Planning and Environmental Consultants

Environmental Impact Assessment Report

Seskin Renewables Wind Farm

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 Development 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 Development. 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 Development 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 Development 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 Development					
Pre-Commencement Phase					
MM1	Environmental Management	EIAR Chapter 4, CEMP	› A CEMP has been prepared for the Proposed Development and is included in Appendix 4-2 of this EIAR. The CEMP includes details of drainage, spoil management, waste management etc, and describes how the above-mentioned audit will function and how the findings are presented. › In the event planning permission is granted for the Proposed Development, 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 written approval. › The on-site construction staff will be responsible for implementing the mitigation measures specified in the EIAR and compiled in Section 6 of the CEMP. Their implementation will be overseen by the ECoW or supervising hydrogeologists, environmental scientists, ecologists or geotechnical engineers, depending on who is best placed to advise on the implementation. The system of auditing referred to above ensures that the mitigation measures are maintained for the duration of the construction phase, and into the operational phase where necessary.		
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		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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 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 have the power to halt the works, should the need arise and will be supported by the developer to ensure the contractor adheres to such an instruction. › The ECoW will also have to call upon the Project Ecologist, Project Hydrologist, or other members of the Project Developer's design team, as required, to oversee the contractor's works on-site.		
MM3	Concrete Deliveries	EIAR Chapter 4	› Only ready-mixed concrete will be used during the construction phase, with all concrete being delivered from a local batching plant in sealed concrete delivery trucks.		
MM4	Site Drainage Plan	EIAR Chapter 4 SWMP 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 and Section 2 of the SWMP. › 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.		
MM5	Preparative Site Drainage Management	EIAR Chapter 4 CEMP Section 3 SWMP Section 3	› The drainage system will be excavated and constructed in conjunction with the road and hard standing construction. Drains will be excavated, and settlement ponds constructed to eliminate any suspended solids within surface water running off the site. › The detailed drainage design will specify all materials and equipment necessary to implement the drainage measures effectively, which will be brought on site in advance of any works commencing.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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. › The works programme for the groundworks part of the construction phase of the Proposed Development will also take account of weather forecasts and predicted rainfall in particular. The site Construction Manager is responsible for making the decision to postpone or abandon works. Large excavations and movements of overburden or large-scale overburden or soil 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.		
MM6	Drainage Inspection	EIAR Chapter 4 CEMP Section 3 SWMP Section 4	› Prior to commencement of works in sub-catchments across the Site, 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.		
MM7	Culvert Construction and Inspection	EIAR Chapter 4 CEMP Section 2 SWMP Section 2	› The size of culverts will be influenced by the depth of the track or road sub-base. In all cases, culverts will be oversized to allow mammals to pass through the culvert. › 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 stone may be used to interrupt the flow of water › 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		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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		
MM8	Drainage Maintenance	EIAR Chapter 4 EIAR Chapter 9 SWMP 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. › The inspection and maintenance plan for the on-site drainage system will be prepared in advance of the commencement of any works. Regular inspections of all installed drainage systems will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended. › 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.		
MM9	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. › Setbacks from sensitive hydrological features, where possible, means that adequate room is maintained for the proposed drainage mitigation measures to be properly installed and operate effectively. The proposed buffer zone will avoid the entry of suspended sediment from earthworks into watercourses		

