Planning and Environmental Consultants

Environmental Impact Assessment Report

Briskalagh Renewable Energy Development, Co. Kilkenny

Chapter 18 – Schedule of Mitigation and Monitoring Measures

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18. SCHEDULE OF MITIGATION AND MONITORING MEASURES

18.1 Introduction

All mitigation and monitoring measures relating to the pre-commencement, construction, operational and decommissioning phases of the Proposed Project are set out in the relevant chapters of this EIAR.

All mitigation which will be implemented during the various phases of the project are presented in Table 18-1 below. The mitigation measures have been grouped together according to their EIAR Chapter and project phases as follows:

- Pre-Commencement Phase (Prior to the implementation of any groundworks)
- Construction Phase
- Operational Phase
- Decommissioning Phase

The mitigation measures in the below format, in Table 18-1, provides an easy to audit list that can be reviewed and reported on during each phase of the Proposed Project. The process of site inspections and environmental audits are set out in the Construction and Environmental Management Plan (CEMP) which is included as Appendix 4-2 of this EIAR. The tabular format in which the below information is presented, can be further expanded upon during each project phase, to provide a reporting template for site compliance audits.

All monitoring measures which will be implemented during the pre-commencement, construction, operational and decommissioning phases of the Proposed Project are outlined in Table 18-2. All monitoring measures were set out in the relevant chapters of this EIAR. The monitoring measures are presented in terms of the monitoring requirement, frequency of monitoring and the mechanism for reporting results where applicable. By presenting the monitoring measures in the below format, it is intended to provide a monitoring schedule that can be reviewed and tracked during all phases of the project to ensure all the required monitoring is completed as required.

It is intended that the CEMP will be updated, where required, prior to the pre-commencement phase of the Proposed Project to include all mitigations and monitoring measures, planning conditions and or alterations to the EIAR and application documents should they emerge during the course of the planning process and would be submitted to the Planning Authority for written approval.

