

17 SCHEDULE OF ENVIRONMENTAL MITIGATION

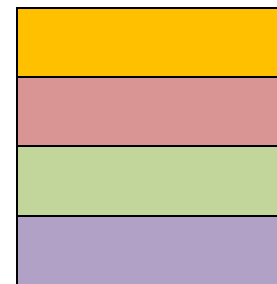
17.1 INTRODUCTION

This Schedule of Environmental Mitigation summarises and sets out an implementation programme for all environmental mitigation measures recommended in the Environmental Impact Assessment Report (EIAR) and Natura Impact Statement (NIS) for the proposed Drumnahough Wind Farm development.

17.2 FORMAT OF THE MITIGATION SCHEDULE

The schedule on the following pages is structured in accordance with the following project phases:

- **Prior to Commencement of Construction**
- **During Construction Phase**
- **Post Construction/ Operational Phase**
- **Decommissioning**



The schedule is presented in a Table format which outlines, for each of the project phases:

- i. the environmental aspect or resource for which mitigation is required,
- ii. the required or proposed mitigation measure to undertake/implemented,
- iii. the persons responsible for implementing the recommended mitigation
- iv. the relevant actions, procedures and plans relating to implementation of the mitigation

Table 17-1: Schedule of Environmental Mitigation Measures

TIME FRAME / SCHEDULE	ENVIRONMENTAL MITIGATION / RECOMMENDATION		PERSON(S) RESPONSIBLE	RELEVANT CHAPTER /ACTION REQUIRED
PLANNING STAGE/PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Construction Traffic Management Plan (CTMP)	A preliminary Construction Traffic Management Plan (CTMP) has been prepared for the project and will be implemented during construction to manage traffic to and from the site. It includes details of the road network to be used by construction traffic, including over-sized loads, and detailed arrangements for the protection of bridges or other structures to be traversed, as may be required. The timing of turbine delivery along the proposed haulage route will be agreed with Donegal County Council and An Garda Síochána to ensure that the impact on the public is minimised.	Developer	Appendix H-2 CTMP To be communicated to Principal Contractor and incorporated into final CTMP.
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Construction Traffic Management Plan (CTMP)	A final CTMP will be prepared by the Principal Contractor. It will take account of the measures specified in the preliminary CTMP submitted with the planning application, and any measures agreed with the relevant authorities.	Principal Contractor	Develop final CTMP and submit to planning authority for comment.
PLANNING STAGE/PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Construction Environmental Management Plan (CEMP)	A Construction Environmental Management Plan (CEMP) has been prepared for the project and will be implemented during construction in order to ensure that the project is constructed in accordance with best practice, with the minimum impact on the surrounding environment. The implementation of proposed mitigation measures, environmental commitments of the project and the monitoring and supervision of these measures will be managed through the CEMP. It includes, but is not limited to, measures to control/manage various elements of the development including the following: <ul style="list-style-type: none"> • Noise and Dust Emissions; • Protection of Water Quality/Sediment and Erosion Control; • Fuel and Oils Management; • Management of Concrete; • Ecological Management (Protection of Habitats and Fauna); • Invasive Species Management; • Management of Archaeology; • Waste Management; • Emergency Response; • Site Environmental Training and Awareness; • Monitoring and Auditing; • Managing Environmental Incidents and Complaints. 	Developer	Chapter 2 Description of Proposed Project Appendix B-2 CEMP To be communicated to Principal Contractor and incorporated into final CEMP.
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Construction & Environmental Management Plan (CEMP)	A final Construction and Environmental Management Plan will be prepared by the appointed Contractor in advance of works commencing and will be submitted to the local authority(s) for approval. Construction method statements will be prepared prior to commencement of construction and incorporated into the CEMP.	Principal Contractor and Responsible personnel identified in the CEMP	Develop final CEMP and submit to planning authority for comment.

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PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Best Practice	<p><u>Environmental Manager</u> An Environmental Manager with appropriate experience and expertise will be employed for the duration of the construction phase to ensure that all the environmental mitigation measures are implemented. This manager will be awarded a level of authority and will be allowed to stop construction activity if there is potential for adverse environmental effects other than those predicted in the Environmental Impact Assessment Report (EIAR).</p> <p><u>Ecological Clerk of Works (ECoW)</u> A suitably qualified and experienced Ecologist will be employed during the construction phase of the project to fulfil the role of ECoW. Duties will include, but are not limited to, the following:</p> <ul style="list-style-type: none"> • Delivery of Tool Box Talks, informing on-site personnel of the ornithological and ecological sensitivities within the proposed development site; • Revision of all Method Statements; • Liaising with Project Ornithologist to discuss any arising issues; • Provision of guidance to contractors to ensure site is compliant with legislation; • Liaising with National Parks and Wildlife Service (NPWS), Local Authorities, other consenting authorities and other relevant bodies with regular updates in relation to construction progress; and • Monitoring of construction phase to ensure all environmental controls and EIAR mitigation are implemented in full. <p>The ECoW will be awarded a level of authority to stop construction activity.</p>	Developer and/or Principal Contractor	Chapters 5 to 16 Appendix B-2 CEMP Appoint Project Team Personnel
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Ornithology – Tree Felling	Pre-construction tree-felling and any vegetation clearance, including the cut back and clearance of hedgerows and scrub, should take place outside the breeding season (1 st March to 31 st August). If felling is required outside of these times, permission should be obtained from NPWS and species checks/surveys carried out before any felling begins.	Principal Contractor	Chapter 7 Ornithology
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Protection of Water Quality – Best Practice	<p>All works in proximity to watercourses shall follow the generic best practice guidance outlined in the following documents:</p> <ul style="list-style-type: none"> • Forestry and Water Quality Guidelines (DMNR, 2000); • Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters (IFI, 2016); and • Guidelines for the crossing of Watercourses during Construction of National Road Schemes (NRA, 2008). <p>Baseline water quality monitoring will be undertaken prior to commencement of works. This will be carried out at selected sites on watercourses draining the proposed development (potentially using some aquatic survey sites as per Appendix D-2, pending grid connection option).</p>	Principal Contractor	Chapter 6 Biodiversity Chapter 10 Water Appendix B-2 CEMP

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<p>PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS</p>	<p>Protection of Water Quality – Drainage & Tree Felling</p>	<ul style="list-style-type: none"> • Prior to any construction activity being carried out, the site will be inspected for areas that would be prone to siltation of nearby rivers/streams. Where necessary, existing pollution prevention measures (check dams and silt ponds) will be maintained/upgraded to ensure optimum standard of water running into streams from the drainage adjacent to access tracks; • Drainage features such as permanent check dams and overland runoff discharge combined with temporary construction phase silt fences and settlement ponds will be installed where new development components are proposed (e.g. access tracks, trenching, hardstands, sub-stations and borrow pits); • Prior to construction, interception ditches will be installed upslope of the proposed works area to intercept any existing overland flows (clean water) and convey them downslope in order to limit the extent of surface water coming into contact with the works and prevent mixing of the clean and dirty water. The clean water conveyed will be discharged via a level spreader downslope of the works over existing vegetation; • To prevent erosion of the ground surface and to attenuate the flow rate to the downstream receiving waters, each clean water drain will be terminated in a discharge channel running parallel to the ground contours that will function as a weir to disperse the flow over a wider area of vegetation. An alternative method is to allow the water to discharge through perforated pipes running parallel to the ground contours. In order to provide for the efficient removal of suspended solids from site run-off during construction, a dedicated three-stage tiered-system of settlement ponds will be put in place prior to the construction of access tracks and the excavation for turbines; • Prior to construction, the drainage system will be monitored by a competent person of the construction team on a regular basis to check if it is working appropriately; • Prior to felling of trees and the stripping of peat overburden over the area of the proposed borrow pits, an interceptor drain will first be excavated upslope in order to intercept existing overland flows and divert them around the borrow pits prior to discharge via a buffer zone on the downslope side; and • Brash from pre-construction tree-felling will be removed from the riparian buffer zones to 30m either side of the watercourse to mitigate against nutrient losses, particularly phosphorous. This will provide clear access for the preparation of drainage works at this stage, which will facilitate access track and turbine construction later. Trees will be felled away from aquatic zones where possible. 	<p>Principal Contractor</p>	<p>Chapter 6 Biodiversity Chapter 3 Civil Engineering Chapter 10 Water Appendix B-2 CEMP</p>

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PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	<p>Biodiversity – Reptiles and Amphibians</p> <p>Reptile and amphibian surveys should be carried out by an ecologist in advance of construction works. These surveys will focus on breeding areas potentially used by amphibians and resting places of lizards. Methodology for frog surveys should follow Reid <i>et al.</i> (2013). Lizard surveys should be undertaken using standard guidance.¹</p>	Developer Ecologist	Chapter 6 Biodiversity Appendix B-2 CEMP
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	<p>Biodiversity – Otter</p> <p>Surveys undertaken in 2019 recorded no otter (<i>Lutra lutra</i>) holts. The targeted surveys focused on the proposed stream crossings within site, and at stream crossings along the proposed grid route options.</p> <p>Should a newly established holt be identified within the works area before the commencement of construction, additional surveys/enabling works will be undertaken only under the appropriate NPWS licence.</p>	Developer Ecologist	Chapter 6 Biodiversity Appendix B-2 CEMP
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	<p>Ornithology – Merlin</p> <p>A Project Ornithologist with appropriate expertise and recognised long-term ornithological experience will conduct pre-construction and construction phase bird surveys at the site.</p> <p>A pre-construction breeding verification survey designed by the Project Ornithologist will be conducted from late February at the proposed wind farm development location and within adjacent areas to assess any evidence of merlin activity or taking up territories. Should merlin be present within 350m of proposed works, construction works within this zone will be restricted to non-breeding months (i.e. October - February inclusive).</p> <p>If breeding activity is identified, the nest site location will be determined as accurately as possible and no construction works shall be undertaken within a 350m buffer. If the nest location shifts closer to proposed infrastructure, no construction works shall be permitted until it can be demonstrated that that merlin are no longer reliant on the nest site. Vehicular movement along roads within the 350m buffer will be permitted once they have been constructed/widened with agreement from NPWS.</p>	Developer Ecologist Project Ornithologist	Chapter 7 Ornithology Appendix B-2 CEMP
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	<p>Biodiversity – Invasive Species</p> <p>No invasive alien species were recorded within the site during baseline surveys. A pre-construction survey will also be carried out, and should invasive species be recorded at works locations on the transport route, along the grid connection route or within the development footprint, an Invasive Species Management Plan will be prepared prior to construction works commencing.</p>	Developer Ecologist	Chapter 6 Biodiversity Appendix B-2 CEMP

