3. CONSIDERATION OF REASONABLE ALTERNATIVES

3.1 Introduction

Article 5(1)(d) of Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment (codification) as amended by Directive 2014/52/EU (the EIA Directive) requires that the EIAR prepared by the developer contains *"a description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the project on the environment."*

Article 5(1)(f) of the EIA Directive requires that the EIAR contains *"any additional information specified in Annex IV relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected."*

Annex IV of the EIA Directive states that the information provided in an Environmental Impact Assessment Report (EIAR) should include a *"description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects."*

The need for the Project and the background of the Development Programmes which led to the development of peat extraction and ancillary activities at the Application Site (i.e. Lemanaghan Bog) is discussed in Chapter 2 Background. This chapter explores the alternatives considered and an indication of the main reason for the final choice, taking into account the environmental effects.

As set out in the '*Guidelines on The Information to be Contained in Environmental Impact Assessment Reports'* (Environmental Protection Agency, 2022), the presentation and consideration of reasonable alternatives investigated is an important part of the overall EIA process.

3.2 Methodology

The European Commission published a number of guidance documents in December 2017 in relation to Environmental Impact Assessment of Projects (Directive 2011/92/EU as amended by 2014/52/EU) including '*Guidance on Screening*', '*Guidance on Scoping*' and '*Guidance on the preparation of the Environmental Impact Assessment Report*'. The EU Guidance Document (EU, 2017) on the preparation of the EIAR outlines the requirements of the EIA Directive and states that, in order to address the assessment of reasonable alternatives, the following must be provided:

- A description of the reasonable alternatives studied; and
- An indication of the main reasons for selecting the chosen option with regards to their environmental impacts.

There is limited European and National guidance on what constitutes a 'reasonable alternative' however the EU Guidance Document (EU, 2017) states that reasonable alternatives "*must be relevant to the proposed project and its specific characteristics, and resources should only be spent assessing these alternatives*".

The guidance also acknowledges that "*the selection of alternatives is limited in terms of feasibility. On the one hand, an alternative should not be ruled out simply because it would cause inconvenience or cost to the Developer. At the same time, if an alternative is very expensive or technically or legally difficult, it would be unreasonable to consider it to be a feasible alternative*".

The current EPA Guidelines (EPA, 2022) state that "*It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account is deciding on the selected option. A detailed assessment (or 'mini-EIA') of each alternative is not required.*"

Consequently, taking consideration of the legislative and guidance requirements into account, this chapter addresses alternatives under the following headings:

- 'Do Nothing' Option;
- Alternative Locations;
- Alternative Industries;
- Alternative Layouts;
- Alternative Processes;
- Alternative Control Measures; and,
- Alternative to the Rehabilitation Plan.

Each of these is addressed in the following sections.

3.2.1 Temporal Range

As outlined in Chapter 1 Introduction, the assessment undertaken in this rEIAR covers the period 1988 (i.e the date when the EIA Directive was required to be transposed into Irish law), to present day. As such, this assessment of alternatives considers the alternatives possible at the Application Site from 1988. As discussed in Chapter 4 Description of the Development, the Project was already well established at the Application Site in 1988, with peat extraction and ancillary activities having commenced there some 28 years earlier in 1960, and the onset of the installation of drainage some 5 years before that, in 1950. As such, alternatives explored before 1988 are also provided for context, to illustrate how and why, by 1988, peat extraction was so extensively developed as an activity at the Application Site, and how previously explored options informed the continuation of peat extraction and ancillary activities beyond 1988 until 2020. It is important to note that while the alternatives to the continuance of the Project after 1988 will be examined, as the Project has already taken place, these alternatives are broadly no longer possible.

3.2.2 Statement of Authority

This section of the rEIAR has been prepared Susan Doran and reviewed by Ellen Costello and Sean Creedon, of MKO. Susan Doran is an Environmental Scientist with MKO with over 3 years' experience in consultancy and conservation. Susan holds Bsc (Hons) in Ecology and Environmental Biology from University College Cork. Prior to her role as Environmental Scientist, Susan was an Ornithologist and Coordinator for the MKO Ornithology Team. Susan has been involved with several large-scale onshore windfarms as assistant Project Manager through the EIA process.