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MM10	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 run will inform the Traffic Management Plan for agreement with the relevant Authorities. › All turbine deliveries will be provided for in a Traffic Management Plan which will be finalised in advance of oversized load deliveries, when the exact transport arrangements are known, delivery dates confirmed and escort proposals in place. › 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		
MM11	Spoil Management	EIAR Chapter 4 CEMP Section 2	› All spoil excavated will be managed on-site. It will be placed within the proposed borrow pit or alongside site access roads, around hardstands. Some topsoil may be temporarily stockpiled locally for reuse for landscaping purposes		
MM12	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. › As the borrow pit excavation progress and become deeper, surface water and groundwater ingress will be removed via pumping to settlement ponds, and re-distribution locally across natural vegetated areas. Where required, additional specialist water treatment measures		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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 during the construction phase 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.		
MM13	Onsite Electricity Substation and Control Buildings	EIAR Chapter 4, CEMP Section 2	› The area of the on-site substation will be marked out using ranging rods or wooden posts		
MM14	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 and services 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.		
MM15	Waste Management	EIAR Chapter 4 CEMP Section 3	› Prior to the commencement of the development a Construction Waste Manager will be appointed by the Contractor. The Construction Waste Manager will be in charge of the implementation of the objectives of the plan, 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					
MM16	Refuelling	EIAR Chapter 4, 8, 9	› Road-going vehicles will be refuelled off site wherever possible; › On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		CEMP Section 3 SWMP Section 3	› 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 plant will be inspected and certified to ensure that they are leak free and in good working order prior to use at the Site. › Fuels stored on site will be minimised. › Onsite refuelling will be carried out by trained personnel only; › All refuelling will be carried out outside of the designated hydrological buffer zones; › Mobile measures such as dip trays and fuel absorbent mats will be used during refuelling operations as required; › All plant and machinery will be equipped with fuel absorbent material and pads to deal with any accidental spillage; › 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; › Spill kits will be available to deal with any accidental spillage in and outside the re-fuelling area. › An emergency plan for the construction phase to deal with accidental spillages will be developed (refer to Section 6 of CEMP); › 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 so that contamination does not occur		
MM17	Cement Based Products Deliveries and Management	EIAR Chapter 4, 9 CEMP Section 3 SWMP 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 on site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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; › Weather forecasting will be used to plan dry days for pouring concrete; and, › The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event; and, › At turbine foundations, lean-mix blinding is used to vertically contain the concrete. While the concrete is contained laterally by temporary/permanent shuttering.		
MM18	Concrete Pouring	EIAR Chapter 4, 9 SWMP Section 3	› 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 while placing concrete. › Ensuring that excavations are sufficiently dewatered before concreting begins and that dewatering continues while concrete sets. › Ensuring that covers are available 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 (https://www.siltbuster.co.uk/sb_prod/siltbuster-roadside-concrete-washout-rcw/) or equivalent. › Disposing of surplus concrete after completion of a pour in agreed suitable locations away from any watercourse or sensitive habitats		
MM19	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.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› A road sweeper will be available if any section of the public roads requires cleaning due to construction traffic associated with the Proposed Development. › When necessary, sections of the haul route will be swept using a truck mounted vacuum sweeper.		
MM20	Watercourse Buffers	EIAR Chapter 4. CEMP Section 3 SWMP Section 2	› 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 watercourses and drains. Buffer zones of 50m around the existing natural drainage features have been used to inform the layout of the Proposed Development. › 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.		
MM21	Water Discharge	EIAR Chapter 4. CEMP Section 3 SWMP 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 Proposed Wind Farm site drainage into the existing site drainage network. 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 upstream of any streams where construction works /linear vegetation removal 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		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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, 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		
MM22	Wastewater Management	EIAR Chapter 4	› Temporary toilets, located within staff portacabins, will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered off site by a 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.		
MM23	Drainage Swales	EIAR Chapter 4, 9 SWMP Section 2	› 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. Swales will intercept the potentially silt-laden water from the excavations and construction areas of the Site and prevent it reaching natural watercourses. › Drainage swales will be installed in advance of any main construction works commencing. The material excavated to make the swale will be compacted on the downslope edge of the drain to form a diversion dike.		
MM24	Interceptor Drains	EIAR Chapter 4, 9	› Interceptor drains will be installed upgradient of any works areas to collect surface flow runoff and prevent it reaching excavations and		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		SWMP Section 2	construction areas of the Site where it might otherwise have come into contact with exposed surfaces and picked up silt and sediment. › The drains will be used to divert upslope runoff around the works area to a location where it can be redistributed over the ground surface as sheet flow. This will minimise the volume of potentially silty runoff to be managed within the construction area. › The interceptor drains will be installed in advance of any main construction works commencing. The material excavated to make the drain will be compacted on the downslope edge of the drain to form a diversion dike.		
MM25	Check Dams	EIAR Chapter 4, 9 SWMP Section 2	› 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. › Check dams will not be used in any natural watercourses, only artificial drainage channels and interceptor drains. The check dams will be left in place at the end of the construction phase to limit erosive linear flow in the drainage swales during extreme rainfall events.		
MM26	Level Spreaders	EIAR Chapter 4, 9 SWMP Section 2	› 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. › The slope in the channel leading into the spreader will be less than or equal to 1%.		
MM27	Piped Slope Drains	EIAR Chapter 4, 9 SWMP Section 2	› 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%		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			in grade. Piped slope drains will be used to transfer water away from areas where slopes are too steep to use level spreaders; › Piped slope drains will only remain in place for the duration of the construction phase of the Proposed Development. on completion of the works, the pipes and rock aprons will be removed and all channels backfilled with the material that was originally excavated from them		
MM28	Vegetation Filters	EIAR Chapter 4, 9. SWMP Section 2	› 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; › Vegetation filters will not be used in isolation for waters that are likely to have higher silt loadings. In such cases, silt-bearing water will already have passed through stilling ponds prior to diffuse discharge to the vegetation filters via a level spreader.		
MM29	Stilling/Settlement Ponds	EIAR Chapter 4, Chapter 9. SWMP Section 2	› Stilling or settlement ponds will be used to attenuate runoff from works areas of the site of the Proposed Development during the construction phase and will remain in place to handle runoff from roads and hardstanding areas of the Proposed Development 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. › A water level indicator such as a staff gauge will be installed in each stilling pond with marks to identify when sediment is at 10% of the stilling pond capacity. Sediment will be cleaned out of the still pond when it exceeds 10% of pond capacity. Stilling ponds will be inspected weekly and following rainfall events. Inlet and outlets will be checked for sediment accumulation and anything else that might interfere with flows.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM30	Dewatering Silt Bag	EIAR Chapter 4, Chapter 9 SWMP Section 2	› 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.		
MM31	Siltbuster	EIAR Chapter 4, 9 SWMP Section 2	› 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. › 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; › 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).		
MM32	New Culverts/ Culvert Upgrades	EIAR Chapter 4, Chapter 9.	› All new proposed culverts and proposed culvert upgrades will be suitably sized for the expected peak flows in the watercourse.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		CEMP Section 2 SWMP Section 2	› Some culverts may be installed to manage drainage waters from works areas of the Proposed Development, 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. › 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.		
MM33	Proposed Grid Connection underground cabling route – existing services, joint bays and watercourse crossings	EIAR Chapter 4, Chapter 9 CEMP Section 2	› The cable ducts will be concrete surrounded where they pass under the public road and under drains or culverts. › Trench supports will be installed, or the trench sides will be benched or battered back where appropriate and any ingress of ground water will be removed from the trench using submersible pumps, fitted with appropriate silt filtration systems, to prevent contamination of any watercourse. › The ducting will be installed as per specification, with couplers fitted and capped to prevent any dirt etc. entering the duct. In poor ground conditions, the ends of the ducts will be shimmed up off of the bed of		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			the trench, to prevent any possible ingress of water dirt. The shims will be removed again once the next length has been connected. Extreme care will be taken to ensure that all duct collars (both ends) are clean and in good condition prior to ducts being joined. › Spacers will be used to ensure that the correct cover is achieved at both sides of the ducting. › The finished surface is to be reinstated, as per original specification. Off-road cabling may be finished with granular fill to facilitate access to the trench for any potential maintenance that is required during the operational phase of the Proposed Development. › 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 drilling pits, it will be contained and removed from the work area 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.		
MM34	Silt Fences	EIAR Chapter 4, 9 SWMP Section 2	› 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. › 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.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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.		
MM35	Sedimats	EIAR Chapter 4, 9 SWMP Section 2	› 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.		
MM36	Oil Interceptors	EIAR Chapter 4, 9 SWMP Section 2	› 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 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 Development (i.e., construction compounds and substation compound).		
MM37	Turbine/Met Mast Foundation Excavations	EIAR Chapter 4 CEMP Section 2	› Material excavated to create the working area will be stored locally for later reuse in backfilling and/or landscaping the working area around the turbine foundation. The excavated material will be sealed using the back of the excavator bucket and surrounded by silt fences to ensure sediment-laden run-off does not occur › Drainage measures will be installed to protect the formation by forming an interceptor drain around the perimeter of the base which will be pumped out or outfall out at the lowest point level spreader or settlement pond. › An embankment approximately 600 mm high will be constructed around the perimeter of each turbine foundation base and a fence will		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			be erected to prevent construction traffic from driving into the excavated hole and to demarcate the working area › All necessary health and safety signage will be erected to warn of deep excavation. › 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 borrow pit or placed alongside access roads 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;		
MM38	Spoil Management	EIAR Chapter 4 CEMP Section 2	› All spoil excavated will be managed on-site. It will be placed within the proposed borrow pit or in linear berms alongside access roads and hardstands within the Site. Some topsoil may be temporarily stockpiled locally for reuse for landscaping purposes › During the initial emplacement of spoil at the proposed borrow pit, straw bales and biodegradable matting will be used to control surface water runoff from the enclosure. › Drainage from areas of spoil placement will be directed to settlement ponds as required or will overflow through controlled overflow pipes (not required for borrow pit as runoff will remain in pit). › Discharge from areas of spoil placement will be intermittent and will depend on preceding rainfall amounts.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Once the areas of spoil placement have been seeded and vegetation is established the risk to downstream surface water is significantly reduced		
MM39	Borrow Pit	EIAR Chapter 4, CEMP Section 2	› As the borrow pit excavation progress and become deeper, surface water and groundwater ingress will be removed via 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 › If blasting is undertaken, 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. › 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		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM40	Electrical Substation	EIAR Chapter 4, CEMP Section 2	› Soil and overburden will be stripped and temporarily stockpiled for later use in landscaping. Any excess material will be sent to the borrow pit void or within linear berms that will be placed along access roads and turbine hardstand areas, where appropriate within the Site. › The foundations will be excavated down to the level indicated by the designer and appropriately shuttered reinforced concrete will be laid over it. An anti-bleeding admixture will be included in the concrete mix. › Lightning poles will be erected at appropriate locations adjacent to the substation. All lightning poles will be appropriately earthed. › Perimeter fencing will be erected.		
Operational Phase					
MM41	Drainage	CEMP Section 3	› The Project Hydrologist will inspect and review the drainage system after construction has been completed to provide guidance on the requirements of an operational phase drainage system. This operational phase drainage system will have been installed during the construction phase in conjunction with the road and hardstanding construction work. › 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.		
MM42	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		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Management (Collection Permit) Regulations, 2007(as amended), will be employed to transport wastewater away from the substation underground storage tank.		
Decommissioning Phase					
MM43	Decommissioning Plan	EIAR Chapter 4	Prior to the end of the operational period the Decommissioning Plan (Appendix 4-4 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.		
MM44	Decommissioning Works	EIAR Chapter 4 DP Section 2	› Turbine foundations would remain in place underground and would be covered with earth and reseeded as appropriate. Leaving the turbine foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in unnecessary environment emissions such as noise, dust and/or vibration. › Site roadways could be in use for purposes other than the operation of the Proposed Development by the time the decommissioning of the Proposed Development is to be considered, and therefore it may be more appropriate to leave the Site roads in situ for future use.		
MM45	Refuelling	EIAR Chapter 4, 8, 9. DP Section 3	The following mitigation measures are proposed to avoid release of hydrocarbons during the Decommissioning Phase: › 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.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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 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.		
MM46	Noise and Vibration	DP section 3 EIAR Chapter 12	› Plant and machinery with low inherent potential for generation of noise and/or vibration will be selected. All plant and equipment to be used on-site will be modern equipment and will comply with the European Communities (Construction Plant and Equipment) (Permissible Noise Levels) Regulations. › Regular maintenance of plant will be carried out in order to minimise noise emissions. Particular attention will be paid to the lubrication of bearings and the integrity of silencers. › All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the works. › Compressors will be of the “sound reduced” 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.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Machines, which are used intermittently, will be shut down during those periods when they are not in use. › Training will be provided by the Site Manager to drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation; and, › 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; › Any extraordinary site work occurring outside of the core working hours will be programmed, when appropriate, so that haulage vehicles would not arrive at or leave the Proposed Wind Farm site between 19:00 and 07:00, with the exception of abnormal loads that would be scheduled to avoid anticipated periods of high traffic flows; › All ancillary pneumatic percussive tools will be fitted with mufflers or silencers of the type recommended by the manufacturers; › Machines will be shut down between work periods (or when not in use) or throttled down to a minimum; › All equipment used on site will be regularly maintained, including maintenance related to noise emissions; › Vehicles will be loaded carefully to ensure minimal drop heights so as to minimise noise during this operation; › All ancillary plant such as generators and pumps will be positioned so as to cause minimum noise disturbance and if necessary, temporary acoustic screens or enclosures will be provided; and › Training will be provided to drivers to ensure smooth machinery operation/driving, and to minimise unnecessary noise generation.		
Chapter 5: Population and Human Health					
Pre-Construction Phase					
MM47	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		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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		
MM48	Human Health (Health and Safety)	EIAR Chapter 5 CEMP Section 5	› The Proposed Development 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. 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		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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 Wind Farm. › 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 ESB Networks		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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 necessitates 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 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): › Identify hazards arising from the design or from the technical, organisational, planning or time related aspects of the project; › Where possible, eliminate the hazards or reduce the risks; › Communicate necessary control measures, design assumptions or remaining risks to the PSCS so they can be dealt with in the Safety and Health Plan; › Ensure that the work of designers is coordinated to ensure safety; › Organise co-operation between designers; › Prepare a written Safety and Health Plan; › Prepare a safety file for the completed structure and give it to the client; and › Notify the Authority and the client of non-compliance with any written directions issued.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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): › Development of the Safety and Health Plan for the construction stage with updating where required as work progresses; › Compile and develop safety file information. › Reporting of accidents / incidents; › Weekly Site meeting with PSCS; › Coordinate arrangements for checking the implementation of safe working procedures. Ensure that the following are being carried out: › 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.		
Operational Phase					
MM49	Population (Residential Amenity)	EIAR Chapter 5	› There are no turbines proposed within 700m (4 x tip height) of any third-party sensitive receptors. › A 2.6m high palisade fence will be erected around the substation which will be painted RAL 6005 (green) to help blend the substation infrastructure in with the surrounding rural landscape. Vegetative		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			screening will also be planted along the eastern elevation of the substation compound		
MM50	Human Health (Health and Safety)	EIAR Chapter 5	› Access to the turbines is through a door at the base of the structure, which will be locked at all times outside maintenance visits. The doors will only be unlocked as required for entry by authorised personnel and will be locked again following their exit. › Staff associated with the project will conduct frequent visits, which will include inspections to establish whether any signs have been defaced, removed, faded, or are becoming hidden by vegetation or foliage, with prompt action taken as necessary. › 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: › Buried cable route markers at 50m (maximum) intervals and change of cable route direction; › Directions to relevant turbines at junctions; › "No access to Unauthorised Personnel" at appropriate locations; › Speed limits signs at Site entrance and junctions; › "Warning these Premises are alarmed" at appropriate locations; › "Danger HV" at appropriate locations; › "Warning – Keep clear of structures during electrical storms, high winds or ice conditions" at Site entrance; › "No unauthorised vehicles beyond this point" at specific Site entrances; and › Other operational signage required as per Site-specific hazards. › The proposed substation, which will be operated by Eirgrid/ESBN will be locked and fenced off from public access. The substation will be operational remotely and manually 24 hours per day, 7 days a week. Supervisory operational and monitoring activities will be carried out remotely using a SCADA system, with the aid of computers connected via a telephone modem link. › Periodic service and maintenance work which include some vehicle movement.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› For operational and inspection purposes, substation access is required. › Servicing of the substation equipment will be carried out in accordance with the manufacturer's specifications, which would be expected to entail the following: o Six-month service – three-week visit o Annual service – six-week visit o Weekly and daily visits as required		
MM51	Shadow Flicker	EIAR Chapter 5	Where daily or annual shadow flicker exceedances are predicted at any inhabitable or third-party dwelling of the identified 52 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.		
MM52	Major Accidents and Natural Disasters	EIAR Chapter 5	› The Proposed Development will be designed and built in line with current best practice and, as such, mitigation against the risk of major accidents and/or disasters will be embedded through the design. In accordance with the provision of the European Commission 'Guidance on the preparation of Environmental Impact Assessment Reports' 2017, a Risk Management Plan will be prepared and implemented on site to ensure an effective response to disasters or the risk of accidents. The plan will include sufficient preparedness and emergency planning measures. › The Proposed Development will also be subject to a fire safety risk assessment in accordance with Chapter 19 of the Safety, Health and Welfare at Work Acts 2005 to 2014, which will assist in the identification of any major risks of fire on site, and mitigation of the same during operation		
Chapter 6: Biodiversity					