¹ <https://www.froglife.org/wp-content/uploads/2013/06/Reptile-survey-booklet-3mm-bleed.pdf>

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PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Residential Amenity/ Landscape & Visual Impact	Turbines are to be a white, off-white or grey colour to correspond with the colour scheme of existing turbines, and will have a matt, non-reflective finish in line with the 2006 Department of Environment, Heritage and Local Government Wind Farm Development Guidelines	Developer	Chapter 2 Description of Proposed Project Chapter 12 Landscape and Visual
PRIOR TO COMMENCEMENT OF CONSTRUCTION WORKS	Archaeology/ Cultural Heritage	<ul style="list-style-type: none"> • Licensed archaeological test excavations should be undertaken in advance of construction at targeted areas of all primary ground impacts associated with the proposed development including: (a) turbine pad foundations; (b) potential borrow pits; (c) substation; (d) proposed internal trackways across greenfield areas and their associated drains and turning areas; (e) greenfield subsurface cable trenching. Based on the results of these tests, further mitigation measures such as the archaeological monitoring of construction works may be required; • Potential directional drilling, geo-technical test-pits and other pre-construction groundworks will also be archaeologically monitored; and • The three upland Malt Settlement Sites will be: (1) archaeologically recorded and surveyed including plans and elevations; (2) a 20m buffer zone (post & wire fence) will be physically established around them under supervision by the project archaeologist in advance of construction to avoid any accidental damage during construction; (3) a report on the results will be submitted to the planning department of Donegal County Council and the National Monuments Service on completion. <p><u>Proposed Forestry Re-planting Sites</u></p> <ul style="list-style-type: none"> • All four proposed re-planting sites in Counties Clare, Galway, Limerick and Cork were examined on a suite of available online aerial imagery including Google Earth, BING and also via the SMR (www.archaeology.ie) and OSI (www.osi.ie). There were no recorded monuments, or recorded artefacts within any of the five proposed forestry Re-planting sites. • The Zone of Notification (60m) of the recorded Enclosure LI047-031 at Ballincolly, Co. Limerick will be physically established on the ground (post & wire fence) under supervision by the project archaeologist in advance of the proposed re-planting works; • In a wider cultural context, the relict remains of the vernacular settlements at Craghera, Co. Clare will be (1) archaeologically surveyed, including plans and elevations; (2) mitigation by avoidance viz a 20m zone of planting exclusion (post & wire fence) will be established around the relict structure and lime kiln sites in advance of re-planting works under archaeological supervision. If this planting exclusion zone is physically established around the two 19th century structures, there will be no impact by the proposed Re-planting works. 	Developer; Project Archaeologist Principal Contractor	Chapter 13 Cultural Heritage Commission qualified archaeologist to undertake test excavations/surveys and monitoring.

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		<p><u>Turbine Delivery Route</u></p> <ul style="list-style-type: none"> • The following mitigation will be undertaken on Turbine Delivery Route at Nodes 16 and 17: <ul style="list-style-type: none"> – No road widening works should be undertaken to the southern (Portal Tomb) side of the road. – An effective temporary high visibility fence should be put in place around the roadside area of Portal Tomb to offset any accidental impacts by the proposed turbine components delivery vehicles. – Widening of the northern side of the road, if required, should be archaeologically tested in advance under licence issued by the National Monuments Service. • Archaeological monitoring of construction works in proximity to Nodes 14, 15 & 21 will be undertaken to ensure impacts by the road widening works do not occur on the lime kilns denoted on the 1st and 2nd Editions of the historic OSi maps in the Cloghroe area. 		
<p>PRIOR TO COMMENCEMENT OF CONSTRUCTION WORK</p>	<p>Residential Amenity /Material Assets</p>	<p>Appropriate mitigation measures can be implemented such that there will either be an imperceptible effect, or no effect, on surrounding reception as a result of the proposed development, with the solution to interference with TV reception or communication links dependent on where the residence receives signal from.</p> <p>As standard practice, a signed Protocol between the developer and Raidió Teilifís Éireann (RTÉ) will be put in place, in which the developer will be responsible to resolve any issue of interference with television reception as a result of the proposed development.</p>	<p>Developer</p>	<p>Chapter 15 Material Assets</p>

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DURING CONSTRUCTION	Land Use	The area of land required to construct, operate, maintain and ultimately decommission the wind farm has been kept to the minimum reasonably practicable area. Existing access roads have been utilised in the design as much as possible such that the existing land use does not change in these areas of the site during the operational life of the wind farm. This approach minimises the area temporarily sterilised from its current land use. The lands across the Drumnahough site can be reinstated at the end of operational life of the wind farm such that it can be used again for agricultural or commercial forestry purposes.	Developer and/or Principal Contractor	Chapter 9 Land and Soil
DURING CONSTRUCTION	Management of Excavations	<ul style="list-style-type: none"> • Where possible, existing forestry tracks will be used to access turbine locations, reducing the volume of material excavated and volumes of crushed rock imported for road construction. If necessary, floated roads will be utilised minimising volumes of any peat excavation; • Peat excavated from turbine bases, hardstanding, roads, cable routes, grid connection and substation etc., during construction will be reused for localised landscaping and reprofiling with excess peat deposited in the material storage areas and peat deposition areas. Excavation will be carried out from access roads or hardstanding areas to reduce the compaction of peat; • Peat excavation and construction of the new access roads will be carried out by first excavating the peat, then placement of a separation layer (e.g. Terram), followed by replacement with compacted crushed rock. Machinery will not operate directly on excavated/stockpiled peat; • Drainage will be constructed in parallel with road construction and turbine excavation. Drainage (including drains, stilling ponds etc) will be constructed using bog mats or “bogmaster” excavators when working in deeper peat areas. This approach will be used in combination with the installation of other drainage protection measures in advance of construction e.g. silt fencing; • Excavations for turbine foundations, hardstands and the roadway from T8 to T9 will be the largest scale excavations at Drumnahough. These excavations will be completed to a location specific temporary works design completed by a suitably qualified and experienced temporary works designer. This is likely to involve creating safe side slope angles, installation of drainage around and within the excavation and installation of sediment control measures within the drainage system; • Within and around excavations, pore-water pressure will be kept low by avoiding loading the peat with spoil or machinery, and by giving careful attention to the existing drainage and how structures could affect it. Removal of peat to approved material storage areas and peat deposition areas will avoid the need for storage adjacent to excavations. A Peat and Spoil Management Plan for the development is discussed in 	Principal Contractor	Chapter 9 Land and Soil Chapter 10 Water Chapter 6 Biodiversity Appendix B-2 CEMP

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		<p>Section 3.15.1 of Chapter 3 Civil Engineering;</p> <ul style="list-style-type: none"> • All temporary cuts/excavations will be carried out such that they are stable or adequately supported. Where appropriate and necessary, cuts and excavations will be protected against ingress of water or erosion by the use of cut off drains around the excavation works. Temporary works will be such that they do not adversely interfere with existing drainage channels/regimes; • Plant and materials will be stored in approved locations only (such as the proposed site compound) in line with the CEMP, and will not be positioned or trafficked in a manner that would surcharge existing or newly-formed slopes; • Excavated peat from the cable route will be used to landscape and reinstate the area around the cable trench following backfilling of the trench with approved materials. The angle of the peat reinstated at the top of the infilled trenches will not exceed 5°; • The removal of soil, subsoil and bedrock is an unavoidable impact of the construction of the cable trenches but every effort will be made to ensure that the amount of earth materials excavated is kept to a minimum in order to limit the impact on the land and soils aspects of the site. Some of the overburden material will be used in the reinstatement of turbine excavations and cable trenches. All other material will be removed to designated storage areas. Temporary storage of material beside the trenches should be done in line with the CEMP; • To mitigate against soil/land erosion, vehicular movements will be restricted to the footprint of the permitted development, particularly with respect to the newly constructed access roads. This implies that machinery must be kept on roads and aside from advancing excavations do not move onto areas that are not permitted for the development; • Earth movement activities will be suspended during periods of prolonged rainfall events to avoid or minimise negative effects to water quality; and • Site management should include the checking of equipment, materials storage and transfer areas, drainage structures and their attenuation ability on a regular basis during the construction phase of the project. The purpose of this management control is to ensure that the measures in place are operating effectively, prevent accidental leakages, and identify potential breaches in the protective retention and attenuation network during earthworks operations. 		

