# 18. SCHEDULE OF MITIGATION AND MONITORING MEASURES

## 18.1 Introduction

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

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

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

The mitigation measures in the below format provides an easy to audit list that can be reviewed and reported on during each phase of the project. The proposal for site inspections and environmental audits are set out in the Construction and Environmental Management Plan (CEMP) which is included as Appendix 4-3 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 project are outlined in Table 18-2. All monitoring measures were set out in the relevant chapters of this EIAR. The monitoring measures are presented in terms of the monitoring requirement, frequency of monitoring and the mechanism for reporting results where applicable. By presenting the monitoring measures in the below format, it is intended to provide a monitoring schedule that can be reviewed and tracked during all phases of the project to ensure all the required monitoring is completed as required.

It is intended that the CEMP will be updated where required prior to the commencement of construction 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 prior to the commencement of the Proposed Project.

## 18.2 EIAR Mitigation Measures

*Table 18-1 Schedule of Mitigation*

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| **EIAR Chapter 4 – Description of the Proposed Project** | | | | | |
| **Pre-Commencement Phase** | | | | | |
| MM1 | Environmental Management | EIAR Chapter 4 | > All proposed activities on the site of the Proposed Project will be provided for in a Construction and Environmental Management Plan (CEMP), prepared prior to the commencement of any operations onsite. The CEMP will set out all measures necessary to ensure works are carried out in accordance with the mitigation measures set out in the EIAR and will set out the monitoring and inspections procedures and frequencies. | | |
| MM2 | Environmental Management | CEMP Section 4 | > The Project Developer will be required to engage a qualified Environmental Engineer, Environmental Scientist, or equivalent, with experience in wind farm construction to fulfil the role of Environmental Clerk of Works (ECoW) to oversee the construction works and audit the implementation of the CEMP. The ECoW will report to the Project Developer and Project Contractor but will liaise closely with the Construction Manager in relation to the Project Contractor's day-to-day implementation of the CEMP onsite.<br>> The Environmental Clerk of Works (ECoW) will be nominated by the Project Developer to oversee the Project Contractor's effective implementation of the Proposed Developments environmental requirements and obligations, as captured in the Construction Environmental Management Plan (CEMP) and provide on-site advice on the mitigation measures necessary as necessary to ensure the project proceeds as intended.<br>> The level, detail and frequency of reporting expected from the ECoW for the Construction Manager, Developer's Project Manager, and any Authorities or other Agencies, will be agreed by all parties prior to commencement of construction, and may be further adjusted as required during the course of the Proposed Project. | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| MM3 | Surface Water Quality | CEMP Section 4 | > Baseline water quality field testing and laboratory analysis will be undertaken where required prior to commencement of felling and construction at the site.<br>> Analysis will be for a range of parameters with relevant regulatory limits along with Environmental Quality Standards (EQSs) and sampling will be undertaken at designated locations as outlined in Figure 9-5 of the EIAR.<br>> Baseline sampling will be completed on at least two occasions, and these should ideally coincide with low flow and high flow stream conditions. The high flow sampling event will be undertaken after a period of sustained rainfall, and the low flow event will be undertaken after a dry spell. | | |
| MM4 | Concrete Deliveries | EIAR Chapter 4<br><br>CEMP Section 3 | > The arrangements for concrete deliveries to the site will be discussed with suppliers before work starts, agreeing routes, prohibiting on-site washout of trucks and discussing emergency procedures.<br>> 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.<br>> | | |
| MM5 | Site Drainage Plan | CEMP Section 4 | > A detailed drainage design for the Proposed Project will be prepared prior to the commencement of construction to by the Project Hydrologist to incorporate these site drainage principles and carry forward into the construction phase of the Proposed Project.<br>> 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 4 of the CEMP. | | |