18.2 EIAR Mitigation Measures

Table 18-1 Schedule of Mitigation

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
EIAR Chapter 4 – Description of the Proposed Project					
Pre-Commencement Phase					
MM1	Environmental Management	EIAR Chapter 4	› All proposed activities on the Site will be provided for in a CEMP. A CEMP has been prepared for the Proposed Project and is included in Appendix 4-2 of this EIAR. The CEMP sets out the key environmental considerations to be considered by the contractor during construction of the Proposed Project. The CEMP includes details of drainage, spoil management and waste management, and details the mitigation and monitoring measures to be implemented in order to comply with the environmental commitments outlined in the EIAR. The contractor will be contractually obliged to comply with all such measures. In the event planning permission is granted for the Proposed Project, the CEMP will be updated prior to the commencement of the development, to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned and will be submitted to the Planning Authority for approval.		
MM2	Environmental Management	CEMP Section 4	› The Project Developer will be required to engage a qualified Environmental Engineer, Environmental Scientist, or equivalent, with experience in wind farm construction to fulfil the role of Environmental Clerk of Works (ECoW) to oversee the construction works and audit the implementation of the CEMP. The ECoW will report to the Project Developer and Project		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Contractor but will liaise closely with the Construction Manager in relation to the Project Contractor's day-to-day implementation of the CEMP onsite. › The ECoW will be nominated by the Project Developer to oversee the Project Contractor's effective implementation of the Proposed Project's environmental requirements and obligations, as captured in the CEMP. The ECoW will be responsible for monitoring the works of the Project Contractor from an environmental perspective on behalf of the Project Developer. For the sake of expediency, the ECoW will report their ongoing audit findings, monitoring results and site observations to both the Project Developer and the Project Contractor, having been nominated by the developer to fulfil the role. › The level, detail and frequency of reporting expected from the ECoW for the Construction Manager, Developer's Project Manager, and any Authorities or other Agencies, will be agreed by all parties prior to commencement of construction, and may be further adjusted as required during the course of the Proposed Project.		
MM3	Surface Water Quality	CEMP Section 4	› Baseline water quality field testing and laboratory analysis will be undertaken where required prior to commencement of felling and construction at the Site. › Analysis will be for a range of parameters with relevant regulatory limits along with Environmental Quality Standards (EQSs) and sampling will be undertaken at designated locations as outlined in Figure 9-7 of the EIAR. › Baseline sampling will be completed on at least two occasions, and these should ideally coincide with low flow and high flow stream conditions. The high flow sampling event will be undertaken after a period of sustained rainfall, and the low flow event will be undertaken after a dry spell.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM4	Concrete Deliveries	EIAR Chapter 4	› The arrangements for concrete deliveries to the Site will be discussed with suppliers before work starts, agreeing routes, prohibiting on-site washout of trucks and discussing emergency procedures. › Only ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in concrete delivery trucks.		
MM5	Site Drainage Plan	EIAR Chapter 4 CEMP Section 2 CEMP Section 3	› The Project Hydrologist will complete a detailed drainage design and maintenance plan before construction commences and will attend the Site to set out and assist with micro-siting of proposed drainage controls as outlined in Section 4.6 of the EIAR. › Prior to any works commencing on the upgrade of existing roads, the requirement for additional roadside drainage will be considered by the Project Hydrologist in line with the proposals outlined in Section 3 of the CEMP.		
MM6	Preparative Site Drainage Management	EIAR Chapter 4 CEMP Section 3	› Drains will be excavated, and silting ponds constructed to eliminate any suspended solids within surface water running off the Site. › An adequate quantity of straw bales, clean stone, terram, stakes, etc. will be kept on site at all times to implement the detailed drainage design measures as necessary. The detailed drainage measures will be installed prior to, or at the same time as the works they are intended to drain.		
MM7	Drainage Inspection	EIAR Chapter 4 CEMP Section 3	› Prior to commencement of works in sub-catchments across the Site, main drain inspections will be completed to ensure ditches and streams are free from debris and blockages that may impede drainage. It is proposed to complete these inspections on a catchment-by-catchment basis as the construction works develop across the Site, as works in all areas will not commence simultaneously.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM8	Watercourse Inspection	EIAR Chapter 4 CEMP Section 2	› Confirmatory inspections of the proposed new watercourse crossing locations will be carried out by the Project Civil/Structural Engineer and the Project Hydrologist prior to the construction of the crossing.		
MM9	Drainage Maintenance	EIAR Chapter 4 CEMP Section 4	› An inspection and maintenance plan for the on-site drainage system will be prepared in advance of commencement of any works. Daily visual inspections of drains and outfalls will also be performed during the construction period to ensure suspended solids are not entering streams and rivers on site, to identify any obstructions to channels and to allow appropriate maintenance of the drainage regime. › Any excess build-up of silt levels at dams, the settlement pond, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed.		
MM10	Earthworks	CEMP Section 3	› Drainage and associated pollution control measures will be implemented onsite before the main construction works commence. Where possible, drainage controls will be installed during seasonally dry ground conditions. This will reduce the possibility of impact on surface waters by suspended sediment released during construction and entrained in surface run-off.		
MM11	Felling	EIAR Chapter 4 CEMP Section 3	› Before the commencement of any felling works, an experienced and competent ECoW shall be appointed to oversee the keyhole and extraction works. › Prior to the commencement of works, review and agreement of the positioning by the Operator of the required Aquatic Buffer Zones (ABZs), silt traps, silt fencing, water crossings and onsite storage facilities for fuel, oil and chemicals will be carried out by the ECoW.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM12	Felling Drainage Management	EIAR Chapter 4 CEMP Section 3	› Prior to the commencement of tree felling for subsequent road construction the following key temporary drainage measures will be installed: › All existing dry forestry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using forestry check dams/silt traps; › Clean water diversion drains will be installed upgradient of the works areas; › Check dams/silt fence arrangements (silt traps) will be placed in all existing forestry drains that have surface water flows and also along existing forestry roadside drains; and, › A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone.		
MM13	Felling Licence	EIAR Chapter 4	› Felling will be carried out under the terms of a licence application to the Forest Service, as per the Forest Service's policy on granting felling licenses for wind farm developments. › The Forest Service's policy on granting felling licenses for wind farm developments requires that a copy of the planning permission for the Proposed Wind Farm be submitted with the felling licence application; therefore, the felling licence cannot be applied for until such time as planning permission is obtained for the Proposed Project.		
MM14	Traffic Management	EIAR Chapter 4, 15 CEMP Section 3	› A detailed Traffic Management Plan (TMP), incorporating all the mitigation measures set out within the CEMP along with Chapter 15 of the EIAR, will be finalised and detailed provisions in respect of traffic management agreed with the roads authority and An Garda Síochána prior to construction works commencing on Site › Prior to the Traffic Management Plan being finalised, a full dry run of the transport operation along the potential routes will be completed using vehicles with attachments to simulate the dimensions of the wind turbine transportation vehicles. This dry		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			run will inform the Traffic Management Plan for agreement with the relevant Authorities. › When the Proposed Grid Connection underground cabling route is located on public roads, a Traffic Management Plan will be prepared prior to any works commencing. A road opening licence will be obtained where required and all plant operators and general operatives will be inducted and informed as to the location of any services		
MM15	Spoil Management	EIAR Chapter 4 CEMP Section 2	› An interceptor drain will be installed upslope of the identified spoil management areas to divert any surface water away from these areas where necessary › Silt fences and double silt-fences will be emplaced down-gradient of spoil management areas and will remain in place throughout the entire construction phase, or until reseeding has been established to a sufficient level; › All the recommendations/best practice guidelines for the placement of spoil in identified spoil management areas and alongside access roads will be confirmed by the Geotechnical Engineer prior to construction		
MM16	Borrow Pit	EIAR Chapter 4 CEMP Section 2	› The area to be used for the borrow pit will be marked out at the corners using ranging rods or timber posts. Drainage runs, and associated settlement ponds will be installed around the perimeter.		
MM17	Grid Connection underground cabling route works	EIAR Chapter 4	› Before works commence, updated surveying will take place along the proposed cable route, with all existing culverts identified. All relevant bodies i.e. ESBN, Kilkenny County Council etc. will be contacted and all up-to-date drawings for all existing services sought.		
MM18	Waste Management	EIAR Chapter 4	› Prior to the commencement of the development, a Construction Waste Manager will be appointed by the Contractor. The		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		CEMP Section 3	Construction Waste Manager will be in charge of the implementation of the objectives of the Waste Management Plan (WMP), ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy is adhered to. The person nominated must have sufficient authority so that they can ensure everyone working on the development adheres to the management plan.		
Construction Phase					
MM19	Refuelling	EIAR Chapter 4, 8, 9 CEMP Section 3	› Road-going vehicles will be refuelled off site wherever possible; › All plant and machinery will be equipped with fuel absorbent material and pads to deal with any accidental spillage; › Fuels volumes stored on site should be minimised. › Any diesel or fuel oils stored at the temporary construction compound will be bunded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity › The electrical substation compound will be bunded appropriately to 110% of the volume of oils that will be stored, and to prevent leakage of any associated chemicals to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; › All hazardous wastes will be stored in bunded containers/areas before being collected by an authorised waste contractor and brought to an EPA licensed waste facility; › An emergency plan for the construction phase to deal with accidental spillages will be developed (refer to Section 6 of the CEMP). Spill kits will be available to deal with and accidental spillage in and outside the refuelling area. › A programme for the regular inspection of plant and equipment for leaks and fitness for purpose will be developed at the outset of the construction phase. › The following mitigation measures are proposed to avoid release of hydrocarbons at the Site:		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site. Heavy plant and machinery will be refuelled on-site by a fuel truck that will come to the Site as required on a scheduled and organised basis. › All refuelling will be carried out outside of the designated watercourse buffer zones. › Taps, nozzles or valves associated with refuelling equipment will be fitted with a lock system; › Only designated trained and competent operatives will be authorised to refuel plant on-site. › Mobile measures such as drip trays and fuel absorbent mats will used during refuelling operations as required. › All waste tar material arising from works on hard top roads will be removed off-site and taken to licenced waste facility; › All plant and machinery will be equipped with fuel absorbent material and pads to deal with any event of accidental spillage.		
MM20	Cement Based Products Deliveries and Management	EIAR Chapter 4, 9 CEMP Section 3	› No batching of wet-concrete products will occur on the Site; › Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place; › Where possible pre-cast elements for culverts and concrete works will be used; › Where concrete is delivered to the Site, only the chute will need to be cleaned, using the smallest volume of water practicable. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be undertaken at lined concrete washout ponds. › The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a temporary lined impermeable containment areas, or a Siltbuster-type concrete wash unit or equivalent;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› The residual liquids and solids will be removed off-site by an appropriately authorised waste collector for disposal at an authorised waste facility;		
MM21	Concrete Pouring	EIAR Chapter 4, 9 CEMP	› Using weather forecasting to assist in planning large concrete pours and avoiding large pours where prolonged periods of heavy rain is forecast. › Restricting concrete pumps and machine buckets from slewing over watercourses (including drains and ditches) while placing concrete. › Ensuring that excavations are sufficiently dewatered before concreting begins and that dewatering continues while concrete sets. › Ensuring that covers are available, and used, when necessary, for freshly placed concrete to avoid the surface washing away in heavy rain. › The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a temporary lined impermeable containment area, or a Siltbuster-type concrete wash unit or equivalent		
MM22	Road Cleanliness	EIAR Chapter 4 CEMP Section 4	› The site roads will be well finished with compacted hardcore, and so the public road-going vehicles will not be travelling over soft or muddy ground where they might pick up mud or dirt. › A road sweeper will be available if any section of the public roads requires cleaning due to construction traffic associated with the Proposed Project. › When necessary, sections of the haul route will be swept using a truck mounted vacuum sweeper.		
MM23	Watercourse Buffers	EIAR Chapter 4. CEMP Section 3	› There will be no direct discharges to any natural watercourses or land drains, with all drainage waters being dispersed as overland flows. All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			watercourses and drains. Buffer zones of 50m around the existing natural drainage features have been used to inform the layout of the Proposed Project. › Buffered outfalls, which will be numerous over the Proposed Wind Farm site, will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the Proposed Wind Farm site.		
MM24	Water Discharge	EIAR Chapter 4. CEMP Section 3	› Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the Site drainage into the existing site drainage network where possible. This will reduce the potential for any increased risk of downstream flooding or sediment transport/erosion. › Silt traps will be placed in the existing drains upgradient of where construction works / tree felling is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area		
MM25	Wastewater Management	EIAR Chapter 4	› The construction compound will consist of temporary site offices, staff facilities and car-parking areas for staff and visitors. Temporary port-a-loo toilets and toilets located within a staff portacabin will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewaters being tankered off site by permitted waste collector to wastewater treatment plants. There will also be a water supply on site for hygiene purposes, by way of a temporary storage tank.		
MM26	Drainage Swales	EIAR Chapter 4 CEMP Section 3	› Drainage swales will be installed downgradient of any works areas to collect surface flow runoff where it might have come into contact with exposed surfaces and picked up silt and sediment.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Swales will intercept the potentially silt-laden water from the excavations and construction areas of the Site and prevent it reaching natural watercourses.		
MM27	Interceptor Drains	EIAR Chapter 4 CEMP Section 3	› Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed over the ground by means of a level spreader. › The interceptor drains will be installed in advance of any main construction works commencing.		
MM28	Check Dams	EIAR Chapter 4 CEMP Section 3	› The velocity of flow in the interceptor drains and drainage swales, particularly on sloped sections of the channel, will be controlled by check dams, which will be installed at regular intervals along the drains to ensure flow in the swale is non-erosive.;		
MM29	Level Spreaders	EIAR Chapter 4 CEMP Section 3	› A level spreader will be constructed at the end of each interceptor drain to convert concentrated flows in the drain into diffuse sheet flow on areas of vegetated ground. The levels spreaders will be located downgradient of any proposed works areas in locations where they are not likely to contribute further to water ingress to construction areas of the Site.		
MM30	Piped Slope Drains	EIAR Chapter 4 CEMP Section 3	› Piped slope drains will be used to convey surface runoff from diversion drains safely down slopes to flat areas without causing erosion. Once the runoff reaches the flat areas it will be reconverted to diffuse sheet flow. Level spreaders will only be established on slopes of less than 6% in grade. Piped slope drains will be used to transfer water away from areas where slopes are too steep to use level spreaders;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM31	Vegetation Filters	EIAR Chapter 4, Chapter 9. CEMP Section 3	› Vegetation filters are the existing vegetated areas of land that will be used to accept surface water runoff from upgradient areas. The selection of suitable areas to use as vegetation filters will be determined by the size of the contributing catchment, slope and ground conditions;		
MM32	Settlement Ponds	EIAR Chapter 4, Chapter 9. CEMP Section 3	› Stilling ponds will be used to attenuate runoff from works areas of the Site during the construction phase and will remain in place to handle runoff from roads and hardstanding areas of the Proposed Project during the operational phase. The purpose of the stilling ponds is to intercept runoff potentially laden with sediment and to reduce the amount of sediment leaving the disturbed area by reducing runoff velocity. Reducing runoff velocity will allow larger particles to settle out in the stilling ponds, before the run-off water is redistributed as diffuse sheet flow in filter strips downgradient of any works areas.		
MM33	Dewatering Silt Bag	EIAR Chapter 4, Chapter 9 CEMP Section 3	› Dewatering silt bags allow the flow of water through them while trapping any silt or sediment suspended in the water. The silt bags provide a passive non-mechanical method of removing any remaining silt contained in the potentially silt-laden water collected from works areas within the Site. › Dewatering silt bags are an additional drainage measure that can be used downgradient of the stilling ponds at the end of the drainage swale channels and will be located, wherever it is deemed appropriate, throughout the Site. The water will flow, via a pipe, from the stilling ponds into the silt bag. The silt bag will allow the water to flow through the geotextile fabric and will trap any of the finer silt and sediment remaining in the water after it has gone through the previous drainage measures. The dewatering silt bags will ensure that there will be no loss of silt into the stream.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM34	Siltbuster	EIAR Chapter 4 EIAR Chapter 9 CEMP Section 3	› Siltbusters or similar equivalent pieces of equipment will be available to filter any water pumped out of excavation areas if necessary, prior to its discharge to stilling ponds or swales. Siltbusters are mobile silt traps that can remove fine particles from water using a proven technology and hydraulic design in a rugged unit. They are specifically designed for use on construction sites. › The siltbuster system comprises an electronic in-line dosing system which provides an accurate means of adding reagents, so overdosing cannot occur; › Continued monitoring and water analysis of pre and post treated water by means of an inhouse lab and dedicated staff, means the correct amount of chemical is added by the dosing system; › Dosing rates of chemical to initiate settlement is small, being in the order of 2-10 mg/L and the vast majority of the chemical is removed in the deposited sediment; › Final effluent not meeting the discharge criteria is recycled and retreated, which has a secondary positive effect of reducing carryover; and, › Use of biodegradable chemical agents can be used at very sensitive sites (i.e. adjacent to SACs).		
MM35	New Culverts/ Culvert Upgrades	EIAR Chapter 4, Chapter 9. CEMP Section 2	› All new proposed culverts and proposed culvert upgrades will be suitably sized for the expected peak flows in the watercourse. › Some culverts may be installed to manage drainage waters from works areas of the Proposed Project, particularly where the waters have to be taken from one side of an existing roadway to the other for discharge. The size of culverts will be influenced by the depth of the track or road sub-base. In some cases, two or more smaller diameter culverts may be used where this depth is limited, though this will be avoided as they will have a higher associated risk of blockage than a single, larger pipe. In all cases, culverts will be oversized to allow mammals to pass through the culvert.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Culverts will be installed with a minimum internal gradient of 1% (1 in 100). Smaller culverts will have a smooth internal surface. Larger culverts may have corrugated surfaces which will trap silt and contribute to the stream ecosystem. Depending on the management of water on the downstream side of the culvert, large stones may be used to interrupt the flow of water. This will help dissipate its energy and help prevent problems of erosion. Smaller water crossings will simply consist of an appropriately sized pipe buried in the sub-base of the road at the necessary invert level to ensure ponding or pooling does not occur above or below the culvert and water can continue to flow as necessary. › All culverts will be inspected regularly to ensure they are not blocked by debris, vegetation or any other material that may impede conveyance.		
MM36	New Watercourse Crossing	EIAR Chapter 4, Chapter 9 CEMP Section 2	› All drainage measures along the proposed road will be installed in advance of the works. › A foundation base will be excavated to rock or competent ground with a mechanical excavator with the foundation formed in-situ using a semi-dry concrete lean mix. The base will be excavated along the stream bank with no instream works required. › Access to the opposite side of the watercourse for excavation and foundation installation will require the installation of a temporary pre-cast concrete or metal bridge pre-cast concrete slab across the watercourse to provide temporary access for the excavator. Plant and equipment will not be permitted to track across the watercourse. › Once the foundation base has been completed, the pre-cast concrete clear-span structure will be installed using a crane which will be set up on the bank of the watercourse and will be lifted into place from the bank with no contact with the watercourse. › The watercourse crossing will be constructed to the specifications of the OPW bridge design guidelines 'Construction, Replacement or Alteration of Bridges and Culverts - A Guide to Applying for Consent under Section 50 of the Arterial Drainage Act, 1945', and		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			in consultation with Inland Fisheries Ireland. Abutments will be constructed from precast units combined with in-situ foundations, placed within an acceptable backfill material.		
MM37	Silt Fences	EIAR Chapter 4 CEMP Section 3	› Silt fences will be installed as an additional water protection measure around existing watercourses in certain locations, particularly where works are proposed within the 50-metre buffer zone of a stream. These areas include around existing culverts, around the headwaters of watercourses, and the proposed locations are indicated on the drainage design drawings included in Appendix 4-3. › Silt fences will be installed as single, double or a series of triple silt fences, depending on the space available and the anticipated sediment loading. The silt fence designs follow the technical guidance document '*Control of Water Pollution from Linear Construction Projects*' published by Construction Industry Research and Information Association (CIRIA, No. C648, 1996). Up to three silt fences may be deployed in series. › All silt fencing will be formed using Terrastop Premium or equivalent silt fence product. Silt fences will be inspected regularly to ensure water is continuing to flow through the fabric, and the fence is not coming under strain from water backing up behind it.		
MM38	Sedimats	EIAR Chapter 4	› Sediment entrapment mats, consisting of coir or jute matting, will be placed at the outlet of the silt bag to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure.		
MM39	Oil Interceptors	EIAR Chapter 4 CEMP Section 4	› An oil interceptor is a trap used to filter out oils or other hydrocarbons from surface water runoff. A suitably sized oil interceptor will be installed wherever it is intended to store		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			hydrocarbons and oils (i.e., construction compounds and substation compound) or where it is proposed to park vehicles during the construction and operational phases of the Proposed Project (i.e., construction compounds and substation compound).		
MM40	Proposed Grid Connection underground cabling route – existing services, joint bays and watercourse crossings	EIAR Chapter 4 CEMP Section 2	› Any underground services encountered along the cable route will be surveyed for level and the ducting will pass over the service provided adequate cover is available. › A minimum clearance of 300 mm will be required between the bottom of the ducts and the service in question. › If the clearance cannot be achieved the ducting will pass under the service and again 300 mm clearance between the top of the ducts and bottom of the service will be achieved. › In deeper excavations an additional layer of marker tape will be installed between the communications duct and top-level yellow marker tape. › If the required separation distances cannot be achieved then a number of alternative options are available such as using steel plates laid across the width of the trench and using 35N concrete surrounding the proposed ducting, with marker tape on the side of the trench. › During construction the joint bay locations will be completely fenced off, once they have been constructed they will be backfilled until cables are being installed › The precise siting of all Joint Bays, Earth Sheath Link Chambers and Communication Chambers within the corridor assessed is subject to approval by ESBN. › The watercourse crossing methodologies, for the provision of the Proposed Grid Connection underground cabling route of the Proposed Project, is set out [in Section 4.8.2.8 of Chapter 4] with the most appropriated option being selected for each crossing location. Instream works are not required at any watercourse crossing along the Proposed Grid Connection underground cabling route.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› The use of a natural, inert and biodegradable drilling fluid such as Clear Bore™ is intended to negate any adverse impacts arising from the use of other, traditional polymer-based drilling fluids and will be used sparingly as part of the drilling operations. It will be appropriately stored prior to use and deployed in the required amounts to avoid surplus. Should any excess drilling fluid accumulate in the reception or launch pits, it will be contained and removed from the site in the same manner as other subsoil materials associated with the drilling process to a licensed recovery facility; › Backfilling of launch & reception pits will be conducted in accordance with the normal specification for backfilling excavated trenches. Sufficient controls and monitoring will be put in place during drilling to prevent frack-out, such as the installation of casing at entry points where reduced cover and bearing pressure exits.		
MM41	Turbine/Met Mast Foundation Excavations	EIAR Chapter 4 CEMP Section 2	› The extent of the excavation will be marked out and will include an allowance for trimming the sides of the excavation to provide a safe working area and slope batter; › Where practical, the soil will be stripped over the area of the excavation and stored locally for reuse, the subsoil will be excavated and stored to one side for reuse during the landscaping around the finished turbine; › No material will be removed from site with excavated spoil being transported and stored in the identified spoil management areas within the Site. › All groundwater and surface water arising from turbine base excavation will be pumped to the dirty water system prior to discharge from the works area; › Soil excavation shall be observed by a qualified archaeologist in accordance with a scheme of archaeological monitoring to identify any significant remains as they come to light; › The foundations excavation will be raised to formation level by compacted layers of well graded granular material will be spread		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			and compacted to provide a hard area for the turbine/met mast foundation.		
MM42	Spoil Management	EIAR Chapter 4 CEMP Section 2	› At the identified spoil management areas, the vegetative top-soil layer will be removed to allow for spoil to be placed and upon reaching the recommended height, the vegetative topsoil layer will be reinstated. › The identified spoil management areas will be developed in a phased approach, with the topsoil removed and temporarily stockpiled within the defined area while the spoil it being placed. The stockpiled topsoil will then be reinstated over the placed spoil, and the exercise will continue within the same spoil management area until the area is full. › The placement of spoil will be restricted to a maximum height of 1.0m, subject to confirmation by the Geotechnical Engineer. It will be compacted to reduce air voids and reduce the migration paths for infiltration by precipitation. This will reduce the amount of potentially silt laden surface water run-off from these spoil management areas. › Where practical, it will be ensured that the surface of the placed spoil is shaped to allow efficient run-off of surface water. Where possible, shaping of the surface of the spoil will be carried out as placement of spoil within the area progresses. This will reduce the likelihood of debris run-off and ensure stability of the placed spoil. › Finished/shaped side slopes of the placed spoil will be not greater than 1 (v): 3 (h) in the dedicated spoil management zones and not greater than 1 (v): 1 (h) alongside access tracks. › Inspections of the spoil management areas will be made by a Geotechnical Engineer through regular monitoring of the works. The appointed contractor will review work practices at spoil management areas when periods of heavy rainfall are expected so as to prevent excessive dirty water runoff from being generated.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› An interceptor drain will be installed upslope of the identified spoil management areas to divert any surface water away from these areas. › Silt fences and double silt-fences will be emplaced down-gradient of spoil management areas and will remain in place throughout the entire construction phase, or until reseeding has been established to a sufficient level. › The surface of the deposited spoil will be profiled to a gradient to be agreed with the Geotechnical Engineer and vegetated or allowed to vegetate naturally as indicated by the Project Ecologist. › All the above-mentioned general guidelines and requirements will be confirmed by the Geotechnical Engineer prior to construction.		
MM43	Borrow Pit	EIAR Chapter 4, CEMP Section 2	The borrow pit will be excavated and backfilled as follows: › The area to be used for the borrow pit will be marked out at the corners using ranging rods or timber posts. Drainage runs, and associated settlement ponds will be installed around the perimeter; › The initial borrow pit excavation will involve removal of soil to the top of bedrock. These materials will be stored temporarily in selected spoil management areas, see Figure 4-16 for details; › All drainage measures prescribed in the detailed drainage design for the Proposed Project will be implemented around the works area; › The bedrock material will be extracted by breaking and blasting from the borrow pit and stockpiled or used as required; › The use of material won from the borrow pit will be sequential with new road construction or turbine foundation formations; › Temporary stockpiling of aggregates will be required to accommodate the cut and fill operations within the borrow pit, and the progression of access roads and turbine excavations; › As the borrow pit excavation progress and become deeper, surface water and groundwater ingress will be removed via		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			pumping to settlement ponds, and re-distribution locally across natural vegetated areas. Where required, additional specialist water treatment measures will be employed to ensure no deterioration in downstream water quality occurs; › When extraction ceases within the borrow pit, the borrow pit will be backfilled with excavated spoil and its associated drainage measures will be removed. › The extraction area of the borrow pit will have to be permanently secured and a stock-proof fence will be erected around the borrow pit to prevent access to these areas as well as the installation of appropriate health and safety signage. Two extraction methods have been assessed for breaking out the useful rock, rock breaking and blasting. As the predicted construction noise levels for both breaking and blasting are well within the construction noise criterion outlined in Table 12-16 of Chapter 12, no specific mitigation measures are required. However, should blasting be required: › The blast engineer will arrange for the necessary quantity of explosive to be brought to site to undertake a single blast. The management of explosives on-site and the actual blasting operation will be agreed in advance with and supervised by An Gardaí Siochána. The blast engineer sets the explosives in place in the boreholes, sets the charges, and fires the blast. › Restriction of hours within which blasting can be conducted (e.g. 09:00 – 18:00hrs). › Notification to nearby residents before blasting starts (e.g. 24-hour written notification). › The firing of blasts at similar times to reduce the 'startle' effect. › On-going circulars informing people of the progress of the works. › The implementation of an onsite documented complaints procedure. › The use of independent monitoring by external bodies for verification of results.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Trial blasts in less sensitive areas to assist in blast designs and identify potential zones of influence.		
Operational Phase					
MM44	Wastewater Management	EIAR Chapter 4	› The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying › The wastewater storage tank alarm will be part of a continuous stream of data from the Proposed Wind Farm turbines, wind measurement devices and electricity substation that will be monitored remotely 24 hours a day, 7 days per week. Only waste collectors holding valid waste collection permits under the Waste Management (Collection Permit) Regulations, 2007(as amended), will be employed to transport wastewater away from the substation underground storage tank.		
MM45	Electrical Substation	EIAR Chapter 4,	› The electrical substation compound will be bunded appropriately to 110% of the volume of oils that will be stored, and to prevent leakage of any associated chemicals to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; › Lightning poles will be erected at appropriate locations adjacent to the substation. All lightning poles will be appropriately earthed. › Perimeter fencing will be erected.		
Decommissioning Phase					
MM46	Decommissioning Plan	EIAR Chapter 4	Prior to the end of the operational period the Decommissioning Plan (Appendix 4-5 of the EIAR) will be updated in line with decommissioning methodologies that may exist at the time and will agree with the competent authority at that time.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM47	Decommissioning Plan	EIAR Chapter 4 DP Section 2	› Upon decommissioning of the Proposed Wind Farm site, turbine foundations will remain in place underground and will be covered with earth and reseeded with an appropriate seed mix to accelerate the resumption of natural drainage management. › The underground cable ducting within the Proposed Wind Farm site will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance.		
MM48	Refueling	EIAR Chapter 4, 8, 9. DP Section 3	The following mitigation measures are proposed to avoid release of hydrocarbons at the Proposed Wind Farm site: › Wherever possible, vehicles will be refuelled off-site, particularly for regular road-going vehicles. › On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site. › Fuel volumes stored on site will be minimised. › Heavy plant and machinery will be refuelled on-site by a fuel truck that will come to the Site as required on a scheduled and organised basis. › All refuelling will be carried out outside designated watercourse buffer zones. › Only designated trained and competent operatives will be authorised to refuel plant on-site. › Mobile measures such as drip trays and fuel absorbent mats will used during refuelling operations as required. › All plant and machinery will be inspected for leaks and fitness for purpose daily. › All plant and machinery will be equipped with fuel absorbent material and pads to deal with any event of accidental spillage › An emergency plan for the decommissioning phase to deal with accidental spillages will be developed (refer to Section 5 of this		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Plan). Spill kits will be available to deal with an accidental spillage in and outside the refuelling area. › A programme for the regular inspection of plant and equipment for leaks and fitness for purpose will be developed at the outset of the decommissioning phase.		
Chapter 5: Population and Human Health					
Pre-Construction Phase					
MM49	Human Health	EIAR Chapter 5	› Prior to commencement of any works, the occupants of dwellings in the vicinity of the proposed works will be contacted and the scheduling of works will be made known. Local access to properties will also be maintained throughout any construction works and local residents will be supplied with the number of the works supervisor in order to ensure that disruption will be kept to a minimum.		
Construction Phase					
MM50	Human Health (Health and Safety)	EIAR Chapter 5 CEMP Section 5	› The Proposed Project will be constructed, operated and decommissioned in accordance with all relevant Health and Safety Legislation, including: o Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005); o Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2016 (S.I. No. 36 of 2016); o S.I. No. 528/2021 - Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021 and o Safety, Health and Welfare at Work (Work at Height) Regulations 2006 (S.I. No. 318 of 2006). › A Health and Safety Plan covering all aspects of the construction process will address the Health and Safety requirements in detail.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			This will be prepared on a preliminary basis at the procurement stage and developed further at construction stage. › All hazards will be identified, and risks assessed. Where elimination of the risk is not feasible, appropriate mitigation and/or control measures will be established. The contractor will be obliged under the construction contract and current health and safety legislation to adequately provide for all hazards and risks associated with the construction phase of the project. Safepass registration cards are required for all construction, delivery and security staff. Construction operatives will hold a valid Construction Skills Certificate Scheme card where required. The developer is required to ensure a competent contractor is appointed to carry out the construction works. The contractor will be responsible for the implementation of procedures outlined in the Safety and Health Plan. Public safety will be addressed by restricting Site access during construction. Fencing will be erected in areas of the Site where uncontrolled access is not permitted. › Goal posts will be established, where necessary, under overhead electricity lines for the entirety of the construction phase of the Proposed Project. › The suitability of machinery and equipment for use near power lines will be risk assessed. › All staff will be trained on operating voltages of overhead electricity lines running the Site. All staff will be trained to be aware of the risks associated with overhead lines. All contractors that may visit the Sites are made aware of the location of lines before they come on to Site. › Barriers will run parallel to the overhead line at a minimum horizontal distance of 6 metres on plan from the nearest overhead line conductor wire. › When activities must be carried out beneath overhead lines, e.g., component delivery or substation construction, a Site-specific risk assessment will be undertaken prior to any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or equipment that will be used		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			prior to any works. Overhead line proximity detection equipment will be fitted to machinery when such works are required. › Information on safe clearances will be provided to all staff and visitors. › Signage indicating locations and health and safety measures regarding overhead lines will be erected in canteens and on Site. › The construction of the Proposed Grid Connection underground cabling will be in phases along the proposed grid route. Prior to commencing grid connection works in the agricultural fields in the townland of Moatpark, goal posts will be established under the 110kV and 38kV overhead lines and remain in place for the duration of the works in this area. The goal posts will not exceed a height of 4.2 metres, unless specifically agreed with ESBN › All staff will be made aware of and adhere to the Health & Safety Authority's 'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021'. This will encompass the use of all necessary Personal Protective Equipment and adherence to the Site Health and Safety Plan. › The scale and scope of the project requires that a Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) are required to be appointed in accordance with the provisions of the Health & Safety Authority's '*Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013*'. › The PSDP and PSCS appointed for the construction stage shall be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations		
Operational Phase					
MM51	Population	EIAR Chapter 5	› The Proposed Wind Farm has been designed in accordance with the parameters set out in the Guidelines and with cognisance of		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
	(Property Values)		the draft Guidelines, adhering to the required setback distances from sensitive receptors set out in those documents.		
MM52	Population (Residential Amenity)	EIAR Chapter 5	› There are no turbines proposed within 740m (4 x tip height) of any third-party receptors.		
MM53	Human Health (Health and Safety)	EIAR Chapter 5	› The build-up of ice on turbines is unlikely to present problems. The wind turbines will be fitted with anti-vibration sensors, which will detect any imbalance caused by icing of the blades. The sensors will cause the turbine to wait until the blades have been de-iced prior to beginning operation. › Lightning conduction cables, encased in protection conduits, will follow the electrical cable run, from the nacelle to the base of the turbine. The conduction cables will be earthed adjacent to the turbine base. The earthing system will be installed during the construction of the turbine foundations. › Access to the turbines is through a door at the base of the structure, which will be locked at all times outside maintenance visits. › Signs will also be erected at suitable locations across the Site as required for the ease and safety of operation of the wind farm: These signs include: o Buried cable route markers at 50m (maximum) intervals and change of cable route direction; o Directions to relevant turbines at junctions; o “No access to Unauthorised Personnel” at appropriate locations; o Speed limits signs at Site entrance and junctions; o “Warning these Premises are alarmed” at appropriate locations; o “Danger HV” at appropriate locations; o “Warning – Keep clear of structures during electrical storms, high winds or ice conditions” at Site entrance;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			○ "No unauthorised vehicles beyond this point" at specific Site entrances; and ○ Other operational signage required as per Site-specific hazards. › An operational phase Health and Safety Plan will be developed to fully address identified Health and Safety issues associated with the operation of the site and providing for access for emergency services at all times.		
MM54	Shadow Flicker	EIAR Chapter 5	Where daily or annual shadow flicker exceedances are predicted at any inhabitable or third-party dwelling of the identified 36 no. sensitive receptors, a site visit will be undertaken firstly to determine the presence of existing screening and window orientation at each potentially affected property. This will determine if the receptor has an actual line of sight to any turbine and actual potential for shadow flicker to occur. Once this exercise is completed and all of the potentially affected properties, the following measures will be employed. **Screening Measures** In the event of an occurrence of shadow flicker exceeding guideline threshold values of 30 minutes per day at residential receptor locations, mitigation options will be discussed with the affected homeowner, including: › Installation of appropriate window blinds in the affected rooms of the residence; › Planting of screening vegetation; › Other site-specific measures which might be agreeable to the affected party and may lead to the desired mitigation. If agreement can be reached with the homeowner, then it would be arranged for the required mitigation to be implemented in cooperation with the affected party as soon as practically possible and for the full costs to be borne by the wind farm operator.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Wind Turbine Control Measures If it is not possible to mitigate any identified shadow flicker limit exceedance locally using the measures detailed above, wind turbine control measures will be implemented. Wind turbines can be fitted with shadow flicker control units to allow the turbines to be controlled to prevent the occurrence of shadow flicker at properties surrounding the wind farm. The shadow flicker control units will be added to any required turbines. A shadow flicker control unit allows a wind turbine to be programmed and controlled using the wind farm's Supervisory Control and Data Acquisition (SCADA) system to change a particular turbine's operating mode during certain conditions or times, or even turn the turbine off if necessary.		
Chapter 6: Biodiversity					
Pre-Construction Phase					
MM55	Invasive Species Management	EIAR Chapter 6 CEMP Section 3	A baseline invasive species survey will be carried out at the Site to identify the presence and location of any invasive species (listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) by a suitably qualified ecologist. If the presence of such species is found at or adjacent to the Site, particularly in areas where its excavation may be required, an invasive species management plan will be prepared for the Site to prevent the introduction or spread of any invasive species within the footprint of the works.		
MM56	Fauna	EIAR Chapter 6	**Otter:**		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› From a precautionary basis, a pre-commencement otter survey will be undertaken in accordance with standard best practice guidance prior to the commencement of site works. › Should the surveys identify the presence of an otter holt, the following measures will be undertaken. A National Parks and Wildlife Service and a derogation licence will be applied for. › No works will be undertaken within 150m of any holts at which breeding females or cubs are present. › No wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance will also not take place within 15m of such holts, except under licence (TII, 2008b). All of the above works will be undertaken or supervised by an appropriately qualified ecologist. **Badger:** › A pre-construction badger survey will be undertaken at the location of the identified sett by a qualified ecologist prior to the commencement of any works to determine if the sett is in use and to identify any additional sett entrances that may have been excavated in the intervening period. In addition, a pre-construction badger survey will be carried out at all proposed infrastructure locations. › The identified sett will be monitored for a minimum least 2 weeks prior to construction using a camera trap to determine if it is in use. › If the sett is found to be in use exclusion measures will be put in place prior to construction in line with NRA (2005b) Guidelines to ensure that the sett is evacuated.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› As per NRA guidelines exclusion from an active sett will only be carried out during the period of July to November inclusive in order to avoid the badger breeding season. › During the breeding season (December to June inclusive) no works will be undertaken within 50m of active setts nor blasting or pile driving within 150m of active setts. › Exclusion zone fencing and appropriate signage will be put in place around the main sett to the south of the Proposed Wind Farm site, which lies outside the construction footprint. This will ensure that there will be no vehicles tracking in the area and no temporary storage of construction materials that could impact the sett.		
MM57	Bats	EIAR Chapter 6 Appendix 6-2	Bats comprise mobile species that can move regularly between tree roosts. As such, the trees with potential roosting features have been considered as a "roost resource" and compensation will be provided to cover for the loss of the resource. The following procedures are proposed prior to felling trees with PRFs: › A pre-commencement survey will be carried out by a suitably qualified ecologist on trees with PRFs proposed for felling. › If a bat roost is identified within any of the trees to be removed/pruned, a bat derogation licence will be obtained from the NPWS, prior to removal and the removal activity will be supervised by a qualified ecologist. › On a precautionary basis, works will be undertaken at an appropriate time of year, as determined by a suitably qualified ecologist, to avoid disrupting sensitive life cycle periods for bats. Tree-felling of mature deciduous trees will be carried out according to the following standard mitigating procedures: • Trees with suitable potential roost features proposed for felling will be checked for bats by a suitably qualified arborist/ecologist at the time of felling.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			• Trees will be nudged two or three times prior to limb removal, with a pause of 30 seconds in between, to allow bats to wake and move. • Rigged felling shall be used to lower the limbs and trunk carefully to ground level and cavities searched by a qualified ecologist. › Felled trees will be left in-situ for a minimum of 24 hours prior to sawing or mulching, to allow any bats present to escape (National Roads Authority, 2006). Where the potential for indirect effects (i.e. disturbance) on bats potentially roosting within watercourse, drain and culvert crossing infrastructure has been identified, the following mitigating procedures are proposed: › An inspection survey will be carried out prior to the commencement of the works to ensure no bats are roosting within the infrastructure. • If the inspection survey cannot provide sufficient data to exclude the presence of a roost (i.e. due to lack of access), an activity survey will also be conducted prior to commencement. › Where evidence of bats is identified during the above pre-commencement surveys, a Derogation Licence will be required from NPWS for the continuation of the works. › The works will be carried out outside the maternity (May-August) and hibernation (November-March) seasons to avoid the potential for disturbance on bats during sensitive periods of their lifecycle.		
Construction Phase					
MM58	Bats	EIAR Chapter 6	Noise Restriction		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		Appendix 6-2	› During 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 (S.I. No. 632 of 2001). Lighting Restriction Exterior lighting, during construction and post construction, shall be designed to minimize light spillage, thus reducing the effect on areas outside the Proposed Project, and consequently on bats i.e. Lighting will be directed away from mature trees/treelines around the periphery of the Proposed Wind Farm site to minimize disturbance to bats. Directional accessories can be used to direct light away from these features, e.g. through the use of light shields (Stone, 2013). The luminaries will be of the type that prevent upward spillage of light and minimize horizontal spillage away from the intended lands. The proposed lighting around the Proposed Wind Farm site shall be designed in accordance with the Institute of Lighting Professionals Guidance Note 08/18 Bats and artificial lighting in the UK. In addition, the applicant commits to the use of lights during construction (such that they are necessary) in line with the following guidance that is provided in the Dark Sky Ireland Lighting Recommendations: › Every light needs to be justifiable, › Limit the use of light to when it is needed, › Direct the light to where it is needed, › Reduce the light intensity to the minimum needed, › Use light spectra adapted to the environment, › When using white light, use sources with a “warm” colour temperature (less than 3000K).		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM59	Aquatic Habitats and Fauna	EIAR Chapter 6, Chapter 9 CEMP Section 3	› The key mitigation measure during the construction phase is the avoidance of sensitive hydrological features, by application of suitable buffer zones. A self-imposed buffer zone of 50m has been put in place for on-site streams and rivers. In addition, a 10m buffer was applied to the main manmade agricultural and forestry drains within the Proposed Wind Farm site. All of the key infrastructure areas are located significantly far away from the delineated 50m watercourse buffer zones with the exception of the upgrading of the existing watercourse crossing, new watercourse crossing, upgrades to existing site access tracks, and the proposed substation › Inland Fisheries Ireland (IFI) will be consulted a minimum of four weeks in advance of watercourse crossing works. The Inland Fisheries Ireland (2016): *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*; and the Scottish Natural Heritage (SNH) *Good Practice During Wind Farm Construction* (SNH, 2019, 4th Edition) will also be adhered to. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI).		
MM60	Woodlands and Linear vegetation	EIAR Chapter 6	› Approximately 3,640m of heavily managed hedgerow will be enhanced through additional planting with native species. It is proposed to plant some native tree species within the hedgerow habitat to further increase the biodiversity value within the Site. › New native hedgerow habitat will be created in the south and north of the Site, approx. 270m . › A total of approximately 1.7 hectares of riparian planting is proposed to be planted on both banks of the Tullaroan stream.		