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Pre-Construction Phase		
MM53	Badger	EIAR Chapter 6	Due to time that can elapse between the original surveys, any future planning consent and construction, a pre-construction badger survey will be carried out to identify the presence of any new setts that may have been established in the intervening period. Any setts identified within 50m of the Proposed Wind Farm infrastructure will subsequently be monitored for a minimum period of 2 weeks using remote cameras in order to ascertain use by badgers and levels of activity. If an active badger sett is identified and works can be undertaken safely (as to avoid sett collapse) then an exclusion zone will be set up around the sett as follows: › Exclusion zone fencing and appropriate signage will be put in place between working areas and badger sett exclusion zones to ensure that there will be no encroachment of the badger sett exclusion zones by construction activities. If a newly established and active sett was identified within an area where works could not avoid direct impacts on the sett then the sett would likely need to be excluded prior to works commencing. This would need to be undertaken in line with current guidelines by an appropriately qualified ecologist in advance of construction works commencing.		
MM54	Otter	EIAR Chapter 6	Given that otter were found to be very active in the vicinity of the Proposed Grid Connection route and due to time that can elapse between the original surveys and any future planning consent and construction, a pre-construction otter survey will be carried out to identify any changes to the baseline in the intervening period. Any changes to the baseline would need to be addressed following National and European legislation.		
MM55	Bats	EIAR Chapter 6	The following procedures are proposed prior to linear vegetation removal with Potential Roost Features (PRFs):		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		Appendix 6-2	Where trees with identified PRFs are proposed for removal, a pre-confirmatory inspection will be carried out by a suitably qualified ecologist prior to linear vegetation removal to ensure there are no bats present. The requirement for a pre-construction survey does not represent a lacuna in the survey assessment but is fully in line with industry best practice. The function of this survey will be to assess any changes in baseline environment since the time of undertaking the surveys in 2023/2024.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.		
Construction Phase					
MM56	Bats	EIAR Chapter 6 Appendix 6-2	**Bat Buffer** › In accordance with NatureScot and NIEA Guidance, a minimum 50m buffer to all habitat features used by bats (e.g., hedgerows, tree lines etc.)		
MM57	Groundwater, Surface Watercourses and Sensitive Aquatic Faunal Species	EIAR Chapter 6, Chapter 9 CEMP Section 3	› The Proposed Development design has been optimised to utilise the existing infrastructure (i.e. existing site roads) where practicable. Only 1 no. new crossing is proposed. › The proposed new stream crossing will be clear span culvert crossing 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;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› All drainage measures will be installed in advance of the works; › Plant and equipment will not be permitted to track across the watercourse; › 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 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 clear-span structure will be installed with no contact with the watercourse; › Once the crossing is in position stone backfill will be placed and compacted against the structure up to the required level above the foundations; › 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 › All new river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM58	Linear Habitats	EIAR Chapter 6	› In order to compensate for the loss of 1.8km of linear habitats, 2.1km of hedgerow reinstatement and 2.4km of hedgerow enhancement will be undertaken within the Proposed Development site. › Hedgerow reinstatement will comprise both translocation of existing hedgerows and new hedgerow planting across the site associated with any new or realigned access tracks and well as planting within existing agricultural fields. › The locations for hedgerow reinstatement (proposed planting and translocation) have been considered to ensure connectivity within the wider landscape for fauna species, in particular bats, and also in consultation with the landowners who are supportive of the proposal. › The proposed reinstatement areas are presented in Figures 2-3 and 2-4 of the Biodiversity Management and Enhancement Plan (BMEP) (Appendix 6-4).This will result in a net gain in this habitat within the site. › Species planted in these locations will be of a similar composition to those occurring on site and will be of local provenance. Translocation of hedgerows will also help with retention of the ground flora seed bank associated with hedgerows on site. Further details with regard to species, planting locations and management is contained within the BMEP.		
MM59	Invasive Species	CEMP Section 3	The following measures are proposed to establish good site hygiene to ensure the control of any potential spread of invasive species during construction works: › A risk assessment and method statement will 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		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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 will be decontaminated prior to relocating to a different works area. The decontamination procedures will 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. › 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					

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM60	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). **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. The proposed lighting around the Proposed Wind Farm shall be designed with consideration of the Institute of Lighting Professionals Guidance Note 08/23 Bats and Artificial Lighting at Night (ILP, 2023). › 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					

