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Rooaunalaghta Green Energy Ltd

Rooaunalaghta Wind Farm

Chapter 20 – Schedule of Mitigations

ROOAUNALAGHTA
Green Energy

BUILT ON KNOWLEDGE

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20. SCHEDULE OF MITIGATION

20.1 INTRODUCTION

This chapter of the EIAR provides a summary of the findings of this EIAR, based on the design and mitigation measures identified within the technical assessments of this report. The schedule below details the measures upon which the findings of this EIAR have been based and are an integral part of the proposed project.

During the pre-construction, construction, operational and decommissioning phases of the proposed project, all personnel working on the project will be required to be responsible for the environmental control of their own work and to perform their duties in accordance with the requirements and procedures of the Construction Environmental Management Plan (see CEMP Appendix 2-2).

20.2 SCHEDULE OF MITIGATION MEASURES

The following table provides a summary of the mitigation measures proposed within this EIAR. In addition, any monitoring proposals have been included.

Table 20.1: Table of Mitigation Measures

Ref No.	Related to	Location	Mitigation Measure	Monitoring
Pre-construction Phase				
Description of Proposed Project				
MM1	Environmental Management – Construction Environmental Management Plan (CEMP)	EIAR Chapter 2	A Construction, Environmental, Management Plan (CEMP) has been prepared for the proposed project and is included as Appendix 2-2 of the EIAR. The CEMP will be updated prior to commencement of any site works to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned. The appointed Contractor will update the CEMP and submit to the planning authority for approval.	As required through the Contractor's CEMP.
MM2	Health and Safety	EIAR Chapter 2	A Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) are required to be appointed in accordance with the provisions of the Safety, Health and Welfare at Work (Construction) Regulations.	As required through the Contractor's CEMP and the Health and Safety Plan.
Population and Human Health				
MM3	Health and Safety	EIAR Chapter 5	Health and safety plans will be developed prior to any construction taking place. A Health and Safety Plan covering all aspects of the construction process will outline Health and Safety requirements in detail. At the procurement stage, the Health and Safety Plan will be prepared on a preliminary basis and developed further at construction stage, with all hazards and risks identified and assessed.	As required through the Contractor's CEMP.
Biodiversity				
MM4	Habitats & Flora	EIAR Chapter 6 / Appendix 6-6 HMP	Habitat protection, restoration and offsetting shall be implemented in accordance with the Habitat Management Plan (Appendix 6-6 of the EIAR). Measures include the protection of retained habitats and the restoration of affected habitats, including the management of bracken and scrub encroachment where required.	Habitat monitoring and management undertaken in accordance with Appendix 6-6 of the EIAR.

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			Any vegetation clearance will take place outside of bird nesting season (01 March – 31 August), in accordance with the Wildlife Act, 1976 (as amended).	
MM5	Badger	EIAR Chapter 6	Pre-construction surveys will be undertaken by a suitably qualified ecologist/Ecological Clerk of Works (ECoW), and appropriate exclusion buffers will be established around any active setts. Blasting works will be programmed to avoid sensitive periods (i.e., December to July, inclusive) and carried out in accordance with relevant guidance and any required licences. Mammal escape ramps will be installed in excavations to prevent entrapment.	Implementation of mitigation measures and exclusion buffers shall be monitored by the ECoW during construction works.
MM6	Otter	EIAR Chapter 6 / NIS	Pre-construction otter surveys will be completed at watercourse crossings and works areas. Water quality protection measures and pollution prevention measures will be implemented throughout construction/decommissioning. Construction lighting will be controlled to avoid illumination of watercourses and riparian habitats	Implementation of otter protection measures shall be overseen by the ECoW, with water quality monitoring undertaken in accordance with the CEMP and the SWMP (Appendices 2-2 and 2-6 of the EIAR).
MM7	Amphibians and Reptiles	EIAR Chapter 6	Pre-construction checks will be undertaken where suitable habitat occurs. Works will avoid impacts on refugia and hibernation features where present, and vegetation clearance, ground preparation and stone movement will be timed to minimise the risk of injury or mortality, including avoidance of the main hibernation period (October to March). Water quality protection measures will be implemented to protect amphibian habitat.	Implementation of habitat protection measures, timing restrictions and good practice working methods shall be monitored by the ECoW during construction works.

Ref No.	Related to	Location	Mitigation Measure	Monitoring
Ornithology				
MM8	Breeding Birds / Construction Disturbance	EIAR Chapter 7	In addition to embedded mitigation measures, a Bird Protection Plan (BPP) shall be prepared and implemented prior to construction. Vegetation clearance shall be undertaken outside the main bird breeding season (01 March – 31 August), in accordance with the Wildlife Act, 1976 (as amended).	Compliance with the Bird Protection Plan and breeding bird protection measures shall be monitored by the ECoW during construction works.
MM9	Peregrine falcon	EIAR Chapter 7	Pre-construction surveys shall determine whether the known peregrine nest site is occupied in the year of construction. Where occupied, a 500-750 m construction disturbance buffer shall be implemented, unless otherwise agreed with NPWS. The nest shall be monitored throughout the breeding season by a suitably qualified ornithologist, with restrictions applied to high-disturbance activities where required.	Breeding activity, nest occupancy and fledging success shall be monitored during the construction phase where the territory is occupied.
Material Assets				
MM10	Underground Services	EIAR Chapter 11	Standard measures / practices to avoid or otherwise minimise impacts to existing utility assets and / or services provision will be undertaken, including: • Prior to the commencement of the construction phase the Applicant will engage with all utility asset owners / service providers; • A confirmatory survey of all existing services (electrical / ESB, water / Uisce Éireann, gas / Gas Networks Ireland (GNI), telecoms cables etc.) will be carried out prior to construction to verify the assumptions in this report and identify the precise locations of any services. Where assets / services are identified, the Applicant will liaise with the service provider;	As required through the Contractor's CEMP.

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			• Utility assets / services (underground and overhead) will be identified and clearly marked prior to any pre-construction (site clearance) / construction / demolition activity occurring; • No excavations will take place without prior consultation with relevant utility asset owners / service providers; • Digging around existing services, if present, will be carried out as per best practice / guidance[1] by hand to minimise the potential for accidental damage; • Prior to any mechanical excavation taking place ESBN will be consulted with and the exact locations of all underground electricity cables established and verified; • All works undertaken in the vicinity of underground assets will be carried out in accordance with current HSA guidance, namely the HSA 'Code of Practice for Avoiding Danger from Underground Services'; • All works will be undertaken with in accordance with the exclusion and safe operating distances around electricity infrastructure as set out in the ESB Code of Practice, as well as HSA guidance including the 'Code of Practice for Avoiding Danger from Overhead Electricity Lines'; • Any proposed works will require a minimum clearance distance of 1 m either side of electrical cables; and, • Liaison with asset owners / service providers will continue as required throughout the construction phase.	
Archaeological, Architectural & Cultural Heritage				

[1] https://www.gasnetworks.ie/home/safety/dial-before-you-dig/

Transmission Policies and Standards (eirgridgroup.com)/ Publications (esbnetworks.ie)

Ref No.	Related to	Location	Mitigation Measure	Monitoring
MM11	Archaeological test-trenching	EIAR Chapter 16	All elements of the Proposed Project that are located within existing greenfield will be subject to a programme of archaeological test trenching prior to the commencement of construction, including proposed works within the Zones of Notification for AH79 and AH99 and test trenches to target the geophysical anomalies that may be impacted by the Proposed Project (Areas 1-5). This work will be carried out under licence to the National Monuments Service of the DoHLGH. If archaeological remains are identified during the course of these works further mitigation will be implemented as required, and will include preservation by record or in-situ. Any further mitigation will require agreement from the DHLGH.	As required through the Programme of Works agreed with NMS.
Construction Phase				
Description of Proposed Project				
MM12	Construction Hours	EIAR Chapter 2	The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 08:00 hrs and 20:00 hrs weekdays and between 08:00 hrs and 13:00 hrs on Saturdays. However, during the following critical periods longer hours will be required: • Concrete pours for turbine foundations; • During turbine installation when the weather is suitable (i.e. light winds); • Delivery of oversized loads; and, • In the unlikely event of an emergency (this is unlikely - see Chapter 18 - Major Accidents and Natural Disasters).	As required through the Contractor's CEMP.