MM61	Invasive Species	EIAR Chapter 6	The following measures are proposed to establish good site hygiene to ensure the control of any potential spread of invasive species during		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		CEMP Section 3	construction works, if they are identified prior to the commencement of the construction phase: › A risk assessment and method statement must be provided by the Contractor prior to commencing works. › Fences will be erected around areas of infestation, as confirmed by test pits, and warning signs shall be erected. › A designated wash-down area will be created, where power-washed material from machinery can be contained, collected and disposed of with other contaminated material. This area will contain a washable membrane or hard surface. › Stockpile areas will be chosen to minimise movement of contaminated soil. › Stockpiles will be marked and isolated. › Contaminated areas which will not be excavated will be protected by a root barrier membrane if they are likely to be disturbed by machinery. Root barrier membranes will be protected by a layer of sand above and below and topped with a layer of hardcore. › The use of vehicles with caterpillar tracks within contaminated areas will be avoided to minimise the risk of spreading contaminated material. › An ECoW/suitably qualified ecologist will be on site to monitor and oversee the implementation of invasive species management plans. Plant and equipment which is operated within an area for the management of materials in contaminated areas should be decontaminated prior to relocating to a different works area. The decontamination procedures should take account of the following: › Personnel may only clean down if they are familiar with the plant and rhizome material and can readily identify it. › Decontamination will only occur within designated wash-down areas.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Vehicles will be cleaned using stiff-haired brush and pressure washers, paying special attention to any areas that might retain rhizomes e.g. wheel treads and arches. › All run-off will be isolated and treated as contaminated material. This will be disposed of in already contaminated areas.		
Operational Phase					
MM62	Bats	EIAR Chapter 6 Appendix 6-2	In accordance with NatureScot and NIEA Guidance, a minimum 50m buffer to all habitat features used by bats (e.g., hedgerows, tree lines etc.) **Blade Feathering** On a precautionary basis, and in addition to buffers applied to habitat features, it is proposed that all wind turbines are subject to 'feathering' of turbine blades when wind speeds are below the cut-in speed of the proposed turbine. This means that the turbine blades are pitched at 90 degrees or parallel to the wind to reduce their rotation speed to below two revolutions per minute while idling. This measure has been shown to significantly reduce bat fatalities (by up to 50%) in some studies (NIEA, 2021). **Bat Mitigation and Monitoring Plan** › The post-construction surveys will be carried out as per the pre-construction survey effort. Post-construction monitoring will include static detector surveys, walked survey transects and corpse searching to record any bat fatalities resulting from collision. › Static monitoring shall take place at each turbine during the bat activity season (between April and October) (NatureScot, 2021, NIEA, 2021). › Carcass searches, to monitor and record bat fatalities, shall be conducted at each turbine in accordance with NIEA Guidance.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			This shall include searcher efficiency trials and an assessment of scavenger removal rates to determine the appropriate correction factor to be applied in relation to determining an accurate estimate of collision mortality. › Monitoring surveys shall continue in Year 2 and 3, and where a curtailment requirement has been identified, the success of the curtailment strategy shall be assessed in line with the baseline data collected in the preceding year(s). **Lighting** With regard to the potential for lighting to increase collision risk, it is noted that there will be limited illumination of the turbines in the form of aviation lighting. Post construction monitoring will be carried out (as outlined below) to assess any potential changes in bat activity patterns and collision risk. Significant effects as a result of lighting are not anticipated; however, if in the course of this monitoring, any potential for significant effects on bats is identified, the site-specific mitigation measures will be reviewed and any changes necessary will be implemented to avoid any such impacts.		
Chapter 7 Birds					
Pre- Construction Phase					
MM63	Birds	EIAR Chapter 7	› Pre-commencement confirmatory surveys will be undertaken prior to the initiation of works at the Proposed Wind Farm site. The survey will aim to identify sensitive sites (e.g. nests or roosts). Any requirement for construction works to run into subsequent breeding or winter seasons following the commencement of works will be subject to a repeat of the pre-construction bird surveys. › Monitoring will be undertaken by a suitably qualified ornithologist. The survey will include a thorough walkover survey to a 500m radius of the development footprint and/or all works		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			areas. If winter roosts or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring at the beginning of the first winter or breeding season of the construction phase. If the roost/nest is found to be active during the construction phase, works will cease within a species-specific buffer of this location (as per Goodship, N.M. and Furness, R.W., 2022) in line with best practice. No works shall be permitted within the buffer until it can be demonstrated that the roost or nest is no longer occupied. › All site staff and subcontractors will be made aware of any restrictions to be imposed by means of a toolbox talk and a map of the 'no-work zone' will be made available to all construction staff. The restricted area(s) will also be marked off using hazard-tape fencing to alert all personnel on site to the suspension of works within that area.		
Construction Phase					
MM64	Birds	EIAR Chapter 7	› If winter roosting or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and no works shall be undertaken within a species-specific disturbance buffer in line with industry best practice (e.g. Goodship and Furness, 2022). No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied.		
MM65	Birds	EIAR Chapter 7	› Works will commence outside the bird nesting season (1st of March to 31st of August inclusive) where possible. Any requirement for construction works to commence during or run into the breeding season following commencement will be informed by pre-construction bird surveys. › The removal of woody vegetation will be undertaken in full compliance with Section 40 of the Wildlife Act 1976 – 2022.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› During the construction phase, noise limits, noise control measures, hours of operation (i.e. dusk and dawn is high faunal activity time) and selection of plant items will be considered in relation to disturbance of birds. All plant and equipment for use will comply with the European Communities (Noise Emission By Equipment For Use Outdoors) Regulations, 2001, as amended (SI 632/2001). Plant machinery will also be turned off when not in use. Please see Chapter 12: Noise and Vibration for more detail associated with noise during the construction phase. › An ECoW and Project Ecologist will be appointed. Duties will include: o Organise the undertaking of a pre-construction walkover bird survey to ensure that significant effects on birds will be avoided. o Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Proposed Wind Farm site. o Oversee management of ornithological issues during the construction period and advise on ornithological issues as they arise. o Provide guidance to contractors to ensure legal compliance with respect to protected species onsite. o Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress as necessary. › If winter roosting or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and no works shall be undertaken within a species-specific disturbance buffer in line with industry best practice (e.g. Goodship and Furness, 2022). No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM66	Kingfisher	EIAR Chapter 7	› Any works within 100m of the Tullaroan Stream during the period March – June will be preceded by a pre-commencement survey to investigate whether any potential active kingfisher nests are present within 100m of the proposed works; › Should an active kingfisher breeding burrow be recorded, then these works will be restricted to outside the main breeding season for kingfisher, i.e. March – June.		
Operational Phase					
MM67	Birds	EIAR Chapter 7	› Operational monitoring will be in line with guidelines issued by the NatureScot (NatureScot, 2009 and NatureScot, 2017). Surveys will be undertaken in Years 1, 2, 3, 5, 10 and 15 of the wind farm's lifetime. › Operational monitoring will include the following survey methods: o Flight activity surveys: vantage point surveys; o Breeding walkover surveys (Adapted Brown & Shepard); and o Targeted bird collision surveys (corpse searches) will be undertaken by a trained dog and handler. The surveys will include detection and scavenger trials, to correct for these two biases and ensure the resulting data is robust.		
Decommissioning Phase					
MM68	Birds	EIAR Chapter 7	During the decommissioning phase, disturbance limitation measures and monitoring will be as per the construction phase and pre-construction phase, respectively.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
EIAR Chapter 8 Land Soils & Geology					
Construction Phase					
MM69	Excavation	EIAR Chapter 8	**Proposed Wind Farm site:** › Placement of turbines and associated infrastructure in areas with suitable ground conditions (based on detailed site investigation data); › The soils and subsoil which will be removed during the construction of turbine hardstands will be localised to the turbine locations. The soil/subsoil will be placed/spread locally alongside the excavations or stored within the borrow pit and/or spoil management areas; › Excavated soils/subsoils shall be excavated and stored separately to topsoil; this will prevent mixing of materials and facilitate reuse afterwards; › At the identified spoil management area, the vegetative topsoil layer will be removed to allow for spoil to be placed and upon reaching the recommended height, the vegetative topsoil layer will be reinstated; › The identified spoil management areas will be developed in a phased approach, with the topsoil removed and temporarily stockpiled within the defined area while the spoil is being placed. The stockpiled topsoil will then be reinstated over the placed spoil, and the exercise will continue within the same spoil management area until the area is full; › The placement of spoil will be restricted to a maximum height of 1.0m, subject to confirmation by the Geotechnical Engineer; › Where practical, the surface of the placed spoil is shaped to allow efficient run-off of surface water. Where possible, shaping of the surface of the spoil will be carried out as placement of spoil within		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			the area progresses. This will reduce the likelihood of debris run-off and ensure stability of the placed spoil; › Finished/shaped side slopes of the placed spoil will be not greater than 1 (v): 3 (h) in the dedicated spoil management zones and not greater than 1 (v): 1 (h) alongside access tracks; › Inspections of the spoil management areas will be made by a Geotechnical Engineer through regular monitoring of the works. The appointed contractor will review work practices at spoil management areas when periods of heavy rainfall are expected so as to prevent excessive dirty water runoff from being generated; › An interceptor drain will be installed upslope of the identified spoil management areas to divert any surface water away from these areas; › Silt fences and double silt-fences will be emplaced down-gradient of spoil management areas and will remain in place throughout the entire construction phase, or until reseeding has been established to a sufficient level; › The surface of the deposited spoil will be profiled to a gradient to be agreed with the Geotechnical Engineer and vegetated or allowed to vegetate naturally as indicated by the Project Ecologist; › All the above-mentioned general guidelines and requirements will be confirmed by the Geotechnical Engineer prior to construction; › The material will be backfilled into the spoil management areas and will be spread evenly across the area; › It will be compacted to reduce air voids and reduce the migration paths for infiltration by precipitation. This will reduce the amount of potentially silt laden surface water run-off from these spoil management areas. Excavated soils/subsoils shall be excavated and stored separately to topsoil; this will prevent mixing of materials and facilitate reuse afterwards; and, › All materials which require management will be stockpiled at low angles (< 5-10˚) to ensure their stability and secured using silt fencing where necessary. This will help to mitigate erosion and unnecessary additions of suspended solids to the drainage system;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Spoil management will take place within a minimal distance of each turbine to avoid excessive transport of materials within the Site. **Proposed Grid Connection underground cabling route:** › Soils and subsoils excavated along the Proposed Grid Connection underground cabling route will be temporarily stored in covered stockpiles along the edge of the road carriageway; › Once the emplacement of the cable has been completed, the stored soils and subsoils will be reinstated, with the minimal amount of compaction required to level the top surface; › The tarmacadam surface along the road sections of the route will be replaced with the same design standard as the surrounding carriageway;		
MM70	Erosion of Exposed Soils/Subsoils During Construction of Infrastructure	Chapter 8	› Soil/subsoil removed from the turbine locations and associated access roads will be used for landscaping, or placed/spread locally alongside the excavation. › Temporary drainage systems will be required to limit runoff impacts during the construction phase. › In forestry areas (near T7) brash mats will be used to support vehicles on soft ground, reducing soil erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal will take place when they become heavily used and worn. Provision will be made for brash mats along all off-road routes, to protect the soil from compaction and rutting. › Soils/subsoils removed from the Proposed Grid Connection groundworks will be removed and either used for Proposed Wind Farm site borrow pit reinstatement/spoil management areas or taken to an appropriately licenced facility.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM71	Erosion of soils/ subsoils during tree felling	EIAR Chapter 8	› All proposed felling works will be completed in accordance with the best practice Forest Service regulation, policies and strategic guidance documents as well as Coillte and DAFM guidance documents to ensure that felling results in minimal potential negative effects on the local soil and subsoil environment. › Before any works are completed silt fences will be installed to limit the movement of entrained sediment in surface water runoff; › All machinery will be operated by suitably qualified personnel; › These machines will traverse the Site along specified off-road routes (referred to as racks); › Brash mats will be placed on the racks to support the vehicles on soft ground, reducing mineral soil disturbance and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur; › The condition of the racks will be continually monitored and fresh brash will be applied when the brash mat becomes heavily used and worn, ensuring that the mat remains effective throughout the operational phase; and, › The location of racks will be chosen to avoid wet and potentially sensitive areas.		
Operational Phase					
MM72	Contamination of Soils by Leakages and Spillages	EIAR Chapter 8	› Mitigation measures for land, soils and geology during the operational phase include the use of aggregate from authorised quarries for use in road and hardstand maintenance. › The base of the substation transformer will bunded and capable of holding 110% of the stored oil volume. › Turbine transformers are located within the turbines, so any leaks would be contained within the turbine.		
Decommissioning Phase					
MM73	Decommissioning Phase	EIAR Chapter 8	Mitigation measures applied during decommissioning activities will be similar to those applied during the construction phase. Some of the impacts will be avoided by leaving elements of the Proposed Project in place where		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			appropriate. The substation will be permanent infrastructure under the control of ESBN. The turbine foundations will be rehabilitated by covering with local topsoil in order to regenerate vegetation, which will reduce runoff and sedimentation effects. Internal roads will remain as access roads for farmers and forestry operations. Mitigation measures to avoid contamination by accidental fuel leakage and erosion of soil by on-site plant will be implemented as per the construction phase mitigation measures.		
EIAR Chapter 9 Water					
Pre- Construction Phase					
MM74	Earthworks	EIAR Chapter 9	**Mitigation by Avoidance:** The key mitigation measure during the construction phase is the avoidance of sensitive aquatic areas where possible, by application of suitable buffer zones (i.e. 50m to main watercourses). The large setback distance from sensitive hydrological features means that adequate room is maintained for the proposed drainage mitigation measures (discussed below) to be properly installed and operate effectively. The proposed buffer zone will: › Avoid physical damage to watercourses, and associated release of sediment; › Avoid excavations within close proximity to surface watercourses; › Avoid the entry of suspended sediment from earthworks into watercourses; and, › Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone; **Pre-commencement Temporary Drainage Works**		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Prior to the commencement of road upgrades (or new road/hardstand or turbine base installs) the following key temporary drainage measures will be installed: › All existing dry land drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using check dams/silt traps; › Clean water interceptor drains will be installed upgradient of the works areas; › Check dams/silt fence arrangements (silt traps) will be placed in all land drains that have surface water flows and also along existing farm track roadside drains; and, › A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone. › An inspection and maintenance plan for the on-site construction drainage system will be prepared in advance of commencement of any works		
Construction Phase					
MM75	Earthworks	EIAR Chapter 9	**Proposed Mitigation by Avoidance:** › Avoid physical damage (river/stream banks and river/stream beds) to watercourses and associated release of sediment; › Avoid excavations within close proximity to surface watercourses; › Avoid the entry of suspended sediment from earthworks into watercourses; and, › Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone. **Mitigation by Design:**		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Source controls: › Interceptor drains, vee-drains, diversion drains, flume pipes, erosion and velocity control measures such as use of sandbags, oyster bags filled with gravel, filter fabrics, and other similar/equivalent or appropriate systems. › Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas. In-Line controls: › Interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sandbags, oyster bags, straw bales, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems. Treatment systems: › Temporary sumps and ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbuster, and/or other similar/equivalent or appropriate systems. The main elements of interaction with existing drains will be as follows: Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system, there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the Proposed Project drainage into the existing site drainage network. This will reduce the potential for any increased risk of downstream flooding or sediment transport/erosion;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Silt traps will be placed in the existing drains upstream of any streams where construction works / tree felling is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area; › Runoff from individual turbine hardstanding areas will be not discharged into the existing drain network but discharged locally at each turbine location through settlement ponds and buffered outfalls onto vegetated surfaces; › Buffered outfalls which will be numerous over the Site will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the Site; and, › Drains running parallel to the existing roads requiring widening will be upgraded, widening will be targeted to the opposite side of the road. Velocity and silt control measures such as check dams, sandbags, oyster bags, straw bales, flow limiters, weirs, baffles, silt fences will be used during the upgrade construction works. Regular buffered outfalls will also be added to these drains to protect downstream surface waters. **Silt Fences:** Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids such as those present in the subsoils/sandstone tills that overlie the Site. This will act to prevent entry to water courses of sand and gravel sized sediment, released from excavation of mineral sub-soils of glacial and glacio-fluvial origin, and entrained in surface water runoff. Inspection and maintenance of these of these structures during construction phase is critical to their functioning to stated purpose. They will remain in place throughout the entire construction phase. Double silt fences will be placed within drains down-gradient of all construction areas inside the 50m buffer zones.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Silt Bags: Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, the majority of the sediment is retained by the geotextile fabric allowing filtered water to pass through. Silt bags will be used with natural vegetation filters or sedimats Sediment entrapment mats, consisting of coir or jute matting, will be placed at the silt bag location to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure. **Settlement Pond Design:** During the initial construction of roads, silt fences, straw bales and biodegradable geogrids will be used to control surface water runoff from works areas. **Level Spreaders and Vegetation Filters:** The purpose of level spreaders is to release treated drainage flow in a diffuse manner and to prevent the concentration of flows at any one location thereby avoiding erosion. Level spreaders are no intended to be a primary treatment component for development surface water runoff. They are not standalone but occur as part of treatment train of systems that will reduce the velocity of runoff prior to being released at the level spreader. In the absence of levelspreaders, the potential for ground erosion is significantly greater than not using them. Vegetation filters are end of line polishing filter that are located at the end the treatment train. In fact, vegetation filters are ultimately a positive consequence of not discharging directly into watercourses which is one of the mitigation components of the drainage philosophy. This makes use of the natural		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			vegetation of the site to provide a polishing filter for the wind farm drainage prior to reaching the downstream watercourses. **Water Treatment Train:** A final line of defence will be provided by a water treatment train such as a "Siltbuster". If the discharge water from construction areas fails to be of a high quality during regular inspections, then a filtration treatment system (such as a 'Siltbuster' or similar equivalent treatment train (sequence of water treatment processes) will be used to filter and treat all surface discharge water collected in the dirty water drainage system. This will apply for all of the construction phase.		
MM76	Tree Felling	EIAR Chapter 9 CEMP Section 3	**Mitigation by Avoidance:** There is a requirement in the Forest Service Code of Practice and in the FSC Certification Standard for the installation of buffer zones adjacent to aquatic zones. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document "Forestry and Water Quality Guidelines" can be found in Section 9.5.2 of Chapter 9 of this EIAR. **Mitigation by Design:** Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods which are set out as follows: › Machine combinations (i.e. handheld or mechanical) will be chosen which are most suitable for ground conditions and which will minimise soils disturbance; › All machinery will be operated by suitably qualified personnel; › Checking and maintenance of roads and culverts will be on-going through any felling operation. No tracking of vehicle through watercourses will occur, as vehicles will use road infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during felling works; › Machines will traverse the Site along specified off-road routes (referred to as racks);		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› The location of racks will be chosen to avoid wet and potentially sensitive areas; › Brash mats will be placed on the racks to support the vehicles on soft ground, reducing mineral soil disturbance and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal should take place when they become heavily used and worn. Provision should be made for brash mats along all off-road routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall; › Silt fences will be installed at the outfalls of existing drains downstream of felling areas. No direct discharge of such drains to watercourses will occur. Sediment traps and silt fences will be installed in advance of any felling works and will provide surface water settlement for runoff from work areas and will prevent sediment from entering downstream watercourses. Accumulated sediment will be carefully disposed of at pre-selected spoil repository areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground; › In areas particularly sensitive to erosion it will be necessary to install double or triple sediment traps and increase buffer zone width. These measures will be reviewed on Site during construction; › Double silt fencing will also be put down slope of felling areas which are located in close proximity to streams and/or relevant watercourses; › Drains and silt traps will be maintained throughout all felling works, ensuring that they are clear of sediment build-up and are not severely eroded; › Timber will be stacked in dry areas, and outside watercourse buffer zones. Check dams and silt traps will be emplaced on the down gradient side of timber storage/processing sites;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water runoff; › Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors **Silt Traps** › Silt traps will be strategically placed down-gradient within forestry drains near streams **Pre-emptive Site Drainage Management** › The works programme for the felling operations will also take account of weather forecasts and predicted rainfall in particular. Operations will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast. Works will be suspended if forecasting suggests any of the following is likely to occur: › >10 mm/hr (i.e. high intensity local rainfall events); › >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or, › >half monthly average rainfall in any 7 days. **Drain Inspection and Maintenance:** The following items shall be carried out during inspection pre-felling and after:		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Communication with tree felling operatives in advance to determine whether any areas have been reported where there is unusual water logging or bogging of machines; › Inspection of all areas reported as having unusual ground conditions; › Inspection of main drainage ditches and outfalls. During pre-felling inspection, the main drainage ditches shall be identified. Ideally the pre-felling inspection shall be carried out during rainfall; › Following tree felling all main drains shall be inspected to ensure that they are functioning; › Extraction tracks near drains need to be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground; › Culverts on drains exiting the Site will be unblocked; and, › All accumulated silt will be removed from drains and culverts, and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall. **Surface Water Quality Management:** › Sampling will be completed before, during (if the operation is conducted over a protracted time) and after the felling activity.		
MM77	Impacts on Groundwater Levels during Excavation Works	EIAR Chapter 9	› Some temporary dewatering may be required where excavations on the lower ground (i.e. in the valley of the Tullaroan Stream) encounter granular subsoils associated with the Kilmanagh Gravels GWB. However, any dewatering works will be temporary, and no significant or permanent excavations are proposed in this area of the Site. › Relevant environmental management guidelines from the EPA quarry 2006 guidance document – "Environmental Management		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			in the Extractive Industry" in relation to groundwater issues will be implemented during the construction phase.		
MM78	Earthworks Resulting in Suspended Solids Entrainment in Surface Waters	EIAR Chapter 4, 9 CEMP Section 4	**Mitigation by Avoidance:** › The key mitigation measure during the construction phase is the avoidance of sensitive hydrological features where possible, by application of suitable buffer zones; › All of the key Proposed Project areas are located significantly away from the delineated 50m watercourse buffer zones with the exception of the construction of the proposed 38kV substation, an existing watercourse crossing, new watercourse crossing and upgrades to existing site access tracks; **Proposed Wind Farm Site** **Mitigation by Design:** *Source controls:* › Interceptor drains, vee-drains, diversion drains, flume pipes, erosion and velocity control measures such as use of sand bags, oyster bags filled with gravel, filter fabrics, and other similar/equivalent or appropriate systems. › Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas. *In-Line controls:* › Interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sand bags, oyster bags, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Treatment systems: › Temporary sumps and ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbuster, and/or other similar/equivalent or appropriate systems It should be noted that for the Proposed Wind Farm site, an extensive network of forestry and agricultural drains already exist, and these will be integrated and enhanced as required and used within the Proposed Wind Farm drainage system; › Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system, there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the Proposed Wind Farm site drainage into the existing site drainage network; › Silt traps will be placed in the existing drains upstream of any streams where construction works / tree felling is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area; › Runoff from individual turbine hardstanding areas will be not discharged into the existing drain network but discharged locally at each turbine location through settlement ponds and buffered outfalls onto vegetated surfaces; › Buffered outfalls which will be numerous over the Site will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the Proposed Wind Farm site; and, › Drains running parallel to the existing roads requiring widening will be upgraded, widening will be targeted to the opposite side of the road. Velocity and silt control measures such as check dams,		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			sand bags, oyster bags, flow limiters, weirs, baffles, silt fences will be used during the upgrade construction works. Regular buffered outfalls will also be added to these drains to protect downstream surface waters. **Proposed Grid Connection** › All existing land and forestry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using forestry check dams/silt traps; › Clean water interceptor drains will be installed upgradient of the works areas; › Check dams/silt fence arrangements (silt traps) will be placed in all existing that have surface water flows; and, › A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone; **Silt Fences:** Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids such as those present in the subsoils/sandstone tills that overlie the site. This will act to prevent entry to water courses of sand and gravel sized sediment, released from excavation of mineral sub-soils of glacial and glacio-fluvial origin, and entrained in surface water runoff. Inspection and maintenance of these of these structures during construction phase is critical to their functioning to stated purpose. They will remain in place throughout the entire construction phase. Double silt fences will be placed within drains down-gradient of all construction areas inside the hydrological buffer zones. **Silt Bags:** Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, the		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			majority of the sediment is retained by the geotextile fabric allowing filtered water to pass through. Silt bags will be used with natural vegetation filters or sedimats Sediment entrapment mats, consisting of coir or jute matting, will be placed at the silt bag location to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure. **Settlement Ponds:** The Proposed Wind Farm footprint has been divided into drainage catchments (based on topography, outfall locations, catchment size) and stormwater runoff rates based on the 10-year return period rainfall event were calculated for each catchment. These flows were then used to design settlement ponds for each drainage catchment. The settlement ponds are designed for 11hr or 24hr retention times used to settle out medium silt (0.006mm) and fine silt (0.004mm) respectively (EPA, 2006) . Settlement ponds at the borrow pit are designed to allow 24hr retention and settlement ponds along access roads and at turbine hardstands will have 11hr retention as there is additional in-line drainage controls proposed along access tracks and at hardstands. The supporting design calculations for all settlement ponds are included on Drawing D501 included in Appendix 4-3. **Level Spreaders and Vegetation Filters:** The purpose of level spreaders is to release treated drainage flow in a diffuse manner, and to prevent the concentration of flows at any one location thereby avoiding erosion. Level spreaders are not intended to be a primary treatment component for development surface water runoff. They are not stand alone but occur as part of a treatment train of systems that will reduce the velocity of runoff prior to be released at the level spreader. In		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			the absence of level spreaders, the potential for ground erosion is significantly greater than not using them. Vegetation filters are essentially end-of-line polishing filters that are located at the end of the treatment train. In fact, vegetation filters are ultimately a positive consequence of not discharging directly into watercourses which is one of the mitigation components of the drainage philosophy. This makes use of the natural vegetation of the site to provide a polishing filter for the Proposed Wind Farm site drainage prior to reaching the downstream watercourses. Again, vegetation filters are not intended to be a single or primary treatment component for treatment of works area runoff. They are not stand alone but are intended as part of a treatment train of water quality improvement/control systems (i.e. source controls: check dams; silt traps; settlement ponds; level spreaders; silt fences; vegetation filters). **Water Treatment Train:** A final line of defence will be provided by a water treatment train such as a "Siltbuster". If the discharge water from construction areas fails to be of a high quality during regular inspections, then a filtration treatment system (such as a 'Siltbuster' or similar equivalent treatment train (sequence of water treatment processes) will be used to filter and treat all surface discharge water collected in the dirty water drainage system. This will apply for all of the construction phase. **Pre-emptive Site Drainage Management:** The works programme for the entire construction stage of the Proposed Project will also take account of weather forecasts, and predicted rainfall in particular. Large excavations and movements of soil/subsoil or vegetation stripping will be suspended or scaled back if heavy rain is forecast. The		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast. **Management of Runoff from the Spoil Management Areas:** It is proposed that excavated soil/subsoil (spoil) will be used to reinstate the proposed borrow pit and any excess spoil will be placed in the designated spoil management areas within the Proposed Wind Farm site and in linear berms along access roads and turbine hardstands where appropriate. The spoil management areas are located outside the 50m hydrological buffer zone. Proposed surface water quality protection measures regarding the spoil management areas are as follows: › Where applicable the vegetative topsoil layer of the spoil management areas will be rolled back to facilitate placement of excavated spoil up to a maximum height of 1.0 metres, following which the vegetative-top soils layer will be reinstated; › Where reinstatement is not possible, spoil management areas will be sealed with a digger bucket and seeded as soon possible to reduce sediment entrainment in runoff; › An interceptor drain will be installed upslope of the identified spoil management areas to divert any surface water away from these areas where necessary; › Silt fences and double silt-fences will be emplaced down-gradient of the designated spoil management areas and will remain in place throughout the entire construction phase, or until reseeding has been established to a sufficient level; › The spoil management areas are an enclosed area and its drainage can be easily managed; › Drainage from the borrow pit will be directed to settlement ponds as required or will overflow through controlled overflow pipes;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Discharge from the borrow pit will be intermittent and will depend on preceding rainfall amounts ; and, › Once the spoil management area has been seeded and vegetation is established the risk to downstream surface water is significantly reduced. Therefore, at each stage of the spoil management area development the above mitigation measures will be deployed to ensure protection of downstream water quality. The borrow pit settlement ponds have been designed to allow a 24hr retention time as per EPA guidance (2006) which is highest level of protection recommended by the EPA with regard to retention time. **Timing of Site Construction Works**: Construction of the site drainage system will only be carried out during periods of low 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. Construction of the drainage system during this period will also ensure that attenuation features associated with the drainage system will be in place and operational for all subsequent construction works		
MM79	Near-stream Works	EIAR Chapter 9	› Near stream construction work, will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works according to the Eastern Regional Fisheries Board (2004) guidance document "Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites", i.e., May to September inclusive. 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		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI); › Where works are necessary inside the 50m buffer double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase		
MM80	Directional Drilling along the Proposed Grid Connection Underground Cabling Route	EIAR Chapter 9, CEMP Section 2	› Although no in-stream works are proposed, the drilling works will only be done over a dry period between July and September (as required by IFI for in-stream works) to avoid the salmon spawning season and to have more favourable (dryer) ground conditions; › The crossing works area will be clearly marked out with fencing or flagging tape to avoid unnecessary disturbance; › There will be no storage of material / equipment or overnight parking of machinery inside the hydrological buffer zone ; › Before any ground works are undertaken, double silt fencing will be placed upslope of the watercourse channels ; › Additional silt fencing or straw bales (pinned down firmly with stakes) will be placed across any natural surface depressions / channels that slope towards the watercourse; › Silt fencing will be embedded into the local soils to ensure all site water is captured and filtered; › The area around the bentonite batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages; › Drilling fluid returns will be contained within a sealed tank / sump to prevent migration from the works area; › Spills of drilling fluid will be cleaned up immediately and contained in an adequately sized skip before been taken off-site; › If rainfall events occur during the works, there will be a requirement to collect and treat small volumes of surface water from areas of disturbed ground (i.e. soil and subsoil exposures created during site preparation works); › This will be completed using a shallow swale and sump down slope of the disturbed ground; and water will be pumped to a proposed settlement pond area at least 50m from the watercourse;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› The discharge of water onto vegetated ground will be via a silt bag which will filter any remaining sediment from the pumped water. The entire percolation area will be enclosed by a perimeter of double silt fencing; › Any sediment laden water from the works area will not be discharged directly to a watercourse or drain; › Works shall not take place during periods of heavy rainfall and will be scaled back or suspended if heavy rain is forecasted; › Daily monitoring of the compound works area, the water treatment and pumping system and the percolation area will be completed by a suitably qualified person during the construction phase. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter is discharged to the watercourse; › If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied; › On completion of the works, the ground surface disturbed during the site preparation works and at the entry and exit pits will be carefully reinstated and re-seeded at the soonest opportunity to prevent soil erosion; › The silt fencing upslope of the river will be left in place and maintained until the disturbed ground has re-vegetated; › There will be no batching of cement along the Proposed Grid Connection underground cabling route ; › There will be no refuelling allowed within 100m of the watercourse crossing; and, › All plant will be checked for purpose of use prior to mobilisation at the watercourse crossing. **Fracture Blow-out (Frac-out) Prevention and Contingency Plan:**		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› The drilling fluid will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used); › The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage; › One or more lines of silt fencing will be placed between the works area and the adjacent river; › Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility; › Adequately sized skips will be used where temporary storage of arisings are required; › The drilling process / pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse; › This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur then drilling will be immediately stopped; › Any frac-out material will be contained and removed off-site; › The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix; and, › If the risk of further frac-out is high, a new drilling alignment will be sought at the crossing location		
MM81	Site Drainage Management	EIAR Chapter 9 CEMP Section 3	**Pre-emptive Site Drainage Management:** The works programme for the entire construction stage of the development will also take account of weather forecasts and predicted rainfall in particular. Large excavations and movements of soil/subsoil or vegetation stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			The following forecasting systems are available and will be used on a daily basis at the Site to direct proposed construction activities: › General Forecasts: Available on a national, regional and county level from the Met Eireann website (www.met.ie/forecasts). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates; › MeteoAlarm: Alerts to the possible occurrence of severe weather for the next 2 days. Less useful than general forecasts as only available on a provincial scale; › 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events; › Rainfall Radar Images: Images covering the entire country are freely available from the Met Eireann website (www.met.ie/latest/rainfall_radar.asp). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive; and, › Consultancy Service: Met Eireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest. › quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive; and, › Consultancy Service: Met Eireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Using the safe threshold rainfall values will allow work to be safely controlled (from a water quality perspective) in the event of forecasting of an impending high rainfall intensity event. Works will be suspended if forecasting suggests either of the following is likely to occur: › >10 mm/hr (i.e. high intensity local rainfall events); › >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or, › >half monthly average rainfall in any 7 days. Prior to works being suspended the following control measures will be completed: › All active excavations will be secured and sealed off; › Temporary or emergency drainage will be installed to prevent back-up of surface runoff; and, › No works will be completed during heavy rainfall and for up to 24 hours after heavy events to ensure drainage systems are not overloaded.		
MM82	Excavation Dewatering	EIAR Chapter 9	› Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations will be put in place; › If required, pumping of excavation inflows will prevent build-up of water in the excavation; › The interceptor drainage will be discharged to the site constructed drainage system or onto natural vegetated surfaces and not directly to surface waters; › The pumped water volumes will be discharged via volume and sediment attenuation ponds adjacent to excavation areas, or via specialist treatment systems such as a Siltbuster unit or silt bag;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› There will be no direct discharge to surface watercourses, and therefore no risk of hydraulic loading or contamination will occur; › Daily monitoring of excavations by the ECoW will occur during the construction phase. If high levels of seepage inflow occur, excavation work will immediately be stopped and a geotechnical assessment undertaken; and, › A mobile 'Siltbuster' or similar equivalent specialist treatment system will be available on-site for emergencies in order to treat sediment polluted waters from settlement ponds or excavations should they occur. Siltbusters are mobile silt traps that can remove fine particles from water using a proven technology and hydraulic design in a rugged unit. The mobile units are specifically designed for use on construction-sites. They will be used as final line of defence if needed.		
MM83	Groundwater and Surface Water Contamination from Wastewater	EIAR Chapter 9	› During the construction phase, a self-contained port-a-loo with an integrated waste holding tank will be used at each of the site construction compounds, maintained by the providing contractor, and removed from site on completion of the construction works; › Water supply for the site office and other sanitation will be brought to site and removed after use from the Site to be discharged at a suitable off-site treatment location; and, › No water or wastewater for sanitation will be sourced on the Site, nor discharged to the Site.		
MM84	Potential Release of Hydrocarbons	EIAR Chapter 9 CEMP Section 3	Whilst no oils are around the cables, a lubricant will be used during cable pulling. The lubricant to be used is Techlude PHD which is a pourable, non-flammable, non-toxic and substantially biodegradable water-based product that does not pose a threat to the environment.		
MM85	Morphological Changes to Surface Watercourses and Drainage Patterns	EIAR Chapter 9	The Proposed Project design has been optimised to utilise the existing infrastructure (i.e. existing site roads) where practicable. Only 4 no. new crossings are proposed. This design prevents the unnecessary disturbance of the existing site drainage network prevents the requirement for widespread instream works across the Proposed Wind Farm site.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› The proposed new stream crossings and upgrade of an existing crossing will be clear span bridge crossings and the existing banks will remain undisturbed. No in-stream excavation works are proposed at these locations and therefore there will be no direct impact on the stream at the proposed crossing locations. Abutments will be constructed from precast units combined with in-situ foundations; › All guidance / mitigation measures required by the OPW and/or the Inland Fisheries Ireland (IFI) is incorporated into the design of the proposed crossings; › All drainage measures will be installed in advance of the works; › Plant and equipment will not be permitted to track across the watercourse; › Access to the opposite side of the watercourse for excavation and foundation installation will require the installation of a temporary pre-cast concrete or metal bridge; › Once the foundations have been completed at both sides of the watercourse, the pre-cast concrete box culvert will be installed using a crane and there will be no contact with the watercourse; › Where the box culvert is installed in sections, the joint will be sealed to prevent granular material entering the watercourse; › As a further precaution, near stream construction work, will only be carried out during the period permitted by IFI for in-stream works according to the IFI (2016) guidance document "Guidelines on protection of fisheries during construction works in and adjacent to waters", i.e., July to September inclusive. 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 (any deviation from this will be done in discussion with the IFI); › Where works are necessary inside the 50m buffer double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase; and,		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› All new river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent. The following mitigation measures are proposed for the grid connection crossing works; › No stockpiling of construction materials will take place along the grid route; › No refuelling of machinery or overnight parking of machinery is permitted in this area; › No concrete truck chute cleaning is permitted in this area; › Works will not take place at periods of high rainfall, and will be scaled back or suspended if heavy rain is forecast; › Local road drainage, culverts and manholes will be temporarily blocked during the works; › Machinery deliveries will be arranged using existing structures along the public road; › All machinery operations will take place away from the stream and ditch banks, apart from where crossings occur. Although no instream works are proposed or will occur; › Any excess construction material will be immediately removed from the area and sent to a licenced waste facility; › Spill kits will be available in each item of plant required to complete the works; and, › Silt fencing will be erected on ground sloping towards watercourses at the stream crossings if required.		
MM86	Potential Effects Associated with Piled Foundations	EIAR Chapter 9	› Strict QA/QC procedures for piling works will be followed; › Piles will be kept vertical during piling works; › Good workmanship will be employed during all piling works; and, › Where required use bentonite seal to prevent upward/downward movement of surface water/groundwater		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM87	Potential Effects on Downstream Surface Water Abstractions	EIAR Chapter 9	Mitigation measures relating to the protection of surface water drainage regimes and surface water quality have been detailed in [MM3] and [MM78], [MM19], [MM20], [MM25] and [MM36] and [MM40]		
MM88	WFD Water Body Status	EIAR Chapter 9	› Mitigation measures for the protection of surface and groundwater water quality will be implemented during the construction phase of the Proposed Project to ensure that there is no deterioration in local or downstream water quality. These mitigation measures will ensure the qualitative status the receiving waterbodies remains unaltered by the Proposed Project.		
MM89	Hydrologically Connected Designated Sites	EIAR Chapter 9, Chapter 6	› Mitigation measures for the protection of surface and groundwater water quality will be implemented during the construction phase of the Proposed Project to ensure that there is no deterioration in local or downstream water quality.		
Operational Phase					
MM90	Progressive Replacement of Natural Surface with Lower Permeability Surfaces	EIAR Chapter 9	**Mitigation by Design:** › Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed over the ground by means of a level spreader; › Swales/road side drains will be used to collect runoff from access roads and turbine hardstanding areas of the Site, likely to have entrained suspended sediment, and channel it to settlement ponds for sediment settling; › On steep sections of access road transverse drains ('grips') will be constructed in the surface layer of the road to divert any runoff off the road into swales/road side drains;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Check dams will be used along sections of access road drains to intercept silts at source. Check dams will be constructed from a 4/40mm non-friable crushed rock; › Settlement ponds, emplaced downstream of road swale sections and at turbine locations, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses; and, › Settlement ponds have been designed in consideration of the greenfield runoff rate		
MM91	Runoff Resulting in Entrained Sediment	EIAR Chapter 9	› Mitigation measures for sediment control are the same as those outlined above for the construction phase.		
Decommissioning Phase					
MM92	Decommissioning	EIAR Chapter 9	Mitigation measures to avoid contamination by accidental fuel leakage and compaction of soil by on-site plant will be implemented as per the construction phase mitigation measures.		
Chapter 10 Air Quality					
Construction Phase					
MM93	Exhaust Emissions	EIAR Chapter 10 CEMP Section 3	› Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. › The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required. › All plant and materials vehicles shall be stored in dedicated areas (onsite). Machinery will be switched off when not in use. › Turbines and construction materials will be transported to the site on specified routes only, unless otherwise agreed with the Planning Authority. Please see Chapter 15 Material Assets for details. › All plant and materials vehicles shall be stored in dedicated areas (onsite).		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction. › The expected waste volumes generated onsite are unlikely to be large enough to warrant source segregation at the Site. Therefore, all wastes streams generated onsite will be deposited into a single waste skip which will be covered. This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements. › Aggregate materials for the construction of the Proposed Wind Farm infrastructure will be predominantly sourced onsite. › Aggregate materials for the construction of Site access tracks and all associated infrastructure will all be sourced from the proposed onsite borrow pit where possible, or else locally sourced, where possible, which will further reduce potential emissions. › A CEMP will be in place throughout the construction phase (see Appendix 4-2).		
MM94	Dust Emissions	EIAR Chapter 10 CEMP Section 3	› Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored to avoid, insofar as reasonably possible, increased runoff. › All plant and materials vehicles shall be stored in dedicated areas within the Site. › Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction. › Turbines and construction vehicles will be transported to the Site on specified haul routes only.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Proposed Grid Connection infrastructure will be transported to the Site on specified haul routes only. › Some construction materials for the Proposed Grid Connection and the Proposed Wind Farm may be sourced locally from licenced quarries. › The agreed haul route roads adjacent to the Site will be regularly inspected for cleanliness and cleaned as necessary. › The roads adjacent to the Site entrances will be checked weekly for damage/potholes and repaired as necessary. › The transport of construction materials around the Site from the nearby quarry facilities will be covered by tarpaulin where necessary. › Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the amount of emissions associated with vehicle movements.		
Operational Phase					
MM95	Exhaust and Dust Emissions	EIAR Chapter 10	› Any vehicles or plant brought onsite during the operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any emissions that arise. › When stationary, delivery and on-site vehicles will be required to turn off engines. › Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements.		
Decommissioning Phase					