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DURING CONSTRUCTION	Management of Ground/Slope/Peat Stability	<ul style="list-style-type: none"> In order to address any concerns with peat stability, a detailed assessment of peat stability has been undertaken on this site. The Peat Stability Risk Assessment Report is included in Appendix E-1 in Volume 3 of the EIAR and identifies areas of higher risk of instability within the site. This information informed the design layout of the wind farm ensuring that the risk of instability is low for the proposed infrastructure. Any construction within the peat depths and topography encountered at the proposed infrastructure locations within this site does not present an unusual level of risk for a peat environment. All site excavations and construction should be supervised by a suitably experienced engineer. The Contractor's method statements for each element of work will be reviewed and approved by the engineer prior to site operations. Specific method statements will be developed for each turbine and hardstanding location within the site; Particular emphasis shall be placed in the Contract that only operators of proven experience in working in peatlands are employed for any work element involving excavation, handling or placement of peat; Prior to excavation, drains should be established to effectively intercept overland flow prior to earthworks and the existing network of drainage within the site should be utilised whenever possible; Peat excavated from the site will not be stockpiled at the work areas. If peat is required for reinstatement, then acrotelm peat (<0.5m shallow, living layer) shall be stripped off the surface of the excavated area and placed carefully at the margins of the work area along the access road and hardstand margins that are characterised by near-horizontal slopes (<3°); From previous landslide evidence (Pollatomish Landslide Co. Mayo (2003) and Derrybrien Landslide Co. Galway (2003)) and historic occurrences, it is strongly recommended that construction activities be assessed for impact after prolonged periods of heavy rainfall as the majority of peat slides occur after an intense period of rainfall Peat monitoring using a sightline monitoring method shall be carried out by the appointed contractor for this development. Monitoring will be carried out at areas of deep excavations (eg. turbine bases), material deposition areas and any area of works with a risk rating higher than "low". The Construction Manager for the project should impart the philosophy that everyone on site is aware of peat stability and report any sign of misalignment in monitoring posts.; and It is recommended that an emergency response system be developed for the construction phase, particularly during the early excavation phase. This, as a minimum, 	Principal Contractor	Chapter 9 Land & Soils Chapter 10 Water Appendix B-2 CEMP Appendix E-1 Peat Stability Risk Assessment Report

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		<p>should involve 24-hour advance meteorological forecasting (Met Éireann download) linked to a trigger-response system. When a pre-determined rainfall trigger level is exceeded (e.g. 1 in 100 year storm event or very heavy rainfall at >25mm/hr), planned responses are undertaken. These responses should include cessation of construction until the storm event, including storm runoff, has passed over. This requirement is also included in the CEMP.</p>		
DURING CONSTRUCTION	Management of Rock Blasting	<ul style="list-style-type: none"> To further mitigate against possible peat instability, blasting will not occur after periods of heavy rainfall. In particular, no blasting will take place for at least 24 hours following a period of rainfall which exceeds 25mm within the previous 24 hours; Rock blasting will only take place within borrow pits if extraction using rippers or hydraulic breakers is deemed impractical. If rock blasting proves to be necessary, a detailed blasting design will be undertaken by a suitably qualified and experience specialist for each borrow pit to ensure that a peak particle velocity (PPV) of 10 mm/s is not exceeded at a distance of greater than 20m from the blast holes as per BS 7385 Part 2: 1993. If this cannot be achieved, blasting will not be permitted at this location; To mitigate against the risk of slope failure occurring, blasting will not be permitted at turbine locations unless robust mitigation measures are put in place. Blasting for the road cuttings and hardstands will be subject to the same rigorous assessment as that proposed at borrow pit and turbine foundation locations; To mitigate against the risk of excessive dust within the vicinity of the borrow pits, the blast areas will be lightly sprayed with water prior to blasting; and A rock blasting plan will be prepared as part of the CEMP, and SSE Renewables and Coillte CGA will comply with their statutory duties in relation to blasting. Donegal County Council will be notified in advance of any blasting activities on the site and the NPWS will be consulted as part of the general consultation. 	Principal Contractor	Chapter 9 Land & Soils Chapter 11 Noise Appendix B-2 CEMP
DURING CONSTRUCTION	Storage and Management of Excavated Material	<ul style="list-style-type: none"> The design of the access road and the location of the turbines will reduce overall peat extraction. Excavated material will be retained within the footprint of the excavation areas and reused for the backfilling, landscaping and restoration around wind farm infrastructure such as turbines and hardstands. No soils should be removed from the site; Reusable excavated sub-soils and aggregate will be stored in temporary stockpiles at suitably sheltered material storage areas to prevent erosion or weathering, and shall be shaped to ensure rainfall does not degrade the stored material; Excavated peat will be stored separately as turves and will be managed in a manner that will not cause a risk of peat movement or sedimentation from runoff; Peat will be deposited only within the buildable areas around the turbines to a maximum height of 1m. The felled areas around the turbines have been identified as a 	Principal Contractor	Chapter 9 Land and Soils Chapter 3 Civil Engineering Chapter 6 Biodiversity Chapter 2 Development Description Appendix B-2 CEMP

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	<p>potential additional area that will be used to store peat, however, priority will be given to restoration of the borrow pits. The proposed locations for the peat and spoil storage are shown on Planning Drawing 19715-MWP-00-00-DR-C-5005;</p> <ul style="list-style-type: none"> • Berms will be formed along sections of floated access roads in order to store an additional volume of excavated peat. These berms will also act as a physical edge protection measure to prevent vehicles falling off the raised floated road edge. This form of storage will be provided on both sides of the internal floated roads where the overall dimensions of the berms will be 1m high by 2.5m wide; • The remainder of the surplus excavated peat and spoil material will be stored within the 4 No. material storage areas at the proposed on-site borrow pits or in the key-hole felled areas; • Peat is characterised by two distinct layers, the lower catotelm layer of highly humified peat and the upper acrotelm layer of fibrous peat which contains the live seed bank. The acrotelm layer should be regarded as an ecological resource that can be used for habitat restoration rather than simply as surplus excavated material; • As peat is excavated the acrotelm layer will be stripped first and set aside temporarily for re-use. As the peat deposition areas are filled they will be covered over with the acrotelm layer. This includes the outer faces of the containing berm(s). The peat deposition areas need to be completed and restored in a continuous cycle so as to minimise the length of time the acrotelm is stored and to allow the vegetation to be re-established as quickly as possible. • It is important that the acrotelm is handled carefully and is not allowed to dry out while being stored. Regular watering may be necessary during periods of dry weather. This will be carried out by the appointed Contractor in accordance with best practice. The catotelm typically does not retain structure after excavation and should be stored in peat ponds to remain wet. • There is likely to be an excess of catotelmic peat. It is important not to spread this excess peat on top of existing vegetation or the reinstated turves, as this would result in the drying out of the excess peat (with a loss of peat mass) and accompanying destruction of vegetation, meaning that the extent of the impact of the construction on vegetation would become larger than necessary. • Re-vegetation of material storage areas and peat deposition areas will promote stability, and reduce desiccation, run-off erosion and susceptibility to freeze/thaw action; • Where natural re-vegetation is unsuccessful or slow to regenerate, the planting of native plant species will be carried out. The project ecologist will advise on the appropriate species and planting requirements necessary to mimic the semi-natural 		

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		<p>habitats in the area. The use of pre-seeded matting will also be considered if required;</p> <ul style="list-style-type: none"> • Where suitable, acrotelm peat will be used for reinstatement around turbines and felled areas. Material unsuitable for reuse will be removed to the borrow pit for permanent storage; • Drainage and siltation control measures will be put in place in all peat storage areas. This will include a dedicated drainage network, temporary silt fences and settlement ponds designed to cater for the size of each storage area. Further details of the drainage philosophy that will be applied, as well as siltation control systems and attenuations systems, is given in Section 3.16 of Chapter 3 Civil Engineering and below in Protection of Water Quality – Drainage; and • Stockpiled materials will be located 50m away from drainage systems, and silt-retaining measures (silt fence/silt curtain or other suitable materials) to reduce risk of silt run-off will be installed along the downgradient edges of stockpiled earth materials. 		
DURING CONSTRUCTION	Protection of Water Quality – Tree Felling / Heavy Rainfall	<ul style="list-style-type: none"> • Mitigation measures for tree felling will be implemented in accordance with the Forestry and Water Quality Guidelines (DMNR, 2000). It is anticipated that these measures will prevent run-off erosion from forest operations sites and consequent sediment release into the nearby watercourses; • Tree felling will take place in advance of the excavation for site access tracks and hard-standing areas. The corridor for tree felling on access tracks will be approximately 30m wide; • Brash from the tree felling will be removed from the riparian buffer zones to 30m either side of watercourses to mitigate against nutrient losses, particularly phosphorus and to provide clear access for the preparation of preliminary drainage works and the later access track and turbine construction. Trees will be felled away from aquatic zones where possible; • Brash mats will be used as necessary on any off-road harvesting routes and replenished if they become worn. Branches, logs or debris will not be allowed to accumulate in aquatic zones and will be removed as soon as possible, especially for those watercourses crossed by proposed cables which are adjacent to forestry; • Natural re-growth of vegetation is anticipated on felled areas, subsequent to construction. This will assist in controlling sediment and phosphorous release. If natural re-growth is found to have been unsuccessful, seeding with an appropriate mix will be undertaken. If required, the mix will be from an approved supplier, or locally harvested. If re-growth does not occur due to poor ground conditions the use of pre-seeded coir or jute matting or similar should be used for additional control; • During periods of heavy precipitation and run-off, works will be halted if they are a risk to water environment, or working surfaces/pads will be provided to minimise soil 	Principal Contractor	Chapter 10 Water Chapter 6 Biodiversity Chapter 9 Land and Soils Appendix B-2 CEMP

TIME FRAME / SCHEDULE	ENVIRONMENTAL MITIGATION / RECOMMENDATION		PERSON(S) RESPONSIBLE	RELEVANT CHAPTER /ACTION REQUIRED
		<p>disturbance. Any requirement for temporary fills or stockpiles will be covered with polyethylene sheeting of suitable grade/gauge to avoid sediment release during periods of heavy rainfall.</p>		
DURING CONSTRUCTION	Protection of Water Quality - Drainage	<ul style="list-style-type: none"> • A robust permanent and temporary drainage system will be put in place including maintenance and enhancement of existing drainage, as well as new systems, to minimise sediment release during construction; • The drainage system alongside existing forest access tracks will be maintained, and improved where required, which will entail for example the clearance of roadside drains of obstructions and overgrown vegetation, where such vegetation could cause a flooding risk; • Along new access tracks, permanent interceptor drains and temporary silt traps will be put in place simultaneously with the construction of site access tracks and turbine base construction, such that excavation works and any constructed hard surface or mineral/peat soils storage areas will have a functioning drainage system in place in advance of the main construction activity. This drainage system will isolate runoff from internal roadways, hardstands and other wind farm infrastructure from the clean catchment runoff by means of a series of open drains; • As the excavation for the site access tracks and hard-standing areas proceeds, 450mm cross-drains will be fitted to the connections provided at the harvesting stage to facilitate the continuity of the routing of overland flow through the existing forest drains. Drains adjacent to access tracks and trenches will be excavated as outlined by Ryan <i>et al.</i> in the Forest Road Manual (2004). The increase in the rate of run-off along the route of the site access tracks and hard-standing areas will be mitigated by the proposed drainage system through the use of permanent check dams within the drains; • Disturbance to the peat layer adjacent to these existing forest tracks will be minimised and thus there will be a low potential for an increase in suspended solids in the surface water run-off. During keyhole tree felling, in order to ensure the subsequent impact of sediment increase due to felling kept to a minimum, drains from keyhole felling areas to watercourses will be blocked. 	Principal Contractor	Chapter 9 Land and Soils Chapter 3 Civil Engineering Chapter 6 Biodiversity Appendix B-2 CEMP
DURING CONSTRUCTION	Protection of Water Quality – Sediment Control	<ul style="list-style-type: none"> • A surface water quality management system and plan, included in Chapter 3 Civil Engineering, has been prepared in order to control erosion and prevent sediment runoff during the construction phase of the proposed development. The implementation of sediment and erosion control measures is essential in preventing sediment pollution (See Planning Drawings 19715-MWP-00-00-DR-C-5403 and 5404); • Settlement ponds and check dams within the drainage and treatment system will provide the essential mechanism for the removal of silt from construction-related runoff, and the controlled return of the treated runoff to the downstream 	Principal Contractor	Chapter 9 Land and Soils Chapter 3 Civil Engineering Chapter 6 Biodiversity Appendix B-2 CEMP