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			Any such out of hours working will be agreed in advance with Mayo County Council apart from in the case of an emergency and in line with the Schedule of Mitigation requirements.	
MM13	Surface Water Drainage / Silt Control	EIAR Chapter 2 and 8	A Surface Water Management Plan (SWMP) has been prepared (Appendix 2-6). The purpose of this plan is to ensure that all works are conducted in an environmentally responsible manner so as to minimise any potential adverse impacts from the proposed project on surface water quality. The plan incorporates the following specific objectives: • Provide overall surface water management principles and guidelines for all phases of the proposed project; • Address erosion, sedimentation and other water quality issues; and, • Present measures and management practices for the prevention and/or mitigation of potential downstream impacts.	As required through the Contractor's CEMP and SWMP.
Population and Human Health				
MM14	Health and Safety	EIAR Chapter 5	All activities carried out by the appointed Contractor during the construction phase will be in accordance with the relevant requirements of the Safety, Health and Welfare at Work Act 2005 as amended and Regulations made under this Act.	As required through the Contractor's CEMP
Biodiversity				
MM15	Designated Sites & Aquatic Ecology	EIAR Chapter 6 / NIS	Potential effects on designated sites and aquatic ecology have been reduced through the application of embedded mitigation measures and a constraints-led design process, including the avoidance of sensitive hydrological and hydrogeological receptors, as outlined in Chapter 9 (Hydrology and Hydrogeology). Additional water quality protection measures shall be implemented in accordance with the CEMP (Appendix 2-2 of the EIAR) and SWMP	Water quality monitoring shall be undertaken in accordance with the CEMP (Appendix 2-2 of the EIAR) and the SWMP (Appendix 2-6 of the EIAR), including monitoring of surface water and groundwater and inspection of water quality protection measures. Monitoring shall be overseen by the Environmental Manager throughout construction works.

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			(Appendix 2-6 of the EIAR), with the most stringent controls applied during the construction phase and day-to-day environmental management measures implemented during operation.	
MM16	Other Mammals	EIAR Chapter 6	Open excavations will be fitted with escape ramps and checked regularly. Vegetation clearance will be supervised, where required, by the ECoW to minimise the risk of injury or mortality to protected mammals.	Implementation of mammal protection measures shall be monitored by the ECoW during construction works in accordance with the Contractor's CEMP.
Ornithology				
MM17	Breeding Birds / Construction Disturbance	EIAR Chapter 7	In addition to embedded mitigation measures, a Bird Protection Plan (BPP) shall be prepared and implemented prior to construction. Vegetation clearance shall be undertaken outside the main bird breeding season (01 March – 31 August), in accordance with the Wildlife Act, 1976 (as amended). Where works are required during the breeding season, pre-construction nesting bird surveys shall be undertaken by a suitably qualified ecologist and appropriate exclusion zones established around active nests. An ECoW shall oversee implementation of bird protection measures throughout construction.	Compliance with the Bird Protection Plan and breeding bird protection measures shall be monitored by the ECoW during construction works.
Land, Soils and Geology				
MM18	Land Use	EIAR Chapter 8 and Chapter 6	• Vegetation clearance will be kept to a minimum. The proposed construction work areas will be demarcated prior to the construction works commencing. No clearance of vegetation will be undertaken outside of the demarcated areas. Construction vehicles will be restricted to designated areas and access tracks in order to avoid impacting adjacent habitats and to ensure that soil compaction is restricted to these areas.	As required by the Contractor's CEMP.

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			• All disturbed ground outside of the permanent footprint will be fully reinstated following the completion of the works. Biodiversity enhancement measures will be undertaken to improve ecological habitats as detailed in Chapter 6.	
MM19	Potential for Contamination	EIAR Chapter 8 and Chapter 6 and CEMP	• Given the pre-mitigation effects are not significant, no additional project-specific mitigation is required beyond standard best practices. All listed measures including concrete/cement management (designated washout bins, offsite batching plant disposal, waste to permitted facilities), bunded storage for plant/oils/IBCs with drip trays, impermeable surfaces with oil interceptors, and spill response planning/training are fully incorporated within the Construction Environmental Management Plan (CEMP) and SuDS Manual, which the contractor will implement as standard procedure. • Any identified soil contamination will be remedied and soil stored in designated area pending removal from the site. Contaminated soils will be removed in accordance with the Waste Management Act 1996 as amended. • Imported stone will be sourced from appropriately regulated quarries and inspected prior to use to minimise the risk of introducing or spreading invasive species. For further discussion on invasive species, see Chapter 6. • All wastes generated on site will be segregated and appropriate materials are re-used on site. Residual materials will be collected by licensed waste hauliers for appropriate sorting, recycling and disposal.	As required by the Contractor's CEMP.
MM20	Soil Compaction and Erosion	EIAR Chapter 8	• Landscaping areas will be sealed and levelled using the back of an excavator bucket to minimise the potential for erosion. The upper vegetative layer will be stored with	As required by the Contractor's CEMP.

Ref No.	Related to	Location	Mitigation Measure	Monitoring
		and CEMP	the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface, to prevent erosion. No additional soil will be imported to the site. • Overburden and rock will be reused on site to reinstate the borrow pit and other excavations. The borrow pit deposition area provides an opportunity for landscaping and restoration to match the natural surroundings. On completion, the borrow pit deposition area surface will be stabilised by using site sourced material, free from invasive species. The soil will be stabilised with the establishment of natural vegetation. • A key project goal is to incorporate sustainability into the design and construction of the proposed project where practical. Where mineral soils are encountered in the excavation and construction of site access tracks, bases, etc, this material will be stockpiled for assessment and subsequent re-use. Where mineral soil is not directly suitable for construction it will be used for reinstatement works and will be geo-engineered as necessary. • As part of the proposed works a borrow pit is proposed to provide materials suitable for construction, the purpose of which is to minimise the need to import aggregates from elsewhere, reducing the project's environmental footprint. It is not intended that the borrow pit be fully reinstated, although it is proposed that the borrow pit will be partially reinstated using suitable excess materials. Approximately 2m of soil will be used to reinstation the borrow pit. • The construction traffic will utilise the permanent access track network for access and egress, and this access will	

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			be constructed in advance of other ground works in a sequential manner. • A CEMP was developed as part of the planning application – See Appendix 2-2. This plan documents how spoil will be managed on site for re-use of materials, the design for on-site re-use and disposal options, and a scheme for the tracking and recording of soil movements. These measures will prevent the erosion of soil in the short and long term. Soils, overburden, and rock will be reused on site to reinstate any excavations where appropriate. • Access tracks and the construction compound will be constructed first to allow for access within the proposed wind farm site. • Construction of internal electricity transmission cables will present similar, but lower-level risks, to the construction risks outlined above, and the same mitigation measures will be adopted as above. Surplus material from the onsite access tracks will be reused on site in the borrow pit or on access track upgrades. Proposed GCR/ Substation • The majority of the proposed GCR cabling will be laid in the public road. Construction method statements and templates will be implemented to ensure that the proposed GCR infrastructure is installed in accordance with the correct requirements, materials, and specifications of ESBN and EirGrid. The ducts will be installed, and the trenches will be reinstated in accordance with ESBN/EirGrid, private third-party landowners and County Council specifications. Once all	

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			are satisfied, then the cables are pulled through the installed ducts in approximately 500 m to 700 m sections. • Excavated mineral material will be temporarily stockpiled onsite for re-use during reinstatement. Stockpiles will be restricted to less than 2 m in height. Stockpiles will be located a minimum of 50 m from surface water features, and all stockpiling locations will be subject to approval by the Site Manager and Project Ecological Clerk of Works (ECoW). • For concrete and asphalt/bitmac road sections, it is proposed to carry out immediate permanent reinstatement in accordance with the specification and to the approval of the local authority and/or private landowners, unless otherwise agreed with the local authority. Surplus excavated bitmac material will be brought to a recycling facility for processing in accordance with the circular economy approach. • For offroad, i.e. access tracks/grass sections, the cable section will be laid within an existing access track, where possible. Silt fences will be utilised along the offroad sections. Short sections (<50m) will be excavated and reinstated on a phased basis with suitable excavated material to ground level and finish in a gravel track as per the EirGrid/ESBN specification. By limiting the excavated sections, the potential for compaction or erosion is limited.	
MM21	Geohazards	Chapter 8	A karst protocol will be employed during construction and involves a series of steps and methodologies in karst areas. An example of the karst feature inspection protocol is	As detailed in the Karst Protocol (See Appendix A of Appendix 2-2 and Appendix 8-1)

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			documented by Madden & O'Hara (2016)[2] Ground stabilisation measures that will be employed include compaction, grouting/stabilisation supervision, geotextile or utilising raft foundations where required. Where weathered limestone or karst is encountered at formation level, the feature will be mapped in detail. Each feature and associated mitigation measure will be documented and included in the safety file for the Proposed Project. The stabilisation measures will be approved by a geotechnical engineer. Where discrete voids or highly fractured rock are encountered, grouting will be used to infill cavities and improve the strength and continuity of the rock mass beneath foundations. Where infilling or grouting is required, works will be supervised by a suitably qualified hydrogeologist to ensure there is no effect on groundwater. The use of micropiles if required is not expected to result in significant effects on groundwater due to their small diameter, limited footprint and the low volumes of excavation required. Installation involves drilling narrow boreholes (typically 100-200 mm diameter) and grouting within the cased borehole, resulting in only minor and highly localised disturbance to the underlying bedrock and any groundwater.	
MM22	Karst Assessment Mitigation	Appendix 8-1	• All proposed infrastructure has been sited to avoid areas of very high karst hazard. Best practice measures as detailed in the Karst Protocol will be implemented if any karst feature is encountered during construction (See Appendix A of Appendix 2-2 and Appendix 8-1)	As detailed in the Karst Protocol (See Appendix A of Appendix 2-2 and Appendix 8-1)