| MM6 | Waste Management | EIAR Chapter 4<br><br>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 Waste Management Plan, ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy is adhered to | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| MM7 | Preparative Site Drainage Management | EIAR Chapter 4<br><br>CEMP Section 4 | > 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.<br>> 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. | | |
| MM8 | Drainage Inspection | EIAR Chapter 4<br><br>CEMP Section 4 | > Prior to commencement of works in sub-catchments across the site, main drain inspections will be completed to ensure ditches and streams are free from debris and blockages that may impede drainage. It is proposed to complete these inspections on a catchment-by-catchment basis as the construction works develop across the site, as works in all areas will not commence simultaneously. | | |
| MM9 | Watercourse Inspection | EIAR Chapter 4<br><br>CEMP Section 4 | > 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. | | |
| MM10 | Drainage Maintenance | EIAR Chapter 4<br><br>CEMP Section 4 | > An inspection and maintenance plan for the drainage system onsite will be prepared in advance of commencement of any works. Regular inspections of installed drainage features will be necessary, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water within the system where it is not intended. The inspection of the drainage system will be the responsibility of the environmental clerk of works or the supervising hydrologist | | |
| MM11 | Earthworks | CEMP Section 4 | > 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. | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| MM12 | Felling | EIAR Chapter 4<br>CEMP Section 2 | > Before the commencement of any felling works, an Environmental Clerk of Works (ECoW) shall be appointed to oversee the works.<br>> Pre-construction surveys will be undertaken prior to the initiation of works at the Site. If winter roosting or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring at the beginning of the first winter or breeding season of the construction phase. If it is found to be active during the construction phase, no works shall be undertaken within a disturbance buffer in line with industry best practice (e.g. Forestry Commission Scotland, 2006; Ruddock and Whitfield, 2007). No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied.<br>> Prior to the commencement of felling works, review and agreement of the positioning by the Operator of the required Aquatic Buffer Zones (ABZs), silt traps, silt fencing, water crossings and onsite storage facilities for fuel, oil and chemicals will be carried out by the ECoW. | | |
| MM13 | Felling Drainage Management | EIAR Chapter 4<br><br>CEMP Section 3 | Prior to the commencement of tree felling for subsequent road construction the following key temporary drainage measures will be installed:<br>> All existing dry forestry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using forestry check dams/silt traps;<br>> Clean water diversion drains will be installed upgradient of the works areas;<br>> Check dams/silt fence arrangements (silt traps) will be placed in all existing forestry drains that have surface water flows and also along existing forestry roadside drains; and,<br>> A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone. | | |
| MM14 | Felling Licence | EIAR Chapter 4 | > Felling will be carried out under the terms of a licence application to the Forest Service, as per the Forest Service's policy on granting felling licenses for wind farm developments. | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| MM15 | Traffic Management | EIAR Chapter 4, 15<br><br>CEMP Section 3 | › Prior to the Traffic Management Plan being finalised, a full dry run of the transport operation along the potential route will be completed using vehicles with attachments to simulate the dimensions of the wind turbine transportation vehicles.<br>› When the 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 | | |
| MM16 | Spoil Management | EIAR Chapter 4<br><br>CEMP Section 2 | › Prior to the use of areas for spoil management an interceptor drain will first be excavated upslope in order to intercept existing overland flow and divert it around the spoil management area prior to discharge via a buffer zone on the downslope side.<br>› Silt fences and double silt-fences will be emplaced down-gradient of spoil management areas and will remain in place throughout the entire construction phase, or until reseeding has been established to a sufficient level.<br>› All the recommendations/best practice guidelines for the placement of spoil in identified spoil management areas and alongside access roads will be confirmed by the Geotechnical Engineer prior to construction | | |
