Stokane Single Turbine

Natura Impact Statement

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Co. Sligo

Natura Impact Statement

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1. INTRODUCTION

JKW Environmental has been commissioned by Aerowest Wind Farm Limited to undertake a Natura Impact Statement in support of an Appropriate Assessment (AA), under Article 6 of the EU Habitats Directive, as transposed into national legislation by the European Communities (Birds and Natural Habitats) Regulations 2011, for the installation of the proposed Stokane Single Turbine (i.e. the Project) at Cloonkeelaun, Co. Sligo.

In accordance with Article 6(3) of the Habitats Directive, as transposed into Irish law by Regulation 42(1) and Part 5 of the European Communities (Birds and Natural Habitats) Regulations 2011 – 2015 (i.e. the "Habitats Regulations") and Part XAB of the Planning and Development Act, 2000 (as amended) (i.e. the "Planning and Development Act"), a Screening Report for Appropriate Assessment (AA) was prepared to assess whether it could or could not be ruled out, on the basis of objective information, that the project, either individually or in combination with other plans or projects, was likely to have a significant effect on any European Sites. The Screening Report for Appropriate Assessment was prepared by JKW Environmental on behalf of Aerowest Wind Farm Limited.

In accordance with the provisions of Section 177T (5) of the Planning and Development Act 2000 (as amended) Sligo Planning Authority has determined that significant effects on the Ox Mountains Bog SAC (Site Code 002006) cannot be ruled out. Sligo Planning Authority states "*Given the proximity of the site to the Ox Mountains Bog SAC and the pathways provided by the Leaffony River and the Gowlan River there is potential for disturbance to QI species, changes in key indicators of conservation status value (water or air etc.) and changes to areas of sensitivity or threats to QI*"

In accordance with the provisions of Section 177T (5) of the Planning and Development Act 2000 (as amended) Sligo Planning Authority has requested that a Natura Impact Statement be prepared.

This NIS provides an examination, analysis and evaluation of the likely impacts from the Project, both individually and in combination with other plans and projects, in view of best scientific knowledge and the conservation objectives of the Ox Mountains Bog SAC. It also prescribes appropriate mitigation to ensure that the Project will not adversely affect the integrity of those sites identified as being at risk of likely significant effects. Finally, it provides complete, precise and definitive findings, which are capable of removing all reasonable scientific doubt as to the absence of adverse effects on the integrity of the European sites concerned.

1.1 SUMMARY OF SCREENING FOR APPROPRIATE ASSESSMENT

1.2 GUIDANCE

This NIS has been undertaken in accordance with National and European guidance documents, as follows:

- Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (2010). DEHLG.
- Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites – Methodological Guidance of the Provisions of Article 6(3) and (4) of the Habitats Directive 92/42/EED. European Commission (2001).
- Managing Natura 2000 Sites – The provisions of Article 6 of the Habitats directive 92/43/EEC. European commission (2018).

The information provided in this NIS is also guided by European and Irish case law pertaining to the approach to Stage 2 Appropriate Assessment. In particular it is noted that the consideration of impacts provided in Section 4 this NIS has been undertaken in the absence of any regard to construction phase best practice measures and operation phase design measures that aim to safeguard the receiving environment and the Ox Mountains Bog SAC from potential adverse impacts.

1.2.1 Background to Habitats Directive Article 6 Assessments

The EC (2001) guidelines outline the stages involved in undertaking an assessment of a project under Article 6(3) and 6(4) of the Habitats Directive. The assessment process comprises the four stages outlined below. Stage 1 to 3 form part of the Article 6(3) process, while Stage 4 forms part of the Article 6(4) process. This NIS presents the findings of an examination, analysis and evaluation of the project to inform a Stage 2 Appropriate Assessment of the project.

- Stage 1 – Screening: This stage defines the proposed plan, establishes whether the proposed plan is necessary for the conservation management of the European Site and assesses the likelihood of the plan to have a significant effect, alone or in combination with other plans or projects, upon a European Site.
- Stage 2 – Appropriate Assessment: If a plan or project is likely to have a significant affect, an Appropriate Assessment must be undertaken. In this stage the impact of the plan or project to the Conservation Objectives of the European Site is assessed. The outcome of this assessment will establish whether the plan will have an adverse effect upon the integrity of the European Site.
- Stage 3 – Assessment of Alternative Solutions: If it is concluded that, subsequent to the implementation of mitigation measures, a plan has an adverse impact upon the integrity of a European Site it must be objectively concluded that no alternative solutions exist before the plan can proceed.
- Stage 4 – Where no alternative solutions exist and where adverse impacts remain but imperative reasons of overriding public interest (IROPI) exist for the implementation of a plan or project an assessment of compensatory measures that will effectively offset the damage to the European Site will be necessary.