[2] Madden and Hara (2016) The treatment of karst features encountered during road construction in County Galway

Ref No.	Related to	Location	Mitigation Measure	Monitoring

			• All earthworks will be designed by a suitably qualified Geotechnical Engineer during the detailed design stage and informed by a detailed confirmatory ground investigation. This investigation will include intrusive methods, such as trial pitting and borehole drilling, with a specified suite of in-situ and geotechnical laboratory testing to further assess the engineering characteristics of the infrastructure locations.
			• Portions of the proposed wind farm site have been classed as having moderate karst hazard, based on professional judgement following site investigation and desktop analysis and proximity to features. In these areas, specific mitigation measures may be required, i.e micropiles and geogrid reinforcement. The following ground investigation works will be carried out at infrastructure locations identified as having medium or greater karst risk:
			  ○ Rotary core boreholes to confirm rockhead depth and quality.
			  ○ Geophysical Surveying to detect voids and solution features, including:
			  ▪ Electrical Resistivity Tomography (ERT)
			  ▪ Microgravity; and
			  ▪ Seismic Refraction
			  ○ Trial pits and dynamic probing to assess near-surface variability and soils
			• Mitigation will be implemented at detailed design stage to reduce the karst risk:
			  ○ For the turbine foundations, a geotechnical investigation will be carried out at each location prior to works commencing. Surveying will	

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			include the drilling of boreholes by rotary core to depth within competent bedrock to determine the strength of rock and assess the potential for karst or weathered rock at each location by a qualified geotechnical engineer to inform foundation design. Micropiles will only be undertaken if geogrid and backfilling is not suitable in areas of weak rock to ensure long term stability, and that the turbine loads are taken to intact rock. A larger number of small piles or micropiles designed with rock sockets to transfer loads via skin friction are preferred in karst landscapes (Rutty & Jennings, 2012, Traylor et al., 2002), rather than a smaller number of large piles relying on end bearing. It is recommended that piles are designed on the basis of transferring loads via skin friction to a rock socket. ○ For access tracks and hardstandings, the karst feature inspection protocol documented by Madden & O'Hara (2016), included in Appendix A of the CEMP (Appendix 2-2), is routinely followed for construction of linear infrastructure in karst landscapes. A similar karst feature inspection protocol will be developed and followed during detailed design. ○ Where small-scale dissolution and voiding are encountered at turbine foundations during detailed ground investigation, mitigation strategy is the use of drilled or grouted piles. The use of piles transfers structural loads to	

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			competent rock beneath karst-affected zones. This approach bypasses voids and weak soils, reducing the risk of differential settlement or collapse. ○ Ground stabilisation measures to be employed include compaction, grouting/stabilisation, geotextile or utilising raft foundations. Where weathered limestone or karst is encountered at formation level, the feature will be mapped in detail. Each feature and associated mitigation measure will be documented and included in the safety file. The stabilisation measures will be approved by a geotechnical engineer. Where infilling or grouting is undertaken works will be supervised by a suitably qualified hydrogeologist to ensure there is no effect on groundwater. ○ Waltham et al. (2005) outline an approach for the remediation of shallow karst features. This methodology involves adding coarse granular fill to the base of karst feature, and progressive backfilling upwards with progressively finer granular fill. All backfill is to be placed in layers 150 mm deep and compacted. Soil around the doline/sinkhole is to be excavated to a radius of 3-5m, before being replaced and compacted with or without incorporation of anchored geogrid. This methodology has been used effectively on Irish road projects in similar karst terrains in East Galway (Madden and O'Hara, 2016).	

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			This methodology is applicable to the proposed wind farm site access tracks and shall be implemented if small scale sinkhole features (<5m in depth) are encountered beneath access tracks. No karst features were observed in line with any access track or other proposed infrastructure. • Where construction takes place in areas of high karst hazard, and if karstic features are identified elsewhere during construction, the following measures shall be implemented: ○ Access tracks will incorporate geogrid-reinforced bridging layers over areas identified as having potential voids or collapse-prone soils ○ Crane hardstands will be designed with enhanced bridging layers to accommodate high point loads and dynamic stresses. • Crane hardstands will be designed with enhanced bridging layers to accommodate high point loads and dynamic stresses.	
Hydrology and Hydrogeology				
MM23	Standard Practice Pollution Control Measures	EIAR Chapter 9	• Near-stream construction work will only be carried out during the period permitted by IFI (2016)[3] guidance document "Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites", that is, May to September inclusive. The	As required by the Contractor's CEMP.

[3] IFI (2016) *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites* *https://www.fisheriesireland.ie/media/guidelines-on-protection-of-fisheries-during-construction-works-in-and-adjacent-to-waters* *[Accessed February 2026].*

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			excavation, installation and reinstatement process for the general GCR works will take on average of two days to complete a 100-metre section similar to minor road works. The proposed HDD will be undertaken over a 2-3 day period with additional time to install the launch and reception pits. The proposed HDD is designed to avoid direct effects on streams in accordance with the IFI guidance (2016)[3] guidance document "Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites". A HDD crossing is proposed for the Black River • On completion of the works, all apparatus, plant, tools, offices, sheds, surplus materials, rubbish and temporary erections or works of any kind will be removed from the site; • All works must follow the guidance set out in the Guidance document entitled: CIRIA guidance note Control of Water Pollution from Construction Sites (CIRIA, 2001); • A 24-hour, seven-day week Emergency Response protocol will be drawn up and implemented. This will be implementable in the unlikely event of an accidental spillage of chemicals, hydrocarbons or release of sediment to the surface or ground water system; • All excavated material will be removed to suitable stockpile areas; • Stockpiling will be limited to areas where the ground is stable and well drained; • Spoil disposal areas will be located where the risk of soil erosion and water quality deterioration is minimal and must also have an adequate buffer from aquatic zones;	

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			• Where spoil disposal areas are bunded, the bunds will extend to a level above the top of the spoil; • Any water discharge from the stockpiles will be monitored (see Section 9.6.4.1). Runoff water will be prevented from flowing directly into the site adjacent drainage channels; • All machinery will be regularly maintained and checked for leaks. Services will not be undertaken within 50 m of aquatic features. Servicing will be undertaken on level, hard surfaced designated areas; • An adequate supply of spill kits and hydrocarbon adsorbent packs will be available at labelled stations throughout the sites with all vehicles on-site carrying spill kits. All relevant personnel will be fully trained in the use of the equipment. Any used spill kits will be disposed of appropriately off-site; • All equipment and machinery will be cleaned prior to entry as a bio security measure. This is to avoid transfer of invasive species on equipment and machinery which may have been used elsewhere to the receiving catchment.	
MM24	Alteration of Surface Water Flow	EIAR Chapter 9 and Appendix 2-6 SWMP	The proposed project is characterised by infiltration rather than surface water flow. Settlement of runoff from hardstand areas will be provided as detailed in chapter 9 section 9.5.1. Prior to the construction of infiltration features, the underlying ground conditions will be verified. Should preferential groundwater pathways be encountered during excavation works, the Karst Management Protocol (See Appendix 8-2 and Appendix 2-2 CEMP) will be implemented.	Local surface water features at the proposed project will be monitored pre-construction and during construction to take account of any variations in the quality of the local surface water environment as a result of activities related to the proposed project.