| MM17 | River Restoration | EIAR Chapter 4<br><br>CEMP Section 2 | › Survey of control points shall be required to establish accurate riffle installation within the tolerance specified by the designer. | | |
| MM18 | Borrow Pit | EIAR Chapter 4, Chapter 13<br><br>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.<br>› An unrecorded crop mark located approx. 20 m northeast of the borrow pit location will be closed off with fencing and signage for the duration of the construction phase. | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| MM19 | Grid Connection underground cabling route works | EIAR Chapter 4 | > Before works commence, updated surveying will take place along the proposed cable route, with all existing culverts identified. All relevant bodies i.e. ESB, Tipperary County Council etc. will be contacted and all up to date drawings for all existing services sought. | | |
| | | | **Construction Phase** | | |
| MM20 | Refuelling | EIAR Chapter 4<br><br>CEMP Section 3 | > Road-going vehicles will be refuelled off site wherever possible;<br>> Fuels volumes stored on site should be minimised. Any fuel storage areas 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;<br>> The electrical substation compound will be bunded appropriately to the volume of oils likely to be stored, and to prevent leakage to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor;<br>> Oils or fuels stored in turbines will be placed within an appropriately sized bunded unit to prevent leakage to groundwater or surface water;<br>> An emergency plan for the construction phase to deal with accidental spillages will be developed (refer to Section 5 6 of this Plan) Spill kits will be available to deal with and accidental spillage in and outside the refuelling area.<br>> A programme for the regular inspection of plant and equipment for leaks and fitness for purpose will be developed at the outset of the construction phase.<br><br>The following mitigation measures are proposed to avoid release of hydrocarbons at the Site:<br><br>> *On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site. Heavy plant and machinery will be refuelled on-site by a fuel truck that will come to the Site as required on a scheduled and organised basis. Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area on-site when not in use.*<br>> *All refuelling will be carried out outside designated watercourse buffer zones.* | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | | > *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 equipped with fuel absorbent material and pads to deal with any event of accidental spillage.* | | |
| MM21 | Concrete Deliveries and Management | EIAR Chapter 4<br><br>CEMP Section 3 | > No batching of wet-cement products will occur on the Site.<br>> Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place;<br>> Where possible pre-cast elements for culverts and concrete works will be used;<br>> No washing out of any plant used in concrete transport or concreting operations will be allowed on-site;<br>> Where concrete is delivered on Site, only the chute will need to be cleaned, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water is to be directed into a dedicated concrete wash out pit. Decommissioning of this pit will occur at the end of the construction phase and water and solids will be tanked and removed from the site to a suitable, non-polluting, discharge location;<br>> All concrete will be paced in shuttering and will not be in contact with soils or groundwater until after it has set;<br>> Use weather forecasting to plan dry days for pouring concrete; and,<br>> Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event.<br>> The arrangements for concrete deliveries to the site will be discussed with suppliers before work starts, agreeing routes, prohibiting on-site washout of trucks and discussing emergency procedures.<br>The 50 m wide watercourse buffer zone will be in place for the duration of the construction phase. No construction activity will occur within the buffer zone with the exception of clear span crossing construction. The buffer zone will:<br>> Prevent any cement-based products accidentally entrained in the construction phase drainage system entering directly into watercourses, achieved in part by ending drain discharge outside the 50 m buffer zone and allowing percolation across the vegetation of the buffer zone;<br>> Provide a buffer against accidental direct pollution of surface waters by any pollutants, or by pollutants entrained in surface water run-off. | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| MM22 | Road Cleanliness | EIAR Chapter 4<br><br>CEMP Section 3 | > 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.<br>> A road sweeper will be available if any section of the public roads requires cleaning due to construction traffic associated with the Proposed Project.<br>> When necessary, sections of the haul route will be swept using a truck mounted vacuum sweeper. | | |