Ellen Costello is a Senior Environmental Scientist with MKO with over 5 years' experience in private consultancy. Ellen holds a BSC (Hons) in Earth Science, and a MSc (Hons) in Climate Change: Integrated Environmental and Social Science Aspects where she focused her studies on renewable energy development in Europe and its implications on environment and society. Ellen's key strengths and expertise are Environmental Protection and Management, Environmental Impact Statements, Project Management, and GIS Mapping and Modelling. Since joining MKO, Ellen has been involved in a range of large-scale infrastructure projects including that of housing, tourism and recreation, renewable energy infrastructure and substitute consent applications for peat extraction. In her role as a project manager, Ellen works with and co-ordinates large multidisciplinary teams including members from MKO's Environmental, Planning, Ecological and Ornithological departments as well as sub-contractors from various fields in the preparation and production of EIARs.

Sean is an Associate Director in the Environment Team at MKO. He oversees a team of highly skilled environmental professionals working on EIAR for large-and medium scale Renewable Energy infrastructure. Sean has directed and overseen multiple renewable energy projects across wind, solar, battery and hydrogen as well as a range of thermal and other energy related developments. He has worked on the planning and environmental impact elements within all stages of wind farm project delivery. He is a member of the MKO senior management team responsible for developing the business, mentoring team members, fostering a positive culture and promoting continuous employee professional development. Sean has over 22 years' experience in program and project development, holds an MSc from NUI Galway and a Diploma in Project Management from Institute of Project Management Ireland.

3.3 Consideration of Alternatives

3.3.1 'Do-Nothing' Option

As outlined in the EPA Guidelines (May 2022), the description of 'Do-Nothing Effects' relates to the environment as it would be in the future should the Project not be carried out. As discussed in Section 3.2.1, the assessment period of this rEIAR commenced in 1988, a time at which peat extraction and ancillary activities was already well-established at the Application Site. In the context of this rEIAR, the Project has been ongoing since the baseline assessment year of 1988. As outlined in Section 3.2.1, peat extraction and ancillary activities commenced at the Application Site in 1950 with the installation of drainage.

The 'Do-Nothing' option is defined as the Project (as described in Section 4.2 of Chapter 4) having ceased at the Application Site in 1988.

In the event of the cessation of the Project at the Application Site in 1988, it is assumed that those lands which by that point had not been subject to the installation of drainage and peat extraction would have remained as a relatively intact raised bog with varying raised bog habitats (such as bog woodland, fen, and sphagnum mosses).

Subsequently, other land-use practices may also have taken place on the Application Site such as agricultural or commercial forestry, or other commercial or non-commercial uses. Under this 'Do-Nothing' option, the IPC licence and associated ongoing decommissioning and planned rehabilitation would not have occurred.

For those lands which as of 1988 had been subject to the installation of drainage in preparation for peat extraction and ancillary activities but not peat extraction itself, it is assumed in the 'do-nothing' scenario that drainage would have remained insitu. Maintenance works to keep established drainage channels clear would have ceased as of 1988 in the 'do-nothing' scenario. It is likely that these areas would have been subject to natural recolonisation of the bog surface. Minor third party turbary activities likely would have occurred along the intact bog edges as was common practise at sites such as the Application Site.

Peat extraction and ancillary activities was underway at the Application Site prior to the required date for the transposition of the EIA Directive in 1988. If peat extraction and ancillary activities ceased from 1988 onwards, then the various residual effects, described throughout this rEIAR, would not have occurred.

However, consideration must be given to the following:

- The legislative mandate given to Bord na Móna in the form of the Turf Development Act 1946, as amended) to acquire and develop peatlands; and
- The uncertainty with respect to the planning status of the activity did not arise until 2019 and was not evident in 1988.

Therefore, this 'Do-Nothing' option was not the chosen option. Peat extraction and ancillary activities have occurred at the Application Site from July 1988 onwards. A decision to cease peat extraction and ancillary activities at the Application Site was taken in 2020 and the Application Site needs to be considered in the context of regularising (without prejudice) the planning status of the lands to facilitate future development (subject to planning consent as required). The Application Site has and will continue to revegetate, and there will be a change from areas of cutover peatland to revegetated peatland. These are described in the individual chapters of the rEIAR.