TIME FRAME / SCHEDULE	ENVIRONMENTAL MITIGATION / RECOMMENDATION		PERSON(S) RESPONSIBLE	RELEVANT CHAPTER /ACTION REQUIRED
		<p>watercourses. This will ensure that the proposed development will not create adverse effects on the aquatic environment that could compromise the ability to meet Water Framework Directive objectives or to fulfil compliance with basic measures required including the Nitrates Directive, the Habitats and Birds Directives and the Drinking Water Directive;</p> <ul style="list-style-type: none"> • Check dams will be placed at regular intervals, based on gradient, along all drains to provide flow attenuation, slow down runoff to promote settlement and to reduce scour and ditch erosion. They will be placed at appropriate intervals and heights, depending on the drain gradient, to allow small pools to develop behind them; • Dewatering of turbine base excavations can result in significant flow rates to the drainage and settlement system if high capacity pumps are used. In order to avoid the need for pumping it is proposed to provide drainage channels from the excavations so as to prevent a build up of water. Where this is not feasible, temporary storage will be provided within the excavations, and dewatering carried out at a flow rate that is within the capacity of the settlement ponds; • Silt fences placed temporarily along drains are an alternative method of reducing the volume of suspended sediment. They will be placed at the end of any locally steep section of drain. They have the double benefit of effectively producing a localised swale to reduce scour effects and also attenuating and filtering the discharge; • A Construction Wheel Wash will be used for vehicles wheels and undersides entering and leaving the construction site. Water residue from the wheel wash will be fed through a settlement pond, interceptor and then discharged to a vegetated area of low ecological value to be decided by the ECoW. The wheel wash area will be cleaned regularly so as to avoid the buildup of residue. 		
DURING CONSTRUCTION	Protection of Water Quality – Settlement Ponds	<ul style="list-style-type: none"> • Drains carrying construction site runoff will be diverted into settlement ponds that reduce flow velocities, allowing silt to settle and reducing the sediment loading. A modular approach has been adopted for the design of the settlement ponds which have been sized to cater for a catchment area of 1,200m² works area. This is equivalent to a road length of 240m or the area of a typical turbine base and crane hardstand. The settlement ponds will be constructed throughout the site and located downhill from the works area; • As recommended in the Sustainable Drainage Systems (SuDS) manual (Woods Ballard <i>et al.</i>, 2015), the settlement ponds have been designed as a three-stage tiered system to facilitate effective cleaning with minimal contamination of water exiting the pond. The design of the drainage and settlement pond system for the site is detailed in the Planning Drawings 19715-MWP-00-00-DR-C-5403 and 5404; • The process consists of primary, secondary and tertiary treatment as follows: 	Principal Contractor	Chapter 9 Land and Soils Chapter 3 Civil Engineering Chapter 6 Biodiversity Appendix B-2 CEMP

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	<ul style="list-style-type: none"> – The <i>primary treatment</i> consists of a three-stage settlement pond with an over-topping weir at each stage. The first chamber will remove most of the sediment load, while the remaining two chambers will remove most of the remaining load. – Before the water is released onto the existing ground surface, it passes through a <i>secondary treatment</i> system in the form of a graded gravel filter bed which removes a further degree of siltation. – The outflow from each interceptor is dispersed across a wide area of vegetation so that the velocity is minimised and the vegetation can filter out the residual sediment. This is the final or <i>tertiary</i> stage of the treatment process. Existing rills and collector drains within the tertiary treatment area are blocked off where necessary to prevent concentration of the flow. • Settlement ponds will require inspection, and cleaning when necessary. This will be carried out by the appointed contractor under low or zero flow conditions so as not to contaminate the clean effluent from the pond. The water level will first be lowered to a minimum level by pumping without disturbing the settled sediment. The sediment will then be removed by mechanical excavator and disposed of in areas designated for deposition of spoil; and • Settlement ponds will require perimeter fencing and signage to ensure that there are no health and safety risks. 		
DURING CONSTRUCTION	<p>Protection of Water Quality - Concrete Control</p> <ul style="list-style-type: none"> • During the pouring of concrete, effective containment measures such as secured concrete forms will be implemented to avoid spilling concrete outside construction areas and to prevent concrete entering any drainage system; • To reduce the potential for cementitious material entering watercourses, concrete pours will be supervised by a suitably qualified Engineer and the Ecological Clerk of Works who will also ensure the pour area is completely drained of water before commencement of a pour. Pours will not take place during forecasted heavy rainfall; • Concrete trucks will be washed out off site at the source quarry. The chutes of the concrete trucks will need to be washed out onsite and this will be done at a concrete washout area on site at the contractor's compound in a dedicated, bunded area. Concrete will not enter the site drainage system; • Washout water to be left to evaporate, hardened concrete to be removed from site or used for backfill or disposed of in accordance with the Site Waste Management Plan. No disposal of concrete remnants would be permitted on site; • Minor works such as concreting-in signage posts or brick-laying substation walls that will involve the use of self loading concrete mixers will use 25kg dry bag cement for the concrete. The mixers will be washed out in the bunded concrete washout area in the contractor's yard area. 	Principal Contractor	Chapter 6 Biodiversity Chapter 10 Water Chapter 3 Civil Engineering Appendix B-2 CEMP

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DURING CONSTRUCTION	Protection of Water Quality – Temporary Construction Compound/Storage	<ul style="list-style-type: none"> • Drainage within the temporary site compound will be directed to an oil interceptor to prevent pollution should any spillages occur; • The storage of materials, containers, stockpiles and waste, however temporary, should follow best practice at all times and be stored at designated areas; • A bunded, impermeable and, if necessary, roofed containment area will be provided within the compounds for the storage of lubricants, oils and site generators etc. Storage of fuels/oil will be located 50m from watercourses; • Temporary storage of cement bound granular mixtures will always be, as per the chemical safety data sheet and the Control of Substances Hazardous to Health (COSHH) regulations, on hardstand areas in a COSHH store or similar (shipping container). The cement will only be in the open when in use; • To contain any solids run-off, cement products located in the open will be placed on hardstand or areas not prone to run off. These areas will be located where there is no direct drainage to surface waters and where the area has been appropriately bunded. This method will prevent any solids run-off; and • Excavated peat will be removed, along with minor quantities of mineral soils, to designated material storage areas. 	Principal Contractor	Chapter 10 Water Chapter 6 Biodiversity Chapter 3 Civil Engineering Appendix B-2 CEMP
DURING CONSTRUCTION	Protection of Water Quality – Fuel/Refuelling Management	<p>All plant will be refuelled on site e.g. excavators, dumpers etc. Rigid and articulated vehicles will be fuelled off site as will all site vehicles (jeeps, cars and vans). At construction stage, a Fuel Management Plan will be developed specific to the site and to the particular plant and equipment required for construction. The plan outlined will have regard to the following elements:</p> <p><u>Fuel Management</u></p> <p>At construction stage, a Fuel Management Plan (which will form part of CEMP) will be developed specific to the site and the particular plant and equipment required for construction. The plan outlined will have regard to the following elements:</p> <ul style="list-style-type: none"> • Mobile bowsers, tanks and drums will be stored in a secure, impermeable storage area, 50m away from drains and open water; • Fuel containers must be stored within a secondary containment system e.g. bund to 110% of volume for static tanks or a drip tray for mobile stores; • Ancillary equipment such as hoses and pipes must be contained within the bund; • Taps, nozzles or valves must be fitted with a lock system; • Fuel and oil stores, including tanks and drums, will be regularly inspected for leaks and signs of damage; • Only designated trained operators will be authorised to refuel plant on site; • Procedures and contingency plans will be set up to deal with any emergency accidents 	Principal Contractor	Chapter 6 Biodiversity Chapter 10 Water Appendix B-2 CEMP

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	<p>or spills; and</p> <ul style="list-style-type: none"> • An emergency spill kit with oil boom and absorbers will be kept on site in the event of an accidental spill. All site operatives shall be trained in its use; <p><u>Refuelling of Construction Plant Onsite</u></p> <p>The following measures will be undertaken to avoid or minimise negative effects to water quality as a result of the use of hydrocarbons:</p> <ul style="list-style-type: none"> • Refuelling will be carried out using 110% capacity double-bunded mobile bowzers. The refuelling bowser will be operated by trained personnel only. The bowser will have spill containment equipment which operators will be fully trained in using; • Plant nappies or absorbent mats to be placed under refuelling point during all refuelling to absorb drips; • Mobile bowzers, tanks and drums will be stored in secure, impermeable storage area, away from drains and open water; • To reduce the potential for oil leaks, only mechanically sound vehicles and machinery will be allowed onto the site. An up-to-date service record will be required from the main Contractor; • Should there be an oil leak/spill, it will be contained immediately using oil spill kits. The nearby dirty water drain outlet will be blocked with an oil absorbent boom until the fuel/oil spill has been cleaned up and all oil and any contaminated material removed from the area. The contaminated material will be properly disposed of in a licensed facility; • The site Environmental Representative will be immediately informed of the oil leak/spill and will assess the cause before managing a clean-up of the leak/spill. He/she will also inspect nearby drains for the presence of oil, initiating a clean-up if necessary; • Immediate action will be facilitated by easy access to oil spill kits. An oil spill kit, that includes absorbing pads and socks, will be kept at the site compound as well as in site vehicles and machinery; • All vehicle/machinery operators will be trained in the correct actions to carry out in the event of a leak/spill. Training will include information on the correct use of spill kits and the correct containment and cleaning up of oil spills/leaks. This training will be provided by the Environmental Manager at site induction; • In the event of a major oil spill, a company providing a rapid response emergency service for major fuel spills will be immediately called for assistance. Their contact details will be kept in the site office and in the spill kits stored in site vehicles and machinery; • Oils will be stored within a steel container in a designated area of the site compound 		