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM96	Decommissioning Phase	EIAR Chapter 10	Any impact and consequential effect that occurs during the decommissioning phase are similar to that which occur during the construction phase, be it of less effect. The mitigation measures prescribed for the construction phase of the Proposed Project will be implemented during the decommissioning phase thereby minimising any potential impacts.		
Chapter 11 Climate					
Construction Phase					
MM97	Greenhouse Gas Emissions	EIAR Chapter 11	In addition to the mitigation measures prescribed in [MM93] above: › Where applicable, low carbon intensive construction materials will be sourced and utilised onsite.		
Operational Phase					
MM98	Greenhouse Gas Emissions	EIAR Chapter 11 Appendix 6-4	› Ensure that all maintenance and monitoring vehicles will be maintained in good operational order while onsite, and, when stationary, be required to turn off engines thereby minimising any emissions that arise. › As detailed in Appendix 6-4, a BMEP, for the Proposed Project has identified biodiversity enhancement and management activities such as native hedgerow planting (approximately 3,640 of hedgerows). It is also proposed to plant some native tree species within the hedgerow habitat to further increase the biodiversity value within the Site. › The identified 3.57ha of forestry that will be permanently felled for the Proposed Wind Farm will be replaced or replanted on a hectare for hectare basis as a condition of any felling licence that will be issued in respect of the Proposed Wind Farm felling (Section 4.3.1.7.2 of Chapter 4 of this EIAR).		
Decommissioning Phase					