In the event that Substitute Consent is not granted for the Application Site in effect, the "Do Nothing" option represents the current situation as at the date of the application for Substitute Consent. As part of Bord na Móna's statutory obligations under IPC licence requirements, a Cutaway Bog Decommissioning and Rehabilitation Plan will continue to be implemented for the Application Site separate to, and independent of the Substitute Consent application. The implementation of this plan is included in the impact assessment below.

The role of cutaway/cutover peatlands such as the Application Site as a significant potential resource for amenity, tourism, biodiversity enhancement and conservation, improvement in air quality, climate mitigation, renewable energy development and education are part of Bord na Móna's vision for the Application Site. The regularisation of the planning status of the Application Site is a significant facilitator in ensuring the sustainable use and management of these peatlands. If this does not occur, the opportunity to continue employment and alternative use of the Application Site for the potential resources and activities mentioned above will be significantly restricted.

3.3.2 Alternative Locations

The identification of suitable peat extraction sites within Bord na Móna Energy Ltd (the Applicant's) landholding began in 1935, when the then newly established Turf Development Board Ltd. began a systemic survey of all Irish bogs (as discussed in Chapter 2 Background, the Turf Development Board Ltd. became Bord na Móna, a statutory corporation, following the commencement of the Turf Development Act, 1946). The surveys of the bogs by the Turf Development Board Ltd. built on the knowledge presented by a series of four reports published by Bog Commissioners between 1810 and 1814, which examined the major bogs of Ireland specifically in relation to their suitability for use in agriculture and provided an excellent starting point for the surveys of bogs suitable for peat extraction. From 1935 to 1937, some 13 initial surveys were carried out and over the next 17 years some 625 separate surveys were done to build an expansive knowledge of the Applicant's landholding and allow informed decisions to be made with regards the selection of sites for peat extraction (Clarke, 2010).

The strategic location of the Application Site centrally in the country, its proximity to other Bord na Móna sites and factories, and the existence of several local roads through the Application Site led to the Application Site being selected for systematic and state-lead peat extraction under the Second Development Programme in the 1940s. By 1988, the Application Site was benefitting from existing onsite infrastructure such as the interconnectivity of the bogs via a rail network, several peat processing buildings, trained staff, and proximity to other Bord na Móna assets.

By 1988, the Application Site was well-established as a large, industrial-scale peat extraction site owned and operated by Bord na Móna. By this time, drainage was installed extensively across the Application Site and peat extraction and ancillary activities was well established and ongoing. The Application Site already benefitted from onsite infrastructure including railway lines and storage, as well as workshop facilities adjacent to the Application Site, had implemented drainage throughout, and employed trained permanent and seasonal staff which were situated locally to the bogs. The existing operations and activities established at the Application Site in 1988 supported the sensical continuance and further expansion of peat extraction and ancillary activities there.

Given that peat extraction and ancillary activities at the Application Site were well established in 1988, choosing an alternative site for peat extraction at that point in time was not a sensical option for Bord

na Móna from an operations or environmental perspective, as all sites which had been identified as suitable for peat extraction and ancillary activities through extensive surveys within Bord na Móna's land holding were subject to peat extraction. Further, to relocate peat extraction and ancillary activities from the Application Site to a site which had not been subject to the insertion of drainage and peat extraction would have likely incurred more significant environmental impacts than continuing peat extraction and ancillary activities at the Application Site post-1988. Continuing peat extraction and ancillary activities at the Application Site, which already benefitted from site clearance, drainage, infrastructure and trained staff, was economical and necessary to meet the national energy demand.

3.3.3 Alternative Industries

The nature and makeup of landcover at the Application Site is fundamental to its selection and use in the peat extraction industry. In 1988, there was no existing alternative industry type established on a site such as a cutaway or cutover bog. As mentioned, by 1988, the Application Site had benefitted from existing onsite infrastructure such as the interconnectivity of the bogs via a rail network, several peat processing buildings, trained staff, and proximity to other Bord na Móna assets. Therefore, continuing with the peat extraction industry was an economically viable decision.

As discussed in Section 3.3.2, the Bog Commissioners published between 1810 and 1814 a series of four reports which set out, in detail, how 1,013,358 acres of bog could be drained, manured and brought into production as agricultural land. The reports were gradually published from 1810 to 1814, and each report contains detailed maps which set out the proposed lines of drainage and the highest and lowest point of each bog. Due to various reasons, including the fact that the British Government was short of money after the Napoleonic Wars, the proposals in the Bog Commissioner's reports were not acted upon.