1.2.1.1 Stage 2 – Appropriate Assessment

The EC Guidance Assessment Criteria for a Stage Two Appropriate Assessment requires the following information:

1. A description of the elements of the project that are likely to give rise to significant effects to European Sites;
2. The setting out of the Conservation Objectives of the Site;
3. A description of how the project will affect key species and key habitats;
4. A description of how the integrity of the site (determined by structure and function and conservation objectives) is likely to be affected by the project (e.g. loss of habitat, disturbance, disruption, chemical changes, hydrological changes etc.);
5. A description of the mitigation measures that are to be introduced to avoid, reduce or remedy the adverse effects on the integrity of European Sites.

This NIS addresses each of these items, but prior to doing so the following sections provide a description of the project; a description of the lands at and surrounding the footprint of the project site; and a description of the OX Mountains Bog SAC.

1.3 REQUIREMENT FOR APPROPRIATE ASSESSMENT

The requirements for Appropriate Assessment (AA) are set out in Article 6 of the Habitats Directive (92/43/EEC) and Part XAB of the Planning and Development Act 2000, as amended [the 2000 Act].

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of habitats and species of community interest, and requires the creation of a coherent EU ecological network of designated Natura 2000 sites (e.g. SACs and SPAs) and a requirement to take the requisite measures to establish a system of protection for the habitats and species listed. The maintenance of habitats and species within European sites at favourable conservation condition will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national and international level.

The Habitats Directive outlines that habitats' and species' qualifying interests, protected by the Directive, must be maintained in "favourable conservation status" within their range. The conservation status of qualifying habitats is achieved when:

- Its natural range, and area it covers within that range, are stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- The conservation status of its typical species is favourable.

Favourable conservation status of a species (as defined in Article 1 of the Habitats Directive) is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

According to the Habitats Directive, an AA is required of any plan or project not directly connected with or necessary to the management of a European Site but likely to have a significant effect thereon, either individually or in combination with any other plans or projects in view of the European Site's conservation objectives. European Sites include Special Areas of Conservation (SAC) designated under the Habitats Directive, Special Protection Areas (SPA) designated under the Birds Directive (2009/147/EEC) and candidate SACs (cSACs) or proposed SPAs (pSPAs), all of which are afforded the same level of protection as fully adopted sites. Both the Habitats and Birds Directives have been fully transposed into Irish law. The provisions of Part XAB of the 2000 Act, as amended, require, inter alia, that an Appropriate Assessment "shall include a determination by the competent authority under Article 6.3 of the Habitats Directive as to whether or not a proposed development would adversely affect the integrity of a European site." It is such an Appropriate Assessment, which the local planning authority as the competent authority must conduct in relation to the proposed planning application for the Proposed Development.

1.4 CONSULATION

The National Parks and Wildlife Service were consulted by email on the 21st July 2022.

2. BASELINE DESCRIPTIONS

2.1 DESCRIPTION OF THE RECEIVING ENVIRONMENT

The site for the proposed development is located in the townland of Cloonkeelaun, County Sligo. The nearest village is Bunnyconnellan in County Mayo, approximately 6.5km to the southwest. Ballina is the main population centre in the area approximately 13km west. Figure 1.1 shows the site location map. The site is accessed from the N59 via a number of local country roads. An existing turbary and wind farm road is used to access the site.

The site lies within a large expanse of peatland that extends from the western foothills of the Ox Mountains. These peatlands slope gently to the west and northwest from approximately 200mOD near Lough Easky to approximately 100mOD approaching the N59. The site is adjacent to the southern part of the Black Lough Wind Farm and northern part of the Carrowleagh Wind Farm.

Cutover bog appears to be the main habitat surrounding the proposed project site. Active turf cutting is on-going all over this area. Conifer plantation, comprised of mainly Sitka spruce (*Picea sitchensis*) and Lodgepole pine (*Pinus contorta*), is located c.750m to the east.

The single turbine will be located on unforested, degraded blanket bog that is comprised of flat areas as well as mounds/ridges. The site has an overall flat topography and high watertable with small to large dystrophic ponds scattered across the landholding.

The proposed turbine location has a high cover of dense heather shrubs, mainly Ling heather (*Calluna vulgaris*), and purple moor grass (*Molinia caerulea*). There are some small cushion of *Sphagnum magellanicum* scattered with lichens. The proposed location for the turbine will be positioned on a mound (c.2.5m higher than the surrounding area) and therefore in a drier part of the bog.