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM99	Decommissioning Phase	EIAR Chapter 11	The mitigation measures prescribed for the construction phase of the Proposed Project will be implemented during the decommissioning phase thereby minimising any potential impacts.		
EIAR Chapter 12 Noise					
Pre- Construction Phase					
MM100	Construction Noise	EIAR Chapter 12	Local residents will be kept informed of the proposed working schedule, where appropriate, including the times and duration of any abnormally noisy activity that may cause concern;		
Construction Phase					
MM101	Construction Noise	EIAR Chapter 12 CEMP Section 3	The following best practice mitigation measures from BS5528-1 standard will be implemented for the duration of the construction phase: › Limiting the hours during which site activities likely to create high levels of noise or vibration are permitted; › Establishing channels of communication between the contractor/developer, Local Authority and residents; › Appointing a site representative responsible for matters relating to noise and vibration; › Monitoring typical levels of noise and vibration during critical periods and at sensitive locations; › Keeping site access roads even to mitigate the potential for vibration from lorries. › Selection of plant with low inherent potential for generation of noise and/ or vibration; › Placing of noise generating / vibratory plant as far away from sensitive properties as possible within the site constraints, and; › Regular maintenance and servicing of plant items. The contract documents will clearly specify that the Contractor undertaking the construction of the works will be obliged to take specific noise abatement measures and comply with the recommendations of British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise. The following list of		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			measures will be implemented on site, to ensure compliance with the relevant construction noise criteria: › No plant used on site will be permitted to cause an on-going public nuisance due to noise. › The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations. › All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract. › Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers. › Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use. › Any plant, such as generators or pumps, which is required to operate close to NSLs outside of general construction hours will be surrounded by an acoustic enclosure or portable screen. › During the course of the construction programme, supervision of the works will include ensuring compliance with the limits detailed in Section 12.3.2.1.1 using methods outlined in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise. › The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 7:00hrs and 19:00hrs Monday to Saturday. However, to ensure that optimal use is made of good weather periods or at critical periods within the programme (i.e. concrete pours, rotor/tower deliveries) it will be necessary on occasion to work outside of these hours.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Rock Breaking: › Fit suitably designed muffler or sound reduction equipment to the rock breaking tool to reduce noise without impairing machine efficiency. › Ensure all leaks in air lines are sealed. › Erect acoustic screen between compressor or generator and noise sensitive area. › When possible, line of sight between top of machine and reception point needs to be obscured. › Enclose breaker or rock drill in portable or fixed acoustic enclosure with suitable ventilation. **Blasting:** › Restriction of hours within which blasting can be conducted (e.g. 09:00 – 18:00hrs). › Notification to nearby residents before blasting starts (e.g. 24-hour written notification). › The firing of blasts at similar times to reduce the 'startle' effect. › On-going circulars informing people of the progress of the works. › The implementation of an onsite documented complaints procedure. › The use of independent monitoring by external bodies for verification of results. › Trial blasts in less sensitive areas to assist in blast designs and identify potential zones of influence.		
Operational Phase					