Nonetheless, over the years, various initiatives were trialled to continually assess if alternative activities could be established on cutover and cutaway bogs. These initiatives included the use of bogs for forestry, agricultural production, and horticulture. In order to best inform the establishment of these alternative industries, two series of surveys were carried out on Bord na Móna peatland soils between 1963 and 1969 with the aim of establishing detailed knowledge on the types of peat in, and the subsoils underneath, every peatland area. The first survey, conducted by An Foras Talúntais[1] ('AFT') was of the mineral soils underneath the peat; the second was of the types of peat in peatlands that had been drained on average for 20 years and on which production had taken place. These surveys informed the siting of potential alternative industries, the trials of which are examined below.

3.3.3.1 Forestry

Afforestation trials on small areas of peatland in Lyrecrumpane, Co. Kerry began in the 1940s. By the early 1950s, discussions between Bord na Móna and the Department of Lands were underway about the possibility of planting trees at Clonsast, and in 1954 it was agreed by Bord na Móna to lease 15 acres of Clonsast to the Department of Lands for the experimental forestry trials. These trials commenced in 1955. Additionally, Bord na Móna agreed to lease a further 55 acres of bog at Lullymore to the Department of Lands to facilitate further forestry trials. In 1960, these land leases at Lullymore were transferred to AFT. By the early 1960s, the Lyrecrumpane forestry plantation had been sold to the Forestry Division of the Department of Lands.

Between 1976 and 1978, AFT undertook research on the growing of short-rotation forestry on cutaway peatlands for biomass. Subsequently in 1978, Bord na Móna agreed to participate in a biomass energy research and development program, devised by the National Board for Science and Technology (NBST) and funded by the European Economic Community. This program was focused on the conversion of biomass to energy, and in 1979, 120 hectares of short-rotation forestry was planted in

[1] *AFT was established with the* Agriculture (An Foras Talúntais) Act, 1958. *The chief function of AFT was 'to review, facilitate, encourage, assist, co-ordinate, promote and undertake agricultural research'.*

Clonsast in Co. Laois, and Boora in Co Offaly. However, the results of these plantings were poor, with yields of dry matter significantly below those which would be required to be economically viable. A similar endeavour of planting 100 hectares of coniferous forestry on blanket bog in Oweninny, Co. Mayo, yielded similar results, and ultimately the project was terminated in 1984.

In 1987, the Government decided that any suitable cutaway bog areas which were deemed suitable for afforestation would be transferred by lease to the Forestry Service. The subsequent planting of these areas by Coillte demonstrated the issues associated with developing viable commercial forestry industry on cutaway areas. These issues included varying peat depths, local microclimates, and susceptibility to late frosts.

In 1998, a joint venture research project between Bord na Móna, Coillte, and the Forest Service, and coordinated by UCD was launched. The objective of the BOGFOR project was to investigate the forestry potential of cutaway bogs and develop techniques for establishing successful forests. This research concluded that while there is potential for the use of cutaway peatlands in establishing successful forestry plantations, any such endeavour would require careful site selection and tailored management techniques to mitigate the inherent difficulties associated with cutaway peatlands as a medium for forestry, including heterogeneity of peat depths, peat types, and sub-peat mineral soil (Renou-Wilson, 2008). At present, Coillte continue to manage some areas of Bord na Móna peatlands via leasehold.

3.3.3.2 Agriculture

As outlined in Section 3.3.2 above, the very initial possible use explored for Bord na Móna boglands was agricultural production. Throughout the decades, various agricultural trials were conducted on Bord na Móna cutaway lands to determine the viability of agricultural production as an alternative industry to the continuation of peat extraction and ancillary activities.

Early AFT research indicated that grass was the most successful crop on cutaway bog (Healy, 1980). From 1962, research focused primarily on grassland and its use for beef production. In 1969, Bord na Móna agreed to provide funding to the AFT to fund research into grass growing on sod peat cutaway at Timahoe, Co. Kildare. In 1971, Bord na Móna provided further funding to AFT to stock cattle on grassland which had been sown on cutaway bog in Lullymore, Co. Kildare. Bord na Móna also began rearing cattle at Clonsast and Derrygreenagh in 1972. While grass yields were acceptable, dietary mineral supplementation was required owing to deficiencies present in the grasslands. In Oweninny, Co. Mayo, a separate sheep-rearing project was undertaken in the early 1970s on grassland that had been developed on cutaway bog, where a flock of 1,000 sheep was established. By 1979, the disparity between the performance of grass on shallow versus deep peat resulted in the deeper peat areas being taken out of grassland production. Due to animal production problems and issues with grass growth, the project was a complete financial loss and was eventually ended in 1983.