| MM23 | Watercourse Buffers | EIAR Chapter 4.<br><br>CEMP Section 4 | > There will be no direct discharges to any natural watercourses, 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. Buffer zones around the existing natural drainage features have been used to inform the layout of the Proposed Project. Buffered outfalls which will be numerous over the site which will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the site | | |
| MM24 | Water Discharge | EIAR Chapter 4.<br><br>CEMP Section 4 | > There will be no direct discharges to any natural watercourses, 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.<br>> Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the Site drainage into the existing site drainage network where possible. This will reduce the potential for any increased risk of downstream flooding or sediment transport/erosion.<br>> Silt traps will be placed in the existing drains upgradient of where construction works / tree felling is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area | | |
| MM25 | Wastewater Management | EIAR Chapter 4 | > The construction compound will consist of temporary site offices, staff facilities and car-parking areas for staff and visitors. Temporary port-a-loo toilets and toilets | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | CEMP Section 2 | located within a staff portacabin will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewaters being tankered off site by permitted waste collector to wastewater treatment plants. There will also be a water supply on site for hygiene purposes, by way of a temporary storage tank. | | |
| MM26 | Drainage Swales | EIAR Chapter 4<br><br>CEMP Section 4 | > 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. | | |
| MM27 | Interceptor Drains | EIAR Chapter 4<br><br>CEMP Section 4 | > Interceptor drains will be maintained up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed over the ground by means of a level spreader. | | |
| MM28 | Check Dams | EIAR Chapter 4<br><br>CEMP Section 4 | > Check dams will be maintained at regular intervals along interceptor drains and swales/roadside drains in order to reduce flow velocities and therefore minimise erosion within the system during storm rainfall events; | | |
| MM29 | Level Spreaders | EIAR Chapter 4<br><br>CEMP Section 4 | > A level spreader will be constructed at the end of each interceptor drain to convert concentrated flows in the drain into diffuse sheet flow on areas of vegetated ground. The levels spreaders will be located downgradient of any proposed works areas in locations where they are not likely to contribute further to water ingress to construction areas of the site. | | |
| MM30 | Piped Slope Drains | EIAR Chapter 4 | > 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 | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | CEMP Section 4 | established on slopes of less than 6% in grade. Piped slope drains will be used to transfer water away from areas where slopes are too steep to use level spreaders; | | |
| MM31 | Vegetation Filters | EIAR Chapter 4<br><br>CEMP Section 4 | > Vegetation filters are the existing vegetated areas of land that will be used to accept surface water runoff from upgradient areas. The selection of suitable areas to use as vegetation filters will be determined by the size of the contributing catchment, slope and ground conditions; | | |
| MM32 | Settlement Ponds | EIAR Chapter 4<br><br>CEMP Section 4 | > Stilling ponds/settlement ponds, emplaced downstream of swales and roadside drains, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses. The stilling ponds will be sized according to the size of the area they will be receiving water from but will be sufficiently large to accommodate peak flows storm events. Inspection and maintenance of all settlement ponds will be ongoing through the construction period. | | |
| MM33 | Dewatering Silt Bag | EIAR Chapter 4<br><br>CEMP Section 4 | > 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.<br>> 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. | | |
| MM34 | Siltbuster | EIAR Chapter 4 | > Siltbusters or similar equivalent piece of equipment will be available to filter any water pumped out of excavation areas if necessary, prior to its discharge to stilling | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | CEMP Section 4 | 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. | | |