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	<p>set apart from vehicular movements in order to prevent collisions between the oil-stores and the machines; and</p> <ul style="list-style-type: none"> Long term storage of waste oils will not be permitted on site. These waste oils will be collected in leak-proof containers and removed from the site for disposal or re-cycling by an approved service provider. 		
DURING CONSTRUCTION	<p>Biodiversity Disturbance to Fauna (general measures) - to (general measures)</p> <ul style="list-style-type: none"> Spraying of vegetation using pesticides (herbicides, fungicides and insecticides) will not be permitted at any stage of development; The areas required to carry out the works associated with the proposed development site will be marked by secure posts and robust high-visibility tape. These areas should be marked out with reference to design drawings under supervision of the project engineer/manager and ECoW. This will ensure sensitive areas are avoided through micro-siting the extents of the working area. Machinery will not be permitted to breach these agreed boundaries during the work and construction vehicles will not encroach onto habitats beyond the proposed development footprint; Duration of construction activities will be restricted to between 07.00 and 19.00 Monday to Friday and between 07.00 and 14.00 on Saturdays. Due to the requirement for the concrete pours to be continuous, the working day may extend outside normal working hours. Similarly, turbine and crane erections may also occasionally occur outside of these times in order to take advantage of low wind periods. Working hours will be confirmed at the outset of the project and any changes in hours will be agreed with the Local Authority; To reduce the potential for disturbance to fauna, construction work will not take place at night unless in exceptional circumstances; In the unlikely event that protected faunal species are found actively using the site for breeding/roosting during the construction phase, works will cease immediately and the area will be cordoned off until advice is sought from the ECoW and/or a suitably qualified expert and/or the NPWS; Should the resting or breeding places of any protected species be discovered within the site during construction works, the ECoW will implement relevant mitigation (e.g. setting up an exclusion zone) and protection measures and then seek advice from NPWS; All mitigation will be carried out using 'Guidelines for the Treatment of otters/badgers prior to the Construction of National Road Schemes' (NRA, 2006) and 'Guidelines for the Treatment of Bats Prior to the Construction of National Road Schemes' (NRA, 2005) and under license from NPWS if required. 	Principal Contractor Appointed Ecological Clerk of Works	Chapter 6 Biodiversity Chapter 2 Description of Proposed Project Appendix B-2 CEMP
DURING CONSTRUCTION	<p>Biodiversity – Avian Disturbance (general)</p> <ul style="list-style-type: none"> Displacement and or disturbance impacts, and habitat degradation will be limited by controlling the movement of vehicles; vehicles will not encroach onto habitats beyond 	Principal Contractor	Chapter 7 Ornithology Appendix B-2 CEMP

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	measures)	<p>the proposed development footprint;</p> <ul style="list-style-type: none"> • The felling of forestry and any required clearance of vegetation, including the cut back, and clearance of hedgerows and scrub will take place outside the breeding season (March to August, inclusive) unless permission is obtained from NPWS; • Where possible, construction will take place outside the breeding season (March to August, inclusive) to minimise disturbance, and/or displacement to breeding birds but where works are necessary, there will be commitment to undertake relevant pre-work checks by the ECoW/ornithologist; • Plant machinery will be turned off when not in use, with no unnecessary revving. All plant and equipment will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations 1996 (SI 359/1996) and other relevant legislation. 	Appointed Ecological Clerk of Works	
DURING CONSTRUCTION	Ornithology - Monitoring	<ul style="list-style-type: none"> • The construction phase of the project will likely be spread across the summer and winter survey periods. Vantage Point surveys will be carried out as described in Section 7.2.2 of Chapter 7 prior to and during construction works. The primary focus of the surveys will be merlin but all species will be recorded in line with standard methodology. • In the event that a target bird species is found actively using the site for breeding and/or roosting in the proximity of works during the construction phase, works will cease immediately, and the area will be cordoned off until advice is sought from the Project Ornithologist/ECOW; • Should a merlin nest be detected within 350m of the permitted construction works or within the site boundary the following will be carried out: <ul style="list-style-type: none"> – The Project Ornithologist (or ECoW if suitably qualified) will immediately notify NPWS; – The location of the nest will be treated as an ecologically sensitive area and will be kept private and out of the public domain; – All high impact and heavy construction works will be suspended within 350m of the merlin nest site; and – The Project Ornithologist/ECOW will monitor the Ecological Sensitive Area and liaise with NPWS. 	Principal Contractor Project Ornithologist	Chapter 7 Ornithology Appendix B-2 CEMP
DURING CONSTRUCTION	Biodiversity – Water Quality Monitoring	<ul style="list-style-type: none"> • During the construction phase of the project, a drainage system monitoring schedule drawn up prior to construction will be followed; this requirement is outlined in Appendix B-2, Section 8 of the CEMP. The monitoring will consist of daily and weekly visual inspection of all elements of the drainage system including immediate maintenance if necessary; • Also during the construction phase, a surface water monitoring schedule, prepared pre-construction, will be followed and will include monthly monitoring of selected watercourses for various parameters as outlined in Appendix B-2, Section 10 of the 	Principal Contractor Appointed Ecological Clerk of Works Appointed Environmental Manager	Chapter 6 Biodiversity Chapter 9 Water Appendix B-2 CEMP

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		CEMP; and <ul style="list-style-type: none"> The currently proposed suite of physiochemical parameters for baseline and monthly analysis are pH, Conductivity, Nitrate, Sulphate, Phosphate, Biological Oxygen Demand (5 day), Total Petroleum Hydrocarbons (TPH) Chemical Oxygen Demand, Total Suspended Solids, Total Hardness, Potassium, Total Organic Carbon, Total Organic Nitrogen, Total Ammonia, Orthophosphate and Iron. These parameters should be reviewed and revised as deemed necessary. 		
DURING CONSTRUCTION	Biodiversity – Bats	Any necessary mitigation measures for bats will be in accordance with the following guidelines: <ul style="list-style-type: none"> Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes (TII, 2005a) Guidelines for the treatment of bats during the construction of National Road Schemes (TII, 2005b); and NPWS Irish Wildlife Manuals, No. 25: Bat Mitigation Guidelines for Ireland (Kelleher & Marnell, 2006). 	Principal Contractor Appointed Ecological Clerk of Works	Chapter 6 Biodiversity Appendix B-2 CEMP
DURING CONSTRUCTION	Biodiversity Management – of Invasive Species	<ul style="list-style-type: none"> To prevent the spread of invasive alien species, mitigation measures will follow the best practise guidelines detailed in <i>The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads</i> (NRA, 2010). Prior to being brought onto the site, it is necessary for all plant and equipment to be clean and free of soil/mud/debris or any organic matter. Prior to entering the site, all plant/equipment will be visually inspected to ensure all adherent material and debris has been removed. All footwear/waders and equipment that is to be used within a watercourse will be treated in order to prevent foreign flora/fauna entering the water. They will also be cleaned after use to prevent the potential spread of invasive species to other river catchments; and Non-native species control will be practised according to the following Inland Fisheries Ireland (IFI) documents, noting that some works components are located at/near watercourses: 'IFI Biosecurity Protocol for Field Survey Work' (Caffrey, 2010). 	Principal Contractor Appointed Ecological Clerk of Works	Chapter 6 Biodiversity Appendix B-2 CEMP
DURING CONSTRUCTION	Habitat Reinstatement	Habitat reinstatement will commence at construction stage. The success of reinstatement will be monitored into operational phase as part of construction “snagging period”, with measures incorporated into an operational monitoring program. This plan would be agreed with NPWS. Measures should be monitored for effectiveness to determine their success and, based on the results, alterations and/or further enhancements will be considered. If measures are successful, monitoring of habitats can cease, though periodic management (e.g. check		Chapter 3 Land and Soil Chapter 6 Biodiversity Appendix B-2 CEMP

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		<p>drains, removal of undesirable regenerating plants and invasive species) may be required.</p> <p>Mitigation in soil management, as outlined in Chapter 3 Land and Soil, will ensure topsoil will be retained for use during reinstatement. The following methodology shall be employed for the habitat reinstatement of cutover habitats along tracks and turbine hard stands:</p> <ul style="list-style-type: none"> • A layer of topsoil/peat will be spread evenly over the area. • These areas shall then be temporarily fenced off and allowed to regenerate naturally. • No fertiliser or herbicide shall be applied; • Potential scrub encroachment will be monitored and appropriate measures adopted if required to manage any potential encroachment; and • Where vegetation is slow to regenerate, native plant species will be planted. The project ecologist will advise on the appropriate species and planting requirements to best mimic the existing nature of the semi-natural habitats in the area. 		
DURING CONSTRUCTION	Traffic	<ul style="list-style-type: none"> • Reasonable efforts will be made to minimise the impact of the works on local residences and users of the public road networks. A Traffic Management Plan (TMP) outlining the required traffic management procedures to be implemented on the public roads during the construction has been prepared and is outlined in Appendix H-2. The Traffic Management Plan will be updated at the construction stage (or the update commenced during planning compliance stage) to ensure controls are in place with all suppliers coming to the project site; • The peak time for use of the public road network by local residents is between 07.00 and 08.30 when school- and commuter-related traffic is at its peak. Where possible, deliveries will be scheduled outside this time frame, and the appointed contractor will liaise with local stakeholders on the delivery schedule. • Construction activities associated with the proposed development will adapt working practices to ensure the safety and convenience of all road users during construction. This includes pedestrians, cyclists and other traffic; • To allow for the safe movement of site traffic during the construction of floated roads; a site traffic management plan will be prepared by the appointed contractor. Care will be taken when reversing vehicles on floating roads to ensure that they do not run along the edge of the road but stay within the delineated safe running zone. • Regular maintenance of plant and equipment should be carried out along with technical inspection of vehicles to ensure efficient performance. All site vehicles and machinery should be switched off when not in use - no idling; and • The majority of aggregate materials for the construction of the wind farm will be obtained from on-site borrow pits. This will reduce the number of delivery vehicles to 	Principal Contractor	Chapter 15 Material Assets Appendix H-2 CTMP Appendix B-2 CEMP

