	198,060*	2011	118,471
1997	198,060*	2012	14,510
1998	198,060*	2013	185,547
1999	198,060*	2014	117,710
2000	198,060*	2015	114,003



Year	Tonnes	Year	Tonnes
2001	198,060*	2016	110,730
2002	198,060*	2017	93,603

* average of peat extraction volumes from 1978-87

4.5.4 Annual Peat Extraction Activities 1988- 2017

The following table describes the primary activities within the Application Site over a calendar year during each of the four quarters.

Table 4-7: Annual Peat Extraction Activities 1988 - 2017

Calendar Quarter	Activities
January to March	Drain/Machinery/Pump/Silt Pond maintenance, Stockpile removal, peat transportation
April to June	Peat extraction, Stockpile development/removal, peat transportation
July to September	Peat extraction, Stockpile development/removal, peat transportation
October to December	Drain/Machinery/Pump/Silt Pond maintenance, Stockpile removal, peat transportation

The above table outlines the main or key activities that occurred during each quarter. Some drain maintenance was carried out during the full year, but it was mainly restricted to outside the peat extraction season. Fuel handling and refuelling would have increased significantly during the peat extraction season due to the increased activity of the peat extraction machinery. During the Peat Extraction Phase, peat extraction volumes gradually reduced across the Application Site, before ceasing in 2017. During the period of gradual decline in peat extraction volumes, a corresponding decline in fuel handling/refuelling, machinery maintenance and stockpile development was observed. Stockpile removal was completed in 2019 with the maintenance of drainage infrastructure ongoing at present. Further detail on this is provided in Section 4.8 below which details the Current Phase of the Project.

4.5.5 Third-Party Peat Extraction Activities

With the establishment of the Turf Development Act of 1981 (which amended and extended the rights of the Turf Development Act 1946-1980), Bord na Móna oversaw a private turf development scheme which provided grants to private bog developers. At the Application Site, minor third-party works occurred. Third party extraction was undertaken in turbary plots along the periphery of the Application Site and as such exact locations and peat extraction volumes are not available.



4.5.6 Ancillary Services and Infrastructure

4.5.6.1 *Railway Infrastructure*

As discussed above, peat extraction areas were served by a network of narrow-gauge rail tracks, laid down in the 1950s and 1960s in the Application Site. The temporary railway infrastructure was moved around using the methods described in Section 4.2.2.2.1 as areas of bog came in and out of production.

Most of the railway infrastructure across the entire Application Site is still present today. The railway lines are regularly maintained. As discussed, the Application Site activities fell under IPC Licence from August 2001 onwards. Condition 9.1.15 of this IPC Licence requires biannual inspection and maintenance of the railcars to ensure no damage, leaks, or flaws in that could result in accidental fuel spillage.

4.5.6.2 *Machine/Wheel Wash Facilities*

Machine washings generated due to the cleaning of various plant machinery (using a power steam wash system when machinery left the bogs) at wash bays drained into the adjacent peatlands drainage system.

4.5.6.3 *Refuelling Activities*

The two refuelling methods described in Section 4.3.5.2 continued throughout the lifetime of the peat extraction phase. However, all tank and drum storage areas have been removed from site,

4.5.5.4 *Environmental Monitoring*

Since August 2001, control and monitoring measures (such as noise, dust, surface water), have been in operation at the Application Site in accordance with the IPC Licence conditions. These conditions are discussed further in Section 4.6.1 below. A copy of the IPC Licence is provided in Appendix 4-1, Volume 3. Background to the IPC application and implementation at the Application Site can be found in Chapter 2 Background, Volume 2.

4.5.7 Non-Peat Related Activities

4.5.7.1 *Commercial Forestry Activities & Other Third Party Activities*

Bord na Móna landholdings at Littleton Bog include approximately 800 acres of coniferous forestry that is managed exclusively by Coillte.

In the northeastern section of Littleton bog, located south of the M8, are a collection of sheds and single-storey buildings constructed in the mid-late 1990s. These buildings were formerly used by the Thurles Shooting Club under a lease agreement which has since expired

4.6 **Control Measures 1988 to 2001**

Post-1988 but prior to the implementation of the IPC Licence at the Application Site in 2001, the environmental management measures set out in Section 4.6.1 were in place across the Application Site. In addition, as evidenced in the 1991 Harkins Report (Appendix 4-9, Volume 3), silt control measures in the form of silt ponds were in place prior to 1988, with Bord na Móna carrying out further studies and surveys throughout the 1980s and 1990s to make improvements to how silt ponds operated so that suspended solids emissions in surface run-off were reduced. This included the construction of new ponds (as described in Section 4.3.5.9) to maintain treatment of run-off while cleaning of existing ponds was in progress.