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM102	Operational Phase Noise	EIAR Chapter 12	**Turbine Curtailment** Modern wind turbines can be programmed to run in reduced modes of operation (or low noise modes) to achieve the attenuation required in the specific wind conditions (i.e. wind speed and direction). If the Proposed Project is granted planning permission, once constructed, a compliance noise survey will be carried out to quantify the wind turbine noise levels due to the Proposed Project and assess their compliance with noise criteria. Should predicted exceedances be confirmed at the commissioning stage of the Proposed Wind Farm, it is proposed to mitigate for this through curtailment of turbine(s) in the relevant wind speed and directions. The curtailment strategy will be developed for the specific relevant turbine installed on the Site and the associated noise emissions at the various operational wind speeds. If necessary, a detailed curtailment strategy matrix will be developed at the detailed design stage in order to achieve the relevant noise criteria at all NSLs. **Amplitude modulation** In the event that a complaint which indicates potential Amplitude Modulation (AM) associated with turbine operation, the operator will employ a qualified acoustic consultant to assess the level of AM in accordance with the methods outlined in the Institute of Acoustics IOA Noise Working Group (Wind Turbine Noise) Amplitude Modulation Working Group Final Report: A Method for Rating Amplitude Modulation in Wind Turbine Noise (9 August 2016) 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 information on the frequency and duration of		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			occurrence, which can be used to evaluate different operational conditions including mitigation. These mitigation measures, if required, will consist of the implementation of operational controls for the relevant turbine type, which may include turbine curtailment and/or stopping turbines under specific operational conditions **Noise Monitoring** An operational noise survey will be undertaken to ensure compliance with any noise conditions applied to the development. It is common practice to commence surveys within six months of the Proposed Wind Farm being fully commissioned. If an exceedance of the noise criteria is identified as part of the c assessment, the guidance outlined in the IOA GPG, specifically Supplementary Guidance Note 5: Post Completion Measurements (July 2014) will be followed, and relevant corrective actions taken.		
Decommissioning Phase					
MM103	Noise	EIAR Chapter 12	During the decommissioning phase of the Proposed Wind Farm there will be noise emissions from site traffic and other on-site activities. A conservative assessment assuming similar overall noise levels as those calculated for the construction phase can be considered for elements that are proposed to be decommissioned. The noise and vibration impacts associated with any decommissioning of the site are considered to be less than those outlined in relation to the construction of the Proposed Project. The mitigation measures prescribed for the construction phase of the Proposed Project will be implemented during the decommissioning phase thereby minimising any potential impacts.		
EIAR Chapter 14 Cultural Heritage					
Pre-construction Phase					
MM104	Sub Surface Archaeological Potential	EIAR Chapter 14	› Pre-development archaeological testing of the Proposed Project infrastructure in previously undisturbed greenfield areas of the Site will be carried under licence from the National Monuments		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Service. This is in order to identify any archaeological features at the earliest stage possible to allow time to deal with any requirements such as preservation in situ (redesign / avoidance) or preservation by record (archaeological excavation). › A report on the testing will be compiled on completion of the work and submitted to the relevant authorities. › Further mitigation such as preservation in situ (avoidance), preservation by record (excavation), buffer zones may be required depending on the results of the testing. › Further mitigation such as preservation in situ (avoidance), preservation by record (excavation), buffer zones may be required depending on the results of the monitoring.		
Construction Phase					
MM105	Recorded Monuments and Protected Structures	EIAR Chapter 14	› Archaeological monitoring of ground works associated with the Proposed Grid Connection underground cabling route where it extends through the ZoN for the historic town of Freshford (KK013-023—) and the graveyard (KK013-023002-) at Freshford Lots. › Archaeological Monitoring of all groundworks during construction by a licensed archaeologist. › A report on the monitoring will be compiled on completion of the work and submitted to the relevant authorities. › Should human remains be uncovered during the works at Freshford all works shall cease and the NMS will be informed of the findings immediately. The services of an osteoarchaeologist will also be required. A decision on how best to proceed will be made in consultation with the NMS. › Protective temporary fencing should be placed around the stone structure CH9 for the duration of the construction works associated with the Proposed Grid Connection underground cabling route in this area.		
Chapter 13 Landscape and Visual					
Pre-Commencement, Construction, Operation and Decommissioning					