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
Pre- Construction Phase					
MM61	Birds	EIAR Chapter 7	› It is proposed that construction works will commence outside the bird nesting season (1st of March to 31st of August inclusive) to avoid the most sensitive time of the year for most bird species with the potential to use the site and its environs. Pre-commencement confirmatory surveys will be undertaken within one month prior to the initiation of works at the Proposed Development to identify sensitive sites (e.g. roosts). Any requirement for construction works to run into the subsequent breeding and winter seasons following commencement will be subject to a repeat of the pre-commencement bird surveys to confirm the absence of breeding birds of conservation concern once per month during the breeding season (April to July) and once during the winter season (October). The survey will aim to identify sensitive sites e.g., nests or roosts depending on the season in question. › The survey will be undertaken by a suitably qualified ornithologist. The survey will comprise a thorough walkover survey of the development footprint and/or all works areas to a 500m radius, where access allows. If winter roosts or nests of birds of high conservation concern are identified, the roost/nest will be earmarked for continued monitoring during works. If the roost/nest is found to be active during works, works will cease within a species-specific buffer of its location in line with best practice guidance (e.g. Forestry Commission Scotland, 2006; Goodship and Furness 2022; Ruddock and Whitfield, 2007) to avoid disturbance. No works shall be permitted within the buffer until it can be demonstrated that the roost/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 to alert all personnel on site to the suspension of works within that area.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
Construction Phase					
MM62	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.		
MM63	Birds	EIAR Chapter 7	› The removal of woody vegetation will be undertaken in full compliance with Section 40 of the Wildlife Act 1976 – 2022. › 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). › 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.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			○ 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.		
MM64	Kingfisher	EIAR Chapter 7	› The horizontal direction drilling for the grid connection cables under the River Nore will be undertaken outside the breeding season (1st March to 31st August inclusive) to avoid impacts on breeding kingfisher. › Silt fences will be installed as an additional water protection measure around existing watercourses.		
Decommissioning Phase					
MM65	Birds	EIAR Chapter 7	It is proposed that decommissioning works will commence outside the bird nesting season (1st of March to 31st of August inclusive) to avoid the most sensitive time of the year for most bird species with the potential to use the site and its environs. Pre-commencement confirmatory surveys will be undertaken within one month prior to the initiation of works at the Proposed Development to identify sensitive sites (e.g. roosts). Any requirement for construction works to run into the subsequent breeding and winter seasons following commencement will be subject to a repeat of the pre-commencement bird surveys to confirm the absence of breeding birds of conservation concern once per month during the breeding season (April to July) and once during the winter season (October). The survey will aim		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			to identify sensitive sites e.g., nests or roosts depending on the season in question. › The surveys will be undertaken by a suitably qualified ornithologist › If the roost/nest is found to be active during works, works will cease within a species-specific buffer of its location in line with best practice guidance (e.g. Forestry Commission Scotland, 2006; Goodship and Furness 2022; Ruddock and Whitfield, 2007). No works shall be permitted within the buffer until it can be demonstrated that the roost/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 to alert all personnel on site to the suspension of works within that area.		
EIAR Chapter 8 Land Soils & Geology					
Construction Phase					
MM66	Subsoil and Bedrock 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; › The majority of the excavated soil/subsoil will be used to reinstate the borrow pit. This will significantly reduce the amount of spoil stored at the natural ground level across the site, which might be subject to erosion from rainfall runoff;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Excavated soils/subsoils shall be excavated and stored separately to topsoil; this will prevent mixing of materials and facilitate reuse afterwards; › Where soils/subsoils are stored alongside roads or turbine hardstands, 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 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 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): 1 (h) alongside access tracks and adjacent to turbine hardstands; › Inspections of the spoil stored within the borrow pit and alongside access tracks/hardstands will be made by a Geotechnical Engineer through regular monitoring of the works. The appointed contractor will review work practices at these locations when periods of heavy rainfall are expected so as to prevent excessive dirty water runoff from being generated; › 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; › 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**		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Soils and subsoils excavated along the Proposed Grid Connection underground cabling route will be temporarily stored in covered stock piles along the edge of the road carriageway or alongside the excavated trench within agricultural lands. › 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 road surface will be replaced with the same design standard as the surrounding carriageway. The topsoil surface will be reinstated in agricultural fields		
MM67	Ground Instability and Failure	Chapter 8	The following measures which will be implemented during the construction phase of the Proposed Development will assist in the management of the geotechnical risks for this site: › Appointment of experienced and competent contractors; › The site will be supervised by experienced and qualified engineering/geotechnical personnel; › Allocate sufficient time for the project; › Prevent undercutting of slopes and unsupported excavations; › Maintain a managed suitable drainage system; › Ensure construction method statements are followed or where agreed modified/ developed; and, › Revise and amend the Geotechnical Risk Register as construction progresses		
			Operational Phase		
MM68	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.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Turbine transformers are located within the turbines, so any leaks would be contained within the turbine.		
			Decommissioning Phase		
MM69	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 Development in place where 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		
MM70	Morphological Changes to Surface Watercourses along the Proposed Grid Connection Cabling Route	EIAR Chapter 9	Prior to the commencement of cable trenching or crossing works the following key temporary drainage measures will be installed: › A double silt fence perimeter will be placed along the road verge on the down-slope side of any works areas that are located inside the watercourse 50m buffer zone; › 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 between the works area and the River Nore;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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; › 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 infiltration 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.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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 or storage of cement allowed at the watercourse crossing; › 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		
MM71	Earthworks	Chapter 9	A key mitigation measure adopted during the design phase is the avoidance of infrastructure close to surface water features across the Proposed Wind Farm site. The Proposed Wind Farm site is significantly distal from any significant surface water course, the nearest being the River Nore located 450m east of the Proposed Wind Farm site. The Proposed Grid Connection underground cabling route crosses 1 no. watercourse, the River Nore. Additional control measures will be undertaken at this location.		
			Construction Phase		
MM72	Earthworks	EIAR Chapter 9	**Proposed Mitigation by Avoidance:** › Avoid physical damage to watercourses, and associated release of sediment; › Avoid excavations within close proximity to surface watercourses;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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, by allowing all surface water/recent rainfall to infiltrate to ground at the 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 or other similar/equivalent or appropriate measures. **In-Line controls:** › Interceptor drains, erosion and velocity control measures such as check dams, sand bags, oyster bags, straw bales, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps/attenuation lagoons, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems. **Treatment systems:** › Silt-buster system or equivalent. **Silt Fences:**		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Silt fencing will be emplaced downgradient of turbines, to prevent any runoff of sediment laden water. Silt fences are effective at removing heavy settleable solids. Inspection and maintenance of these structures will be carried out during construction phase. They will remain in place throughout the entire construction phase. Double silt fences will also be emplaced where the Proposed Grid Connection is near sensitive areas. **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, most of the sediment is retained by the geotextile fabric allowing filtered water to pass through. The discharge from the silt bags will be directed to the settlement ponds, where the water will be allowed to naturally infiltrate to ground for the wind farm drainage prior to reaching the downstream watercourses. **Pre-emptive Site Drainage Management** The works programme for the initial construction stage of the Proposed Wind Farm site will also take account of weather forecasts and predicted rainfall in particular. Large excavations and movements of 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. **Management of Runoff from Areas of Spoil Placement** It is proposed that excavated subsoil will be primarily used to backfill the borrow pit. Any excess will be used for landscaping throughout the Site or		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			accommodated in linear berms alongside the Proposed Wind Farm site access roads and turbine hardstands. Proposed surface water quality protection measures regarding the areas of spoil placement are as follows: › During the initial emplacement of spoil at the borrow pit, silt fences, straw bales and biodegradable matting will be used to control surface water runoff from the enclosure. › Drainage from areas of spoil placement will be directed to settlement ponds as required or will overflow through controlled overflow pipes (not required for borrow pit as runoff will remain in pit). › Discharge from the areas of spoil placement will be intermittent and will depend on preceding rainfall amounts. › Once the areas of spoil placement, have been seeded and vegetation is established the risk to downstream surface water is significantly reduced. Therefore, at each stage of the development of the spoil placement areas, the above mitigation measures will be implemented to protect downstream water quality. **Timing of Site Construction Works** Construction of the 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. 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		
MM73	Groundwater Flows and Levels due to alteration of recharge	EIAR Chapter 9	**Mitigation by Avoidance - Groundwater Flows:**		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Wind Farm site › The construction of the turbines, met mast, access roads and other ancillary features of the Proposed Development could impact groundwater flows within the Proposed Wind Farm site, if a particular pathway *e.g.* karst conduit, existed near the development, however based on all the available site investigation data no reasonable pathways have been identified. The identification and avoidance of any potential karst features has been a key aim of the intrusive and extrusive site investigations, through geophysical surveys, drilling and trial pit excavations and is considered to be the most rational method of mitigating against affecting flow paths, by avoiding any potential karst areas. › The Site data outlined, within Section 9.3.6.2 and 9.3.6.3 of this chapter and outlined in more detail within Chapter 8 of this EIAR provides sufficient scientific data to say, with a high degree of certainty, that the construction of the turbine foundations, met mast, site access roads, substation and other relatively near surface constructs, will not interact with or alter the existing groundwater recharge, and underlying groundwater flow, regimes. **Grid Connection** › The Proposed Grid Connection underground cabling route will be routed along an existing road carriageway and within agricultural lands. The trench will be excavated to a depth of ~1.3m with the soil/subsoil removed and backfilled in place. As such there will be no significant change in the permeability of the lands occupied by the Proposed Grid Connection underground cabling route. **Mitigation by Design - Groundwater Levels:**		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› As mentioned above, the critical driver of groundwater levels and the potential to affect them is through groundwater recharge. The drainage design of the Proposed Wind Farm site has been designed to mimic the existing hydrological regime within the Site, whereby surface water runoff pathways are generally short and rainfall readily percolates to ground. The drainage design incorporates check dams to reduce velocities, and level spreaders to allow water to infiltrate to ground.		
MM74	Groundwater Levels and Local Groundwater Well Supplies during Excavation	EIAR Chapter 9	**Mitigation by design:** › The turbine locations are located on lands where the ground elevations are between ~80 and 180m OD; › The elevations of the turbine foundations are above the elevations of groundwater levels recorded in monitoring wells and local domestic/farm wells, and therefore of the known groundwater levels within the Proposed Wind Farm site. The turbine foundations will be excavated to 3-5mbgl and as such will not intercept any aquifer units, but will be excavated within the overlying subsoil and near-surface bedrock		
MM75	Pile Foundations	EIAR Chapter 4, 9	Proposed mitigation measures relative to piling works will comprise: › Where driven piles are used, they will have a cross section without re-entrant angles; › 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 bentonite seals will be used to prevent upward/downward movement of surface water/groundwater		