4.6.1 Archaeological Code of Practice

Bord na M6na has a long history of co-operation with the National Museum of Ireland, the National Monuments Service and the relevant governmental departments overseeing heritage at the time, in relation to the cultural and archaeological importance of wetlands as well as the potential for, and handling of, archaeology discovered in bogs. After the discovery and subsequent preservation of trackways at Corlea Bog, Co. Longford by Bord na M6na employees in the 1980s, a new programme for peatland archaeology was established. Since 1991 an annual programme of archaeological survey, initially funded by the National Monuments Service, has been conducted in Bord na M6na Bogs, with the results being forwarded for inclusion in the Sites and Monuments Record.

Since 1998, Bord na M6na has a statutory duty under the Turf Development Act 1998 (Section 56) to afford appropriate protection for the environment and the archaeological heritage.

Section 56.- The Company and each subsidiary shall ensure that its activities are so conducted as to afford appropriate protection for the environment and the archaeological heritage.

The 1998 Act was in accord with the development of an *Agreed Principles for the Protection of Wetlands Archaeology in Bord na M6na Bogs* (1998) between the Minister for Arts, Heritage and the Gaeltacht, the National Museum of Ireland and Bord na M6na. The Agreed Principles set out 10 standards within which archaeology in the Bord na M6na peatlands were managed. Five Archaeological Liaison Officers were spread across the Bord na M6na Bog Groups and received training on how to deal with and report finds. Since 1998, all archaeological surveys were funded by Bord na M6na. The surveys have been accompanied by an annual programme of selective archaeological excavation and paleo-environmental analysis. By 2013, 64,000 of the c. 80,000-hectare land holdings of Bord na M6na had been subject to archaeological survey.⁶

A Code of Practice between the Department of Arts, Heritage and the Gaeltacht, the National Museum of Ireland and Bord na M6na was established in 2012. This Code superseded the Agreed Principles. The Code provided a framework within existing legislation, policy and practice to enable Bord na M6na to progress with peat extraction and ancillary activities and simultaneously ensure archaeological control measures are in place. The measures Bord na M6na are responsible for are listed below:

Bord na M6na will

10. Engage a Project Archaeologist
11. Maintain the network of Archaeological Liaison Officers.
12. Disseminate a set of Archaeological Protection Procedures
13. Ensure that any monuments or archaeological objects discovered during peat extraction are protected in an appropriate manner by following the Archaeological Protection Procedures.
14. Ensure that any newly discovered monuments on Bord na M6na lands are reported in a timely manner to the National Monuments Service of the Department of Arts, Heritage and the Gaeltacht.
15. Ensure that any archaeological objects discovered on Bord na M6na lands are reported immediately to the Duty Officer of the National Museum of Ireland.
16. Prioritise monuments for investigation taking account of monument vulnerability, contractual obligations and peat production targets.

⁶ Department of the Arts, Heritage and the Gaeltacht 2013 Review of Archaeological Survey and Mitigation Policy relating to Bord na M6na Peatlands since 1990. <https://www.archaeology.ie/sites/default/files/media/pdf/bnm-peatland-review-final-report-20-06-2013.pdf>



17. Prepare tenders for archaeological mitigation of impacts on monuments, to include excavation and recording, in consultation with the Project Archaeologist and the Minister.
18. Engage professional Consultant Archaeologists to carry out mitigation of monuments, including the required palaeo-environmental assessment and post-excavation studies.
19. Provide the necessary finance to fulfil the post-excavation requirements of the Minister and the Director including the conservation of archaeological objects and the provision of scientific analyses and dating, as well as the production of reports on all archaeological work, to a standard which will meet the approval of the Minister.

4.7 Control Measures 2001 to Present Day (Post-IPC Licence)

4.7.1 Environmental Monitoring and Conditions under IPC Licence

Bord na Móna was granted an IPC Licence (P0499-01) for the Littleton Bog Group (which encompasses the Application Site) in August 2001. Following this grant, the control measures listed in Section 4.6 above have been updated and expanded. The background to the IPC application and implementation at the Application Site can be found in Chapter 2 - Background, Volume 2 and a copy of the licence is provided in Appendix 4-1, Volume 3. The licence application is publicly available and can be viewed on request at EPA headquarters PO Box 3000 Johnstown Castle Estate County Wexford Y35 W821.

Following the grant of the IPC Licence in 2001, Bord na Móna staff underwent an EPA IPC Licence Compliance training programme, which resulted in the development of an environmental management system. This system addresses emissions to water and air, noise, vibration and odour emissions, waste management, use of natural resources, visual effects and the natural environment and eco-system. Please see Appendix 4-5, Volume 3 for the Bord na Móna IPC training programme.