In addition to livestock, Bord na Móna also examined the option of growing vegetables and other crops on their lands. Commencing in 1967, AFT began trials of bamboo on Bord na Móna lands. AFT also commenced trials of a multitude of cereal crops and other vegetables, including onions, French beans, peas, flax, rapeseed, mustard and poppies, all of which proved unsuccessful. There was limited success with trials of beet and potato crops in areas of deep peat.

Ultimately, experiments undertaken in respect of agricultural production across the Bord na Móna landbank have determined that product yields are significantly less than those required to maintain financial viability. As such, the continuation of peat extraction and ancillary activities from 1988 onwards on lands which were already developed for that purpose was the only viable option.

3.3.3.3 Horticulture

In 1966, Bord na Móna established a shrub nursery at Lullymore for the growing of ornamental shrubs and trees on cutaway peatland. The intent was to establish a major industry which involved the growing and export of mostly ericaceous shrubs. In 1970, the board of Bord na Móna expanded the area of shrub nursery and purchased a substantial quantity of shrubs. However, by 1982, the then soon-to-be appointed managing director of Bord na Móna, Paddy MacEvilly, instructed that the shrub nursery be closed, though in 1983, it was agreed that the facility remain open for another year. The project was ultimately economically unviable and did not provide the financial returns needed to justify its operation. Ultimately, the Lullymore shrub nursery was sold in 1988.

3.3.3.4 Renewable Energy

The first largescale development or industry to be located on a cutover peat site was the Bord na Móna Bellacorick Wind Farm which was commissioned on Oweninny bog in Co. Mayo in 1992. This was followed by the adjacent Oweninny Wind Farm (Phase 1), a joint venture with ESB Networks, which was commissioned in 2019. Bord na Móna have since developed numerous renewable energy developments, including Mountlucas Wind Farm, Bruckana Wind Farm, Cloncreen Wind Farm, Oweninny Wind farm (Phase 2), Derrinlough Wind Farm, and Timahoe North Solar Farm. These developments will play an invaluable role in decarbonising electricity production nationally, while providing additional benefits such as employment and the provision of public amenity in the form of walkways and other installations. Local communities also benefit from additional rates paid to the Local Authority which support the provision of local services, community benefit schemes, upgrading of road infrastructure in the vicinity of the developments as required, payment of taxes from the developments, and dividends from Bord na Móna to the State, and indirect employment created through the sub-supply of a wide range of products and services.

Additionally, the permanent footprint of these renewable energy projects is small relative to the extent of the lands on which they are sited, leaving large tracts of lands available for peatland rehabilitation and enhancement. The experience at Bord na Móna's existing wind energy developments has clearly demonstrated that peatland rehabilitation and wind farm development can co-exist successfully. The opportunity to build renewable energy infrastructure on land that can also develop as a carbon sink and enhance wildlife habitats presents a unique opportunity to meet Ireland climate change and biodiversity enhancement commitments.

It has generally been accepted by policy makers at national, regional and local level that the cutaway bogs present potentially ideal locations for renewable energy infrastructure.

Of each of the alternative industries examined by Bord na Móna in devising plans for peatlands exclusive of peat extraction and ancillary activities, renewable energy is the chosen option. The benefits, which include decarbonisation of electricity, employment opportunities, community benefits, and providing for significant rehabilitation and enhancement opportunities of peatlands make renewable energy the logical alternative option to peat extraction and ancillary activities.

Bord na Móna recognises the Application Site as an important natural asset which has the potential to play a strategic role in meeting national climate action targets. Intact or functioning peatlands are natural carbon sinks which can play a considerable role in mitigating against the impacts of climate change. Bord na Móna has transitioned from peat production to renewable energy, sustainable waste management, carbon storage and biodiversity conservation.