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM106	Landscape Effects	EIAR Chapter 13	Through the iterative project design process, informed by early-stage impact assessment work, landscape modelling, ZTV mapping and photomontage preparation, public and stakeholder consultation every effort has been made to bring forward the optimum design for the Proposed Wind Farm with respect to landscape and visual factors. The Proposed Project layout that is the subject of this LVIA, already incorporates the following landscape and visual design considerations for good wind farm design, with a particular focus on site selection: › The proposed turbines are strategically sited within a modified working landscape with limited visibility from large areas of the LVIA Study Area and designated high-sensitivity landscape and visual receptors. › The characteristics of the elevated landforms and terrain surrounding the proposed turbines provide visual enclosure, obscuring visibility and reducing the visual envelope of the Proposed Project from vast areas of the wider landscape and LVIA Study Area. › The turbine layout has been designed to create a coherent arrangement of turbines, contiguous and connected to each other visually and with consistent spacing in line with the sitting of wind farms within Hilly and Flat Farmland Landscape Types in the 'Wind Energy Development Guidelines for Planning Authorities' published by the Department of the Environment, Heritage and Local Government (DoEHLG) in 2006: hereafter, 'the Guidelines' . › Siting of proposed turbines adheres to the minimum 500m set back distance from residential receptors in the Guidelines and also the recommended 4 times tip height set back distance to third party properties, explicitly set out for residential visual amenity in the 'Draft Revised Wind Energy Development Guidelines' published by the Department of Housing, Planning and Local Government (DoHPLG in 2019): hereafter, 'the draft Guidelines' .		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› The proposed turbines are sited within a landscape characterised by agricultural fields bordered by mature hedgerows and treelines which provide visual screening of the Proposed Wind Farm, limiting its visibility from receptors in a large proportion of the wider landscape setting. › The layout of the Proposed Project ensures minimal loss of valuable landscape receptors and biodiversity corridors. In addition, as part of the Proposed Project, it is proposed to plant, a 5m riparian buffer in the form of hedgerows along both sides of a 1.1km segment of the Tullaroan Stream within the Proposed Wind Farm site. The proposed riparian buffer comprises an area of 1.7ha of planting. Please see Chapter 6 Biodiversity and Appendix 6-4 Biodiversity Management and Enhancement Plan for details. › The onsite 38kV substation is the only above-ground component of the Proposed Grid Connection, and it is situated within the Proposed Wind Farm site. The substation is within an agricultural field enclosed by mature vegetation, which provides visual screening and substantially limits views of the proposed structure.		
Chapter 15 Material Assets - Traffic					
Pre-Construction, Construction and Operation					
MM107	Traffic	Chapter 15	**Mitigation by Design** › Selection of the most appropriate delivery route to transport the wind turbine components, requiring the minimum remedial works to accommodate the vehicles as set out in Section 15.1.1. › Selection of the shortest underground grid connection route, minimising the impacts on the existing road network and traffic		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM108	Construction and Operational Site Access off the L-5024	Chapter 15	As set out in Section 15.1.2.3 and shown in Figure 15-1a of this EIAR, in order to separate traffic movements travelling to and from the site it is proposed that all traffic accessing the site will travel east along the L5024 and turn right into the site, with all traffic exiting the site turning right out onto the L5024. It is proposed that temporary traffic management measures will be introduced at this location during the construction phase, including signs and the presence of a Flagman on busy delivery days. While the details of the traffic management measures will be developed in detail and submitted for agreement with Kilkenny County Council prior to the construction of the Proposed Project, they will include the following measures, › Introduction of signage on westbound and eastbound approaches to the proposed temporary access on the L1009 and the access on the L5024 warning of approaching construction site (TMS Traffic Signs WK001). › Signage on the L1009 eastbound indicating the temporary construction access approaching on the left (TMS traffic Sign WK052) and similar on westbound lane indicating the temporary link approaching on the right (TMS Traffic Signs WK053). Similar signs to be included on the L5024 during the construction phase. › It is proposed that the temporary speed limit of 50 km/h is indicated on the section of the L5024 in the proximity of the access junction. › The introduction of signage on the approaches to both access junctions warning of the presence of Flagmen (TMS traffic Sign WK061).		
MM109	General Traffic Management	EIAR Chapter 15	A Traffic Management Plan (TMP), included as Appendix 15-2 of this EIAR, will be finalised and confirmatory detailed provisions in respect of traffic management agreed with the road's authority and An Garda Síochána prior		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			to construction works commencing. The detailed TMP will also include the following measures: › Traffic Management Coordinator – a competent Traffic Management Co-ordinator will be appointed for the duration of the construction of the Proposed Project and this person will be the main point of contact for all matters relating to traffic management. › Delivery Programme – a programme of deliveries will be submitted to Kilkenny County Council and other relevant authorities in advance of deliveries of turbine components to the Proposed Wind Farm site. For general construction traffic, routes to and from the site avoiding the settlement of Kilmanagh will be agreed with Kilkenny County Council and strictly adhered to by all suppliers. › Information to locals – Locals in the area will be informed of any upcoming traffic related matters e.g. delivery of turbine components at night, via letter drops and posters in public places. Information will include the contact details of the Contract Project Co-ordinator, who will be the main point of contact for all queries from the public or local authority during normal working hours. An "out of hours" emergency number will also be provided. › A Pre and Post Construction Condition Survey – A pre-condition survey of roads associated with the Proposed Project will be carried out prior to construction commencement to record the condition of the road. A post construction survey will be carried out after works are completed. Where required the timing of these surveys will be agreed with the local authority. › Liaison with the relevant local authorities - Liaison with the relevant local authorities including the roads sections of local authorities that the delivery routes traverse, and An Garda Siochana, during the delivery phase of the large turbine vehicles, when an escort for all convoys will be required. › Implementation of temporary alterations to road network at critical junctions – At locations where required highlighted in Section 15.1.9.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Identification of delivery routes – These routes will be agreed and adhered to by all contractors. › Travel plan for construction workers to Site– A travel plan for construction staff, which will include the identification of a routes to / from the Site and identification of parking areas will be implemented by the main contractor. › Temporary traffic signs – As part of the traffic management measures temporary traffic signs will be put in place at all key junctions, including the proposed access junctions on the L1009 and L5024.All measures will be in accordance with the "Traffic Signs Manual, Section 8 – Temporary Traffic Measures and Signs for Road Works" (DoT now DoTT&S) and "Guidance for the Control and Management of Traffic at Roadworks" (DoTT&S). Construction staff (flagman) will be present at key junctions during peak delivery times. › Delivery times of large turbine components - The management plan will include the delivery of large wind turbine plant components at night in order to minimise disruption to general traffic during the construction stage. › Diversion routes during the construction of the Proposed Grid Connection Underground Cabling Route – As set out in Section 15.1.7 of this EIAR. › Additional measures - Various additional measures will be put in place in order to minimise the effects of the development traffic on the surrounding road network including sweeping / cleaning of local roads as required. › Re-instatement works - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers.		
Chapter 15 Other Material Assets					
Pre-Construction					

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM110	Public Water Supply and Infrastructure	EIAR Chapter 15	The Proposed Project infrastructure has been designed to avoid existing underground electricity cables and other services and can be described as mitigation by design, therefore there is no potential to give rise to effects on electrical and other services. Notwithstanding the above, specific measures are incorporated into the CEMP, included as Appendix 4-2 of this EIAR, to ensure that the construction of the Proposed Project will not have effect on underground electrical cables and built services at the Site. The mitigation measures include the following: › Any area where excavations are planned will be surveyed and all existing services will be identified prior to commencement of any works. › Liaison will be had with the relevant sections of the Local Authority including all the relevant area engineers to ensure all services are identified. › Excavation permits will be completed, and all plant operators and general operatives will be inducted and informed as to the location of any services. › The contractor must comply with and standard construction codes of practice in relation to working around electricity, gas, water, sewage and telecommunications networks.		
			Construction Phase		
MM111	Irish Rail	EIAR Chapter 15	› Cognisance of requirements for third parties as set out in 'CCE Department Technical Guidance Document CCE-TMS-310 Guidance on Third Party Works' and 'CCE Departmental and Multidisciplinary Standard I-DEP-0121 Third Party Works: Additional Details of Railway Safety Requirements' will be adhered to. › Contact will be made to IEDR 30 days prior to the works that will take place at a minimum of 20m northwest of CIE infrastructure.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM112	Overhead Lines	EIAR Chapter 15 CEMP Section 5	› Goal posts will be established, where necessary, under overhead electricity lines for the entirety of the construction phase of the Proposed Project. › The suitability of machinery and equipment for use near power lines will be risk assessed. › All staff will be trained on operating voltages of overhead electricity lines running the Site. All staff will be trained to be aware of the risks associated with overhead lines. All contractors that may visit the Sites are made aware of the location of lines before they come on to Site. › Barriers will run parallel to the overhead line at a minimum horizontal distance of 6 metres on plan from the nearest overhead line conductor wire. › When activities must be carried out beneath overhead lines, e.g., component delivery or substation construction, a Site-specific risk assessment will be undertaken prior to any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or equipment that will be used prior to any works. Overhead line proximity detection equipment will be fitted to machinery when such works are required. › Information on safe clearances will be provided to all staff and visitors. › Signage indicating locations and health and safety measures regarding overhead lines will be erected in canteens and on Site. › The construction of the Proposed Grid Connection underground cabling will be in phases along the proposed grid route. Prior to commencing grid connection works in the agricultural fields in the townland of Moatpark, goal posts will be established under the 110kV and 38kV overhead lines and remain in place for the duration of the works in this area. The goal posts will not exceed a height of 4.2 metres, unless specifically agreed with ESBN › All staff will be made aware of and adhere to the Health & Safety Authority's 'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Work (Construction) (Amendment) Regulations 2021'. This will encompass the use of all necessary Personal Protective Equipment and adherence to the site Health and Safety Plan. › All health and safety measures as detailed in the Construction Environment Management Plan and Chapter 5 Population and Human Health will be adhered to during the construction, operation and decommissioning phases.		
MM113	Waste Management	EIAR Chapter 15 CEMP Section 3	› A WMP has been prepared and forms part of the CEMP in Appendix 4-2 of the EIAR › Waste management will be carried out in accordance with Best Practice Guidelines on the Preparation of Resource and WMPs for Construction & Demolition Projects (2021) produced by the EPA. The WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Project. Disposal of waste will be seen as a last resort. › All hazardous wastes will be stored in bunded containers/areas before being collected by an authorised waste contractor and brought to an EPA licensed waste facility. Hazardous wastes will be kept separate from non-hazardous wastes that contamination does not occur. Please see the CEMP for best practise measures to prevent the creation of waste materials. › The expected waste volumes generated on-site are unlikely to be large enough to warrant source segregation at the Site. Therefore, all waste streams generated on-site will be deposited into a single waste skip. This waste material will be transferred to a Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. › The waste generated from the turbine erection will be limited to the associated protective covers which are generally reusable. Considering the specialist nature of this packaging material the majority will be taken back by suppliers for their own reuse. Any other packaging waste generated from the turbine supply will be		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			deposited into the on-site skips and subsequently transferred to the MRF. › It is not envisaged that there will be any waste material arising from the materials used to construct the site roads as only the quantity of stone necessary will be sourced from the on-site borrow pit and local quarries and brought on site on an 'as needed' basis. › Site personnel will be instructed at induction that under no circumstances can waste be brought to site for disposal in the on-site waste skip. It will also be made clear that the burning of waste material on-site is forbidden		
Operational Phase					
MM114	Telecommunications	EIAR Chapter 15	› In the event of interference occurring to telecommunications, the Guidelines acknowledge that 'electromagnetic interference can be overcome' by the use of divertor relay links out of line with the wind farm. › A signed protocol agreement between 2rn and the applicant can be found in Appendix 15-4. The protocol document ensures that in the event of any interference occurring to television or radio reception due to operation of the wind farm, the required measures, as set out in the document, will be carried out by the applicant to rectify this. The protocol document ensures that the appropriate mitigation is carried out in the event of unanticipated broadcast interference arising to television or radio reception as a result of the Proposed Wind Farm.		
MM115	Aviation	EIAR Chapter 15	The following IAA requests will be complied with should the Proposed Project be consented: › Agree an aeronautical obstacle warning light scheme for the wind farm development		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Provide as-constructed coordinates in WGS84 format together with ground and blade tip height elevations at each wind turbine location and › Notify the Authority of intention to commence crane operations with at least 30 days prior notification of their erection.		
MM116	Waste Management	EIAR Chapter 15	› It is not anticipated that any significant volume of waste will be generated within the Site during the operational phase of the Proposed Project as only a small number of operational and maintenance personnel will be present on within the Proposed Wind Farm site certain times. Any waste generated due to the operation and maintenance of the Proposed Project will be disposed of in a covered skip, located within the on-site substation compound. The waste material will be transferred to a Materials Recovery Facility (MRF) by a fully licenced waste contractor where the waste will be sorted into individual waste stream for recycling, recovery or disposal.		
Decommissioning					
MM117	Decommissioning	EIAR Chapter 15	The measures outlined for the construction phase are considered the same for the decommissioning phase.		