The conditions of the IPC Licence are intended for the protection of the environment and apply from the time of grant of the IPC Licence. The EPA has undertaken Technical Amendments of the IPC Licence for the purpose of aligning the conditions of the IPC Licence to the objectives of national and European environmental protection legislation enacted over the lifetime of the IPC Licence. The IPC Licence was subject to a Technical Amendment for the purpose of the European Communities Environmental Objectives (Surface Water) Regulations, 2009 and it now contains an objective to 'maintain' or 'restore' the surface water quality to the defined 'Good Status'. With the implementation of conditions listed in the IPC Licence, the potential environmental effects of peat extraction and ancillary activities on water quality (such as the release of elevated concentrations of suspended sediments, and by association on aquatic ecosystems and protected species), have and continue to reduce through the implementation of IPC Licence conditions. Please see Chapter 8 - Hydrology, Hydrogeology and Water Quality, Volume 2 of this rEiAR and the Annual Environmental Reports (AER) included as Appendix 4-3, Volume 3 for details.

The IPC Licence is subject to 14. No. conditions pertaining to the ongoing monitoring and maintenance to ensure any emissions from site activities will comply with and not contravene, any of the requirements of Section 83(3) of the Environmental Protection Agency Act, 1992 outlined below:

(3) The Agency shall not grant a licence or revised licence for an activity unless it is satisfied that—

(a) any emissions from the activity will not result in the contravention of any relevant air quality standard specified under section 50 of the Air Pollution Act, 1987, and will comply with any relevant emission limit value specified under section 51 of the Air Pollution Act, 1987,



(b) any emissions from the activity will comply with, or will not result in the contravention of, any relevant quality standard for waters, trade effluents and sewage effluents and standards in relation to treatment of such effluents prescribed under section 26 of the Local Government (Water Pollution) Act, 1977,

(c) any emissions from the activity or any premises, plant, methods, processes, operating procedures or other factors which affect such emissions will comply with, or will not result in the contravention of, any relevant standard including any standard for an environmental medium prescribed under regulations made under the European Communities Act, 1972, or under any other enactment,

(d) any noise from the activity will comply with, or will not result in the contravention of, any regulations under section 106,

(e) any emissions from the activity will not cause significant environmental pollution, and

(f) the best available technology not entailing excessive costs will be used to prevent or eliminate or, where that is not practicable, to limit, abate or reduce an emission from the activity, and, where appropriate, the Agency shall attach conditions relating to the matters specified in the foregoing paragraphs to the licence or revised licence.

Conditions 1-4 of the licence outlined the Scope, Management, Interpretation and Notification procedures required by the Applicant, respectively. Conditions 11 to 14 detail the Monitoring(equipment use), Recording and Reporting, Emergency Response and Financial Provisions duties of the Applicant. Conditions 5 to 10 pertain to environmental monitoring and management:

- Condition 5 Emissions to Atmosphere
- Condition 6 Emissions to Water
- Condition 7 Waste Management
- Condition 8 Noise
- Condition 9 Water Protection
- Condition 10 Decommissioning and Cutaway Bog Rehabilitation

In compliance with Condition 5, the Applicant must undertake annual tests on boiler combustion efficiency and dust monitoring. Please see Chapter 9- Air Quality, Volume 2 for further details. Condition 6 ensures the Applicant establishes a surface water discharge monitoring programme which is reviewed annually and a report submitted to the EPA quarterly. The Applicant is also required to submit water sample results annually, implement and maintain silt ponds. Condition 9 pertains to the 'Water Protection' and outlines the weekly, monthly, quarterly, and annual inspections Bord na Móna must carry out to provide for the protection of surface and groundwater. There are currently silt pond inspections and maintenance including quarterly grab sampling ongoing at the Application Site. Please see Chapter 8 - Hydrology,Hydrogeology, and Water Quality, Volume 2 for further details. Condition 7 compels the Applicant to correctly dispose of waste to licenced facilities. Please see Chapter 13 - Material Assets (including Traffic and Transport), Volume 2 for details. Condition 8 ensures that any on site activities do not give rise to noise exceedances at noise sensitive locations. Please see Chapter 10 - Noise and Vibration, Volume 2 for further details. Condition 10 pertains to site decommissioning followed by peatland rehabilitation and is detailed in section 4.8 below, which details the Remedial Phase, and Chapter 6 - Biodiversity, Volume 2. It is the intention of the Applicant to continue implementing and practising the mitigation and monitoring measures as listed in the Licence after the site is decommissioned, where applicable.



4.7.2 Standard Operation Procedures

To facilitate the production of AERs, Bord na Móna produced an *Environmental and Operational Procedures for Protection of Surface Water* document which comprises a suite of Standard Operation Procedures (SOPs) which have the overall aim of promoting and maintaining environmental integrity throughout all Bord na Móna activities. The document includes SOPs for drainage planning and implementation, silt pond and outfall maintenance, waste management, peat extraction methods, and general bog housekeeping. The SOPs also set out emergency preparedness and response procedures, how to deal with complains, effective communication with Bord na Móna operatives, the local community and local authorities. Please see Appendix 4-11, Volume 3 Environmental and Operational Procedures for Protection of Surface Water for details.