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		site, thereby reducing the amount of emissions associated with vehicle movements.		
DURING CONSTRUCTION	Road Construction	<p>The most effective method of reducing the volume of sediment created by construction is the immediate surfacing of all service roads with high quality, hard wearing crushed aggregate such as basalt, granite, schist limestone, laid to a transverse grade. When stormwater drains transversely cross a road constructed from hard wearing aggregate, as opposed to low class aggregate, the level of suspended solids is reduced significantly. This mitigation measure is fundamental to effective water quality management and will form part of the Construction Contract.</p> <p>In the case of road construction in areas of peat, imported limestone is normally used where the site won rock is not suitable. This can have the added benefit of contributing a balancing pH to help protect water quality from acidic runoff. The proposed development area can be serviced by several quarries which are within relatively short distance from the site. These can be used as a source of hard-wearing aggregate for road construction where necessary.</p>	Principal Contractor	Chapter 3 Civil Engineering
DURING CONSTRUCTION	Noise & Dust	<ul style="list-style-type: none"> • Best practice in the form of <i>BS5228 –1&2, Code of Practice for the Control of Noise and Vibration on Construction and Open Sites (2009, amended 2014)</i> will be adopted during the construction phase in order to minimise the noise generated by construction activities and nuisance to neighbours; • Should blasting be required, a site-specific Blast Management Plan will be developed for approval by Donegal County Council prior to any blasting taking place. This plan will detail mitigation measures to be undertaken to control vibration and air overpressure from blasting. Examples of such measures includes: <ul style="list-style-type: none"> – Public roads will be inspected regularly for cleanliness and cleaned as necessary. – All loads entering and leaving the site will be covered during dry periods if dust becomes a nuisance on site. – Control of vehicle speeds passing over access roads and crane hardstanding areas within the site. – The use of water as a dust suppressant, e.g. a water bowser to spray access tracks and crane hardstanding areas during any extended dry periods when fugitive dust emissions could potentially arise. • Most construction activities (excluding those unlikely to produce substantial noise levels or as otherwise agreed with Donegal County Council) will be restricted to the hours of 07.00 to 19.00 Monday to Friday, and 07.00 to 14.00 on Saturdays. 	Principal Contractor	Chapter 8 Air and Climate Chapter 11 Noise Chapter 9 Land and Soil Appendix B-2 CEMP
DURING CONSTRUCTION	Waste Management	<ul style="list-style-type: none"> • Waste will be managed in accordance with the waste hierarchy in Council Directive 98/2008/EC on waste and section 21A of the Waste Management Act 1996, as amended, as follows: (a)Prevention; (b)re-use; (c)Recycling; (d)Other recovery (including energy recovery); and (e) Disposal; 	Principal Contractor	Chapter 15 Material Assets Chapter 9 Land & Soil Appendix B-2 CEMP

TIME FRAME / SCHEDULE	ENVIRONMENTAL MITIGATION / RECOMMENDATION		PERSON(S) RESPONSIBLE	RELEVANT CHAPTER /ACTION REQUIRED
		<ul style="list-style-type: none"> All waste for offsite treatment/disposal is to be stored temporarily in appropriate dedicated storage areas. The areas in which wastes are stored on site are segregated to prevent material and contaminated surface water runoff entering local surface water drains; All chemical, hydrocarbon or other controlled wastes will be stored in designated areas in appropriate approved containers within bunds or on spill pallets, as required; and All waste to be removed from site will be undertaken by authorised waste contractors and transported to an authorised facility in accordance with best practice and the site waste management plan as discussed in the CEMP as included in Appendix B-2. 		
DURING CONSTRUCTION	Replacement Lands and Forestry	<p>All works will follow the management mitigation principles as outlined in the forestry and water quality guidelines (DMNR, 2000). These mitigation principles include the creation of buffer zones to the aquatic zones on the lands. Trees will not be planted within 5m of an aquatic zone. There will be no ground preparation within the buffer zone. Where trees are being planted to restore or create riparian woodland, pit planting must be used.</p> <p>Ground preparation is to be carried out when there is less of a risk of heavy rainfall. Existing drains will not be disturbed. Drains and sediment traps will be installed during ground preparation. Collector drains will be excavated at an acute angle to the contour (0.3%-3% gradient) to minimise flow velocities. Main drains to take discharge from collector drains will be provided with waterdrops and rock armour where there are steep gradients, and will avoid being placed at right angles to the contour. Drainage channels will taper out before entering the buffer zone to ensure that discharged water gently fans out over the buffer zone before entering the aquatic zone, with sediment filtered out from the flow by ground vegetation within the zone. On erodible soils, sediment traps will be installed at the end of the drainage channels to the outside of the buffer zone.</p> <p>Drains and sediment traps will be maintained throughout the rotation, ensuring that they are clear of sediment build-up and are not severely eroded. Correct drain alignment, spacing and depth will ensure that erosion and sediment build-up are controlled. Sediment traps will be sited outside the buffer zone and have no direct outflow into the aquatic zone. Their capacity can extend over the life of the plantation or have limited storage. In the latter case, machine access is required to enable the accumulated sediment to be excavated. Sediment will be carefully disposed of away from all aquatic zones. Sediment traps will be clearly marked and securely fenced for safety. Sediment traps will be constructed on even ground and not on sloping ground. In areas particularly sensitive to erosion, it may be necessary to install double or triple sediment traps.</p>		Chapter 10 Water Chapter 9 Land & Soil Chapter 2 Description of Proposed Project

TIME FRAME / SCHEDULE	ENVIRONMENTAL MITIGATION / RECOMMENDATION		PERSONS RESPONSIBLE	RELEVANT CHAPTER / ACTION REQUIRED
POST CONSTRUCTION / OPERATIONAL PHASE	Water Quality – Sediment Control	<p>The potential impact on the land and soils environment of the site due to excavations will be lower during operation and maintenance, as the majority of excavations will have been reinstated. Some erosion of soil may continue into the early stages of the operational phase as reinstated areas will initially have bare soil. However as vegetation becomes established and equilibrium is achieved, erosion rates will reduce to normal levels.</p> <p>Sediment control measures will remain in place onsite during the above period. Silt ponds constructed for water quality protection will remain in place and be maintained for six months post construction phase. Six months post construction, where necessary, ponds will be partly filled with stone so that they will not present a long-term safety risk. The remaining ponds will be left to fill in and re-vegetate naturally or will be retained as ponds for biodiversity as outlined in Section 6.9.6 of Chapter 6 Biodiversity.</p> <p>Runoff from the roads, hard-standings, and other works areas will continue to be directed to these ponds and from there to the outfall weirs. Check dams within the drainage channels will also remain in place. The retention of this drainage infrastructure will ensure that runoff continues to be attenuated and dispersed across existing vegetation before reaching the downstream receiving waters.</p> <p>In the unlikely event of failure of the settlement ponds, as a result of a blockage for instance, the effect on the increase in run-off in the receiving watercourses will have a minor negative effect, in cognisance of the design volumes (small relative to surface water flows) and nature of the overburden (seepage from peat in stream catchments can be expected to sustain through flow to surface waters).</p>	Wind Farm Operator Appointed Ecologist	Chapter 3 Civil Engineering Chapter 6 Biodiversity Chapter 10 Water
POST CONSTRUCTION / OPERATIONAL PHASE	Biodiversity – Water Quality and Fish Stocks	<p>The risks associated with sedimentation and contamination of the watercourses and aquifers due to erosion and runoff will be reduced to minimal levels as areas are re-vegetated and construction traffic ceases. The aquifer is classified as poor and once mitigation measures are implemented, hydrological conditions will not be altered to a degree that would affect local groundwater or water quality.</p> <p><u>Water Quality Monitoring</u></p> <ul style="list-style-type: none"> It is important to keep ecological disruption of watercourses to a minimum and to maintain the aquatic ecosystem in a healthy, functional condition, particularly since the proposed development is largely in the River Finn catchment, with aquatic conservation interests; 	Wind Farm Operator Appointed Ecologist	Chapter 6 Biodiversity Chapter 9 Land and Soils Chapter 10 Water Appendix D-2 Aquatic Ecology and Fish Report

TIME FRAME / SCHEDULE	ENVIRONMENTAL MITIGATION / RECOMMENDATION	PERSONS RESPONSIBLE	RELEVANT CHAPTER /ACTION REQUIRED
	<ul style="list-style-type: none"> • It is considered that biological water quality monitoring is sufficient for surface water quality monitoring during operation phase; • It is recommended that macroinvertebrates be sampled annually on the first, second and third years at the aquatic sites listed in the Aquatic Ecology and Fish Report in Appendix D-2 and continue in subsequent years should there be instability within macroinvertebrate communities; • Sites in the Deelee sub-catchment or in catchments not affected by the proposed development may be omitted in respect of grid connection options; and • Biotic indices corresponding with those used in Appendix D-2, as well as Functional Feeding Group Analysis should be carried out in line with methodology described in Appendix D-2. A key biotic index in this regard is the Quality Rating System. This biotic index has been shown to be a robust and sensitive measure of riverine water quality and has been linked with both chemical status and land use pressures in catchments (Clabby <i>et al.</i>, 1992). <p><u>Fish Stock Assessment</u> Fish have a number of advantages as indicator organisms for biological monitoring programmes as outlined in Kelly <i>et al.</i> (2007). Given the baseline information obtained for fish in the receiving environment, fish stock surveys will be undertaken at the same sites and at the same frequency as water quality surveys in the previous section. Methodology will replicate that outlined in Appendix D-2.</p>		
POST CONSTRUCTION /OPERATIONAL PHASE	<p>Biodiversity Enhancement Plan (BEP)</p> <p>An objective of the proposed development is to enhance the biodiversity value of the area through the suitable management and maintenance of the surrounding habitats. Enhancement of biodiversity will be implemented at the proposed development site through a Biodiversity Enhancement Plan (BEP). The BEP shall be developed by an ecologist and agreed with NPWS to provide a framework for the conservation and enhancement of ecological features during operation stage and beyond.</p> <p>Biodiversity enhancement measures will aim to offset any habitat loss created as a result of the proposed development works at construction stage, and also help to weaken overland surface water connectivity between the proposed development and downslope watercourses during operation stage.</p> <p>The BEP will commence at construction stage, in line with habitat reinstatement. Carrying out mitigation and enhancement measures concomitantly should maximise efficiency and</p>	Wind Farm Operator Appointed Ecologist	Chapter 6 Biodiversity Qualified ecologist to prepare a Biodiversity Enhancement Plan (BEP) in accordance with the recommendations in Chapter 6.