The bog and operational wind farms are well serviced by tracks which vary from floating roads to roads founded on the subsoil. The existing road infrastructure has been upgraded to service the southern part of the operational Black Lough Wind Farm, adjacent forestry and northern part of the Carrowleagh Wind Farm.

The Project site is located c. 204m at its closest point, the existing control building at Black Lough WF, from the Ox Mountains Bogs SAC. The proposed turbine is located c. 755m from the SAC.

The site is in the upper catchments of the Leaffony and Gowlan rivers. These rivers are within hydrometric areas 34 (Moy & Killala Bay) and 35 (Sligo Bay-Drowes), respectively. The OSi 6- inch mapping shows the Carns River (EPA-named Leaffony_010) rising just north of the site and flowing in a northerly direction. The Culleens River joins with the Ballyglass River, downstream of which it is referred to as the Leaffony River. It discharges to Killala Bay. The cabling to the Black Lough Wind Farm control building and part of the access road crosses into the catchment of the Gowlan River in hydrometric area 35 (Sligo Bay-Drowes). Hydrometric Area No 35 includes the surface catchment drained by the River Drowes and all streams entering tidal waters in Sligo Bay and between Lenadoon Point and Aughrus Point, County Donegal. The Gowlan River flows to the Easky River approximately 3.7km northeast of the site. The Easky River flows to the north, discharging to the Atlantic Ocean at Easky.

The project site is located partially within the Foxford Easky East, Easky West and Collooney Groundwater Bodies. The groundwater vulnerability for the site has been classified as low vulnerability for all of the above groundwater bodies.

2.2 OX MOUNTAINS BOG SAC

This site comprises several upland blanket bogs situated in the Slieve Gamph, or Ox Mountain range, on the border between counties Sligo and Mayo. The town of Tobercurry lies approximately 12 km to the south-east. Most of the underlying rock is composed of metamorphic schists and gneisses, but igneous intrusions are also found, as at the silica-rich granitic ridge to the east of Easky Lough.

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

- [3110] Oligotrophic Waters containing very few minerals
- [3160] Dystrophic Lakes
- [4010] Wet Heath
- [4030] Dry Heath
- [7130] Blanket Bogs (Active)*
- [7140] Transition Mires
- [7150] Rhynchosporion Vegetation
- [1013] Geyer's Whorl Snail (*Vertigo geyeri*)
- [1528] Marsh Saxifrage (*Saxifraga hirculus*)

The Ox Mountains Bogs SAC is of considerable conservation significance, due primarily to the extensive, largely intact areas of blanket bog it contains. This habitat is listed, and given priority status, on Annex I of the E.U. Habitats Directive. The value of the site is increased by the presence of good examples of several other annex-listed habitats, i.e. wet heath, dry heath, oligotrophic lakes, transition mires, Rhynchosporion vegetation and dystrophic lakes. Also of note is the presence of Marsh Saxifrage and *Vertigo geyeri*, both nationally rare species, and the populations of two rare and threatened bird species. Part of the site has been designated as a Statutory Nature Reserve.

An assessment of some of the habitat types listed in Annex I Habitats Directive, which are qualifying interests for Ox Mountains Bogs SAC, is listed below in Tables 2a and 2b.

Table 2a: Assessment of some of habitat types listed in Annex I Habitats Directive, which are qualifying interests for Ox Mountains Bogs SAC. (See Natura 2000 Explanatory notes; A: excellent, B: good, C: significant/average); Extent has been updated from the Conservation Objectives supporting document (NPWS, 2016).

Annex I Habitats * denotes Priority Habitats	Code	Cover (ha)	Representativity	Relative Surface	Conservation Status	Global Assessment
Lowland oligotrophic lakes	3110	221	B	C	B	B
Wet Heath	4010	1083	B	B	B	B
Blanket Bog (active)*	7130	7097	A	B	A	A
Rhynchosporion depression	7150	49.6	A	C	A	A
Natural dystrophic lakes and ponds	3160	317	A	B	A	A

Table 2b: Species listed in Annex II Habitats Directive

Species listed in Annex II Habitats Directive	Population	Site Assessment			
Name		**Population**	**Conservation**	**Isolation**	**Global Assessment**
Vertigo geyeri	Permanent	B	B	A	B

2.3 BRIEF DESCRIPTION OF THE PROJECT

The development will comprise the installation of:

- One turbine with a nominal tip height of 150m.
- Construction of approximately 330m of new floating access road.
- Construction of a hardstand area to facilitate turbine installation. The cranage area will be built on tills, while the storage and assembly areas will be floated.
- Underground cabling between the turbine and the grid connection point, located at the Black Lough Wind Farm 20kV control building.
- Use of the existing hardstand at turbine T06 for the temporary construction site compound.
- Improvements and temporary modifications to existing public road infrastructure to facilitate delivery of abnormal loads and construction access. These improvements have been made for the Black Lough Wind Farm construction, so only minimal works are envisaged.