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			A suitably qualified hydrogeologist will inspect the feature and recommend appropriate measures. **Proposed GCR** The proposed watercourse crossings will be completed in the summer months to avoid periods of potential flooding. This time period coincides with the period of lowest expected rainfall and, therefore, minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses. Mitigation measures in relation to the proposed GCR are outlined in the CEMP in Appendix 2-2 of the EIAR. The mitigation measures include • Near-stream construction work will only be carried out during the period permitted by IFI (2016)[3] • All works must follow the guidance set out in the Guidance document entitled: CIRIA guidance note Control of Water Pollution from Construction Sites (CIRIA, 2001); • A 24-hour, seven-day week Emergency Response protocol will be drawn up and implemented. This will be implementable in the unlikely event of an accidental spillage of chemicals, hydrocarbons or release of sediment to the surface or ground water system;	The locations and main water parameters are outlined in the proposed surface water monitoring schedule in the Surface Water Management Plan, Appendix 2-6. Inspections of silt traps are critical after prolonged or intense rainfall while maintenance will ensure maximum effectiveness of the proposed measures. Stockpiles and the borrow pit will be evaluated and monitored and kept stable for safety and to minimise erosion. Turbidity monitors/alarms will be strategically placed upstream and downstream of works to assess the main construction period i.e. turbine base construction. Where elevated turbidity is noted, visual checks will be undertaken. All monitoring equipment will be calibrated regularly to ensure that results are accurately measured as detailed in the SWMP[4] . Corrective Actions will include: • Investigate whether channels used to convey water are protected with vegetation, erosion control blankets, or a similar erosion control measure. If not, implement appropriate erosion control measures. • Check all outlets and location of turbidity monitors • Stop dewatering if the downstream area shows elevated turbidity or erosion. • Check outlet protection or a velocity dissipation device.

[4]Note – SWMP includes for groundwater level and water quality monitoring

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			• All excavated material will be removed to suitable stockpile areas; • Stockpiling will be limited to areas where the ground is stable and well drained; • Spoil disposal areas will be located where the risk of soil erosion and water quality deterioration is minimal and must also have an adequate buffer from aquatic zones; • Where spoil disposal areas are bunded, the bunds will extend to a level above the top of the spoil; • Any water discharge from the stockpiles will be monitored (See Section 9.6.4.1). Runoff water will be prevented from flowing directly into the site adjacent drainage channels; • All machinery will be regularly maintained and checked for leaks. Services will not be undertaken within 50 m of aquatic features. Servicing will be undertaken on level, hard surfaced designated areas; • An adequate supply of spill kits and hydrocarbon adsorbent packs will be available at labelled stations throughout the sites with all vehicles on-site carrying spill kits. All relevant personnel will be fully trained in the use of the equipment. Any used spill kits will be disposed of appropriately off-site; • All equipment and machinery will be cleaned prior to entry as a bio security measure. This is to avoid transfer of invasive species on equipment and machinery which may have been used elsewhere to the receiving catchment. Imported stone material will be checked to ensure no invasive species.	• Ensure a stable, erosion-resistant surface (e.g., well-vegetated grassy areas, clean filter stone, geotextile underlayment) in place at outlets. • Check for leaking pumps, hoses, and pipe connections and fix if identified. A programme of inspection and maintenance will be designed, and dedicated construction personnel assigned to manage this programme. A checklist of the inspection and maintenance control measures will be developed, and records kept in accordance with the SWMP. During the construction phase, field testing and laboratory analysis of a range of parameters will be undertaken at adjacent watercourses, specifically following heavy rainfall events (i.e., weekly, monthly and event based as appropriate).

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			One HDD crossing is proposed on the GCR. HDD is a trenchless method to remove direct impact to watercourses/drains however a number of control measures are proposed to ensure there are no significant effects from the HDD. Mitigation measures applicable to HDD include: • A competent and experienced Contractor will be appointed to undertake the HDD works; • The Contractor will prepare a HDD Method Statement using industry best practice and relevant guidance to inform the optimal methodology for the works. The Method Statement will include biosecurity controls and an incident response plan for any potential frac-out; • The Contractor will undertake the directional drilling in accordance with industry best practice including British Standard EN 16191:2014 Tunnelling machinery, safety requirements and CIRIA C648 'Control of water pollution from linear construction projects Technical Guidance' (CIRIA, 2006a); • The contractor will ensure that all personnel working on site are trained in pollution incident control response. A regular review of weather forecasts of heavy rainfall is required to avoid works in very wet conditions. The Contractor will be required to prepare a response plan in advance of the works commencing; • Weather conditions will be considered when planning construction activities to minimise the risk of runoff from site, no works will be scheduled when an orange or red weather warning is in place; • There will be no storage of fuels/drilling fluid within 30 m of a watercourse;	

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			• Provision of exclusion zones and barriers (sand bags and silt fences) between any excavated material and any surface water features will be installed to prevent sediment washing into the receiving water environment. Silt fences will be installed and the contractor will ensure that silt fences are regularly inspected and maintained during the construction phase; • Clay (Bentonite) based drilling fluids will not be used; instead, inert food-grade, biodegradable drilling fluids will only be used for these works. The drill profile will achieve a minimum 1.5 m depth beneath the riverbed. • To prevent loss of drilling fluids or 'frac-out' from occurring, a series of actions and controls will be implemented; the drill fluids operator will monitor drill fluid density, viscosity and solids content on an ongoing basis, to ensure that the fluid does not increase in viscosity, requiring additional pressure to maintain mobility; • Viscometers will be used to measure drill fluid gel strength and shear strength. Filtrate can also be measured to calculate the amount of filter cake building up on the internal wall of the bore. Any increases in pump pressure experienced by the drill operator will be investigated immediately to prevent the risk of pressure build up within the annulus. In some circumstances, depending on the drilling equipment used, the pilot drill borehole assembly will be fitted with a down hole pressure monitor to measure pressure in the annulus between the drill and the bore wall. This will give an early indication of pressure build up in the hole and allow the drill operator to prevent a 'frac-out'. If there is a risk of a	

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			'frac-out' a number of measures will be implemented including: ○ pumping a high viscous drilling fluid with a higher density to the risk zone; and ○ circulate and pump loss circulation material (typically cork or manufactured inert polymers) to the risk zone to seal the risk zone, grouting of the risk zone, and, or launch a packer before the risk zone. • Reception pits will be situated outside of the riparian zone. A buffer zone width of 30 m or greater will be maintained from the drainage channel; • The contractor will implement procedures to maximise the recirculation or reuse of drilling fluid to minimise waste disposal; • Disposal of drilling fluids will be the responsibility of the contractor to an approved and licenced waste facility; • Monitoring of the drilling operations will be undertaken at all times by the contractor under the supervision of an Ecological Clerk of Works (ECoW) with stop works authority. The monitoring will include visual inspection of the pits and monitoring of the volume of returns flowing back to the entry pit. The monitoring personnel will be in constant communication with the drilling rig operator and thus will be able to immediately cease drilling if necessary; and • As part of the SWMP, pre-Construction and construction phase baseline water quality monitoring will be undertaken.	

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			With regard to the Shancloon stream crossing, instream works will be scheduled during periods of low flow and undertaken within the appropriate fisheries working window, as set out in IFI (2016)[3] guidance document "Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites", Prior to commencement of the Shancloon stream crossing works, appropriate sediment and erosion control measures, including geotextile silt curtains, straw bales, silt fences or equivalent filtration measures, will be installed downstream of the works area, to minimise the release of suspended solids and to protect downstream water quality. The Shancloon Stream is a historically straightened, heavily modified watercourse characterised by a U-shaped channel. Owing to its small catchment area and limited contributing flows, the watercourse exhibited semi-dry conditions in summer period including the August 2026 aquatic survey, with only isolated standing pools present and no observable flow. To facilitate the crossing works, temporary upstream and downstream dams will be installed using sandbags and water-filled dams, and flume pipe(s) will be placed to convey all stream flows around the work area. Once the diversion system is operational, the existing culvert will be removed and the crossing works undertaken within the isolated section of channel. Any residual water within the work area will be directed to a temporary sump and removed by pumping. Where ground	

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			conditions are suitable, water will be discharged to a vegetated infiltration area. Where infiltration is not feasible due to saturated ground conditions, water will first be directed through an appropriately sized settlement tank prior to discharge. This will ensure that suspended sediments are removed before any water leaves the work area. Installation of the cable ducting will then be undertaken within the isolated and dewatered section of channel. On completion of the works, the stream bed, banks and culvert crossing will be reinstated to their original profile and condition, the temporary diversion structures will be removed, and natural surface water flows will be restored. All disturbed areas will be stabilised as soon as practicable to minimise the potential for erosion and sediment mobilisation.	
MM25	Alteration of Groundwater Flow	EIAR Chapter 9	Based on the site investigation data, no significant dewatering would be required at the borrow pit or turbine locations; however, minor inflows may occur in the proposed excavations. Groundwater encountered will be managed and treated in accordance with CIRIA C750, 'Groundwater control: design and practice' (CIRIA, 2016). Groundwater from the borrow pit will be treated initially in a proprietary settlement tank and in the settlement ponds with overland flow towards the surface water network, see Drawing 11981-2040 to 11981-2044. An infiltration basin following the settlement ponds will be utilised to manage storm water runoff from hardstanding. The construction of soakaway chambers and filter drains to disperse surface water in a controlled manner. In addition,	The dewatering operations will be inspected each day when dewatering water is ongoing to ensure that dewatering treatment controls are working correctly; to evaluate whether there are observable indicators of sediment discharges; Where any issues are encountered, action will be undertaken to correct any problems at the proposed project or with the dewatering controls that may have contributed to the discharges. Regular inspections of the infiltration basins will be undertaken to ensure no direct discharge to groundwater. Regular monitoring of groundwater (levels and quality) will take place using the monitoring boreholes installed