MM76	Surface Water and topographically downgradient Surface Water bodies	EIAR Chapter 9	**Mitigation by Avoidance:**		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› The primary mitigating factor in relation to downgradient surface water bodies is the general lack of surface water courses across the Proposed Wind Farm site and the surrounding area. The rainfall falling on the Proposed Wind Farm site recharges to the underlying groundwater aquifer. › The exceptions to this are at turbine T8, where a small seepage face runs into a field drain, before discharging to the Ballyconra stream, as well as at T4, where the Archerstown stream exists ~ 380m southwest of turbine T4. These works will be completed between the months of May-October with minimal consequence as the field drain will be dry. › Along the Proposed Grid Connection underground cabling route, the cabling will be emplaced within existing road carriageways and existing bridges. The utilisation of the existing roadways and bridges avoids any in-stream works.		
MM77	Refuelling	EIAR Chapter 9	Mitigation measures not already outlined in MM17,MM46 include: › Fuel storage areas if required will be bunded appropriately for the fuel storage volume for the time period of the construction and fitted with a storm drainage system and an appropriate oil interceptor; › Surface water runoff from temporary construction compounds will be collected and drained via silt traps and hydrocarbon interceptors prior to recharge to ground.		
MM78	Water Contamination from Wastewater Disposal	EIAR Chapter 9 CEMP Section 3	**Pre-emptive Site Drainage Management:** › A self-contained port-a-loo system with an integrated wastewater holding tank will be used at the 2 no. temporary 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,		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› No water for sanitation purposes will be sourced on the Site or discharged to the Site		
MM79	Excavation Dewatering	EIAR Chapter 9 CEMP	› 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; › 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.		
MM80	Cement Based Products	EIAR Chapter 4,9 CEMP	Mitigation measures not outlined in MM18, MM19 include: › Sand blinding, Damp-proof Membrane (DPM) and concrete blinding are to be provided at turbine formation level to create a vertical cut-off barrier and to mitigate the risk of concrete leakage into the ground below the turbine foundations		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM81	Morphological Changes to Surface Watercourses within the Proposed Wind Farm Site	EIAR Chapter 9	The Proposed Development design has been optimised to utilise the existing infrastructure (i.e. existing site roads) where practicable. Only 1 no. new crossing is proposed. Due to the existing hydrological/hydrogeological regimen, characterised by high recharge through the soils/subsoils, there is a very limited site drainage network. Mitigation measures for the crossings are outlined in MM58. 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 in consultation with Inland Fisheries Ireland. Abutments will be constructed from precast units combined with in-situ foundations, placed within an acceptable backfill material. Confirmatory inspections of the proposed new watercourse crossing location will be carried out by the Project Civil/Structural Engineer and the Project Hydrologist prior to the construction of the crossing.		
MM82	Potential Effects on Public Water Schemes and Domestic Water Supplies	EIAR Chapter 9	Mitigation measures for the protection of surface and groundwater water quality as from MM73-MM81 will be implemented during the construction phase of the Proposed Development 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 Development.		
MM83	WFD Water Body Status	EIAR Chapter 9	Mitigation measures for the protection of surface and groundwater water quality as outlined from MM73-MM81 will be implemented during the construction phase of the Proposed Development 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 Development.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM84	Hydrologically Connected Designated Sites	EIAR Chapter 9, Chapter 6	Mitigation measures for the protection of surface and groundwater water quality as outlined from MM73-MM81 will be implemented during the construction phase of the Proposed Development 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 Development.		
			Operational Phase		
MM85	Progressive Replacement of Natural Surface with Lower Permeability Surfaces	EIAR Chapter 9	**Mitigation by Design:** › Interceptor drains will be installed up-gradient of 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 slowly re-distributed over the ground surface and infiltrate through the soil and subsoils; › Swales/road side drains will be used to collect runoff from access roads and turbine hardstanding areas of the Proposed Wind Farm site, likely to have entrained suspended sediment, and channel it to infiltration areas for sediment settling; and, › Check dams will be used along sections of access road drains to attenuate flows and intercept silts at source. Check dams will be constructed from a 4/40mm non-friable crushed rock.		
MM86	Effects on Designated Sites	EIAR Chapter 9	› Regular maintenance of the on-site drainage system. The maintenance schedule will be reduced once natural vegetation is re-established, which will provide consistent filtration through the soil/subsoil; › The use of fuel storage bunds for any hydrocarbons (fuel/oils) and the ongoing maintenance of the bund structures; and, › Any maintenance works which may involve soil movement (such as the removal of sediment from the settlement ponds) will take place during the dry months of the year (May - September).		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM87	WFD Status	EIAR Chapter 9	In addition to the mitigation measures outlined in MM86 infiltration areas will be emplaced downstream of road swale sections and at end of the downstream collector drains, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall and allow the rainfall to recharge to ground effectively		
Decommissioning Phase					
MM88	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					
MM89	Exhaust Emissions	EIAR Chapter 10 CEMP Section 3	› All construction vehicles and plant used onsite during the construction phase will be maintained in good operational order. If a vehicle requires repairs this work will be caried out, thereby minimising any emissions that arise. › Turbines components will be transported to the Site on specified routes only, unless otherwise agreed with the Planning Authority. › All machinery will be switched off when not in use. › Users of the Site will be required to ensure that all plant and vehicles are suitably maintained to ensure that emissions of engine generated pollutants are kept to a minimum. › The majority of aggregate materials for the construction of the Proposed Development will be obtained from the borrow pit on site. This will significantly reduce the number of delivery vehicles accessing the site, thereby reducing the amount of emissions associated with vehicle movements. › The Materials Recovery Facility (MRF) facility will be local to the Proposed Development site to reduce the amount of emissions associated with vehicle movements. The nearest licensed waste facility to the Wind Farm Site is Dunmore Recycling and Waste Disposal		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			located approximately 12.5km to the southeast of the site of the Proposed Development		
MM90	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 Wind Farm Site. › Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction. › Turbines and construction traffic will be transported to the site on specified haul routes only. › Grid Connection infrastructure will be transported to the site on specified haul routes only. › Construction materials for the proposed Grid Connection and a small volume for the proposed Wind Farm Site will be sourced locally from licenced quarries. › The agreed haul route road adjacent to the Wind Farm 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 transportation of materials from the borrow pit around the Wind Farm Site will be covered by tarpaulin or similar covered vehicles where necessary. › The transportation of construction materials from locally sourced quarries for the proposed Grid Connection infrastructure and a small volume for the proposed Wind Farm Site will be covered by tarpaulin where necessary. › If necessary, excavated material will be dampened prior to transport to the borrow pit or alongside site access roads, around hardstands .		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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 Proposed Development to reduce the amount of emissions associated with vehicle movements › A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-2). The CEMP includes dust suppression measures.		
			Operational Phase		
MM91	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.		
			Decommissioning Phase		
MM92	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 Development will be implemented during the decommissioning phase thereby minimising any potential impacts.		
			Chapter 11 Climate		
			Construction Phase		
MM93	Greenhouse Gas Emissions	EIAR Chapter 11	› All construction vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise. › When stationary, delivery and on-site vehicles will be required to turn off engines.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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. › It is intended to obtain the majority of materials for the construction of the Proposed Wind Farm from the proposed onsite borrow pit (with some material being imported from local licenced quarries as needed). This will significantly reduce the number of delivery vehicles accessing the site, thereby reducing the amount of emissions associated with vehicle movements. › A Construction and Environmental Management Plan (CEMP) (Appendix 4-2) will be in place throughout the construction phase. › The CEMP (Appendix 4-2) includes a Waste Management Plant (WMP) which outlines the best practice procedures that will occur during the construction phase relating to waste material. o The WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Development. Disposal of waste will be seen as a last resort. o Section 4.3.4.7 of Chapter 4 for this EIAR refers to the methodology that will be utilised to manage onsite waste. This waste material will be transferred to a licensed o /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor, o The MRF facility will be local to the Proposed Development site to reduce the amount of emissions associated with vehicle movements. › Where applicable, low carbon intensive construction materials will be sourced and utilised onsite		
			Operational Phase		
MM94	Greenhouse Gas Emissions	EIAR Chapter 11	› Ensure that all maintenance and monitoring vehicles will be maintained in good operational order while onsite, and, when		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		Appendix 6-4	stationary, be required to turn off engines thereby minimising any emissions that arise. › As detailed in Appendix 6-4, a BMEP, for the Proposed Wind Farm has identified biodiversity enhancement and management activities such as native hedgerow planting and enhancement.		
Decommissioning Phase					
MM95	Decommissioning Phase	EIAR Chapter 11	The mitigation measures prescribed for the construction phase of the Proposed Development will be implemented during the decommissioning phase thereby minimising any potential impacts.		
EIAR Chapter 12 Noise					
Pre- Construction Phase					
Construction Phase					
MM96	Construction Noise	EIAR Chapter 12 CEMP Section 3	› The contract documents will specify that the Contractor undertaking the construction works will be obliged to adopt best practice noise abatement measures contained in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise and BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration		
Operational Phase					
MM97	Operational Phase Noise	EIAR Chapter 12	**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 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. **Amplitude Modulation**		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			In the event that a complaint which indicates potential excessive amplitude modulation (AM) associated with the Proposed Lifetime Extension, 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 occurrence, which can be used to evaluate different operational conditions including method to mitigate any excessive AM. These mitigation measures, if required, will consist of the implementation of operational controls for the relevant turbine type, which will include turbine curtailment under specific operational conditions. In the absence of widely accepted and robust planning conditions to control amplitude modulation (AM) from wind turbines, the commitments outlined in this EIAR are considered best practice. The proposed approach will ensure that any negative impacts arising from AM, if identified, associated with the operation of the Proposed Development will be effectively addressed by the operator		
Decommissioning Phase					
MM98	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 Development. The mitigation		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			measures prescribed for the construction phase of the Proposed Development will be implemented during the decommissioning phase thereby minimising any potential impacts.		
EIAR Chapter 13 Archaeological Architectural & Cultural Heritage					
Pre-construction Phase					
MM99	Pre-commencement Archaeological Surveys	EIAR Chapter 13	› Prior to the commencement of construction, a programme of archaeological test trenching will be carried out at the location of the proposed turbine hardstands, compound, borrow pit and along the access roads. This work will be carried out under licence to the National Monuments Service of the DHLGH. Dependent on the results of the testing assessment, further mitigation may be required, such as preservation by record or in-situ and/or archaeological monitoring. Any further mitigation will require agreement from the DHLGH.		
Construction Phase					
MM100	Recorded Monuments and Protected Structures	EIAR Chapter 13	› All topsoil stripping associated with the proposed development, including site investigation, will be subject to archaeological monitoring. This work will be carried out under licence to the National Monuments Service of the DHLGH. If archaeological remains are identified during the course of these works further mitigation may be required, such as preservation by record or in-situ. Any further mitigation will require agreement from the DHLGH. › All inventions that are required along townland boundaries, as part of the construction of the proposed development, will be subject to archaeological monitoring, to include a full record of the sections of townland boundaries that are removed. This work will be carried out under licence to the National Monuments Service of the DHLGH.		
Chapter 14 Landscape and Visual					
Pre-Commencement, Construction, Operation and Decommissioning					