The existing Black Lough Wind Farm control building and existing grid connection to Glenree 110kV substation will be used. No additional grid connection works are envisaged.

2.3.1 Surface Water Management Plan

Section 7.4.3 (Site Specific Water and Sediment Management) of the Environmental Report, accompanying this application, outlines the management of surface water. Figure FI-7-3 shows the proposed surface water management infrastructure. The outline Surface Water Management Plan is set out in Section 6.4.2 of the CEMP submitted as part of response to the request for further information.

Turbine

The turbine is located on a ridge, slightly elevated (approximately 2.5m) over the adjacent near flat peatland. Drainage from the turbine area is to the west to a long cutover plot which drains to the north. Drainage from the turbine location is overland flow; there is no direct connectivity to the man-made drainage. Peat is typically 1.5m deep within the footprint of the works area. The surface water management will consist of:

- A silt fence will be erected around the earthworks area.
- A silt trap will be installed in the unlikely event that dewatering of the turbine foundation excavation is required. Provision is also made for the installation of a settlement pond.

Access Road

The access road to the hardstand will be a floating road. It will extend from the T06 hardstand to the hardstand of the proposed turbine. Peat depth along the alignment of the road is typically 2.5m. The construction of the floating road will be staged (built in layers) as detailed in the CEMP which will result in compression and strengthening of the underlying peat. The construction approach will avoid peat excavation; the alignment avoids the deepest peat on site; the construction method and route alignment reduces risk ranking of peat slippage to 'negligible' (the lowest ranking). The surface water management will consist of:

- Double rows of silt fencing will be erected on the downgradient (eastern) side of the road where the road crosses local low points (preferential flow paths). It is envisaged that as the peat compresses and consolidates, the road will settle. Water will move along through the road to these low points and flow via overland flow across the peatland. The silt fences will

remove silt washed from the road construction material. The silt fences will be removed after construction.

- A cutaway turf plot will be utilized as a settlement pond for the works within its catchment. Temporary plywood / plastic baffles will be installed to divide the pond into three chambers, with weirs at alternate sides to increase the flow length through the pond. The baffles will also increase the capacity of the pond.
- Under road drainage pipes will be provided at locations where overland flow paths have been identified by the project Environmental Clerk of Works (ECoW). These will facilitate surface water movement along its natural flow paths to ensure that the construction catchment hydrology remains unchanged (i.e., that drainage from areas currently in one catchment do not get diverted to the adjacent catchment).

3. ELEMENTS OF THE PROJECT THAT HAVE THE POTENTIAL TO RESULT IN SIGNIFICANT EFFECTS

Sligo Planning Authority carried out a Screening for Appropriate Assessment in relation to the proposed project which concluded that "*Given the proximity of the site to the Ox Mountains Bog SAC and the pathways provided by the Leaffony River and the Gowlan River there is potential for disturbance to QI species, changes in key indicators of conservation status value (water or air etc.) and changes to areas of sensitivity or threats to QI".* However, it must be noted that the Leaffony River does not provide a pathway to the Ox Mountains Bog SAC. The Leaffony River flows to the west of the Ox Mountains Bog SAC, neither the Leaffony or any of its tributaries flows through the SAC.

The elements of the project that will have the potential to give rise to impacts to Ox Mountains Bog SAC are outlined in Table 3.1 below. As shown in Table 3.1 the principal qualifying features at risk of experiencing likely significant effects as a result of the project include the Annex I and Annex II qualifying habitats and species of Ox Mountain Bog SAC.

It is noted that the identification of elements of the project that have the potential to give rise to significant effects and the examination of these elements (as outlined in Section 3 and 4 below) has been undertaken without regard to the proposed drainage management measures or any other mitigation measures that will be implemented as part of the project.