4.8 Current Phase – 2017 to Present Day

4.8.1 Decommissioning Process

In January 2021, Bord na Móna formally announced that peat extraction across all bogs within its landholding had ceased, although peat extraction activities had ceased at the Application Site prior to this in 2017. The Application Site still operates under the requirements of IPC Licence P0499-01, and any decommissioning works undertaken with respect to peat extraction are in accordance with Condition 10 of the IPC Licence, which states that:

'10.1 following termination of use or involvement of all or part of the site in the licenced activity, the licensee shall:

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

In compliance with Condition 10.1 of the IPC Licence, it is a requirement to decommission the Application Site by removing/disposing/recovering buildings, equipment, waste etc from the Application Site. 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 Act. 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 Application 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 drainage pipes, remaining peat stockpiles, stockpile covering, pumps, septic tanks and fuel tanks. To date, the only decommissioning underway at the Application Site was the removal of remaining peat stockpiles from the bogs. This was completed by mid-2019. The removal of rail infrastructure in Lanespark and Derryvella was completed in 2024. Infrastructure to be decommissioned at the Application Site is listed in Table 4-8 below. It should be noted that no extant buildings will be demolished as part of the decommissioning programme.



Table 4-8: Infrastructure Decommissioning List for the Application Site. Sourced from the Cutaway Bog Decommissioning and Rehabilitation Plan 2024 for Littleton Bog

Item	Description	Application Site Decommissioning Plan
1	Clean-up of remaining or unconsolidated waste or materials located in Bogs, Yards, Buildings and Offices	Where relevant
2	Clean Silt Ponds	Cleaning Silt Ponds
3	Decommission Peat Stockpiles	Where relevant
4	Decommission or Removal of Buildings and Compounds	Where relevant
5	Decommission Fuel Tanks and associated facilities	Where relevant
6	Decommissioning and Removal of Bog Pump Sites	Not relevant
7	Decommissioning or Removal of Septic Tanks	Where required

In relation to waste management, Condition 7 of the IPC Licence requires these now defined waste items to be disposed of or recovered as follows:

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

Condition 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.

Condition 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.

Condition 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 IPC Licence, waste items are and will continue to be removed for recycling or disposal, using external contractors with the required waste collection permits, approved under Condition 7.2, and waste records are and will continue to be maintained as required under Condition 7.3.

Where possible, Bord na Móna will target preferred waste treatment methods from the waste hierarchy to identify waste that can be reused or recycled in lieu of recovery or disposal.

The validation of the success of compliance with Condition 10.1 of the IPC Licence is carried out through an Independent Closure Audit (ICA) which is followed by an EPA Exit Audit (EA) and the eventual partial or full surrender of the licence.

4.8.2 Peatland Rehabilitation Plans (Rehabilitation Phase 1)

It is also a requirement of 'Condition 10 Cutaway Bog Rehabilitation' of the IPC Licence that following the above decommissioning of use of all or part of their bogs, Bord na Móna, prepares (to the satisfaction of the EPA) and implements a Cutaway Bog Rehabilitation Plan.

'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.*

Reason: To make provision for the proper closure of the activity ensuring protection of the environment.'

In 2018, Bord na Móna produced Cutaway Bog Decommissioning and Rehabilitation Plans for the Longfordpass, Littleton, Lanespark and Derryvella bogs located within the Application Site. Bord na Móna has prepared an updated Cutaway Bog Decommissioning and Rehabilitation Plan for Littleton and Longfordpass in 2026. These plans have been submitted to the EPA (please see Appendix 4.2, Volume 3 for all Cutaway Bog Rehabilitation Plans).



An updated Cutaway Bog Decommissioning and Rehabilitation Plan for Ballybeg, Lanespark and Derryella was prepared in 2025 to include Phase 2 measures (See section 4.9 below for further details). Bord na Móna rehabilitated the bogs in a phased approach under the requirements of the IPC Licence and in strict accordance with the criteria outlined in Condition 10.3 as stated above. Please see Appendix 4-2, Volume 3 for copies of each of the Cutaway Bog Decommissioning and Rehabilitation Plans.

The plans are bog-specific, and outline:

- Criteria which define successful rehabilitation;
- Consultation undertaken with relevant parties;
- Main issues for rehabilitation;
- Proposed rehabilitation programme;
- Proposed timeframe to implement the rehabilitation programme; and,
- Associated aftercare, maintenance and monitoring.