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM101	Landscape Effects	EIAR Chapter 14	All construction activities will follow best practice methods to reduce impacts upon the environment and landscape of the Site. Further details are presented in the Construction and Environmental Management Plan (CEMP) contained in Appendix 4-4 of this EIAR. The following measures should be implemented to mitigate landscape effects during the construction phase of the Proposed Development: › In all circumstances, excavation depths and volumes will be minimised, and excavated material will be re-used where possible. › Where the cable trench is to be located in the road verge, subsoil should be piled on site and re-used after cabling works. Should any medium planting be removed, it should be replaced with the same or similar species whenever it is not possible to salvage and reinstate. New topsoil should be provided should the existing topsoil not be of sufficient standard. › Any areas of bare soil remaining after the landscaping phase will be seeded as soon as possible with a grass-seed mix to minimise sediment run-off. › To minimise cut and fill activities required to construct the Proposed Development, the proposed access roads and other infrastructure such as hard stands have been designed to avoid steep gradients and hilly terrain within the Site. › In all circumstances, excavation depths and volumes will be minimised, and excavated material will be re-used where possible		
MM102	Visual Effects	EIAR Chapter 14	General housekeeping measures necessary to meet Health & Safety requirements are implemented to ensure that active construction areas within the Site will be kept tidy, thereby mitigating localised visual impacts on the Site itself during the construction phase		
MM103	Mitigation by Good Design	EIAR Chapter 14	› **Appropriate Zoning and Sensitivity Ratings in Local Planning:** Six turbines are in Co. Kilkenny land area zoned as 'Open to		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Consideration' for wind energy development in the Kilkenny WES; two turbines are in Co. Laois land area with a 'Medium' landscape sensitivity rating and capacity to accommodate new uses without significant adverse effects. › **Compliance with Wind Energy Development Guidelines Set-Back Distances:** Siting of Proposed turbines well exceeds the minimum 500m set-back distance from residences set out in the DoEHLG 2006 Guidelines and adheres to the 4-times-tip-height set-back distance prescribed for residential visual amenity by the Draft 2019 Guidelines. › **Siting in a Working Landscape of Low Sensitivity:** All Proposed turbines and infrastructure of the Proposed Wind Farm are sited in a rural working landscape, a Site that has been highly modified from its natural state and does not comprise any unique or sensitive features of county, regional or national significance and primarily consisting of agricultural farmland, thereby considered to have relatively low sensitivity to wind farm development. › **Appropriate Landscape Character Type:** The landscape character type with active agriculture patchwork fields delineated by hedgerows matches 'Hilly and Flat Farmland' from the Draft 2019 Guidelines, which is considered an appropriate landscape type for accommodating wind energy development. › **Visual Containment by Topography:** The siting of turbines within the Nore Valley, on the upland plateau between Ballynalacken Hill (east) and Knockmannon Hill (west) provides extensive visual containment, with Zone of Theoretical Visibility (ZTV) mapping showing no visibility across large areas of the LVIA Study Area, especially to the north-east, east, south-east, and south-west. › **Visual Balance and Scenic Integration:** The Proposed turbines have been strategically sited to ensure visual balance within the landscape of the wider Nore River Valley landscape, as demonstrated by photomontages showing that turbines most often appear as a neatly arranged linear arrays upon an elevated ridgeline when viewed from prominent receptors in the valley.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› **Long Ranging Views:** The Proposed Development does not obstruct long-ranging views of general scenic value or does not obstruct views of a high scenic amenity within the high sensitivity Nore Valley LCA › **Distance from Scenic Designations:** The Proposed Development is well set-back from designated Scenic Views and Prospects (closest = 4.5km) and therefore will not give rise to significant effects on designations with potential visibility. › **Localised Visual Screening:** Mature vegetation and undulating terrain restrict wider landscape visibility within a 5km radius. › **Coherent Turbine Layout:** The Proposed turbines are spaced appropriately in two staggered linear arrays in response to the underlying field pattern, such that they read coherently within the landscape and are of acceptable form and arrangement in alignment with the recommended siting and design of turbines for Hilly and Flat Farmland in the DoEHLG 2006 and Draft 2019 Guidelines. › **Minimal New Ancillary Infrastructur**e: The internal site road layout makes use of the existing tracks where possible (to be upgraded for construction and the delivery of wind turbine components), thereby minimising the requirement for new tracks within the Site. › **Underground Grid Connection:** The Proposed Grid Connection Route to the national electricity grid is underground, thereby eliminating potential landscape and visual effects during the operational phase. › **Avoidance of Landscape Receptors on Site:** The layout of the Proposed Wind Farm ensures minimal loss of valuable landscape receptors and biodiversity corridors such as mature hedgerows, the design ensures the integrity of existing field boundaries.		
Chapter 15 Material Assets - Traffic					
Pre-Construction, Construction and Operation					
MM104	Traffic and Transport	Chapter 15, Appendix 15-2	**Mitigation by Design**		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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 15.1.9 of this EIAR. › Selection of the shortest underground grid connection route, minimising the impacts on the existing road network and traffic		
MM105	Traffic Management Plan	Chapter 15, Appendix 15-2	A detailed Traffic Management Plan (TMP), incorporating all the mitigation measures included as Appendix 15-2 of this EIAR, will be finalised and confirmatory detailed provisions in respect of traffic management agreed with the roads authority and An Garda Síochána prior to construction works commencing on Site. In addition, the traffic management measures proposed for the following construction traffic scenarios are set out for the grid connection in Appendix 15-2: Traffic Management Plan for Seskin Renewables Wind Farm Development; **Delivery of abnormal sized loads:** The transport of large components is challenging and can only be done following extensive route selection, route proofing and consultation with An Garda Síochána, the local authority and its road section and roads authorities. Turbine components are usually transported in convoys of 3 vehicles (sometimes up to 5 vehicles subject to approval) at night when traffic is lightest. This will be undertaken in consultation with the roads authorities, An Garda Síochána Traffic Corp and special permits are generally required. **Management of Standard HGVs on L58333 leading to site:** It is proposed that access for all general construction traffic will be provided to and from the Proposed Wind Farm site the access junction off the L58333. The proposed junction has a radii of 13m to provide for standard HGVs turning right into the site and right out of the site, in accordance with		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			TII guidelines Geometric Design of Junctions (DN-GEO-03060). Visibility splays of 90m taken from a setback of 2.4m are provided in accordance with a design speed of 60 kph. The proposed junction layout and visibility splays are shown in Figure 15-12 of the EIAR. **Temporary traffic management for access on the L58333 during concrete foundation pouring days** As set out in Section 2, the abnormally sized loads will be delivered via the access junction on the L58333 during night-time hours accompanied by an escort provided by An Garda Síochána. For the 8 days that it is proposed that concrete deliveries are made via the access junction on the L58333 it is proposed that the junction will be controlled by the following temporary traffic management measures: › Introduction of signage warning of roadworks ahead on northbound and southbound approaches to the access on the L58333. › Signage on the L58333 northbound approach indicating the construction access approaching on the left and similar on the southbound approach to the access approaching on the right. › Signage on the L58333 northbound and southbound approaches to access junction warning of Flagmen. › The presence of a Flagman at the proposed temporary access on the L58333 during hours of operation on the concrete foundation pouring days. › Closure by means of a gate at all times outside of operation during the construction and operational stages of the Proposed Development **Traffic management measures during construction of cable grid connection** In addition to traffic management measures required for additional traffic movements generated during the construction of the Proposed Wind Farm		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			site, traffic arrangements for the proposed grid connection underground cabling route works are included in Section 15.1.7 of the EIAR. The proposed 38kV onsite electrical substation will be connected by 38kV underground cabling to the existing 110kV Ballyragget Substation. The underground cabling route measures approximately 3.4km of which approx. 2.2km is located within the public road corridor. The proposed route is shown in Figure 15-6 of the EIAR. It is considered that the retention of 2 lane operation on the N77 will be possible for the majority of the duration of the construction of the Proposed Grid Connection underground cabling route. The exception to this will be during the construction of the short 35m section of the route when it crosses west to east over the N77. During the construction of this section, which could be undertaken during one night, a "Stop & Go" traffic management system will be in operation in order to retain 2-way flow on the N77. It is therefore concluded that no road closures will be required during the construction of the Proposed Grid Connection underground cabling route. It is estimated that the route will take a total of approximately 23 days to construct. On 22 of these days 2-way traffic flow will be retained on the N77 and on one day, or night, a stop & go facility will require to be operated on the N77.		
MM106	Detailed Traffic Management Plan	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 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		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			the Proposed Development 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 Development site. 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. › **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 Development 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. › **Implementation of temporary alterations to road network at critical junctions** – At locations where required highlighted in Section 15.1.9. › **Identification of delivery routes** – These routes will be agreed and adhered to by all contractors. › **Travel plan for construction workers to Proposed Development site**– While the assessment above has assumed the worst case that construction workers will drive to the Proposed Development site, the construction company will be required to provide a travel plan for construction staff, which will include the identification of a routes to / from the site and identification of an area for parking. › **Travel plan for construction workers to underground electric cabling route** – Due to the transient nature of the underground grid connection		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			construction site which will generally be on a section of the public road, construction workers will be transported to and from the site by the construction company at the beginning and end of each shift. › **Traffic management measures on L58333** - Marshalling (at site access and southern end of L58333) and control of traffic will be in operation during the 8 days during which the concrete foundations are poured, as set out in the TMP included as Appendix 15-2. › **Drivers conduct** – All drivers will follow normal rules of the road and will receive toolbox talk regarding the delivery route and planned holding points prior to any deliveries. › **Standard permitted axial loads** – Will not be exceeded. › **Temporary traffic signs** – As part of the traffic management measures temporary traffic signs will be put in place at all key junctions, including the access junction on the L58333 during the 12 month construction period. 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). A member of construction staff (flagman) will be present at the access junction on the L58333, and the N77 / L58333 junction during the 8 days on which the concrete turbine foundations are poured. › **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. › **Re-instatement works** - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers. All works will be done in accordance with the Guidelines for the Opening, Backfilling and Reinstatement of Openings in Public Roads, DTToS, September 2015. › **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 wheel washing facilities on Site and sweeping / cleaning of local roads as required.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			It is confirmed that details for the Traffic Management Plan for the Proposed Development will be agreed with the Road Section of Kilkenny County Council prior to construction and contact will be maintained with the Road and Traffic Section throughout the construction phase.		
Decommissioning Phase					
MM107	Decommissioning	Chapter 15	In the event that the Proposed Development is decommissioned after the 35 years of operation, a decommissioning plan, will be prepared for agreement with the local authority, as described in Chapter 4 and Appendix 4-4 Decommissioning Plan. This plan will include a material recycling / disposal and traffic management plan will be prepared for agreement with the local authority prior to decommissioning, in accordance with Scottish Natural Heritage report (SNH) Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms (SNH, 2013).		
Chapter 15 Other Material Assets					
Construction Phase					
MM108	Overhead Lines	EIAR Chapter 15	› Goal posts will be established under overhead lines for the entirety of the construction phase. They will not exceed a height of 4.2 metres, unless specifically agreed with ESB Networks › The suitability of machinery and equipment for use near power lines will be risk assessed. › All staff will be trained on the routes and operating voltages of overhead electricity lines running across the proposed main site entrance. 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.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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. › Prior to the delivery of turbines to the Proposed Development site, a dry run of the route using vehicles with similar dimensions will occur. Please see Section 15.1.9 above for details. › When activities must be carried out beneath overhead lines, e.g. component delivery or grid cable laying, 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 is undertaken 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. › 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. › All health and safety measures as detailed in Section 5 of Construction Environment Management Plan and Chapter 5 Population and Human Health will be adhered to during the construction, operation and decommissioning phases. › 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.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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.		
MM109	Water Services	EIAR Chapter 15	› In advance of any construction activity, the contractor will undertake pre-commencement surveys to confirm the presence or otherwise of any services such as water supply. If found to be present, the relevant service provider will be consulted with in order to determine the requirement for specific excavation or relocation methods and to schedule a suitable time to carry out works. In the event that water mains are encountered the water supply will be turned off by the utility so work can commence on diverting the service. The section of existing pipe will be removed and will be replaced with a new pipe along the new alignment of the service. The works will be carried out in accordance with the specifications of the relevant utility provider		
MM110	Broadband Services		› 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		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM111	Aviation	EIAR Chapter 15	The scoping response from the IAA and DoD sets out lighting requirements for turbines as detailed above. These requirements will be complied with for the Proposed Development and any further details will be agreed in advance of construction with the IAA, i.e. crane erection. The coordinates and elevations for built turbines will be supplied to the IAA, as is standard practice for wind farm developments.		
Operational Phase					
MM112	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. The following mitigation options are proposed in the event of any potential impact that the Proposed Wind Farm turbines may have on telecommunications links. › Increasing the Radio Antenna Installation heights; › Relaying the link via existing links in the surrounding area and;		
Decommissioning					
MM113	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	Water and Drainage	EIAR Chapter 4,9 CEMP Section 4 SWMP Section 4	Prior to commencement of works in sub-catchments across the Site, main drain inspections will be competed 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. Water quality field testing and laboratory analysis will be undertaken prior to commencement of construction at the site. The monitoring programme will be subject to agreement with Laois and Kilkenny County Councils but will be based on the planning stage programme already outlined in the EIAR and CEMP and presented in this document. Baseline sampling will be completed on at least two occasions and these will 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. However, prior to commencement of works in sub-catchments across the site, drain inspections will be competed to ensure ditches and streams are free from debris and blockages that may impede drainage. These inspections will be done on a catchment by catchment basis as the construction works develop across the site, as works in all areas will not commence simultaneously	On going	Monthly	Project Hydrologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			An inspection and maintenance plan for the on-site drainage system will be prepared in advance of the commencement of any works.			
MX2	Traffic	EIAR Chapter 15, CEMP Section 3	A pre-condition survey of roads associated with the Proposed Development will be carried out prior to construction commencement to record the condition of the road.	Once	Once	Traffic Consultant
MX3	Ecology/Ornithology	EIAR Chapter 4,6,7 CEMP Section 4	The Project Ecologist will not be full time on site but will undertake pre-commencement surveys and visit the site as required. The project ecologist/ornithologist will undertake a pre-construction transect/walkover bird survey to ensure that significant effects on breeding birds will be avoided. In the event that the presence of such species is found at or adjacent to the Proposed Development footprint during pre-commencement surveys, 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.	On going	As required	Project Ecologist/Ornithologist
MX4	Ornithology	EIAR Chapter 7	It is proposed that construction works will commence outside the bird nesting season (1st of March to 31st of August inclusive) to avoid the most sensitive time of the year for most bird species with the potential to use the site and its environs. Pre-commencement confirmatory surveys will be undertaken within one month prior to the initiation of works at the Proposed Development to identify sensitive sites (e.g. roosts). Any requirement for construction works to run into the subsequent breeding and winter seasons following commencement will be subject to a repeat of the pre-commencement bird surveys to confirm the absence of breeding birds of conservation concern once per month during the breeding season (April to July) and once during the winter season (October). The survey will aim to identify sensitive sites e.g., nests or roosts depending on the season in question.	Once	As required	Project Ornithologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			The survey will be undertaken by a suitably qualified ornithologist. The survey will comprise a thorough walkover survey of the development footprint and/or all works areas to a 500m radius, where access allows. If winter roosts or nests of birds of high conservation concern are identified, the roost/nest will be earmarked for continued monitoring during works. If the roost/nest is found to be active during works, works will cease within a species-specific buffer of its location in line with best practice guidance (e.g. Forestry Commission Scotland, 2006; Goodship and Furness 2022; Ruddock and Whitfield, 2007) to avoid disturbance. No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied.			
MX5	Archaeology	EIAR Chapter	Prior to the commencement of construction, a programme of archaeological test trenching will be carried out at the location of the proposed turbine hardstands, compound, borrow pit and along the access roads. This work will be carried out under licence to the National Monuments Service of the DHLGH. Dependent on the results of the testing assessment, further mitigation may be required, such as preservation by record or in-situ and/or archaeological monitoring. Any further mitigation will require agreement from the DHLGH.	Once	As Required	Project Archaeologist
Construction Phase						
MX6	Health and Safety	EIAR Chapter 5, CEMP Section 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): › Development of the Safety and Health Plan for the construction stage with updating where required as work progresses; › Compile and develop safety file information. › Reporting of accidents / incidents; › Weekly Site meeting with PSCS;	Daily	Daily	PSCS