The implementation of key elements of the 'Brown-to-Green' Strategy between 2018 – 2020 resulted in both significant changes and progress in re-focusing and strengthening Bord na Móna's operations to renewable energy generation, recycling and the development of other low carbon enterprises. Bord na Móna's formal announcement in January 2021 that all industrial scale peat extraction on lands within its

management would permanently cease represents a historic milestone in the implementation of the 'Brown-to-Green' strategy.

Bord na Móna continues to progress its 'Brown-to-Green' Strategy on the basis of 4 no. core strategic actions):

i) Provide Ireland with sustainable energy from renewable sources at scale;
ii) Effectively rehabilitate our peatlands;
iii) Deliver world-class waste and resource recovery solutions; and,
iv) Help Ireland reimagine how it engages with climate action

In line with Ireland's carbon reduction ambitions Bord na Móna intend to utilise, as appropriate, its landbank, including the Application Site, for both renewable energy infrastructure and rehabilitation measures to facilitate environmental stabilisation of the bog group and the optimisation of climate action benefits. The reduction of emissions is a key proponent of the enacted Climate Action and Low Carbon Development (Amendment) Act 2021, which aims to achieve a climate neutral economy by no later than 2050. The establishment of low carbon economies through increased renewable energy generation, e.g., wind, has therefore become a time-critical consideration underpinning the current development of the country.

An alternative to the above would be to continue peat extraction and ancillary activities at the Application Site. However, this option is not in line with Bord na Móna's Brown to Green Strategy, nor is it compatible with local, national or international energy or climate policies and targets. Please see Chapter 2 Background for details.

Therefore, Bord na Móna's preferred option for future development at the Application Site is the implementation of wind energy infrastructure which is both compatible with climate change policy and targets and Bord na Móna's Brown to Green Strategy. Any proposed renewable energy infrastructure will be compatible with Bord na Móna's Cutaway Bog Decommissioning and Rehabilitation Plan which will, irrespective of any future use of the lands, be implemented in agreement with the EPA as per Condition 10 of the IPC Licence. The selected future proposal for the Application Site is the proposed Lemanaghan Wind Farm which can maximise the Application Site's renewable energy potential without significant environmental impact and can coincide harmoniously with the Draft Bord na Móna Cutaway Bog Decommissioning and Rehabilitation Plan which is a statutory obligation of Bord na Móna under Condition 10 of the IPC Licence. The compatibility of both rehabilitation works associated with Condition 10 of the IPC Licence, and the proposed Lemanaghan Wind Farm is cumulatively assessed in this rEIAR. The proposed Lemanaghan Wind Farm is currently subject to a standalone Environmental Impact Assessment Report which takes full consideration of the compatibility of the proposed wind farm with peatland rehabilitation in the environmental impact assessment.

3.3.4 Alternative Layouts

Peat extraction and ancillary activities have been ongoing at the Application Site since the 1950s. In the context of peat extraction and ancillary activities, it is considered that drainage infrastructure is the defining element of the site layout. The drainage layout at any given time between 1950 and the cessation of peat extraction and ancillary activities in 2020 was considered the most optimum layout at the time with respect to local conditions. The drainage layout was altered from time to time depending on a change in local conditions but has broadly remained the same. Drainage designs, as described in Chapter 4, have remained unchanged since their initial installation on the Application Site in 1950, though the number of drains and orientation of same may have changed as required in response to local conditions and as operations expanded across the Application Site through the decades. It is considered that the site layout was at all times the optimum layout to facilitate the Project on site. The layout at any given time would have ensured optimal resource utilisation (as an example, the location of temporary rail lines would change as required to minimise fuel usage and time expended transporting extracted peat from the Application Site to Ferbane Power Station).

3.3.5 Alternative Processes

As outlined in Chapter 4 Description of the Development, the methods associated with peat extraction and ancillary activities have been well-developed over time, since the onset of peat extraction and ancillary activities on Bord na Móna lands in the 1940s. Throughout the decades, these processes have been continually improved, utilising the most up-to-date techniques and machinery to make the process as efficient as possible. The organisation of Bord na Móna bogs into bog groups allowed local oversight into development, ensuring that locally encountered conditions could be worked in the most efficient manner possible. The processes used at any given time were based on extensive observation, research and development to inform the most optimum solutions available; in this regard, the highly-skilled staff who worked at the Application Site were a significant asset to the Project, as their site-specific knowledge and understanding of the bogs they worked was instrumental in informing which machines were most suitable for the processes being undertaken, and whether any modifications to machines, which could be made locally at Lemanaghan Works adjacent to the Application Site, could enhance the efficiency of the processes of the Project. Throughout the decades, machinery was kept up to date with the best available technology to ensure that the Project was operating with maximum efficiency, while also satisfying required safety standards and also enhancing environmental performance (e.g. as more modern and powerful tractor engines were developed and utilised on site, the number of tractors required to undertake peat extraction and ancillary activities would have lessened, thereby reducing fuel consumption and emissions from same).