Decommissioning and rehabilitation plans have been developed from a combination of the following:

- 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, 2018);
- Significant international engagement during this period with other countries in relation
- to best-practice 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);
- Ongoing consultation and engagement with internal and external stakeholders regarding rehabilitation, biodiversity and other general issues over the years about the Littleton Bog Group;
- Geographical Information System (GIS) Mapping;
- Bord na Móna drainage surveys;
- Bog topography and LIDAR data;
- Previous research studies on site; and,
- Hydrological modelling.

The plans and review plans take cognisance of the EPA Guidance on the Process of Preparing and Implementing a Bog Rehabilitation Plan (2020). Each plan contains within a detailed ecological report and GIS mapping pack. The key objective of Bord na Móna peatland rehabilitation is environmental stabilisation. The rehabilitation of the bogs supports biodiversity e.g., plants, insects, bird and mammals, and the formation of wetland peatland and woodland habitats. In addition, peatland rehabilitation will bring a range of benefits to the local community via improvements in the local landscape and it is also complying with national policies and strategies regarding the reduction of carbon emissions, supporting biodiversity and enhancing water quality. It is anticipated it will take up to 30 years for naturally functioning wetland and peatland ecosystems to fully re-establish.



To inform the rehabilitation plans for each bog, both national and local stakeholders, including neighbours whose land adjoins the relevant bog units 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) were contacted. Any identified local interest groups were also informed of the opportunity to engage with this rehabilitation plan, and when identified invited to submit their comments or observations in relation to the proposed rehabilitation. All correspondence received has been acknowledged and evaluated against the rehabilitation work proposed and the each of the plans contain a review of the consultation.

Prior to the submission of the Cutaway Bog Decommissioning and Rehabilitation Plans to the EPA for agreement, a baseline ecology survey was carried out to determine the status of natural colonisation, the potential for targeted revegetation and/or rewetting and the future development at the Application Site to ensure stabilisation of the future cutaway. The measures associated with each of the rehabilitation plans and their statuses have been detailed below. A timeline for the stages of the measures included in the Cutaway Bog Decommissioning and Rehabilitation Plans is provided in Table 4.9 below. Further details can be found in the Cutaway Bog Decommissioning and Rehabilitation Plans provided in Appendix 4-2, Volume 3.

4.8.3 Description of Rehabilitation Measures

Rehabilitation Phase 1 works commenced in Littleton, Longfordpass, Lanespark and Derryvella in 2018 with extensive drain-blocking and hydrological management. The key objective of peatland rehabilitation is environmental stabilisation. The rehabilitation works that have been completed and commenced in Phase 1 are described in the Cutaway Bog Decommissioning and Rehabilitation Plans (Appendix 4.2, Volume 3) and in Table 4-9 below. The Cutaway Bog Decommissioning and Rehabilitation Plans included in Appendix 4-2, Volume 3 provides a description of the four bogs of the Application Site and their ecology. It also provides a framework and outlines the typical works that is undertaken to achieve the aims of successful rehabilitation (the criteria for which are defined in the plan) and a timescale for when the various elements of the plans have been implemented or will likely be implemented. The remedial measures to be undertaken follow proven and standard procedures that have been successfully applied by Bord na Móna and are known to be effective as detailed below.

Drain Blocking

Drains have been blocked at the Application Site using a number of methods depending on the size and type of drain. These methods will include the following:

- Peat dams within small drainage channels on the cutover bog; and,
- Removal or blocking of drainage pipes, or modification of drainage levels, where required.

These methods are fully described in the Irish Wildlife Manual, Best Practice in Raised Bog Restoration in Ireland (Mackin et al, 2017).



Monitoring

As per the Cutaway Bog Decommissioning and Rehabilitation Plans, a programme of monitoring, aftercare and maintenance was implemented at the Application Site to validate the efficacy of the rehabilitation measures in achieving environmental stabilisation. These measures are detailed in the Cutaway Bog Decommissioning and Rehabilitation Plans as submitted to the EPA (Appendix 4-2, Volume 3). All surface and ground water monitoring has been submitted to the EPA as per licence requirements. Monitoring carried out at the Application Site assessed 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. Monitoring visits also considered any requirements for further practical rehabilitation measures. The baseline condition of the site has been established post-rehabilitation implementation by using an aerial survey to take an up-to-date aerial photos and this evaluation is presented in the Cutaway Bog Decommissioning and Rehabilitation Plans. These have been used to verify completion of rehabilitation measures.

Rehabilitation Phase 1 at Littleton, Longfordpass, Lanespark and Derryvella was completed between 2018-2021. Please see Table 4-9 which details the timeline and all the rehabilitation measures completed. (see Appendix 4-2, Volume 3 for further details regarding all Cutaway Bog Decommissioning and Rehabilitation Plans).