Table 3.1: Elements of the Project with the Potential to give rise to Significant Effects

Element	Details	Potential Impact to Ox Mountains Bog SAC
Site Access	Construction of approximately 330m of new floating access road. Improvements and temporary modifications to existing public road infrastructure to facilitate delivery of abnormal loads and construction access. These improvements have been made for the Black Lough Wind Farm construction, so only minimal works are envisaged.	Potential impacts associated with access tracks include: • Sediment pollution during construction and associated hydrological impacts. • Ground failure and peat slides resulting from poor construction management and/or an underlying risk of peat slippage at and in the vicinity of the construction works area. A detailed assessment for the potential for ground failure and a peat slide to occur is provided in Section 6.4 of the Environmental Report accompanying the application.
Cable Trenching	Cabling between the turbine and the existing Black Lough WF control building, which will involve the excavation of a trench approximately 1.2m deep and 0.4m wide. This will follow close to the road alignment.	Cable trenches can act as drainage channels for surface water runoff or lead to the drainage of adjacent habitats. Where trenches are constructed on slopes the flow of water could lead to the erosion of soils, which could enter watercourses and increase the rate of suspended solids.

Turbine foundation, and crane pad	The turbine foundation requires the excavation of peat and soft soils. The foundation will either be piled or shallow foundation.	• Effect on adjacent area due to potentially high concentrations of sediment discharge. • Oil or chemical contamination. • Ground failure/peat slides resulting from poor construction management and/or an underlying risk of peat slippage at and in the vicinity of the construction works area. A peat slide event will have the potential to have severe and wide-ranging effects to aquatic fauna and habitats downstream within the Ox Mountains Bog SAC
Operating Wind Farm	Operating wind farm will involve rotating turbine blades and generally infrequent visits by maintenance personnel to and from wind farm sites.	• Operating turbines can result in habitat loss and displacement for bird species. • The Ox Mountains Bog SAC is used during the summer months by Greenland White-fronted Geese, with 40-50 birds recorded at Lough Easky, located c.7km east of the proposed turbine location. Section 9.4.4 of the Environmental Report details the avian surveys completed during May 2021-April 2022. No Greenland White-fronted Goose was observed during these surveys. • In the summer a number of pairs of Golden Plover breed in the SAC. Golden Plover was recorded on three separate occasions during avian surveys. All records were outside of the breeding season. All Golden Plover flights were at a distance from the proposed turbine location. The closest flight recorded was c.1.2km north of the turbine location. No evidence was collected during vantage point surveys to indicate that Golden plover is breeding within the vicinity of the proposed turbine. • No SPAs are located within the wider vicinity of the project and no populations of birds that are listed as special conservation interests for SPAs in the wider surrounding area have been identified as interacting with the wind farm site or relying on the wider area surrounding the wind farm site for foraging, roosting or nesting.

		• Based on the absence of such bird species in the vicinity of the project, the construction, operation and decommissioning of the project will not have the potential, alone or in combination with other wind farms, to result in likely significant effects to the bird populations listed as special conservation interests for SPAs in the wider surrounding area.
Decommissioning	Wind turbines have a typical life expectancy of 30 years. The decommissioning of a turbine will involve: • Disassembly and removal of the turbine, including its blades, nacelle and tower and transportation off site. • Removal of turbine electrical and control equipment and transportation off-site for reuse or reclamation. • Removal of all underground infrastructure at shallow depths. • Areas where subsurface components are removed will be graded to match adjacent contours, stabilized with an appropriate seed mix, and allowed to re-vegetate naturally. • Removal of hardstand and road construction materials. These areas will be regraded and planted with an appropriate seed mix.	Effects on hydrology and water quality during decommissioning.

3.1 ASSESSMENT OF GROUND FAILURE & PEAT SLIDE RISK

A construction-related peat stability assessment for the site has been carried out and is provided in Section 6.4 of the Environmental Report accompanying the application. The conclusion of that assessment is that the risk of construction-related peat landslide is low to negligible across the landbank, and it is unlikely to occur. The assessment identifies design and avoidance measures to reduce peat landslide risk within the construction footprint to a ranking of 'negligible' (the lowest ranking). Mitigation and monitoring measures to manage the residual risk are also detailed in the CEMP.

3.2 SUMMARY OF THE ELEMENTS OF THE PROJECT THAT HAVE THE POTENTIAL TO RESULT IN SIGNIFICANT EFFECTS

Table 3.1 lists the elements of the project and identifies the potential impacts that could arise as a result of the project. In summary, changes to the hydrology of the catchment and potential contamination of surface waters due to construction and operational phases have been identified as having the potential to result in negative effects on the aquatic dependent habitats and species of the Ox Mountains Bog SAC.

Section 3.1 summarises the assessment of the risk of ground failure/peat slide posed by the project, as detailed in the Environmental Report, and has identified a negligible to low risk associated with the construction of the proposed wind farm infrastructure. Given this assessment, the proposed development will not pose a significant adverse risk to the conservation status of the qualifying habitats of the Ox Mountains Bog SAC associated with peat slide. In addition, given the negligible risk ranking of a peat slide occurring the associated risk to water quality downstream within the Gowlan catchment and contributing to the status of the Ox Mountains Bog SAC will also be negligible.