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			the proposed site layout would include an infiltration basin which would be used for control of any surface water runoff. In accordance with NRA 2015 guidance (Road Drainage and the Environment)[5] , where rock is shallow (<2m), the soakaway design would include a minimum of 1m of engineered material (1 x 10-7 permeability) across the base of the basin. While the guidance is for higher risk road construction scheme, the guidance will be applied to the proposed wind farm. The base of an infiltration basin will have a slope of <1% to allow infiltration throughout the entire basin. Side slopes will be <1/3 to prevent erosion of the sides of the basin. The outfall from the settlement will discharge to a filter strip to provide additional water quality treatment.	onsite and any available well data immediately downstream of turbines during the construction phase.
MM26	Alteration of Groundwater Quality	EIAR Chapter 9	If groundwater is encountered during excavation works, water pumped from excavations will be treated to remove sediment by the use of silt bags. Silt bags will be managed and monitored to ensure no breakthrough or bypass. Water will discharge from the silt bags into settlement ponds and the SuDS network. During the construction phase, all works associated with the construction of the GCR will be undertaken in accordance with the guidance contained within CIRIA Document C811 'Environmental Good Practice on Site' (CIRIA, 2023). Groundwater pumped from excavations will be treated to remove silt by the use of silt bags. When undertaking HDD works, turbidity monitoring will be undertaken.	
Material Assets				

[5] NRA (2015) DN-DNG-03065 - Road Drainage and the Environment

Ref No.	Related to	Location	Mitigation Measure	Monitoring
MM27	Aviation	EIAR Chapter 11	The following standard practices will be undertaken: • An aeronautical warning light scheme will be agreed with the IAA and Irish Air Corps; • The final as-constructed coordinates and dimensions of each turbine be mapped and provided to Mayo County Council and other stakeholders, including the IAA and Irish Air Corps prior to erection of turbines to ensure that maps and databases are up-to-date for flight navigation; and • 30 days' notice will be given to the IAA prior to any crane operations commencing during the construction phase.	As required by the Contractor's CEMP.
MM28	Telecommunications	EIAR Chapter 11	In order to ensure there are no issues with construction, all telecommunication operators will be contacted in advance of construction to check that they have no new links in operation at that time. Prior to construction, Ground Penetrating Radar (GPR) surveys will be undertaken to accurately locate existing underground infrastructure. In the unlikely event that a communication underground cable or link is damaged or interfered with during construction, the operator will be contacted to agree to arrange a repair which will be carried out as soon as possible at the developers' cost.	As agreed with the relevant Operators / 2RN.
			The developer will sign an agreement with 2RN prior to construction to commit to restoring service to any end users that may have their service disrupted as a result of the proposed project. This is standard industry practice and will eliminate any potential effects in this regard.	As agreed with 2RN.

Ref No.	Related to	Location	Mitigation Measure	Monitoring
MM29	Waste Management (inc. wastewater)	EIAR Chapter 11	Best practice waste management practices will be employed. Segregation of waste will be carried out to maximise the potential for waste recycling and minimise potential effect on waste services. Suitably permitted commercial waste collectors will be employed to remove any waste arisings generated from construction to the nearest appropriately licensed waste management facilities.	As required by the Contractor's CEMP.
			During the construction phase, wastewater from the staff welfare facilities will be managed by means of a sealed storage tank, with all wastewater being tankered off-site occasionally (as required) by a permitted waste collector to a wastewater treatment plant. The permitted waste collector will also be responsible for ensuring clean water storage tanks are topped up. The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying. Low volume flush toilets (such as those in commonly used port-a- loos) and low volume sink faucets will be used to significantly reduce the volume of wastewater produced. In addition, the number of staff is likely to fluctuate rather than being constantly at 60 people per day, thereby reducing the volume of wastewater produced.	
Noise & Vibration				
MM30	Noise and Vibration Best Practice	EIAR Chapter 12	The contract documents will specify that the Contractor undertaking the construction works will be obliged to adopt best practice noise abatement measures contained in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise and BS 5228-2:2009+A1:2014 Code of practice for	As required by the Contractor's CEMP.

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			noise and vibration control on construction and open sites – Vibration. To ameliorate any potential noise effects that may present during the construction phase, a schedule of noise control measures has been formulated in accordance with best practice guidance, and the contract documents will require the Contractor to implement these measures. These are outlined in the Construction and Environmental Management Plan (CEMP) that has been prepared for the proposed project (see Appendix 2-3, EIAR Volume III). For blasting associated with borrow pits, the guidance documents discussed in BS 5228-2:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration and The Transport Infrastructure Ireland (TII) (formerly National Roads Authority (NRA)) publication Guidelines for the Treatment of Noise and Vibration in National Road Schemes (2004) contain appropriate criteria for blasting activities and a detailed assessment will be undertaken by a specialist blast design engineer to determine the blast design parameters. Recommendations contained within BS 5228: Part 1 and the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations 1988 will be implemented in relation to blasting operations.	
Air Quality				
MM31	Air Quality – Communications	EIAR Chapter 14	An Environmental Manager (EM) will be in assigned by the appointed contractor. The EM will be responsible for co-ordinating the day-to-day management of environmental	• To determine if any short-term dust impacts will occur, a minimum of daily visual inspections for dust soiling of receptors (including roads, and surfaces

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			impacts during the Construction Phase. The EM will be responsible for performing inspections as deemed necessary and manage responses to environmental incidents. The name and contact details of the EM will be responsible for construction dust management and air quality issues will be displayed at the construction compound/site boundary hoarding, as well as head/regional office contact details. A complaints register will be kept by the appointed contractor detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out.	such as street furniture, cars and windowsills) adjoining the construction works areas will be undertaken. Inspection results will be recorded in the site inspection log. Cleaning will be provided, if necessary, such as in the event of a dust complaint resulting from the proposed project construction works. • The potential for dust generation increases when rainfall is less than 0.2 mm / day and at wind speeds of greater than 10 m/s. To determine if these conditions are likely to affect the site, the weather forecast will be consulted daily, specifically the hourly forecasts for wind speeds as well as 12-hour rainfall radar showing anticipated amounts of precipitation in mm. • The frequency of site inspections by the EM responsible for dust management will be increased to a minimum of twice daily during the above conditions. The effectiveness of dust control methods will be monitored via visual inspections and work that would generate dust (e.g. moving materials from stockpiles or transferring loose dry materials from trucks) will be limited in so far as is practicable during these weather conditions.
MM32	Construction Works Area Management	EIAR Chapter 14	• Construction compounds will be laid out so that machinery and dust causing activities such as stockpiles are located away from receptors, as far as is practicable. • The appointed contractor will provide a site hoarding of 2.4 m height at a minimum at construction compounds, which will assist in minimising the potential for dust impacts off-site. Construction works area fencing,	As required by the Contractor's CEMP.

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			barriers and scaffolding will be kept clean using wet methods. • Stockpiles will be covered to prevent wind whipping. • Earthworks and exposed areas/soil stockpiles will be re-vegetated to stabilise surfaces as soon as practicable. • Any chutes and conveyors will be enclosed and skips will be covered. • Drop heights from any conveyors, loading shovels, hoppers and other loading or handling equipment will be minimised. Fine water sprays will be used on such equipment where visible dust plumes are generated. • Cutting, grinding or sawing equipment will be fitted with or used in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. • Equipment will be readily available in the construction works areas site to clean any dry spillages. Spillages will be cleaned up as soon as reasonably practicable after the event using wet cleaning methods. • A water bowser will be used to spray work areas (hardstands and access tracks and grid connection route) and haul roads, especially during periods of excavations works coinciding with dry periods of weather. • An adequate water supply for effective dust or particulate matter suppression and mitigation will be ensured, and non-potable water will be used where possible and appropriate. Construction works area runoff of water or mud will be managed as per the Surface Water Management Plan (SWMP, Appendix 2-6) and Chapter 9 Hydrology and Hydrogeology.	