Table 4-9: Application Site Rehabilitation Programme Rehabilitation Phase 1 Summary (Littleton, Longfordpass,). Please see Appendix 4-2 for more details.

	Longfordpass (2026 Plan)	Littleton (2026 Plan)
<p>Completed Rehabilitation Measures</p>	<ul style="list-style-type: none"> • A rehabilitation programme was carried out in Longfordpass between 2018-2021 (Rehabilitation Phase 1). These measures varied in intensity, were targeted in places and reflected the existing environmental conditions. • Some areas of bare peat had regular drain-blocking (Drain-blocking). • Some areas were subject to reducing or ceasing pumping (Hydrological management). • Some areas had minimal intervention as there were already re-vegetated and developing a mosaic of wetland, woodland and peatland habitats (Minimal intervention). • Some areas were allowed to continue to develop as wetland due to the natural breakdown of drainage and ceasing drain maintenance (Wetland). • Cutaway habitats are continuing to develop across Longfordpass Bog. Birch scrub and woodland has significantly expanded across the site on some of the drier, more elevated ground on the western side. • Pioneer vegetation is continuing to develop across the site and the bare peat cover is rapidly shrinking. 	<ul style="list-style-type: none"> • A rehabilitation programme was carried out in Littleton between 2018-2021 (Rehabilitation Phase 1). These measures varied in intensity, were targeted in places and reflected the existing environmental conditions. • Some areas of bare peat had regular drain-blocking (Drain-blocking). • Some areas were subject to reducing or ceasing pumping (Hydrological management). • Some areas had minimal intervention as there were already re-vegetated and developing a mosaic of wetland, woodland and peatland habitats (Minimal intervention). • Some areas were allowed to continue to develop as wetland due to the natural breakdown of drainage and ceasing drain maintenance (Wetland). • The majority of Littleton Bog is now vegetated or re-vegetating. Some sections have been developing as secondary habitats for a significant period of time (40 years). Birch woodland and scrub has significantly expanded across the site on some of the drier ground. • In general, cutaway habitats are developing according to the underlying environmental conditions and reflect the varying topography, hydrology and peat depths.



	Longfordpass (2026 Plan)	Littleton (2026 Plan)
<p>Short-term Rehabilitation Measures 0-2 years (Ongoing)</p>	<ul style="list-style-type: none"> In general, cutaway habitats are developing according to the underlying environmental conditions and reflect the varying topography, hydrology and peat depths. Part of the site north of the M8 has already re-vegetated, with pioneer vegetation maturing and developing a mosaic of typical cutaway habitats with Birch woodland predominating. Bare peat areas within the cutaway is limited. Natural re-colonisation of the cutaway so far has been effective. All stock-piles have been removed from the site as part of the decommissioning phase of industrial peat production operations. Other parts of the site (younger cutaway) are naturally colonising for > 10 years and are developing a mosaic of cutaway habitats. Natural re-colonisation of the cutaway so far has been quite effective. Bare peat areas within the cutaway parts of the site are shrinking as vegetation develops and consolidates. 	<ul style="list-style-type: none"> A significant part of the site has already re-vegetated, with pioneer vegetation maturing and developing a mosaic of typical cutaway peatland habitats with Birch woodland predominating. Bare peat areas within the older cutaway areas are limited. Natural re-colonisation of the cutaway so far has been quite effective.. A portion of the site has already been developed as a conifer plantation by Coillte. All stock-piles have been removed from the site as part of the decommissioning phase of industrial peat production operations. Other parts of the site (younger cutaway) are naturally colonising for > 10 years and are developing a mosaic of cutaway habitats. Natural re-colonisation of the cutaway so far has been quite effective. Bare peat areas within the cutaway parts of the site are shrinking as vegetation develops and consolidates.
	<ul style="list-style-type: none"> There will be ongoing monitoring of the site and appropriate rehabilitation planning related to any changes in land-use or proposed developments in the future at Longfordpass. Silt-ponds will be monitored during this period and there will be continued maintenance and cleaning (if required) to prevent silt run-off from the site during the rehabilitation phase. Ongoing. 	<ul style="list-style-type: none"> There will be ongoing monitoring of the site and appropriate rehabilitation planning related to any changes in land-use or proposed developments in the future at Littleton. Silt-ponds will be monitored during this period and there will be continued maintenance and cleaning (if required) to prevent silt run-off from the site during the rehabilitation phase. Ongoing.