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			› Coordinate arrangements for checking the implementation of safe working procedures. Ensure that the following are being carried out: › 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			
MX7	Ecology and Environment	EIAR Chapter 4 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 Contractor but will liaise closely with the Construction Manager in relation to the Project Contractor's day-to-day implementation of the CEMP on site. The responsibilities and duties of the ECoW will include the following: › Review/approval of the CEMP and supporting environmental documentation and review/approval of contractor method statements; › Undertake environmental monitoring, inspections and reviews to ensure the works are carried out in compliance with the CEMP by the Project Contractor;	Daily	As Required	ECoW

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			› Manage the water quality monitoring programme and turbidity monitors; › Maintain a live Actions List and accompanying map outlining any corrective actions across the site requiring attention or action by the contractor; › Confirm for the Project Contractor that pre-commencement requirements have been met to allow construction activities to commence; › Highlight for the contractor, any abandonment triggers that are occurring and inform the contractor that works are to cease; › Generate environmental reports as required to show environmental data trends and ensure environmental records are maintained throughout the construction period; › Advise site management/contractor/sub-contractors on: › Prevention of environmental pollution and improvement to existing working methods; › Changes in legislation and legal requirements affecting the environment; › Suitability and use of plant, equipment and materials to prevent pollution; › Environmentally sound methods of working and systems to identify environmental hazards; › Assist the contractor in coordinating the required inputs and site visits from the Project Ecologist or Project Hydrologist to support the ECoW role; › Ensure immediate notification of any environmental incidents are issued to the Construction Manager and Project Developer; › Support the investigation of incidents of significant, potential or actual environmental damage and ensure corrective actions are carried out, recommend means to prevent recurrence and communicate incident findings to relevant parties. › Liaise with the Project Design Team and attend meetings to report on audit findings			

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			› Support the contractor who will be responsible for providing toolbox talks and site induction content to ensure the requirements of the CEMP are delivered on site. › The geotechnical design requirements of the Proposed Development are not within the remit of the ECoW. 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 Development.			
MX8	Water Quality and Monitoring	EIAR Chapter 9 CEMP Section 4 SWMP Section 4	Daily visual inspections of the installed drains and outfalls will 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. Should the suspended solids levels measured during construction, at the pre-determined sampling locations, be higher than the baseline levels, the source will be identified, and additional mitigation measures implemented. Inspection sheets and photographic records will be kept on site. Inspection points will include the in-situ field monitoring point locations, the laboratory analysis sampling points and continuous monitoring locations. Inspection points will depend on works being completed within the catchment upstream of the identified monitoring locations. Visual inspections will also be completed after major rainfall events, i.e., after events of >25mm rainfall in any 24-hour period and data including photographs will be collected by visual inspections and independently assessed by the supervising hydrologist who will monitor and advise on the records being received.	Daily	Monthly	ECoW

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			Daily Visual Inspection locations will be confirmed by the Project Hydrologist prior to the commencement of the construction phase. The following periodic inspection regime will be implemented: › Daily general visual inspections of site operations and inspections of all watercourses 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 any maintenance that is required. Any changes, such as discolouration, odour, oily sheen or litter shall be noted and corrective action shall be implemented. High risk locations such as settlement ponds will be inspected daily. Daily 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 Environmental Clerk of Works 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/ Environmental Clerk of Works of the drainage measures during construction phase; › Quarterly site inspections by the Project Hydrologist/ Environmental Clerk of Works of the drainage measures after construction for a period of one year following the construction phase; and,			

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			› 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.			
MX9	Turbidity Monitoring	EIAR Chapter 9 CEMP Section 4	› Continuous, in-situ, monitoring equipment will be installed where required at locations surrounding the wind farm site. The monitoring equipment will provide continuous readings for turbidity levels, flow rate and water depth in the watercourse. This equipment will be supplemented by daily visual monitoring at their locations. › The proposed locations for continuous, in-situ monitoring will be confirmed by the Project Hydrologist prior to the commencement of the construction phase	Daily	As Required	ECoW/Project Hydrologist
MX10	Laboratory Analysis and Field Monitoring		› Baseline laboratory analysis of a range of parameters with relevant regulatory limits and EQSs will be undertaken as per water monitoring programme for the overall windfarm development and each primary watercourse along the route. This will not be restricted to just these locations around the immediate wind farm site with further sampling points added as deemed necessary by the ECoW, in consultation with the Project Hydrologist and Site Manager, as the construction phase progresses › Field chemistry measurements of unstable parameters, (pH, conductivity, temperature) will be taken at the surface water monitoring locations, as per water monitoring programme for the overall wind farm development and each primary watercourse along the route and also at all installed sonde locations. These analyses will be carried out by either the ECoW or the Project Hydrologist. In-situ field monitoring will be completed on a weekly basis. In-situ field monitoring will also be completed after major rainfall events, i.e., after events of >25mm rainfall in any 24-hour period. The Project Hydrologist	Monthly	Monthly	ECow/Project Hydrologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			will monitor and advise on the readings collected by in-situ field monitoring			
MX11	Reactive Site Drainage Management	EIAR Chapter 9 CEMP Section 4 SWMP Section 3	The detailed drainage plan prepared for the site has provided for reactive management of drainage measures. The effectiveness of drainage measures designed to minimise runoff entering works areas and capture and treat potentially silt-laden water from the works areas, will be monitored continuously by the Environmental Clerk of Works (ECoW) on-site. The ECoW or project 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. 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 the situation on the ground at a particular time. In the unlikely event that works are giving rise to siltation of watercourses, the ECoW or project 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, as outlined in Section 2.5 above, will be installed in advance of works recommencing.	As required	As Necessary	ECoW
MX12	Plant and Equipment Inspections	EIAR Chapter 4,9 CEMP Section 4	The plant used will be regularly inspected for leaks and fitness for purpose.	As Required	Monthly	ECoW
MX13	Biodiversity	CEMP Section 4	A Project Ecologist will be appointed. The responsibilities and duties of the Project Ecologist will include the following:	As required	As required	Project Ecologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			› Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Site. › 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. › Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress			
MX14	Geotechnical Aspects	EIAR Chapter 4, CEMP Section 2,4	The Geotechnical Engineer will report to the Construction Manager and is responsible for inspection and review of geotechnical aspects associated with construction of the Proposed Development. The Geotechnical Engineer will not be full time on site but will visit site at least once a month during the construction phase civil works and on a weekly basis during site preparation/groundworks. The responsibilities and duties of the Geotechnical Engineer will include the following: › Visit site regularly, or at least once a month during the construction phase, to complete geotechnical audits and reviews and report any issues to the Construction Manager; › Ensuring that identified hazards are listed in the Geotechnical Risk Register and that these are subject to ongoing monitoring; and, › Ongoing inspection and monitoring of the Proposed Development, particularly in temporary stockpile areas, through all phases of construction (including pre, during and post construction) and ensure construction is carried out as specified in the EIAR, NIS and in relevant planning conditions.	Monthly	Monthly	Geotechnical Engineer
MX15	Archaeological Monitoring	EIAR Chapter 13	› All inventions that are required along townland boundaries, as part of the construction of the proposed development, will be subject to archaeological monitoring, to include a full record of	As Required	As Required	Project Archaeologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			the sections of townland boundaries that are removed. This work will be carried out under licence to the National Monuments Service of the DHLGH. › All topsoil stripping associated with the proposed development, including site investigation, will be subject to archaeological monitoring. This work will be carried out under licence to the National Monuments Service of the DHLGH. If archaeological remains are identified during the course of these works further mitigation may be required, such as preservation by record or in-situ. Any further mitigation will require agreement from the DHLGH			
Operational Phase						
MX16	Surface Water Quality	CEMP Section 4	› The Project Hydrologist will inspect and review the drainage system after construction has been completed to provide guidance on the requirements of an operational phase drainage system. This operational phase drainage system will have been installed during the construction phase in conjunction with the road and hardstanding construction. › 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 sampling for laboratory analysis for the range of parameters adopted during pre-commencement and construction phases will continue after construction is complete. The project hydrologist will monitor and advise on the readings received from the testing laboratory and monitoring will only cease once the hydrologist is satisfied that the chemical and biological monitoring results show that there is no adverse impact on the quality of surface water within the natural watercourses draining the site.	Monthly	Monthly	ECoW
MX17	Bats	EIAR Chapter 6	To assess the effects of the Proposed Development on bat activity, at least 3 years of post-construction monitoring is proposed. Post-	Years 1, 2, 3	Annually	Project Ecologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		Appendix 6-2	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 the mitigation and monitoring plan will be reviewed, and any identified efficiencies incorporated into the programme. This approach allows for an evidence-based review of the potential for bat fatalities at the Proposed Wind Farm, post construction, to ensure that the necessary measures, based on a new baseline post-construction, are implemented for the protection of bat species locally. The effectiveness of any mitigation/curtailment needs to be monitored in order to determine (a) whether it is working effectively (i.e. the level of bat mortality is incidental), and (b) whether the curtailment regime can be refined such that turbine down-time can be minimised whilst ensuring that it remains effective at preventing casualties **Monitoring Year 1** **Bat activity surveys:** The post-construction surveys will be carried out as per the pre-construction survey effort. Static monitoring will take place at each turbine during the bat activity season (between April and October) (NatureScot, 2021, NIEA, 2021). Full spectrum recording detectors will be utilised for the same duration as during pre-application surveys and at the same density (NatureScot, 2021). As described in Section 3.5 above, the assessment of bat activity levels will include the use of 'Ecobat' (or similar alternative), a web-based interface, allowing uploaded activity data to be contrasted with a comparable reference range, allowing objective and robust interpretation. Walked survey transects will also be conducted.			