3.3 ASSESSMENT OF POTENTIAL IMPACTS ON THE OX MOUNTAINS BOG SAC & MITIGATION

The project elements leading to potential negative impacts on the integrity of the SAC have been identified in Table 3.1. Potential negative impacts are restricted to changes to the hydrology of the catchment and potential contamination of surface waters due to construction and operational phases.

3.3.1 Indirect Impacts on Aquatic Species and Associated Habitats

During construction and operation, the proposed turbine could potentially impact on the existing drainage network that flows into the Gowlan River which connects with the Easky River. There is also potential for accidental spillage of fuels, mixer washings, concrete and other contaminants on site during construction, which may also drain into the surrounding watercourses affecting the downstream SAC or species of high conservation value such as the Freshwater Pearl Mussel. Forestry activities and existing run-off from peatlands in the catchment already contribute to sedimentation and an increase in algal growth within the River Easky. Unmitigated run-off from proposed wind farms, such as this, would exacerbate the problem and contribute to habitat degradation.

A hydrology impact assessment was carried out as part of the environmental assessment for the development to estimate the percentage increase in runoff from the site due to the development.

Potential down-gradient flooding is impacted by a significant increase in the runoff (rate and/or volume) at a development site. The hydrology impact assessment at the Stokane site concludes that the increase in runoff will be imperceptible. The development will not connect to the existing drainage network, so runoff from the development footprint will be diffuse over-the-edge to the bog surface.

Removal of peat may result in the exposure of the underlying subsoils to sources of contamination. However, there is expected to be >20m of tills underlying the development footprint so the aquifer vulnerability rating will not change. Groundwater is not expected to be impacted by the proposed turbine. There is potential to encounter perched groundwater in the peat during the excavation of the cable trenches. Although the excavations will be shallow, approximately 1.2m deep, the watertable in the peat is shallow. If groundwater is encountered and builds up in the trench, it may need to be removed from the trench for the ducting to be placed; small amounts of groundwater would not need to be removed. Water removed will be managed, as described in mitigation below, so it does not present a risk to the nearby watercourses.

Freshwater Pearl Mussel

The Annex II species freshwater pearl mussel is not a qualifying interest of the Ox Mountains Bogs SAC and the Easky River (where populations have been recorded, *Margaritifera* Record 2015, NPWS database) has not been designated a NHA for the species. However, the freshwater pearl mussel is afforded protection under Section 23 of the Wildlife Act, 1976 (amended Section 31, 2000).

Potential secondary impacts on freshwater pearl mussel from construction works are generally limited to pollution events which have the potential to impact on the Gowlan and Easky rivers.

The Gowlan River (east of the site of the proposed development) was surveyed in July 2010 and found not to host Freshwater pearl mussel (Ecoserve, 2010).

In May 2018 Malachy Walsh and Partners carried out further FPM surveys in specific reaches of the Gowlan River and the Weeloge Stream as follows:

- A 200m section of the Weeloge Stream was surveyed extending upstream from its confluence with the Gowlan River.
- Approximately 400m of the lower extent of the Gowlan River, west of Black Lough Wind Farm (T1&T2), and downstream of its confluence with the Weeloge Stream, was surveyed.
- A 250m section of the upper extent of the Gowlan River was surveyed upstream from its confluence with the Weeloge Stream.

It was concluded that the surveyed sections of the Gowlan River and Weeloge Stream do not support an important population of FPM (Malachy Walsh, 2018).

***Vertigo geyeri* (Geyer's Whorl Snail)**

Geyer's whorl snail (*Vertigo geyeri*) is a Qualifying Interest species for the Ox Mountains Bogs SAC. It is found in constantly wet habitats such as stable flushes.

With regards to potential impact on *Vertigo geyeri*, the Whorl Snail is thought to be sensitive to any hydrological changes in their associated habitat, i.e. typically ground-water fed flushes. Such flush areas which were identified as a typical habitat for *Vertigo geyeri* have been identified in the vicinity

of Black Lough Wind Farm from Moorkens & Associates, 2011 and Long, 2018. However, no flushes of any kind were recorded within the proposed site or in the surrounding area. *Vertigo geyeri* is considered to have the least tolerance for habitat change of all the protected Vertigo species, as it is highly demanding of a constant and very even supply of groundwater. The hydrological regime that supports this constancy of supply needs to be protected from change of quantity or quality of groundwater. Any construction and operational interference with groundwater recharge of the flush, due to interception and redirection of flows naturally destined for the flush, caused by artificial drainage and de-watering of seepage in excavations could affect the hydrology of the flushes and therefore the population of *Vertigo geyeri*.