	Longfordpass (2026 Plan)	Littleton (2026 Plan)
<p>Long-term Rehabilitation Measures (>5 years) (Ongoing)</p>	<ul style="list-style-type: none"> The effect of any targeted active management will be monitored and further work determined if required. Monitoring of the site to ensure stabilisation and complete re-vegetation. Evaluate success of short-term rehabilitation measures outlined above and enhance where necessary (to be determined by selected short-term management above). Decommissioning of silt-ponds will be assessed. Ongoing. Reporting to the EPA will continue until the site is deemed environmentally stable. IPC License surrender process begins. To be commenced. 	<ul style="list-style-type: none"> The effect of any targeted active management will be monitored and further work determined if required. Ongoing. Monitoring of the site to ensure stabilisation and complete re-vegetation. Ongoing. Evaluate success of short-term rehabilitation measures outlined above and enhance where necessary (to be determined by selected short-term management above). Completed. Decommissioning of silt-ponds will be assessed. Ongoing. Reporting to the EPA will continue until the site is deemed environmentally stable. Ongoing. IPC License surrender process begins. To be commenced.



Table 4-10: Application Site Rehabilitation Phase 1 Summary (Lanespark & Derryvella bog). Please see Appendix 4-2 for more details.

Lanespark, Ballybeg, Derryvella (2025 Plan)	
Completed & Ongoing Rehabilitation Measures (Phase 1)	<ul style="list-style-type: none"> • Previous rehabilitation was carried out in Ballybeg, Lanespark and Derryvella in 2018-2021 (Rehabilitation Phase 1), see Figure BNM-DR-26-07-30: Previous Rehabilitation in the accompanying mapbook. • Measures included wide-spread drain-blocking, berms, and hydrological management. A pump in Lanespark Bog was decommissioned. There was some fertiliser treatment in Derryvella Bog. • A significant part of the site has already re-vegetated, with significant cover of pioneer vegetation developing a mosaic of typical cutaway peatland and wetland habitats. The 2000 aerial photo shows that this side of the site was in peat extraction, with some emerging gravel mounds and ridges. By 2006 some areas were cutaway and peat extraction had stopped on a phased basis. Now there is a mosaic of pioneer habitats and the area has also been re-wetted, with wetlands developing in basins. • Natural re-colonisation of the cutaway so far has been effective. Bare peat areas within the cutaway are reducing as vegetation develops and consolidates. Areas of bare peat treated with fertiliser in Derryvella have also revegetated quite well.

4.9 Remedial Phase

For Rehabilitation Phase 2 works, Bord na Móna are proposing to carry out additional rehabilitation in Derryvella Bog in 2026. No additional Rehabilitation works are proposed at Littleton, Longfordpass and Lanespark outside of the ongoing measures presented in Tables 4-9 and 4-10 in the previous section (and as detailed in the Rehabilitation Plans presented in Appendix 4-2). Rehabilitation measures for Phase 2 works proposed in Derryvella are detailed in Table 4-11 below (see Appendix 4-2, Volume 3 for further details regarding all Cutaway Bog Decommissioning and Rehabilitation Plans).



Table 4-11: Application Site Rehabilitation Programme (Lanespark & Derryvella bogs). Please see Appendix 4-2 for more details.

	Lanespark, Ballybeg, Derryvella 2025 Plan
<p>Short-term planning actions (Phase 2) (0-1 years)</p>	<ul style="list-style-type: none"> • Seek formal approval of the enhanced plan, noting the alternative standard plan should funding from the Scheme not materialise 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 engineering drawings outlining how the various rehabilitation methodologies will be applied to Ballybeg/Lanespark/Derryvella 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). • A drainage management assessment of the proposed enhanced rehabilitation measures will be carried out and any issues identified resolved and the rehabilitation plan adapted. • A review of known archaeology and an archaeological impact appraisal of the proposed rehabilitation will be carried out. The results of this assessment will be incorporated into the rehabilitation plan to minimise known archaeological disturbance, where possible. • A review of issues that may constrain rehabilitation such as known rights of way and existing land agreements is to be carried out. • An ecological appraisal of the potential impacts of the planned rehabilitation on the presence of sensitive ground-nesting bird breeding species (e.g. breeding waders) is to be carried out. The scheduling of rehabilitation operations will be adapted, where required. • Ensure all activities comply with the environmental protection requirements of the IPC Licence. • Carry out Appropriate Assessment of the Rehabilitation Plan. <p>Track implementation and enforcement of the relevant IPC Licence conditions, the mitigation measures (AA) and other environmental control measures during the implementation of the rehabilitation plan.</p>