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			Key weather parameters and other factors that are known to influence collision risk will be monitored and shall include: › Windspeed in m/s (measured at nacelle height) › Temperature (ºC) › Precipitation (mm/hr) **Carcass searches** 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. Surveys should cover all activity seasons and the use of a trained dog detection team will be carried out to ensure maximum efficiency. **Monitoring Years 2 & 3** 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). The performance of any curtailment programme in terms of its ability to respond to the changes in bat abundance based on temperature and wind speed shall be analysed to confirm it is neither significantly over- nor under-curtailing during different periods of bat activity. At the end of each year, the efficacy of any mitigation/curtailment programme shall be reviewed, and any identified efficiencies incorporated into the programme. The requirement for continued post-consent monitoring will also be considered. Should no bat			

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			fatalities be recorded in Year 1, curtailment (where applicable) in Year 2 and Year 3 could be reduced/re-evaluated or removed with monitoring continuing to inform this strategy. **Bat Boxes** A licenced ecologist will carry out a yearly bat box Monitoring protocol for the first three years of the operational life of the Proposed Wind Farm. The ecologist will confirm and flag bat boxes in use by bats, evidence of bats, droppings, urine splashing, bat fur oil stains and/or dead bats. Monitoring will be carried out a suitable time of year to ensure no disturbance to any roosting bats, particularly in the case of a maternity roost. The best time of year for a bat box monitoring protocol to be carried out is September/ October. Evidence or presence of nesting birds will be flagged and removed outside the bird nesting season. 2FN bat boxes must be checked to remove excess bat droppings and flag any bird nests being constructed within a bat box. If a bird nest is found, a secondary bat roosting source must be erected to replace the bat roosting source lost. The results of the first three years of monitoring will inform the need for and frequency of further monitoring and maintenance of the bat boxes, to be reviewed by the Project Ecologist and agreed with the wind farm operator			
MX18	Biodiversity	EIAR Chapter 6 Appendix 6-4	The Biodiversity Management and Enhancement Plan will be maintained and monitored in partnership between the developer, the 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.	Annually	Annually	Project Ecologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			Maintenance of Newly Planted Hedgerow: In order to facilitate the successful establishment of the new hedgerow to be planted within the Proposed Wind Farm site, and to promote biodiversity value of these the following measures are proposed (DAERA, 2022): › New hedgerow shrub planting will be kept weed and litter free until the new plants are established, particularly from ruderal weeds. Healthy growth will be maintained by allowing the plant to occupy as much of the planting areas as possible to allow them to achieve as close their natural form as possible. › During spring and autumn maintenance periods all trees and plants will be checked and adjusted/replaced as required, soil firmed, and any dead wood present removed back to healthy tissue and mulch added if required. Where tree guards are no longer required these will be removed to avoid damage to the tree. › During the first growing season, all standard trees/ semi-mature trees will be watered regularly during any prolonged dry periods during the growing season (i.e. in April, May, June, July and August). During the second growing season the trees will be kept well-watered as often as required, particularly during June, July and August. › Hedgerows should be trimmed every two – three years, with the cutting height raised 10-15cm each year, with trimming taking place in late winter (January / February), thus allowing flowers and fruit to develop. › Hedgerows can be trimmed to produce an 'A' Shaped hedgerow which allows more light into the base. › Any tree, hedge or shrub that is removed, uprooted, destroyed or that becomes seriously damaged, defective diseased or dead shall be replaced in the same location with another plant of the			

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			same species and size as that originally planted. All such replacements shall be carried out within the first planting season following the loss. **Monitoring and Maintenance of Translocated Hedgerow** Once translocated, the hedgerow should be well watered to ensure topsoil is washed in to fill any voids. Leave a 1-2m wide margin on each side of the hedge for biodiversity. Double fencing at 1-2m on either side of the hedge to protect against livestock. Control competing vegetation, such as grasses and ruderal vegetation (DAERA, 2022). The hedgerow should be inspected in the growing season following translocation to assess the percentage take of the plants (following heavy pruning and translocation, some plants can be very late producing leaves). Any dead plants should be replaced. The translocated hedgerow will require trimming back after the first season's growth to encourage bushy growth, followed by bi-annual cutting (Devon Hedge Group, 2015). **Monitoring and Reporting:** Hedgerows and replanted trees will be inspected following the main growing season (i.e. in September) for the first three 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 and corrective actions implemented. Monitoring results will be reported after each monitoring year as noted above. Reports detailing the monitoring works carried out, the results obtained and a review of their success, along with any suggestions for amendments to the plan			

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
MX19	Ornithology	EIAR Chapter 7 Appendix 7-6	In line with best practice measures, a detailed post-construction Bird Monitoring Programme has been prepared for the operational phase of the proposed development. The programme of works will monitor parameters associated with collision, displacement/barrier effects and habituation during the lifetime of the project. Surveys will be scheduled to coincide with years 1, 2, 3, 5, 10 & 15 of the lifetime of the wind farm. Monitoring measures are broadly based on guidelines issued by the NatureScot (SNH, 2009). The following individual components are proposed: › Flight activity surveys: vantage point surveys. › Breeding bird surveys: O'Brien & Smith › Targeted bird collision surveys (corpse searches) will be undertaken with trained dogs. The surveys will include detection and scavenger trials, to correct for these two biases and ensure the resulting data is robust. The proposed programme of monitoring was not proposed in response to any identified significant effect but rather as a best practice measure (as per guidance outlined in NatureScot, 2009). The monitoring is comprehensive and considered entirely adequate in this regard. The results of this monitoring will be reported to the Planning Authority following each monitoring year and will include recommendations that may inform additional mitigation or adaptation if required	Years 1-5, 10 and 15	Monthly	Project Ornithologist
MX20	Noise and Vibration	Chapter 12	Commissioning noise surveys 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 a wind farm being commissioned.	Once within six months	As required	Noise Consultant

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			In the unlikely event that an exceedance of the noise criteria is identified as part of the commissioning assessment, the guidance outlined in the IOA GPG and 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 turbine noise levels are within the relevant noise criterion curves/planning conditions 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. The commissioning survey will include a review for the presence of audible tones associated with the operation of the wind turbine farm in accordance with Annex C of ISO 1996-2:2017 Acoustics – Description, measurement and assessment of environmental noise Part 2: Determination of sound pressure levels			
Decommissioning Phase						
MX21	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
MX22	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.	As required	As required	Site Manager

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			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.			
MX23	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
MX24	Decommissioning	EIAR Chapter 7	Pre-commencement confirmatory surveys will be undertaken within one month prior to the initiation of works at the Proposed Development to identify sensitive sites (e.g. roosts). Any requirement for construction works to run into the subsequent breeding and winter seasons following commencement will be subject to a repeat of the pre-commencement bird surveys to confirm the absence of breeding birds of conservation concern once per month during the breeding season (April to July) and once during the winter season (October). The survey will aim to identify sensitive sites e.g., nests or roosts depending on the season in question. The surveys will be undertaken by a suitably qualified ornithologist. The surveys will comprise a thorough walkover survey of the development footprint and/or all works areas to a 500m radius, where access allows. If winter roosts or nests of birds of high conservation concern are identified, the roost/nest will be earmarked for continued monitoring during works. If the roost/nest is found to be active during works, works will cease within a species-specific buffer of its location in line with best practice guidance (e.g. Forestry Commission Scotland, 2006; Goodship and Furness 2022; Ruddock and Whitfield, 2007). No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied.	Prior to Decomissioning	As required	Project Ornithologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			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 to alert all personnel on site to the suspension of works within that area.			