Ref No.	Related to	Location	Mitigation Measure	Monitoring
MM33	Operating Vehicles / Machinery	EIAR Chapter 14	• Engines of all vehicles will be switched off engines when stationary - idling vehicles are not permitted; • The use of diesel- or petrol-powered generators will be avoided, and mains electricity or battery powered equipment will be used where practicable; and,	As required by the Contractor's CEMP.
MM34	Earthworks Activities	EIAR Chapter 14	• Materials with the potential to produce dust, such as excavated material, will be removed from the construction works area as soon as possible, unless being re-used within the construction works area. Management of extracted material is detailed in the Construction and Demolition Resource and Waste Management Plan (CEMP, Appendix 2-2). • Areas exposed by earthworks will be re-vegetated to stabilise surfaces as soon as practicable. Hessian, mulches or trackifiers will be used where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. Cover will only be removed in small areas during work and not all at once. • During dry and windy periods and when there is a likelihood of dust nuisance (defined under "Monitoring" measures below), water-based dust suppression (e.g. bowser) will operate to ensure soil moisture content is high enough to increase the stability of the soil and thus suppress dust. • For areas of earthworks that are within 50m of Cloughmoyne SAC, dust screen barriers will be used between activities and the SAC edge to ensure that where minimal dust is generated despite the other mitigation measures for earthworks, this will be prevented from blowing onto the SAC.	As required by the Contractor's CEMP.

Ref No.	Related to	Location	Mitigation Measure	Monitoring
MM35	Construction Activities	EIAR Chapter 14	• Sand and other aggregates will be stored in bunded areas and will not be allowed to dry out, unless this is required for a particular process. • Smaller supplies of fine power materials bags will be sealed after use and stored appropriately to prevent dust escaping.	As required by the Contractor's CEMP.
MM36	Measures specific to trackout (transport of dust and dirt from the construction works areas onto the public road network)	EIAR Chapter 14	• A speed restriction of 25 kph will be applied as an effective control measure for dust for on-site vehicles. • Vehicles transporting loose materials (e.g. spoil or sand) entering and leaving the proposed project works areas and construction compounds will be covered with tarpaulin to prevent escape of materials during transport. Before entrance onto public roads, trucks will be checked to ensure the tarpaulins are properly in place. • Where construction work area or construction compound conditions result in large amounts of mud building up on truck wheels, wheel washing will be carried out for trucks before they use the public road network. • Water-assisted dust sweeper(s) will be used at the access points to a construction compound and the immediate adjoining local road, to remove, as necessary, any material tracked out of the compound. • Any on-site haul routes will be inspected for integrity and necessary repairs to the surface will be carried out as soon as reasonably practicable.	As required by the Contractor's CEMP.
Climate				
MM37	Construction Activities	EIAR Chapter 15	Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. During the construction phase the	As required by the Contractor's CEMP.

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			following best practice measures shall be implemented on site to prevent significant GHG emissions and reduce impacts to climate and are further detailed in the CEMP (Appendix 2-2): • Appointing a suitably competent contractor who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled; • The replacement, where feasible, of standard concrete containing Portland cement concrete with an alternative concrete mix with lower associated embodied carbon, as per the Climate Action Plan. This will be a minimum of 30% GGBS replacement, or concrete with equivalent or lower associated embodied carbon; • Procurement contracts will ensure that material choices with lower associated embodied carbon relative to standard construction materials are considered favourable during tender; • Materials will be reused on site where possible; • Prevention of on-site or delivery vehicles from leaving engines idling, when not in use, even over short periods; • Ensure all plant and machinery are well maintained and inspected regularly; • Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the GHG emissions associated with the site; • Where practicable, opportunities for materials reuse will be incorporated within the extent of the proposed project including the use of reclaimed asphalt and recycled aggregate, which will reduce the virgin material needs;	

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			• Sourcing materials (aggregates, concrete and steel) locally where possible to reduce transport related CO_2 emissions; • Bare soil areas will be minimised in extent and duration. Temporary soil stockpiles will be covered or seeded to minimise run-off. All landscape areas, including temporary compound areas, will be reinstated; • Use of EV's during construction, where feasible; • Use of HVO during construction, where feasible; • Use of mains electricity or batteries during construction of the 110 kV substation; • Backloading of HGVs to reduce transport emissions; and • Use of geogrids in paved areas.	
Cultural Heritage				
MM38	Archaeological Monitoring Along Townland Boundaries	EIAR Chapter 16	Archaeological Monitoring	All interventions that are required along townland boundaries, as part of the construction of the Proposed wind farm, will be subject to archaeological monitoring, and will include a full record of the sections of townland boundaries that are removed. This work will be carried out under licence to the National Monuments Service of the DoHLGH.
MM39	Archaeological Monitoring Where the Proposed GCR Passes Recorded Monuments	EIAR Chapter 16	Archaeological Monitoring	The three areas where the proposed GCR passes recorded monuments will each be monitored. All three of these areas are located within the existing roads network. This work will be carried out under licence to the National Monuments Service of the DoHLGH.
Traffic and Transportation				
MM40	Traffic Management Plan (TMP)	EIAR Chapter 17	A comprehensive Traffic Management Plan (TMP) has been prepared and is provided in Appendix 17-1. The mitigation measures outlined in that and below will be implemented	As required through the TMP and CEMP

Ref No.	Related to	Location	Mitigation Measure	Monitoring
		Appendix 17-1 Appendix 2-2	during the construction phase of the Proposed Development and will be incorporated into the Construction Environmental Management Plan (CEMP) (Appendix 2-2) and TMP.	
MM41	Proposed Wind Farm Mitigation Measures	EIAR Chapter 17	The following measures will be implemented to minimise construction traffic effects associated with the wind farm infrastructure: • Sufficient advance warning signage shall be provided in advance of all site entrances on the R334 and L2104 and maintained for the duration of the construction phase. • HGV movements shall, where practicable, be scheduled to avoid peak traffic periods and school opening and closing times. • Loading and unloading of deliveries shall be undertaken within designated areas inside the site compound to avoid obstruction of the public road network. • Access for residents, agricultural traffic, businesses and emergency services shall be maintained throughout the construction phase, where practicable. • Wheel wash facilities shall be provided at site exits, where required, to minimise the transfer of mud and debris onto public roads. • Public roads in the vicinity of the site shall be inspected regularly and cleaned, where necessary, to maintain road safety and cleanliness. • Adequate barriers, signage, cones and warning systems shall be provided around temporary works areas and excavations in accordance with relevant health and safety requirements.	

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			• Pre-construction and post-construction condition surveys shall be undertaken along approved haul routes, including public roads, bridges and associated infrastructure. • Any damage attributable to construction activities shall be repaired and reinstated following agreement with the relevant Roads Authority.	
MM42	Proposed Turbine Delivery Route (TDR) Mitigation Measures	EIAR Chapter 17	The following measures will be implemented in relation to turbine component deliveries and AILs: • Temporary traffic management measures, including stop/go systems, temporary traffic signals, escort vehicles and traffic marshals, shall be implemented where required. • Temporary lane closures, road closures and traffic diversions shall be agreed in advance with the relevant Roads Authority and An Garda Síochána. • Abnormal load deliveries shall be managed in accordance with agreed delivery protocols and permit requirements. • Where sufficient road width is available, stop/go arrangements shall be utilised to minimise the requirement for road closures. • Advance notification of abnormal load movements shall be provided to relevant stakeholders, road authorities and emergency services, where required.	
MM43	Proposed Grid Connection Route (GCR) Mitigation Measures	EIAR Chapter 17	The following measures will be implemented during construction of the grid connection (including 110 kV substation and all underground cables) infrastructure: • All road opening works shall be undertaken in accordance with the Guidelines for Managing Openings in Public Roads (Purple Book) and any relevant road opening licence requirements.	

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			• All permits, licences and approvals required for works affecting the public road network shall be obtained prior to commencement of the relevant works. • Traffic management measures shall be implemented at all locations where works have the potential to affect public roads. • Temporary traffic management and reinstatement measures shall be undertaken in consultation with the relevant Roads Authorities. The mitigation measures outlined above have been assessed as part of this EIAR and will be implemented through the CEMP (Appendix 2-2) and the TMP (Appendix 17-1) for the duration of the construction phase. A Construction & Environmental Management Plan is included in Appendix 2-2 which also details the mitigation measures that will be implemented during the construction phase. Pre and post construction pavement and bridge surveys will be carried out to determine any road deterioration that needs to be rectified. This will be agreed with the Planning Authority prior to construction and where damage is caused by the works road surfaces will be repaired and reinstated.	
MM44	Areas where excavations are being carried out	Appendix 17-1 (TMP)	• Provide adequate protection in the form of barriers. • This should be supplemented by use of warning tape and/ or cones to prevent any pedestrians from falling into excavated areas.	As required through the TMP
MM45	High risk areas (Eg. LPG, Fuel, Gas, Electrical)	Appendix 17-1 (TMP)	• Provide appropriate signage around high-risk areas	

Ref No.	Related to	Location	Mitigation Measure	Monitoring
MM46	Pedestrian safety throughout the site	Appendix 17-1 (TMP)	• Provision of pedestrian pathways. • Pedestrians to wear high-vis vests and other relevant PPE. • Required training for machine operators and vehicle drivers. • Clearly defined traffic routes. • Designated parking areas for site personnel. • Proper maintenance of vehicles and equipment. - Ensure site is well lit. • Ensure site is clear of any trip hazards which could cause harm to pedestrians. • Ensure that when the turbine blade reaches the site there are no interferences with pedestrians and the blade.	
MM47	Collisions at the site entrance/exit	Appendix 17-1 (TMP)	• Ensure adequate spacing is provided • Ensure sufficient traffic control is put in place both on site, on the R334 and on the L2104 when required.	
MM48	Speeding on site	Appendix 17-1 (TMP)	• Provide relevant speed limit signage. • Provide ramps if deemed necessary.	
MM49	Emergencies	Appendix 17-1 (TMP)	• Staff trained for emergency situations. • Designated area for emergency services. • Ensure emergency area parking is unobstructed at all times	
MM50	Potential visitor injury	Appendix 17-1 (TMP)	• Visitors should be accompanied at all times on site. • Visitors should sign in upon entry and be briefed on the site.	
MM51	Delivery Driver Collision	Appendix 17-1 (TMP)	• Delivery drivers to be instructed upon entry. • A safe route for delivery drivers should be provided on site including the appropriate signage.	