3.3.5.1 Peat Extraction Processes

Sod peat extraction was the initial form of peat extraction employed by the Turf Development Board, and subsequently Bord na Móna. Before peat extraction became a mechanised process (i.e. undertaken with machinery), peat, or 'turf', was extracted by hand in the form of sods, using a shovel-like implement known as a 'sleán'. The transition from hand-won sod peat to mechanised sod peat extraction was a significant one; in addition to being quicker and increasing yields relative to those of hand-won turf, the use of machinery known as 'Baggers' (as described in Section 4.2.2.2.1 of Chapter 4), produced a sod of superior composition, due to the ability of the Bagger to macerate the extracted peat before extrusion into formed sods. 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. There were a number of advantages to macerating sod peat which could not be achieved during the production of hand-won sods, including:

- Machine sods had a higher calorific value when combusted due to their increased density and uniformity when compared with hand-won turf;
- Increased density of sods meant that transport of sods was more economical when compared with hand-won sods;
- Quicker drying time of machine sods compared to hand-won sods; and,
- Once dry, machine sods were much more impervious to the absorption of water, compared to hand-won sods.

At the time of the commencement of peat extraction and ancillary activities at the Application Site, mechanised sod peat extraction was considered the optimal form of peat extraction.

The use of milled peat from Bord na Móna bogs for energy generation was considered between Bord na Móna and the Electricity Supply Board (ESB) in the early 1950s, in the early years of the Second Development Programme (which is detailed in Section 2.1.3.1 of Chapter 2 Background). Milled peat extraction was initially concepted in order to facilitate the production of manufactured peat briquettes. However, there were several advantages in its use for electricity generation versus sod peat, particularly for large-scale power generation. These advantages included:

Improved Consistency of Peat

As discussed in Chapter 4 Description of the Development, milled peat consists of fine particles of peat, which are spread and dried on the bog before being harvested. Compared to sod peat, milled peat has a more consistent moisture content and particle size. This consistency is an important attribute in the context of large-scale power plants, as it allows for more stable, and therefore efficient combustion, when compared to sod peat.

Increased Yields

Milled peat extraction typically allowed for a greater volume of peat to be extracted from a given area of a bog. This was in part due to the faster drying time of milled peat; when extracted, both milled and sod peat were spread on the surface of the bog for drying. Due to the smaller particle size, milled peat inherently dried faster than sod peat.

Suitability to Large-Scale Power Generation

Increased yields associated with milled peat versus sod peat meant that greater volumes of peat could be secured to fuel larger electricity generation installations. The consistent composition of milled peat when compared with sod peat also allowed for more efficient combustion in power stations. Additionally, milled peat allowed for a continuous feeding of fuel into power station boilers, which was not possible with sod peat.

3.3.6 Alternative Control Measures

As outlined in Chapter 4 Description of the Development, from 1988, but prior to the implementation of the IPC Licence at the Application Site in 2000, a range of control measures were in place across the Application Site. In addition, as evidenced in the 1991 Harkins Report, Appendix 4-9, 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 to maintain treatment of run-off while cleaning of existing ponds was in progress.

Additionally, after the discovery and subsequent preservation of trackways at Corlea Bog, Co. Longford by Bord na Móna 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 Móna Bogs, with the results being forwarded for inclusion in the Sites and Monuments Record.