Summary of mitigation measures during the construction phase:

Specific surface water management and sediment control for the turbine location, access road, cable route, and construction site compound, provided in Section 7.4.3 of the Environmental Report and the CEMP, have been designed which together with proposed mitigation measures will mitigate against any potential negative impacts. In addition, surface water and sediment management are set out in Section 6.4.2 of the CEMP.

Therefore, it will ensure no indirect adverse hydrological impacts on watercourses or on the hydrology of the peatland habitats and the species they contain.

A summary of construction phase mitigation is as follows:

- During the construction phase, best practices will be employed to minimise the release of sediment laden storm water runoff.
- The developer will appoint an Environmental/Ecological clerk of works (ECoW) for the duration of the construction project. The ECoW will have an ecological and environmental management background with practical experience of wind farm construction projects. The ECoW will monitor the environmental aspects of construction (water quality, performance of surface water management infrastructure, etc.). The ECoW will have the authority to instruct the contractor to implement additional mitigation measures, if deemed appropriate. The ECoW will maintain a written record of all environmental issues on site, including incidents and monitoring results. This file will be made available to the relevant Authorities upon request. The ECoW will be responsible for notifying the relevant Authorities of any environmental incident.
- Following mobilisation to site, surface water management infrastructure will be the first works carried out. Additional controls will be installed as needed as construction progresses through the site, and/or as identified during site inspections of surface water management infrastructure.
- Earthworks will be suspended during extreme weather conditions. An extreme rainfall event will be classified as an event that corresponds to the Met Éireann Orange – Weather Alert for rainfall. The ECoW will monitor the weather forecast to make preparations ahead of adverse weather conditions.
- Clean surface water runoff will be diverted around earthworks areas to minimise the potential volume of silted water generated. To achieve this, shallow cut-off drains or temporary plastic diversion barriers will be installed.
- Settlement pond(s) will be used to treat runoff from the site. As detailed in the CEMP, a cutaway plot will be used at the northern end of the site and a second pond will be constructed near the turbine location, if required.

- Areas stripped of vegetation will be kept to a minimum. Areas around hardstands will be reinstated / landscaped on an on-going basis as this infrastructure is constructed. Peat turves will be placed on the surface to expedite this restoration. Where peat turves are not available, restored areas will be seeded. This will reduce areas of soil exposed to erosion. It will also provide beneficial reuse the peat near its source.
- Stockpiled soils will be kept a minimum distance of 50m from any watercourse. Silt fences will be placed downgradient of stockpiles to treat any polluted runoff.
- Floating roads will be used to minimise the volume and extent of peat excavation.
- Silt fences will be installed at the downslope side of the floating road at low points where natural drainage occurs. This will slow flows and remove silt washed from the newly constructed road. These will be removed after construction.
- The road and hardstanding areas will be constructed with aggregate – there will not be a hard-paved surface. This will reduce runoff volumes.
- If required, dewatering of the foundation excavation will be to temporary silt traps. Flow from the silt traps will be diffuse. The water would travel overland and any silt would be settled before reaching the drains or streams.
- The release of cement to water courses will be prohibited. Concrete pours will occur in contained areas, using shuttering. Rinsing down of concrete trucks will be done at a dedicated location on site – erected at the hardstand of turbine T06. The rinse down area will consist of a lined metal skip placed within a berm, lined with terram and stone filter. This will have the capacity to hold enough water for the rinse down of 85 trucks using 150 litres per truck. Water will be able to percolate through the stone filter and terram while removing cement fines. These rinse down points will not receive surface water runoff so capacity to receive rinse down water is always available. It will be located a minimum distance of 50m from any watercourse with water released to diffuse flow once pH has neutralised and confirmed by the ECoW. Signage will be erected at the concrete pour locations directing drivers to the rinse down area. The rinse down area will be removed at the end of the construction phase.
- Hydrocarbons (oils, diesel and chemicals) will be stored and managed in an appropriate manner to ensure no negative impacts. Specific measures will include:
    - Any storage of oils and diesel on site will be in steel or plastic tanks of good integrity and bunded to 110 % of tank capacity. All fuel and hydraulic fluids will be stored in the site COSHH store located in the site compound.
    - Refuelling will be carried out directly from delivery vehicles. Refuelling of mobile plant will not take place within 50m of any sensitive receptor. Refuelling by mobile bowser may be used for small generators etc. Toolbox talks on refuelling will be given to delivery drivers in addition to plant operatives.
    - Fuels, lubricants and hydraulic fluids for equipment used on the construction site will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, and provided with spill containment according to best codes of practice.
    - Any spillage of fuels, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the site and properly disposed of.
    - Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for disposal or re-cycling.
    - Appropriate spill control equipment, such as oil soakage pads, will be kept in the site plant to deal with any accidental spillage. Spare spill kits will be kept at the construction site compound.
- The public road serving the site will be kept clean of mud and debris so that silt is not washed to watercourses downstream of the site and outside the control of the development. If mud or debris is tracked onto the public road from vehicles leaving the site, the road will be swept.