| MM35 | New Culverts/ Culvert Upgrades | EIAR Chapter 4 | > All new proposed culverts and proposed culvert upgrades will be suitably sized for the expected peak flows in the watercourse.<br>> Some culverts may be installed to manage drainage waters from works areas of the Proposed Project, particularly where the waters have to be taken from one side of an existing roadway to the other for discharge. The size of culverts will be influenced by the depth of the track or road sub-base. In some cases, two or more smaller diameter culverts may be used where this depth is limited, though this will be avoided as they will have a higher associated risk of blockage than a single, larger pipe. In all cases, culverts will be oversized to allow mammals to pass through the culvert.<br>> 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. 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. | | |
| MM36 | New Watercourse Crossing | EIAR Chapter 4<br><br>CEMP Section 2 | > 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.<br>> Access to the opposite side of the watercourse for excavation and foundation installation will require the installation of a temporary pre-cast concrete or metal bridge pre-cast concrete slab across the watercourse to provide temporary access for the excavator. Plant and equipment will not be permitted to track across the watercourse. | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | | > Once the foundation base has been completed, the pre-cast concrete box culvert will be installed using a crane which will be set up on the bank of the watercourse and will be lifted into place from the bank with no contact with the watercourse.<br>> 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. | | |
| MM37 | Directional Drilling | EIAR Chapter 4, chapter 9<br><br>CEMP Section 3 | > Near stream construction work, will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works according to the Eastern Regional Fisheries Board (2004) guidance document "Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites", i.e., May to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI);<br>> 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 | | |
| MM38 | Silt Fences | EIAR Chapter 4<br><br>CEMP Section 3 | > Silt fences will be installed as an additional water protection measure around existing watercourses in certain locations, particularly where works are proposed within the 50-metre buffer zone of a stream. These areas include around existing culverts, around the headwaters of watercourses, and the proposed locations are indicated on the drainage design drawings included in Appendix 4-3.<br>> Silt fences will be installed as single, double or a series of triple silt fences, depending on the space available and the anticipated sediment loading. The silt fence designs follow the technical guidance document 'Control of Water Pollution from Linear Construction Projects' published by Construction Industry Research and Information Association (CIRIA, No. C648, 1996). Up to three silt fences may be deployed in series. | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | | > 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. | | |
| MM39 | Sedimats | EIAR Chapter 4 | > 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 | | |
| MM40 | Oil Interceptors | EIAR Chapter 4<br><br>CEMP Section 4 | > The limited amount of fuel to be stored on the Site will be in appropriately bunded containers and a bunded area for oil storage will be constructed within the temporary construction compounds. | | |
| MM41 | Grid Connection underground cabling route | EIAR Chapter 4<br><br>CEMP Section 2 | > Any underground services encountered along the cable route will be surveyed for level and the ducting will pass over the service provided adequate cover is available.<br>> A minimum clearance of 300 mm will be required between the bottom of the ducts and the service in question.<br>> If the clearance cannot be achieved the ducting will pass under the service and again 300 mm clearance between the top of the communications duct and bottom of the service will be achieved.<br>> In deeper excavations an additional layer of marker tape will be installed between the communications duct and top-level yellow marker tape.<br>> If the required separation distances cannot be achieved then a number of alternative options are available such as using steel plates laid across the width of the trench and using 35N concrete surrounding the proposed ducting, with marker tape on the side of the trench.<br>> During construction the joint bay locations will be completely fenced off once they have been constructed they will be backfilled until cables are being installed<br>> The precise siting of all Joint Bays, Earth Sheath Link Chambers and Communication Chambers within the corridor assessed is subject to approval by ESBN and Eirgrid. | | |