Since 1998, Bord na Móna 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 Móna Bogs (1998) between the Minister for Arts, Heritage and the Gaeltacht, the National Museum of Ireland and Bord na Móna. The Agreed Principles set out 10 standards within which archaeology in the Bord na Móna peatlands were managed. Five Archaeological Liaison Officers were spread across the Bord na Móna Bog Groups and received training on how to deal with and report finds. Since 1998, all archaeological surveys were funded by Bord na Móna. 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 Móna had been subject to archaeological survey. A Code of Practice between the Department of Arts, Heritage and the Gaeltacht, the National Museum of Ireland and Bord na

Móna was established in 2012.[2] This Code superseded the Agreed Principles. The Code provided a framework within existing legislation, policy and practice to enable Bord na Móna to progress with peat extraction and ancillary activities and simultaneously ensure archaeological control measures are in place.

As described in Chapter 4 Description of the Development, from April 2000, IPC Licence P0500-01 was implemented across the Application Site. 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. In the intervening period since the grant of the IPC Licence, Bord na Móna has implemented the mitigation and monitoring measures as listed in the Licence. Bord na Móna intend to continue implementing and practising the mitigation and monitoring measures as listed in the Licence after the site is decommissioned, where applicable.

As outlined above, Bord na Móna have, of their own volition, implemented control measures across the Application Site to reduce environmental impact and have proactively engaged with the relevant specialist stakeholders to ensure that control measures are proportionate and correctly applied and monitored. It is considered that these control measures were the optimum possible control measures with respect to Project activities at the Application Site between 1988 and present day.

3.3.7 Alternative to Rehabilitation Plan

It is a statutory obligation of Bord na Móna under Condition 10 of the EPA Licence to rehabilitate peatlands of the Boora Bog Group, of which the Application Site is a part, once the site is fully decommissioned. A Draft Cutaway Bog Decommissioning and Rehabilitation Plan has been produced for the Application Site. Please see Appendix 4-2 for the Draft Bord na Móna Cutaway Bog Decommissioning and Rehabilitation Plan and Appendix 4-1 for the EPA licence decommissioning requirements. An alternative option would be to not implement any rehabilitation plan of the site. The rehabilitation of the site will be implemented irrespective of this application and in line with the requirements of the EPA. The discharge of Condition 10 will facilitate the permanent rehabilitation of the Boora Bog Group in conjunction with any parallel future end-uses (such as proposed wind energy infrastructure) and have been cumulatively assessed with the future wind energy development in the following chapters. Accordingly, and as outlined in the Cutaway Bog Decommissioning and Rehabilitation Plan, it is anticipated that significant effects on the environment can be remediated.

3.3.8 Conclusion

The location, nature, landcover and scale of the site determined its selection by Bord na Móna, under powers vested by the Turf Development Act,1946, as a strategic and important national asset to generate considerable fuel sources for the State. Alternative industries or uses were not possible at this site in 1988 and alternative locations could only be other large scale peat sites which were acquired by the State and also underwent large-scale peat extraction. Thus, alternative locations or industries are not considered a reasonable alternative. Similarly, as peat extraction and ancillary activities was already ongoing in 1988 and continued until June 2020, a 'do nothing' option is not credible as the Project has already occurred. Building on the success of operations from 1950 to 1988, the further expansion of peat extraction and ancillary activities was undertaken from 1988 at the Application Site in the form of the continuation of peat extraction and ancillary activities on the land which had been drained for this purpose prior to 1988.

With the implementation of Bord na Móna's 'Brown-to-Green' Strategy and the permanent cessation of peat extraction and ancillary activities at the Application Site, the Applicant recognises the opportunity

[2] *2012 Code of Practice between the Department of Arts, Heritage and the Gaeltacht, the National Museum of Ireland and Bord na Móna* https://www.archaeology.ie/sites/default/files/media/publications/cop-bord-na-mona-en.pdf

to transform the Application Site into a sustainable, clean, and renewable energy source while simultaneously facilitating peatland rehabilitation at the Application Site and providing opportunities for amenity, tourism and employment. Thus, the selected future proposal for the site includes a proposed wind energy development which can maximise the Application Site's renewable energy potential without significant environmental impact and can coincide harmoniously with peatland rehabilitation plans which are statutory obligation of Bord na Móna under Condition 10 of the IPC Licence. The compatibility of both rehabilitation works associated with Condition 10 of the IPC Licence, and the proposed Lemanaghan Wind Farm is cumulatively assessed in this rEIAR. The proposed Lemanaghan Wind Farm will be subject to a standalone Environmental Impact Assessment Report, and which will take the peatland rehabilitation plans into consideration.