Mitigation measures to be employed during the operation phase are:

- To mimic as close as possible greenfield runoff rates and volumes, permeable finishes on roads and hardstands will be used.
- Existing site drainage in the landholding will be inspected and maintained during the lifetime of the project. Drains will be cleared of debris, so blockages do not occur. These tasks will be included in the contract for the turbine operator.
- Rainfall concentrated at the turbine tower will be collected and discharged to a level spreader west of the turbine.
- Clay plugs will be installed along the length of the cable trench to eliminate these acting as preferential pathways.

It has been concluded that, once the mitigation measures and recommendation specified above have been rigorously and fully implemented, there will be no significant effects on the hydrology and hydrogeology of the nearby SAC.

3.4 CUMULATIVE AND IN-COMBINATION EFFECTS

A review of existing and future projects (as per current applications) in the vicinity of the development was carried out. Carrowleagh Wind Farm, Co. Mayo (southeast of the proposed development) is operational. Black Lough, Bunnyconnellan, Dunneill, Lackan and Kingsmountain wind farms are all operational have been considered in the assessment of potential cumulative impacts as they are located in the vicinity of the Ox Mountains Bogs SAC. The planning permission for the permitted Kilbride Wind Farm, a 21-turbine project located 1km to the south of the Stokane turbine in County Mayo, has lapsed. As such, there are no cumulative impacts to be assessed.

The height of the turbines and their potential impact on flight heights which birds habitually use along either migration or local flight paths is an influencing factor in determining whether the proposed development will combine with these nearby wind farms to produce negative effects (barrier effect; increased collision risk and disturbance to birds utilising foraging grounds whilst on migration). The proposed wind turbine would be in addition to seventeen turbines that are already operational at the adjacent Carrowleagh site and the two wind turbines operational at the southern part of the Black Lough Wind Farm. Therefore, the cumulative effect of the additional turbine would be negligible. This is supported by data collated during the bird monitoring surveys associated with the adjacent Carrowleagh Wind Farm where imperceptible impacts on birds have been noted following five years of survey. Overall, given the insignificant level of impact identified with this development, it is concluded that in-combination barrier effects, mortality and disturbance to foraging grounds are negligible and no cumulative impacts are foreseen in this case.

The proposed turbine is in the Leaffony sub-catchment, and a section of the access road and cabling connection are in the sub-catchment of the Gowlan River – Weeloge Stream. Turbine T06 of the Black Lough Wind Farm is in the catchment of the Leaffony River. Turbine T05 of the Black Lough Wind Farm and eight turbines of the Carrowleagh Wind Farm are in the catchment of the Weeloge Stream. An OHL connection between the four northern turbines of Black Lough WF and the control building went through the Ox Mountains Bog SAC and was subject to an EIA and NIS. The EIAs for theses wind farms, and wind farm extensions and OHL connection were reviewed, and in relation to increased runoff it was determined that it would not be significant. Based on this, the in-combination of the proposed development and the nearby developments will not be significant. Their associated EIARs (EISs), Screening for AA reports and NIS have stated that no negative impacts on the Ox Mountains bogs SAC have been foreseen.

4. CONCLUSION

The potential impacts during the construction, operation and decommissioning of the turbine have been considered in the context of the Natura 2000 sites and their conservation objectives. Potential adverse impacts on the Ox Mountains Bogs SAC were identified during screening by Sligo Planning Authority who requested a Stage two Appropriate Assessment be carried out. As a result of the ecological impact assessment carried out, it is considered that, once the mitigations measures and recommendations have been implemented, the conservation objectives for these Natura 2000 sites would not be compromised by the proposed development, nor would the proposed activities have any significant impact on the habitats and species for which it has been designated.

In the context of such an assessment it is the considered view of the author of this NIS that with the mitigations measures set out in this report, there would be no significant adverse effects on the integrity of any Natura 2000 sites as a result of the construction, operation or decommissioning of the turbine or as a result of combination or cumulative effects.

5. REFERENCES

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