TIME FRAME / SCHEDULE	ENVIRONMENTAL MITIGATION / RECOMMENDATION	PERSONS RESPONSIBLE	RELEVANT CHAPTER / ACTION REQUIRED
	<p>environmental benefits. The success of the BEP will be monitored during the operational phase as part of the construction “snagging period” with measures incorporated into an operational monitoring programme agreed with the NPWS. Effectiveness of these measures will be monitored to determine if they are successful and based on the results, alterations and/or further enhancements will be considered. If the measures prove successful, monitoring of habitats can cease, although periodic management may be required.</p> <p><u>Peat Habitat Restoration</u></p> <p>Removal of forestry is a proven restoration measure and has been used effectively at a number of raised bogs in Ireland by organisations such as Coillte (Mackin <i>et al.</i>, 2017). Areas within the proposed development currently classified as conifer plantation were previously peat habitats but these areas have now been altered by drainage and other impacts associated with commercial plantation.</p> <p>An area to the south of T11 and T12 currently under commercial forestry will be selected for peatland restoration. Small patches of bog vegetation have survived in the wettest parts, presumably where trees failed, with wet heath covering much of the rest of the area. The aim is to restore the original hydrological conditions of the peat, connect the site to bog/wet heath immediately adjacent to the north/east, and to prevent further drying. Borrow pits in areas previously under conifer plantation will be reinstated to peatland, where the target habitat is cutover bog.</p> <p>Peat habitat restoration will be in line with the National Peatlands Strategy (NPWS, 2017), with reference also to guidance in ‘Best practice in raised bog restoration in Ireland’ (Mackin <i>et al.</i>, 2017). The basic enhancement measures can be adapted with reference to Mackin <i>et al.</i> (2017) according to conditions and tree characteristics, and are outlined here:</p> <ul style="list-style-type: none"> • Trees within the selected restoration area should be manually felled by chainsaw; • Branches should be removed from trees and the pruned material packed into the drains to slow down movement of water across/out of the site along these features, particularly in reference to the headwaters of Carraig An Langáin Stream; • An excavator (smaller size) with 1000mm tracks will be employed to block the drains using dams constructed of: <ul style="list-style-type: none"> – mechanically installed peat removed from the construction zone; or – boles from felled Sitka spruce; and 		

TIME FRAME / SCHEDULE	ENVIRONMENTAL MITIGATION / RECOMMENDATION	PERSONS RESPONSIBLE	RELEVANT CHAPTER / ACTION REQUIRED
	<ul style="list-style-type: none"> • Fencing should be installed to prevent grazing animals from trespassing. <p>The intended final restored habitat type is upland blanket bog and mosaics of upland blanket bog with wet heath. Monitoring of the effectiveness of the enhancement measures will be carried out and will include:</p> <ul style="list-style-type: none"> • Assessment of the recovery of bog vegetation will be carried out until a stable habitat type considered to represent the target for the restoration is reached; • Measurement of recovery success against targets, including surveys to document floral compositions; and • Hydrological monitoring to assess the hydrological recovery of the peat. <p><u>Riparian Buffer Zones & Forestry Setback Distances</u></p> <p>In some locations of the proposed development site conifer plantation extends to the margins of streams. This approach to planting negatively impacts aquatic flora and fauna in a number of ways as outlined Section 6.9.3 of Chapter 6 Biodiversity.</p> <p>A river riparian/aquatic buffer zone will be created to provide a buffer between the watercourses within the site and conifer plantation. Guidance described in the “<i>Environmental Requirements for Afforestation</i>” (DAFM, 2016) will be followed. The riparian setback zone will be designed to create an intact and permanent buffer area of natural vegetation alongside the aquatic zone. This will protect water quality and aquatic ecosystems quality from possible overland sediment flow and nutrient runoff from the proposed development and from the impacts associated with land practices at the site. The riparian setback breaks the ‘pathway’ between the source of possible pollution and the receiving watercourse. In suitable areas native woodland/scrub/tree species will be planted.</p> <p>The proposed clearing of conifers and replanting will aim to increase the ecological function of the affected watercourses by restoring semi-natural riparian habitats (native woodland) and maintaining ecological continuity (e.g. bat commuting/foraging corridors). Setback areas will be allowed to re-vegetate naturally with native seed bank and by planting native species such as heathers (<i>Calluna spp.</i>, <i>Erica spp.</i>), deergrass (<i>Trichophorum cespitosum</i>) and purple moor-grass (<i>Molinia caerulea</i>).</p> <p>The riparian buffer zone open, and planted, areas will create structural diversity and important woodland edge, opening habitats for native flora and fauna. The buffer zone will</p>		

TIME FRAME / SCHEDULE	ENVIRONMENTAL MITIGATION / RECOMMENDATION	PERSONS RESPONSIBLE	RELEVANT CHAPTER / ACTION REQUIRED
	<p>form part of the overall woodland site and will be left largely undisturbed during forestry operations/afforestation and throughout any subsequent woodland development. This will enable the river banks to develop into a well-vegetated area that supports a mosaic of natural ground vegetation and (potentially/likely) pockets of native scrub, thereby enhancing site biodiversity.</p> <p>The minimum riparian setback distances for aquatic zones (as measured from the bank of the watercourse) will depend on the gradients/slope leading to the aquatic zone. The water setback will be strategically widened at key locations onsite where site hydrology and slope increase the vulnerability of receiving waters. Based on ground conditions/topography, the width of the setback will be varied to avoid artificial lines and to create a naturally undulating forest edge. Setback distances can be found in Table 6-20 in Chapter 6 Biodiversity.</p> <p>The riparian setback zones will not be used for any purpose which might undermine its protective purpose or which could damage the aquatic zone. Planting is limited to environmental setback planting and excludes forestry operations such as cultivation and drainage. Machine traffic will also be excluded, with the exception of limited access for maintaining boundaries etc. Planning the integration of riparian buffer zones into the BEP will be a component of the CEMP and it may be economically and environmentally beneficial if works associated with stream buffer zones were undertaken during construction stage.</p> <p><u>Riparian Woodland Creation</u></p> <p>As the site occurs in an upland windswept area of peat overburden, it is likely that any trees/scrubs on watercourse riparian areas will have been stunted if they occurred prior to conifer plantation. From observation of existing conditions at watercourses within the proposed development site, the following will be carried out to enhance riparian zones:</p> <ul style="list-style-type: none"> • Areas that are slow to re-vegetate will be planted with species such as birch (<i>Betula pubescens</i>), hawthorn (<i>Crataegus monogyna</i>), pedunculate oak (<i>Quercus robur</i>), blackthorn (<i>Prunus spinosa</i>), hazel (<i>Corylus avellana</i>), willow species (<i>Salix spp.</i>) and gorse (<i>Ulex europaeus</i>); and • Along sheltered and/or high gradient areas, appropriate tree-planting within the setback areas will be carried out. This should enhance watercourses by stabilising 		

TIME FRAME / SCHEDULE	ENVIRONMENTAL MITIGATION / RECOMMENDATION	PERSONS RESPONSIBLE	RELEVANT CHAPTER / ACTION REQUIRED
	<p>banks, cooling/shading areas, and facilitating allochthonous input to the aquatic ecosystem, thereby creating further habitat diversity within the setback. These tree-planting measures should include:</p> <ul style="list-style-type: none"> – Planting of single or small irregular groups (5-10 individual stems) of native trees and species at strategic areas along the riparian setback; – This planting should not be greater than 20% of the area of the water setback; – Deer use the site so trees should be pit-planted and protected from grazing using individual tree shelters/small fenced-off enclosures where necessary; – Trees within set-back zone are to be pit-planted. No cultivation should be permitted within the water setback, but if required, soil can be imported from outside the setback area and deposited to create individual planting positions; – No fertiliser should be applied - post sapling trees will be used to avoid competition with ground flora; and – For the management of vegetation within setback zones, herbicide use will be prohibited. Management measures can include trampling, mulching and mats. <p><u>Silt Retention within Aquatic Setback Zones</u></p> <p>Within the setback zones, sediment trapping will be brought about by blocking drains and slowing the overland flow of water to allow for the infiltration and filtering of water through vegetation before entry into the aquatic zone. This will reduce the volume of sediment entering the rivers/streams and consequently increase the in-stream biodiversity, particularly for fish species.</p> <p>During works along riparian areas, silt control measures outlined in the <i>Standards for Felling and Reforestation</i> (DAFM, 2019) will be applied. An ecologist will supervise this work. The development of riparian setback zones will help reduce the negative effects of drainage and promote biodiversity both along and within watercourses by increasing floral and faunal species richness.</p> <p><u>Ponds</u></p> <p>Where conditions allow, silt ponds constructed for water quality protection associated with proposed development infrastructure will be retained post construction to allow for colonisation by local aquatic flora and fauna. This has been assessed as being a positive impact and is not considered to represent a risk to any animal group. The decision to retain ponds will be dependent on factors including location, stability and retention (or not) of</p>		