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			• Loading and unloading are carried out in a designated area on site. • Adequate space to be provided at the site entrance for delivery drivers.	
MM52	Reversing Vehicles and machinery	Appendix 17-1 (TMP)	• Vehicles and machinery to be equipped with the appropriate audio and visual devices where required.	
MM53	Poorly lit areas around the site	Appendix 17-1 (TMP)	• Ensure that the site is well lit throughout the site for the duration of working hours.	
Operational Phase				
Description of Proposed Project				
MM54	Operational Health and Safety	EIAR Chapter 2	Access to the turbines is through a door at the base of the structure, which will be locked at all times outside maintenance visits.	As required through the project Operational Management Plan / Health and Safety Plan.
			Signs will be erected at suitable locations across the site as required for the ease and safety of operation of the wind farm. Further details are provided in the CEMP (Appendix 2-2 of the EIAR).	As required through the project Operational Management Plan / Health and Safety Plan.
			The components of a wind turbine are anticipated to have a useful lifespan of 35 years or more and are equipped with a number of safety devices to ensure safe operation during their lifetime. During the operation of the wind farm regular maintenance of the turbines will be carried out by the turbine manufacturer or appointed service company. A project or task specific Health and Safety Plan will be developed for these works in accordance with the site's health and safety requirements.	As required through the project Operational Management Plan / Health and Safety Plan.
Biodiversity				
MM55	Bats	EIAR Chapter 6	Existing roost features and associated habitat will be retained and protected. Bat buffers will be maintained	Post-construction bat activity monitoring shall be undertaken during operational Years 1, 2 and 3 to assess

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			around turbines, and habitat management measures implemented to reduce collision risk. A targeted smart curtailment strategy will be applied to turbines T1, T5, T8, T12 and T13 during suitable weather conditions within the bat activity season (May to October, inclusive). Lighting will be designed to minimise disturbance to bats and key commuting features.	bat activity levels, turbine-specific activity patterns and the effectiveness of mitigation measures, including curtailment and habitat management. Post-construction mortality monitoring shall be undertaken during operational Years 1, 2 and 3, and subsequently during Years 5, 10, 15 and 25, to assess collision and barotrauma mortality and to inform adaptive management measures where required. (see Chapter 6 of the EIAR)
Ornithology				
MM56	Operational Monitoring	EIAR Chapter 7	A Bird Monitoring Plan shall be agreed with the Planning Authority and NPWS prior to operation. Ornithological monitoring shall be undertaken during operational Years 1, 2, 3 and 5 and shall include collision monitoring (carcass searches), vantage point surveys, winter walkover surveys and nocturnal goose surveys as specified within Chapter 7. Monitoring results shall be reviewed with NPWS to confirm predicted collision risk, displacement and barrier effects and to identify any unforeseen impacts requiring adaptive management.	Ornithological monitoring shall be undertaken during operational Years 1, 2, 3 and 5 in accordance with Chapter 7 to verify predicted collision risk, displacement and barrier effects, and to identify any unforeseen impacts requiring adaptive management (see Chapter 7 of the EIAR).
Land, Soils and Geology				
MM57	Contamination	EIAR Chapter 8 and Chapter 6	• Fuel and oil storage and handling requirements will be as detailed for construction, with permanent fuel and oil storage located within permanent covered bunds. Regular ecological inspections will be conducted to ensure no invasive species are present – See Chapter 6. • Welfare facilities will be provided at the substation location. These welfare facilities will produce foul effluent, and these effluents will be stored in a holding	As required by the Contractor's CEMP.

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			tank prior to removal to an approved treatment facility. These wastewater treatment systems and bunds shall be subject to inspection and maintained as required, with effluent removed by a licenced contractor as required.	
MM58	Geohazards	EIAR Chapter 8 and CEMP	No significant effects were identified in Section 8.5.3 of Chapter 8 and therefore no additional mitigation measures are required.	Monitoring will consist of regular inspection of drains to prevent blockages and inspections of specific areas after significant rainfall events, as per the CEMP.
Hydrology and Hydrogeology				
MM59	Alterations to Surface Water Quality	EIAR Chapter 9	No additional mitigation over and above what is stated in Chapter 2 is required during operational phase.	Regular bund testing will be undertaken along with inspections of the SuDS infrastructure. Monitoring of swales (visually) will be undertaken to ensure check dams and silt entrapment measures are effective and operating to specification.
Shadow Flicker				
MM60	Turbine Shutdown	EIAR Chapter 10	Shadow Flicker Control System: Shadow flicker control systems, consisting of light sensors and specialised software, will be installed on each of the wind turbines. The control system will calculate, in real-time: • Whether shadow flicker has the potential to effect nearby sensitive receptors, based on pre-programmed co-ordinates for the sensitive receptors and turbines; • Wind speed (can affect how fast the turbine will turn and how quickly the flicker will occur); • Wind direction; and • The intensity of the sunlight.	As required through the Shadow Flicker Control System.

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			When the control system detects that the sunlight is strong enough to cast a shadow, and the shadow falls on a sensitive receptor or sensitive receptors, then the turbine will automatically shut down; and will restart when the potential for shadow flicker ceases at the effected sensitive receptors. The atmospheric variables that determine whether shadow flicker will occur or not, will be continuously monitored at the wind farm site and the data fed into the wind farm's SCADA control system. The strength of direct sunlight is measured by way of photocells, and if the sunlight is of sufficient strength to cast a shadow, the shadow flicker control mechanisms come into effect. Wind speed and direction are measured by anemometers and wind vanes on each turbine and on the wind farm's met mast, and if wind speed and direction is such that a shadow will be cast, the shadow flicker control mechanisms come into effect. The moving blades of the turbine will require a short period of time to cease rotating and as such there may be a very short period (less than 60 seconds (depending on site specific wind conditions)) during which the blades are slowed to a complete halt. The proposed method of mitigation will be implemented to mitigate shadow flicker effects at all sensitive receptors within the study area, allowing for a short period of time for the rotor to come to a stop. Appendix 10-1 of the EIAR contains all calculated potential shadow flicker periods for each turbine. The relevant data will be input into the turbine control software. In the event that complaints of shadow flicker are received by the Applicant / site operator or by the local authority, the Applicant will conduct an investigation and the complaints frequency, duration and time of	

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			complaints will be considered and specialist modelling software will be used to confirm the occurrence(s). Should the complaint persist, a shadow flicker survey involving the collection of light data will also be carried out at the sensitive receptor in which the complaint was made. Further refinement of the shadow control system will be conducted to mitigate adverse shadow flicker occurrence.	
Material Assets				
MM61	Aviation	EIAR Chapter 11	Standard aviation safeguarding measures will be implemented. The details of any aviation lighting requirements will be agreed with the relevant aviation stakeholders, including the IAA and, where required, the Department of Defence/Irish Air Corps. This will ensure that the proposed project is appropriately identified as an aviation obstacle. The final turbine locations and dimensions will be provided to the relevant authorities to facilitate updates to aeronautical charts, obstacle datasets and navigation systems.	As required by the Contractor's CEMP.
MM62	Telecommunications	EIAR Chapter 11	Where potential effects on telecommunications infrastructure were identified, mitigation measures have been developed in consultation with the relevant network operators. These measures include operator agreements, implementation of protocol arrangements where appropriate, and modification or relocation of affected telecommunications infrastructure where required. The details of such mitigation would be confirmed prior to construction by ongoing consultation with the telecom	As required by the Contractor's CEMP.