Lanespark, Ballybeg, Derryvella 2025 Plan	
Short-term practical actions (0-2 years) (Phase 2)	<ul style="list-style-type: none"> • Carry out proposed measures as per the Phase 2 rehabilitation. This will include targeted drain-blocking, along with fertiliser application targeting bare peat areas of headlands, high fields and other areas (where required) and hydrological management. All rehabilitation measures will be carried out with regard to best practice environmental control measures (Appendix IV). • Monitor the success of rehabilitation measures. • Carry out the proposed monitoring, as outlined. • Silt ponds will be monitored during this period and there will be continued maintenance and cleaning to prevent potential run-off of suspended solids from the site during the rehabilitation phase. <p>Submit an ex-post report to the Scheme regulator to verify the eligible measures to be carried out in year 1 of the Scheme, and an ex-ante estimate for year 2 of the Scheme; and so on for each year of the Scheme.</p>
Long-term (>3 years) (Phase 2)	<ul style="list-style-type: none"> • Evaluate success of short-term rehabilitation measures outlined above and remediate where necessary. • Delivery of a monitoring, aftercare and maintenance programme (See section 10.2 of Appendix 4-2). • Decommissioning of silt-ponds will be assessed and carried out, where required. <p>Reporting to the EPA will continue until the IPC Licence is surrendered.</p>



4.10 Potential Future Land Use

4.10.1 Proposed Littleton Wind Farm

The Application Site is an important natural asset and has the potential to play a strategic role in meeting national climate action targets, which have become all the more significant in light of the Climate Action and Low Carbon Development (Amendment) Act 2021, the Climate Action Plan 2024, the Climate Change Performance Index 2024, and the Change Advisory Council's Annual Report 2024. These reports provide an updated assessment of both global climate change and climate change in the context of Ireland and identify the increasingly discernible impacts climate change is having on both the environment and society. In line with the Applicant's vision to assist in achieving a climate neutral Ireland by 2050, it is intended to utilise the Application Site for both peatland remediation and wind energy infrastructure and to facilitate environmental stabilisation of the Application Site and the optimisation of climate action benefits.

The future use of the lands within the Application Site will be a separate and standalone Application, therefore, they are considered cumulatively for the purpose of this Application. It is intended to develop lands at the Application Site in the future for a renewable energy development and to carry out rehabilitation on the bogs where relevant. As outlined above, it is intended to use lands at the Application Site for a renewable energy development. Littleton Wind Farm DAC (a joint venture between SSE and Bord na Móna) intends to submit an Application for, inter alia, an 11 no. turbine wind farm. This will be a standalone SID Application, submitted directly to An Coimisiún Pleanála and will be accompanied by an EIAR which will include an assessment of the implementation of the rehabilitation measures at the Application Site in conjunction with the construction, operation, and decommissioning of the Proposed Wind Farm.

The key objectives of environmental stabilisation and re-wetting of the cutaway areas will occur between and surrounding the proposed windfarm infrastructure. The EIAR for the proposed Littleton Wind Farm will detail issues related to peat management during wind farm construction. This has proven successful during construction of Mountlucas and Cloncreen Wind Farms. In the event that natural re-vegetation was unsuccessful, then other measures such as re-seeding would be considered.

The Cutaway Bog Decommissioning and Rehabilitation Plans, which will accompany the planning application for the proposed Littleton Wind Farm, detail how the Application Site will be rehabilitated alongside the construction and operation of the proposed wind farm, should the proposed Littleton Wind Farm be consented. Further details of this proposed wind farm development can be obtained at the project website (<https://www.littletonwindfarm.ie/>). A separate planning application for the proposed Littleton Wind Farm will be submitted directly to An Coimisiún Pleanála through the Strategic Infrastructure Development planning process.

Both the remedial measures and the proposed Littleton Wind Farm are cumulatively assessed with the future remedial measures that will be carried at the Substitute Consent Application Site.

4.10.2 Ongoing and Future Enhanced Rehabilitation Measures (PCAS)

As discussed in Section 4.8 part of Condition 10 of the IPC Licence (P0499-01), decommissioning and rehabilitation will be carried out as standard remedial measures associated with peat extraction and ancillary activities at the Application Site. In line with the Applicant's accelerated decarbonisation strategy, and the availability of government funding, the company has also committed to ambitious enhanced peatland decommissioning, rehabilitation and restoration measures, targeting circa 33,000ha in over 80 no. Bord na Móna bogs.



This strategy has been developed to optimise ecosystem service benefits of peatland rehabilitation and restoration, particularly carbon storage and reducing carbon emissions. In addition, this will also benefit biodiversity and water (water quality and catchment management), as well as providing space for local communities and people to enjoy the outdoors.

In the event that future PCAS plans are not implemented or prepared, the Application Site will be rehabilitated in line with the rehabilitation plans outlined in Section 4.8 and Section 4.9 and included in Appendix 4-2.

Both the enhanced rehabilitation measures (PCAS) and the proposed Littleton Wind Farm development are cumulatively assessed in this rEiAR with the future remedial measures (described in Section 4.8, Section 4.9, and Section 4.10) that will be carried out at the Application Site a part of the IPC Licence requirements under Condition 10 of the Licence.



4.11 References

Clarke, Donal, Brown Gold, A History of Bord na Móna and the peat industry in Ireland (2010)



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