TIME FRAME / SCHEDULE	ENVIRONMENTAL MITIGATION / RECOMMENDATION	PERSONS RESPONSIBLE	RELEVANT CHAPTER / ACTION REQUIRED
	<p>water. The ECoW and site engineer will decide which ponds to retain.</p> <p>These ponds will act as wetland niches during the operational stage and beyond. Retained silt ponds can be expected to act as wetland areas for aquatic and terrestrial macroinvertebrates, amphibians and birds, and as a source of drinking-water for fauna. Physical variation/heterogeneity is a key influence in biodiversity richness meaning sinuosity in the design of the pond is preferable to linearity. Pond borders/banks and stone filter beds should be of varied shapes and/or angles in accordance with each specific silt pond location, where local topography would dictate design. Guidance in wetland habitat creation in Gilbert and Anderson (1998) will be followed.</p> <p><u>Bats</u> A total of twenty bat boxes and thirty bird boxes will be erected within/adjacent to riparian buffer zones. Bat boxes should be installed and maintained (if required) by an ecologist according to manufacturer's instructions. Any boxes installed should be robust and cater for the specific species previously recorded at the proposed development site. Guidance for installation of bat boxes should follow:</p> <ul style="list-style-type: none"> • Bat Conservation Ireland (BCI) Guidance Notes for Agri-environmental Schemes (2015); and • Bat Mitigation Guidelines for Ireland (Kelleher and Marnell, 2006). <p><u>Other</u> A proportion of trees felled by keyholing should be stacked in piles to create habitat for small mammals such as pygmy shrew (<i>Sorex minutus</i>) and for invertebrates such as beetles. Dead wood creates a damp habitat for invertebrates and their larvae which in turn provides a nutritious food source for birds and mammals. These features will be constructed under ECoW supervision and should be placed:</p> <ul style="list-style-type: none"> • In areas where their benefit can be maximised (e.g. near trails); and • At least 10m from watercourses in areas that are proposed for riparian woodland creation. 		
POST CONSTRUCTION / OPERATIONAL PHASE	<p>Noise</p> <p>It is proposed that if planning consent is granted for the proposed development, conditions attached to the planning consent should include the requirement that if a noise complaint is made, the operational noise levels of the wind farm should be measured to demonstrate</p>	Wind Farm Operator	Chapter 11 Noise

TIME FRAME / SCHEDULE	ENVIRONMENTAL MITIGATION / RECOMMENDATION	PERSONS RESPONSIBLE	RELEVANT CHAPTER / ACTION REQUIRED
	<p>compliance with the conditioned noise limits. Such monitoring should be done in full accordance with ETSU-R-97 relevant good practice as set out in the IOA GPG and include penalties for characteristics of the noise such as tonality (if present).</p>		
POST CONSTRUCTION / OPERATIONAL PHASE	<p>Residential Amenity/ Material Assets</p> <p>If interference to the telecommunication services arises from the wind farm development, the Developer will work with telecommunication providers to remedy any issues of interference to affected communication links. Appropriate mitigation measures can be implemented such that there will either be an imperceptible effect, or no effect, on surrounding reception as a result of the proposed development, with the solution to interference with TV reception or communication links dependent on where the residence receives signal from.</p> <p>As standard practice, a signed Protocol between the developer and RTÉ will be put in place, in which the developer will be responsible to resolve any issue of interference with television reception as a result of the proposed development.</p>	Wind Farm Operator	Chapter 15 Material Assets
POST CONSTRUCTION / OPERATIONAL PHASE	<p>Management of Ground/Slope Stability</p> <p>The potential impact on the land and soils environment of the site due to excavations will be lower during operation and maintenance, as the majority of excavations will have been reinstated. Some erosion of soil may continue into the early stages of the operational phase as reinstated areas will initially have bare soil. However as vegetation becomes established and equilibrium is achieved, erosion rates will reduce to normal levels.</p> <p>All vehicular movement during operation and maintenance will be restricted to the areas of hardstanding and existing/newly constructed access roads. The volume of traffic during the operational phase will be greatly reduced in comparison with the construction phase. The potential impact on slope stability will therefore be small.</p>	Wind Farm Operator	Chapter 9 Land and Soils
POST CONSTRUCTION / OPERATIONAL PHASE	<p>Biodiversity Bats -</p> <p>Post-construction surveys will be carried out in order to assess the effectiveness of proposed mitigation measures. These surveys will be undertaken in years one, three and five. Based on the results, a five-year review will then be carried out to determine whether or not measures have been successful and if necessary, alterations and/or further enhancements will be undertaken. Bat monitoring during the operational phase shall include the following elements:</p> <ul style="list-style-type: none"> • Fatality searches for bats; and • Post construction monitoring of bat activity within the proposed development site. <p>The NPWS should be contacted to discuss the full scope and timing of these post-construction surveys prior to the completion of the construction phase.</p>	Wind Farm Operator	Chapter 6 Biodiversity

TIME FRAME / SCHEDULE	ENVIRONMENTAL MITIGATION / RECOMMENDATION		PERSONS RESPONSIBLE	RELEVANT CHAPTER / ACTION REQUIRED
		<p>Post-construction bat monitoring will be developed in line with recommendations in Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation (SNH, 2019), and those recommended by Bat Conservation Ireland (BCI, 2012).</p> <p>Should significant effects to bat species (for example bat fatalities underneath turbines) be identified during monitoring, additional mitigation measures will be considered such as increased cut-in speeds or curtailment. If required, each of these measures could be temporally and spatially focussed, e.g. only undertaken at individual turbines or in certain seasons.</p>		
POST CONSTRUCTION / OPERATIONAL PHASE	Biodiversity - Ornithology	<p>Bird surveys will continue during the operational phase from the same Vantage Point locations used during pre-construction surveys. Any specific bird behaviours that indicate an avoidance and/or change of activity from those recorded during baseline studies will be of particular note. The timing and extent of bird surveys will be agreed with NPWS.</p> <p>If there are detectable changes in bird behaviour or if collisions are found to be greater than those predicted, additional mitigation such as the curtailment of turbine operation times may be required.</p> <p>A detailed Operational Avian Monitoring Programme will be prepared for the operational phase of the proposed development. The monitoring programme at a minimum will include:</p> <ul style="list-style-type: none"> • Breeding bird surveys (with particular focus on merlin); • Winter bird surveys; and • Targeted bird collision surveys (carcass searches). 	Wind Farm Operator	Chapter 7 Ornithology
POST CONSTRUCTION / OPERATIONAL PHASE	Shadow Flicker	<p>The model has identified that there is the potential for shadow flicker to occur and has identified the times that this may arise. The developer is committed to installing mitigation measures that will eliminate shadow flicker.</p> <p>Turbines will be programmed to shut down during periods when shadow flicker is predicted to occur. This strategy has been successfully employed at other wind farms.</p>	Wind Farm Operator	Chapter 14 Shadow Flicker

TIME FRAME / SCHEDULE	ENVIRONMENTAL MITIGATION / RECOMMENDATION		PERSONS RESPONSIBLE	RELEVANT CHAPTER /ACTION REQUIRED
DECOMMISSIONING	Removal of Wind Farm Components & Site Reinstatement	<p>At the end of the estimated 30-year lifespan of the proposed wind farm, the Developer will decide to either repower the turbines or to decommission them. Any further proposals for development at the site during or after this time will be subject to a new planning permission application.</p> <p>If it is decided to decommission the wind farm, a comprehensive reinstatement proposal, including the implementation of a programme that details the removal of all structures and landscaping, will be submitted to Donegal County Council and NPWS for approval prior to the decommissioning work. Removal of infrastructure will be undertaken in line with landowner requirements and regulatory requirements, and the best practice guidelines applicable at the time. The information below outlines the likely decommissioning tasks based on current requirements and best practice.</p> <p>Prior to the decommissioning work, the following shall be provided to Donegal County Council and NPWS for approval:</p> <ul style="list-style-type: none"> • A plan outlining measures to ensure the safety of the public workforce and use of best techniques available at the time; and • A comprehensive reinstatement proposal, including the implementation of a programme that details the removal of all above ground structures and landscaping. <p>If the site is to be decommissioned, cranes of similar size to those used for construction will disassemble each turbine. The towers, blades and all turbine components will then be removed.</p> <p>Wastes generated during the decommissioning phase will be taken off site, and disposed of at an authorised waste facility. Any materials suitable for recycling will be disposed of in an appropriate manner.</p> <p>At present it is anticipated that underground cables connecting the turbines to the selected substation will be cut back and left underground. The cables will not be removed if an environmental assessment of the decommissioning operation demonstrates that this would do more harm than leaving them <i>in situ</i>. The assessment will be carried out closer to the time to take into account environmental changes over the project life.</p> <p>The new 110kV substation will remain in place as it will be under the ownership of ESB/EirGrid. Hardstand and turbine foundation areas will be left <i>in situ</i> and covered with soil to match the existing landscape. Access roads will be left for use by the landowners.</p>	Wind Farm Operator	<p>Chapter 2 Description of the Proposed Project</p> <p>Prepare Decommissioning Management Plan and submit to local authority(s) for agreement.</p>

DECOMMISSIONING	Management of Ground/Slope Stability	<p>Concrete bases will be left in the ground, covered with topsoil and allowed to naturally re-seed in line with IWEA best practises (IWEA, 2017). The area around the bases will be rehabilitated by covering it with locally sourced soil in order to regenerate the vegetation. This will also reduce run-off and sedimentation effects.</p> <p>The mitigation measures for decommissioning form part of the environmental assessment required at the end of the design life of the wind farm.</p>	Wind Farm Operator	Chapter 9 Land and Soil
DECOMMISSIONING	Biodiversity & Ornithology	<p>The Drumnahough Wind Farm will be in operation for 30 years. Decommissioning will adhere to best practice guidelines recommended at the time and implement appropriate mitigation measures. During decommissioning:</p> <ul style="list-style-type: none"> • Disturbance limitation measures will be as per the construction phase; • Plant machinery will be turned off when not in use; and • All plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (SI 359/1996). 	Wind Farm Operator	Chapter 6 Biodiversity Chapter 7 Ornithology
DECOMMISSIONING	Replacement Forestry	<p>At the end of the forestry lifetime in the replacement lands, the felling will be subject to the requirements of a felling licence and adherence to the environmental mitigation measures associated with the licence.</p>	Wind Farm Operator	Chapter 9 Land and Soil

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