Ref No.	Related to	Location	Mitigation Measure	Monitoring
			operators. Further details are provided in Appendices 11-1 and 11-2 of the EIAR.	
			The Applicant have committed to sign an agreement with 2RN prior to construction to commit to restoring service to any end users that may have their service disrupted as a result of the proposed project. This is standard industry practice and will eliminate any potential effects in this regard.	As agreed with 2RN.
Noise and Vibration				
MM63	Wind Turbine Noise	EIAR Chapter 12	Mitigation in the form of turbine curtailment can ensure that the residual turbine noise levels will be within the turbine noise criteria in specific wind conditions (i.e., wind speed and direction). To address the potential exceedances predicted, the Vestas V136 turbine in this assessment can be programmed to operate in low noise modes for specific wind speed bins and periods. The V136 turbines can be configured for up to 3 different operating modes (SO11, SO12 and SO13) and all modern wind turbines will have similar controls to reduce the noise emission of the turbine in certain conditions. For any turbine curtailment strategy that is developed, consideration must be given to the practical benefits. Such curtailment may unnecessarily reduce the electrical power generating capacity of a wind farm, for an imperceptible change to the overall turbine noise levels. When curtailing for exceedance of the night-time criterion consideration should be given to the background noise at the specific NSL to avoid unnecessarily curtailing turbine noise when the	**Noise Compliance Monitoring Programme** Noise Compliance Monitoring refers to testing the wind turbine noise levels due to the Proposed Project against the planning conditions, in terms of overall noise levels. Prior to the commissioning of the project, the developer will submit a Noise Compliance Monitoring Programme (NCMP) to the planning authority for written agreement. The NCMP will include a detailed methodology for noise measurements, procedures for recording results and locations at which noise is to be monitored. The NCMP will include both commissioning noise surveys to test compliance with the noise levels in the planning condition, and also a Complaint Management Protocol with a clear path to address any noise complaint. Under the NCMP, compliance noise surveys will be undertaken to verify compliance with any noise conditions applied to the development. Surveys will

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			result would yield an imperceptible change to the overall turbine noise levels. The principles outlined in this section for addressing potential exceedances at a limited range of operational wind speeds and directions will be applied to all turbines considered in this assessment, if required, to ensure compliance with noise limits With curtailment in place the operation of proposed project will be within the proposed turbine noise limits at all locations. This would be controlled in practice through a planning condition imposing noise limits on operational noise from the wind turbines at neighbouring residential properties, in line with the noise criteria outlined in Chapter 12 section 12.5.2 and/or the relevant operational criteria associated with the grant of planning for the proposed project.	commence within six months of a wind farm being commissioned. The guidance outlined in the IOA GPG and Supplementary Guidance Note 5: Post Completion Measurements (July 2014) will be complied with. In the unlikely event that an exceedance of the noise criteria is identified as part of the commissioning assessment, detailed mitigation strategy will be followed in the form of curtailment. Following the implementation of the measures, the commissioning noise survey will be repeated. **Noise Complaint Management Protocol** In the event of a noise-related complaint associated with the operation of the Proposed Project, the Operator will fully investigate the complaint in accordance with the agreed NCMP. In the event of a complaint associated with noise tonality or amplitude modulation associated with the proposed project, the operator will fully investigate the complaint in accordance with the agreed NCMP. A Noise Complaint Management Protocol for addressing amplitude modulation and tonality is presented in Appendix 12-7. A final version of this protocol will be contained within the NCMP to be agreed the relevant Local Authority.
MM64	Amplitude Modulation and Tonality	EIAR Chapter 12 Appendix 12-7	In the event that a complaint which indicates potential excessive amplitude modulation (AM) associated with the proposed project, the operator will fully investigate the complaint in collaboration with the turbine manufacturer, through review of the meteorological periods and conditions during which the reported AM occurs. If an ongoing issue with excessive AM is identified, a mitigation strategy to reduce the level of AM will be implemented through engineering methods and/or curtailment of specific turbines. The operator may appoint a qualified acoustic consultant to objectively assess the level of AM in	

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			accordance with the methods outlined in the IOA AMWG or subsequent revisions. The measurement method outlined in the IOA AMWG document, known as the 'Reference Method', will provide a robust and reliable indicator of AM and yield important objective information on the frequency and duration of occurrence, which can be used to evaluate different operational conditions including methods to mitigate any excessive AM. These mitigation measures, if required, will consist of the implementation of operational controls for the relevant turbine type, which will include turbine curtailment under specific operational conditions and may in very unlikely circumstance require turning specific turbine off under certain conditions to minimise adverse impacts from excessive AM associated with the proposed project. If the complaints suggest the potential occurrence of clearly audible tonality in the wind turbine noise, the audibility of the tones will be investigated from measured data with a robust, objective method such as that included in ISO 1996-2:2017 with modifications in IEC 61400-11-2. If the rated level of the wind farm is above the limit, then the operator would liaise with the turbine manufacturer to investigate and implement measures to reduce the rated level to below the limit. This may involve engineering methods, operational changes and/or (in very unlikely circumstance) curtailment of specific turbines. The commitment outlined to control amplitude modulation (AM) from wind turbines are considered best practice. The proposed approach will ensure that any adverse impacts from excessive amplitude modulation (AM) associated with	

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			the operation of the proposed project are effectively managed by the operator.	
Air Quality				
MM65	Maintenance Associated with the Wind Farm Components	EIAR Chapter 14	During the operational phase of the proposed project, the works onsite will be limited to maintenance associated with the wind farm components. Although the intensity of activity will be only a small fraction of the construction phase, all employees and contractors that are on site will ensure that machinery used is properly maintained and is switched off when not in use to avoid unnecessary exhaust emissions from maintenance traffic.	None
Decommissioning Phase				
Land, Soils and Geology				
MM66	Decommissioning activities	EIAR Chapter 8	A fuel management plan to avoid contamination by fuel leakage during decommissioning works will be implemented as per the construction phase mitigation measures.	As required by the agreed decommissioning plan / mitigation measures agreed at the time of decommissioning.
Hydrology and Hydrogeology				
MM67	Decommissioning activities	EIAR Chapter 9	Decommissioning of the proposed project will involve the disassembly and removal of the turbines offsite. The potential effects have been assessed as similar to the construction phase and, therefore, the mitigation measures for the construction phase will also be implemented during decommissioning. Turbine hardstands will be covered over with soil and allowed to vegetate. It is not proposed to restore all hardstanding areas after decommissioning. The risks associated with leaving tracks and infrastructural components in situ are low. Therefore, no likely significant effects will occur based on the proposed decommissioning.	As required by the agreed decommissioning plan / mitigation measures agreed at the time of decommissioning.

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MM68	Alteration of Surface Water Flow	EIAR Chapter 9	SuDS measures will remain in place during the decommissioning period.	
MM69	Alteration of Surface Water Quality	EIAR Chapter 9	Mitigation measures applied during decommissioning activities will be similar to those applied during construction where relevant. Some of the effects will be avoided by leaving elements of the proposed wind farm site and GCR in place.	
Material Assets				
MM70	Material Assets: Decommissioning activities	EIAR Chapter 11	During decommissioning, the activities required to facilitate wind turbine decommissioning and removal from site will be similar to those outlined for the construction phase, albeit in reverse to a lesser extent and duration than during the construction stage. The onsite substation and grid connection will remain part of the national network. Mitigation measures proposed for the decommissioning phase will include liaising with telecommunication providers to check if any new links are in the area which could potentially be obstructed by works and best practice waste management practices will continue to be employed.	As required by the agreed decommissioning plan / mitigation measures agreed at the time of decommissioning.
Noise and Vibration				
MM71	Noise and Vibration	EIAR Chapter 12	Prior to the decommissioning phase, a decommissioning plan will be agreed with the local authority and implemented by the contractor during the works.	As required by the agreed decommissioning plan / mitigation measures agreed at the time of decommissioning.
Air Quality				
MM72	Air Quality: Decommissioning activities	EIAR Chapter 14	As the dust emissions during the decommissioning phase are expected to be of a similar or lesser magnitude to those identified during the construction phase, the mitigation measures applicable to construction phase dust emissions are also considered suitable for those during the decommissioning phase where applicable.	As required by the agreed decommissioning plan / mitigation measures agreed at the time of decommissioning.

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Climate				
MM73	Climate: Decommissioning activities	EIAR Chapter 15	The same mitigation measures implemented during the construction phase will be applied during the decommissioning works for the management of GHG emissions and reduction of impacts to climate.	As required by the agreed decommissioning plan / mitigation measures agreed at the time of decommissioning.
Traffic and Transportation				
MM74	Decommissioning Activities and Traffic	EIAR Chapter 17 and Appendix 17-1 (TMP)	During the project design development, embedded mitigation was a fundamental part of the design process. This included the decommission phase of the proposed project as outlined above. To allow the vehicles to travel on some of the roads of narrower width, temporary traffic management operations will be implemented.	As required by the agreed decommissioning plan and TMP / mitigation measures agreed at the time of decommissioning.



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