18.3 EIAR Monitoring Measures

Table 18-2 Schedule of Monitoring

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
Pre-Construction Phase						
MX1	Drainage Maintenance	EIAR Chapter 4 CEMP Section 4	An inspection and maintenance plan for the drainage system on-site will be prepared in advance of commencement of any works on the Proposed Project. Regular inspections of all installed drainage features will be necessary, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water at parts of the systems where it is not intended. The inspection of the drainage system will be the responsibility of the ECoW or the Project Hydrologist. The drainage inspection and maintenance plan are included in the CEMP in Appendix 4-2 of this EIAR.	On going	Monthly	Project Hydrologist
MX2	Tree Felling	EIAR Chapter 9	Sampling will be completed before, during (if the operation is conducted over a protracted time) and after the felling activity. The 'before' sampling will be conducted within 4 weeks of the felling activity, preferably in medium to high water flow conditions. The "during" sampling will be undertaken once a week passes, or after rainfall events. The 'after' sampling will comprise as many samplings as necessary to demonstrate that water quality has returned to pre-activity status (i.e. where an impact has been shown).	As Required	Monthly	ECoW
MX3	Invasive Species	EIAR Chapter 6 CEMP Section 3	A pre-commencement invasive species survey shall be completed for the site.	Once	As required	Project Ecologist
MX4	Ornithology	EIAR Chapter 7	Pre-construction surveys will be undertaken prior to the initiation of works at the Proposed Wind Farm. The survey will include a thorough walkover survey to a 500m radius of the Proposed Wind Farm footprint and all works areas, where access allows. If winter roosting or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring at the beginning of the first winter or breeding season of	Once	As required	Project Ornithologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			the construction phase. If it is found to be active during the construction phase, no works shall be undertaken within a disturbance buffer in line with industry best practice (e.g. Forestry Commission Scotland, 2006; Ruddock and Whitfield, 2007; Goodship and Furness, 2022). No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied.			
Construction Phase						
MX5	Health and Safety	EIAR Chapter 5, CEMP 5	The PSCS appointed for the construction stage shall be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to): › Reporting of accidents / incidents › Induction of all site staff including any new staff enlisted for the project from time to time; › Toolbox talks as necessary; › Maintenance of a file which lists personnel on Site, their name, nationality, current Safe Pass number, current Construction Skills Certification Scheme (CSCS) card (where relevant) and induction date; › Report on site activities to include but not limited to information on accidents and incidents, disciplinary action taken and PPE compliance; › Monitor the compliance of contractors and others and take corrective action where necessary; and › Notify the Authority and the client of non-compliance with any written directions issued.	Daily	Daily	PSCS
MX6	Water Quality and Monitoring	EIAR Chapter 9 CEMP Section 4	During the construction phase, the Project Contractor will be responsible for the effectiveness of drainage measures. This responsibility extends to drainage maintenance, to ensure that the installed drainage measures continue to perform as intended by the	As required	As Necessary	ECoW

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			detailed drainage design. Silt fences, check dams, level spreaders and other drainage measures likely to form part of the detailed drainage design, require regular maintenance to ensure they continue to function effectively, and the Project Contractor is entirely responsible for this maintenance. The drainage measures installed on-site should be inspected at least weekly by the contractor and maintained as required during the construction phase of the Proposed Project to ensure good performance.			
MX7	Water Quality and Monitoring	EIAR Chapter 9 CEMP Section 4	› Regular general visual inspections of site operations and inspections of all drainage infrastructure within the Site and in the surrounding area by the ECoW or a suitably qualified and competent person as delegated by the ECoW; › Inspections to include all elements of drainage infrastructure to ensure the system is operating correctly and to identify and maintenance that is required. Any changes, such as discolouration, odour, oily sheen or litter will be noted and corrective action will be implemented. High risk locations such as settlement ponds will be inspected regularly. Regular inspections checks will be completed on plant and equipment, and whether materials such as straw bales or oil absorbent materials need replacement; › Event based inspections by the ECoW as follows: › >10 mm/hr (i.e. high intensity localised rainfall event); › >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or, › Rainfall depth greater than monthly average in 7 days (prolonged heavy rainfall over a week). › Monthly site inspections by the Project Hydrologist/ ECoW during construction phase;	As Required	As Necessary	ECoW

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			› Quarterly site inspections by the Project Hydrologist/ ECoW after construction for a period of one year following the construction phase; and, › A written record will be maintained or available on-site within this Construction Environmental Management Plan (CEMP) which will be maintained on-site during the construction phase.			
MX8	Turbidity Monitoring	EIAR Chapter 9 CEMP Section 4	› Turbidity monitors or sondes can be installed where required at locations surrounding the Site. The sondes will provide continuous readings for turbidity levels in the watercourse	Daily	As Necessary	ECoW
MX9	Reactive Site Drainage Management	EIAR Chapter 9 CEMP Section 4	The effectiveness of drainage measures designed to minimise runoff entering works areas and capture and treat silt-laden water from the works areas, will be monitored continuously by the ECoW or supervising hydrologist on-site. The ECoW or supervising hydrologist will respond to changing weather, ground or drainage conditions on the ground as the project proceeds, to ensure the effectiveness of the drainage design is maintained in so far as is possible. This may require the installation of additional check dams; interceptor drains or swales as deemed necessary on-site. The drainage design may have to be modified on the ground as necessary, and the modifications will draw on the various features outlined above in whatever combinations are deemed to be most appropriate to situation on the ground as a particular time. In the event that works are giving rise to siltation of watercourses, the ECoW or supervising hydrologist will stop all works in the immediate area around where the siltation is evident. The source of the siltation will be identified and additional drainage measures such as those outlined above will be installed in advance of works recommencing.	As required	As Necessary	ECoW

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
MX10	Water Quality and Monitoring	EIAR Chapter 9	Regular surface water monitoring forms will be utilised at every works site near any watercourse. These will be taken on a regular basis and kept on site for record and inspection.	As required	As Necessary	ECoW
MX11	Surface Water Quality	EIAR Chapter 9 CEMP Section 4	Baseline water quality field testing and laboratory analysis will be undertaken where required prior to commencement of felling and construction at the site. The baseline monitoring programme will be subject to agreement with Kilkenny County Council. Analysis will be for a range of parameters with relevant regulatory limits along with Environmental Quality Standards (EQSs) and sampling will be undertaken at designated locations as outlined in Figure 9-5 of the EIAR. Baseline sampling will be completed on at least two occasions, and these should coincide with low flow and high flow stream conditions. The high flow sampling event will be undertaken after a period of sustained rainfall, and the low flow event will be undertaken after a dry spell. Regular monitoring of excavations by a suitably qualified person will occur during the construction phase. If high levels of seepage inflow occur, excavation work should immediately be stopped, and a geotechnical assessment undertaken.	As Required	Monthly	ECoW
MX12	Tree Felling	EIAR Chapter 9	Checking and maintenance of roads and culverts will be on-going through any felling operation. No tracking of vehicle through watercourses will occur, as vehicles will use road infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during felling works. Also, regular surface water monitoring forms (for visual inspections and field chemistry measurements) will also be utilised at every	As Required	Monthly	ECoW

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			works site near any watercourse. These will be taken regularly and kept on site for record and inspection.			
MX13	Plant and Equipment Inspections	EIAR Chapter 9 CEMP Section 4	The plant used will be regularly inspected for leaks and fitness for purpose.	As Required	Monthly	ECoW
MX14	Traffic and Transport	CEMP Section 3	› The agreed haul route roads adjacent to the site will be regularly inspected for cleanliness and cleaned as necessary. › The roads adjacent to the site entrances will be checked weekly or damage/potholes and repaired as necessary.	As required	Monthly	ECoW
MX15	Biodiversity	CEMP Section 4	A Project Ecologist will be appointed. The responsibilities and duties of the Project Ecologist will include the following: › Undertake a pre-construction transect/walkover bird survey to ensure that significant effects on breeding birds will be avoided. › Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Proposed Project area. › Oversee management of ornithological and ecological issues during the construction period and advise on ornithological issues as they arise. › Provide guidance to contractors to ensure legal compliance with respect to protected species onsite. › An Ecologist will monitor the one-way exclusion gates established at any badger sett discovered during pre-construction surveys that are within 50m of excavation works. The gates will be checked every 3 to 5 days during the 21-day period to ensure badgers do not succeed in re-entering the sett.	As required	As required	Project Ecologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			› Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress.			
MX16	Spoil Management	EIAR Chapter 4, CEMP Section 2	Inspections of the spoil management areas will be made by a Geotechnical Engineer through regular monitoring of the works. The appointed contractor will review work practices at spoil management areas when periods of heavy rainfall are expected so as to prevent excessive dirty water runoff from being generated.	As required	As required	Geotechnical Engineer
MX17	Archaeological Monitoring	EIAR Chapter 13	› Archaeological Monitoring of all groundworks during construction by a licensed archaeologist. › A report on the monitoring should be compiled on completion of the work and submitted to the relevant authorities. › Soil excavation shall be observed by a qualified archaeologist in accordance with a scheme of archaeological monitoring to identify any significant remains as they come to light. › Further mitigation such as preservation in situ (avoidance), preservation by record (excavation) may be required depending on the results of the monitoring.	As Required	As Required	Project Archaeologist
Operational Phase						
MX18	Surface Water Quality	CEMP Section 4	› Monthly water sampling and laboratory analysis will be undertaken for the first six months during the operational phase. › Quarterly site inspections by the Project Hydrologist/ ECoW after construction for a period of one year following the construction phase	Monthly	Monthly	ECoW
MX19	Drainage Inspections	CEMP Section 4	The drainage system will be monitored in the operational phase until such a time that all areas that have been reinstated become re-vegetated and the natural drainage regime has been restored.	Monthly	Monthly	ECoW

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
MX20	Bats	EIAR Chapter 6 Appendix 6-2 Appendix 6-4	To assess the effects of the Proposed Project on bat activity, at least 3 years of post-construction monitoring is proposed. Post-construction monitoring will include static detector surveys, walked survey transects and corpse searching to record any bat fatalities resulting from collision. At the end of each year, the efficacy of any mitigation/curtailment programme shall be reviewed, and any identified efficiencies incorporated into the programme. **Bat Monitoring Plan** › Post-construction surveys will be carried out as per the pre-construction survey effort. Post-construction monitoring will include static detector surveys, walked survey transects and corpse searching to record any bat fatalities resulting from collision. › Static monitoring shall take place at each turbine during the bat activity season (between April and October) (NatureScot, 2021, NIEA, 2021). › Carcass searches, to monitor and record bat fatalities, shall be conducted at each turbine in accordance with NIEA Guidance. This shall include searcher efficiency trials and an assessment of scavenger removal rates to determine the appropriate correction factor to be applied in relation to determining an accurate estimate of collision mortality. › Monitoring surveys shall continue in Year 2 and 3, and where a curtailment requirement has been identified, the success of the curtailment strategy shall be assessed in line with the baseline data collected in the preceding year(s).	Years 1, 2, 3	Annually	Project Ecologist
MX21	Biodiversity	EIAR Chapter 6	The Biodiversity Management and Enhancement Plan will be maintained and monitored in partnership between the developer, the	As required.	As required.	Project Ecologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		Appendix 6-4	Project Ecologist and the Landowners. The proposed management actions will be conveyed to the developer and each of the landowners, and management alterations implemented as required to achieve the targets of the management plan. **Linear Habitat Replanting:** › Hedgerows and replanted trees will be inspected following the main growing season (i.e. in September) for the first five years of growth, where the requirement for replacement planting will be assessed. If any shrubs are dead or damaged, these will be replaced using the same species within the next planting season. › Recommendations for ongoing or remedial management required will be specified within an Environmental and Ecological Report, produced by a suitably experienced ecologist, with any criteria failures identified and corrective actions implemented. › Monitoring results will be reported by a suitably experienced ecologist within an Environmental and Ecological Report with any criteria failures identified and corrective actions implemented. **Riparian Buffer Zone Creation** › To confirm that habitat creation has been successful the above outlined woodland replanting scheme will be monitored by a qualified ecologist at the following intervals: › 6 Months, › 1 Year, › 2 Years.	September, Year 1-5 6 months, Year 1-5	Annually Annually	Project Ecologist Project Ecologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			› 3 Years, › 4 Years, › 5 Years. In order to carry out monitoring, a qualified ecologist will conduct inspections and relevés of the planting area at the above outlined temporal intervals following the main growing season (i.e. in September). These inspections and relevés will be recorded and entered into a monitoring report. The collected information will inform the success of the proposal allow for adaptive intervention if it is deemed necessary e.g. if any shrubs are dead or damaged these will be replaced using the same species within the next planting season. Monitoring will be undertaken in partnership between the developer, the Project Ecologist, and the Landowner. At the end of the 5-year monitoring plan as outlined above, the Project Ecologist will assess the need for and frequency of further monitoring of the woodland replanting area in agreement with the wind farm operator. **Pine Marten and Red Squirrel Boxes** Monitoring will take place yearly after installation of boxes for the first three years of the operational Proposed Wind Farm. The results of the first three years of monitoring will inform the need for and frequency of further monitoring and maintenance of the boxes, to be reviewed by the Project Ecologist and agreed with the wind farm operator. Disturbance can result in the abandonment of nesting sites. Therefore, monitoring should be carried out using non-invasive methods where possible. Monitoring results will be reported after each monitoring year. Reports detailing the monitoring works carried out, the results	Year 1-3	Annually	Project Ecologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			obtained and a review of their success, along with any suggestions for amendments to the plan will be prepared			
MX22	Ornithology	EIAR Chapter 7 Appendix 7-6	Survey methods employed for post-construction monitoring will be in line with guidelines issued by the NatureScot (NatureScot, 2009 and NatureScot, 2017). Post-construction monitoring will be undertaken in Years 1, 2, 3, 5, 10 and 15 of the wind farm's lifetime. **Bird Monitoring Programme:** Post-construction monitoring will include vantage point surveys, bird distribution and abundance surveys and a programme of regular corpse searching for birds that may potentially collide with operating turbines during the operational phase of the wind farm project. › Bird monitoring will include the following survey methods: › Flight activity surveys: vantage point surveys; › Breeding walkover surveys (Adapted Brown & Shepard); and › Targeted bird collision surveys (corpse searches) will be undertaken by a trained dog and handler. The surveys will include detection and scavenger trials, to correct for these two biases and ensure the resulting data is robust.	Years 1-5, 10 and 15	Monthly	Project Ornithologist
MX23	Noise and Vibration	Chapter 12	An operational noise survey will be undertaken to ensure compliance with any noise conditions applied to the development. It is common practice to commence surveys within six months of the Proposed Wind Farm being fully commissioned. If an exceedance of the noise criteria is identified as part of the assessment, the guidance outlined in the IOA GPG, specifically Supplementary Guidance Note 5: Post Completion Measurements (July 2014) will be followed, and relevant corrective actions taken. For example, implementation of noise reduced operational modes resulting in curtailment of turbine operation can be implemented for specific turbines in specific wind conditions to ensure predicted noise levels are within the relevant	Once within six months	As required	Noise Consultant

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			noise criterion curves/planning condition limits. Such curtailment can be applied using the wind farm SCADA system without undue effect on the wind turbine performance. Following implementation of these measures, noise surveys will be repeated to confirm compliance with the noise criteria.			
Decommissioning Phase						
MX24	Decommissioning	DP Section 1	In accordance with SNH guidance, "best practice not to limit options too far in advance of actual decommissioning but to maintain informed flexibility until close to the end-of-life of the wind farm". A Decommissioning Plan will be reviewed and updated prior to commencement of decommissioning works to take account of the relevant conditions of the planning permission and current health and safety standards	End of operational life	As required	Developer/ Appointed Contractor
MX25	Decommissioning	DP Section 3	In general, the ECoW will maintain responsibility for monitoring the decommissioning works and Contractors/Sub-contractors from an environmental perspective. The ECoW will act as the regulatory interface on environmental matters. The Site Manager will be responsible for reporting to and liaising with Kilkenny County Council and other statutory bodies as required. The Site Manager in consultation with the ECoW will be responsible for employing the services of a suitably qualified ecologist and any other suitably qualified professionals as required throughout the decommissioning works.	As required	As required	Site Manager
MX26	Decommissioning	DP Section 3	Prior to decommissioning, a suitably qualified ecologist will complete an invasive species survey of the Site to identify invasive species where any minor excavation will be required. If present in these areas, the ecologist will propose suitable management measures.	As required	As required	Project Ecologist
MX27	Decommissioning	Appendix 7-6	Decommissioning surveys will be undertaken prior to the initiation of decommissioning works at the Proposed Wind Farm site. The survey will aim to identify sensitive sites (e.g. nests or roosts). Any requirement for decommissioning works to run into subsequent	As required	As required	Project Ornithologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			breeding or winter seasons following the commencement of works will be subject to a repeat of the decommissioning bird surveys. Monitoring will be undertaken by a suitably qualified ornithologist. The survey will include a thorough walkover survey to a 500m radius of the development footprint and/or all works areas. If winter roosts or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring at the beginning of the first winter or breeding season of the construction phase. If the roost/nest is found to be active during the decommissioning phase no works shall be undertaken, works will cease within a species-specific buffer of this location (as per Goodship, N.M. and Furness, R.W., 2022) in line with best practice. No works shall be permitted within the buffer until it can be demonstrated that the roost or nest is no longer occupied. All site staff and subcontractors will be made aware of any restrictions to be imposed by means of a toolbox talk and a map of the 'no-work zone' will be made available to all construction staff. The restricted area will also be marked off using hazard-tape fencing to alert all personnel on site to the suspension of works within that area			