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| | | | > The crossing methodologies employed at the culvert and manmade drain crossings along the underground cabling route , will be selected from the suite of watercourse crossing options , as appropriate, depending on culvert type, depth, size and local ground conditions.<br>> 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 Site in the same manner as other subsoil materials associated with the drilling process to a licensed recovery facility.<br>> 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.<br>> Inland Fisheries Ireland have published guidelines relating to construction works along water bodies entitled "Requirements for the Protection of Fisheries Habitats during Construction and Development Works at River Sites", and these guidelines will be adhered to during the construction of the Proposed Project. | | |
| MM42 | Oversized Swales | EIAR Chapter 4<br><br>CEMP Section 3 | > Drainage swales will be installed downgradient of any works areas to collect surface flow runoff where it might have come into contact with exposed surfaces and picked up silt and sediment. Swales will intercept the potentially silt-laden water from the excavations and construction areas of the Site and prevent it reaching natural watercourses. | | |
| MM43 | Water Discharge | EIAR Chapter 4 | > All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses. Buffer zones around the existing natural drainage features have been used to inform the layout of the Proposed Project. | | |
| MM44 | Wastewater Management | EIAR Chapter 4. | > Temporary toilets will be used during the construction phase as part of the welfare facilities for site staff and visitors. Wastewater from toilets will be directed to a | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | CEMP Section 3 | sealed storage tank, with all wastewaters tankered off site by an appropriately consented waste collector to wastewater treatment plants. | | |
| MM45 | Collector Drains | EIAR Chapter 4.<br><br>EIAR Chapter 9 | > Swales will be used to intercept and collect run off from construction areas of the site during the construction phase, and channel it to settlement ponds for sediment attenuation as per the drainage design. | | |
| MM46 | Interceptor Drains | CEMP Section 3<br><br>EIAR Chapter 9 | > Interceptor drains will be installed up-gradient of any works areas to collect surface flow runoff and prevent it reaching excavations and construction areas of the site. It will then be directed to areas where it can be re-distributed over the ground as sheet flow as per the drainage design. | | |
| MM47 | Level Spreaders | CEMP Section 3<br><br>EIAR Chapter 4, 9 | > 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. | | |
| MM48 | Stilling Ponds | CEMP Section 3<br><br>EIAR Chapter 4, 9 | > Stilling ponds/settlement ponds, emplaced downstream of swales and roadside drains, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses. The stilling ponds will be sized according to the size of the area they will be receiving water from but will be sufficiently large to accommodate peak flows storm events. Inspection and maintenance of all settlement ponds will be ongoing through the construction period. | | |
| MM49 | Silt Bag | CEMP Section 3. | > 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 | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | EIAR Chapter 4, 9 | removing any remaining silt contained in the potentially silt-laden water collected from works areas within the site. | | |
| MM50 | Siltbuster | CEMP Section 3. EIAR Chapter 4, 9 | > Siltbuster type concrete unit. This type of Siltbuster unit catches the solid concrete and filters and holds wash liquid for pH adjustment and further solids separation. The residual liquids and solids will be removed off-site by an appropriately authorised waste collector for disposal at an authorised waste facility.<br>> The siltbuster system comprises an electronic in-line dosing system which provides an accurate means of adding reagents, so overdosing cannot occur;<br>> 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;<br>> Dosing rates of chemical to initiate settlement is small, being in the order of 2-10 mg/L and the vast majority of the chemical is removed in the deposited sediment;<br>> Final effluent not meeting the discharge criteria is recycled and retreated, which has a secondary positive effect of reducing carryover; and,<br>> Use of biodegradable chemical agents can be used at very sensitive sites (i.e. upstream of SACs). | | |
| MM51 | Culvert Upgrades | CEMP Section 3. EIAR Chapter 4, 9 | > All new proposed culverts and proposed culvert upgrades will be suitably sized for the expected peak flows in the watercourse.<br>> All proposed new stream crossings will be bottomless or clear span culverts and the existing banks will remain undisturbed. No in-stream excavation works are proposed and therefore there will be no direct impact on the stream at the proposed crossing location; | | |
| MM52 | Silt Fences | CEMP Section 3. EIAR Chapter 4, 9 | > Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids such as those present in the subsoils/sandstone tills that overlie the Site. This will act to prevent entry to water courses of sand and gravel sized sediment, released from excavation of mineral sub-soils of glacial and glacio-fluvial origin, and entrained in surface water runoff. Inspection and maintenance of these of these structures during construction phase is critical to their functioning to stated purpose. They will remain in place throughout | | |

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| | | | the entire construction phase. Double silt fences will be placed within drains down-gradient of all construction areas inside the 50m buffer zones.<br>> Silt fences will be placed within drains down-gradient of all construction areas.<br>> They will remain in place throughout the entire construction phase.<br>> 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.<br>> The silt fence designs follow the technical guidance document 'Control of Water Pollution from Linear Construction Projects' published by CIRIA (Ciria, No. C648, 1996). Up to three silt fences may be deployed in series.<br>> All silt fencing will be formed using Terrastop Premium or equivalent silt fence product.<br>> 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 | | |
| MM53 | Excavations | EIAR Chapter 4<br><br>CEMP Section 4 | > 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;<br>> 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;<br>> No material will be removed from site with excavated spoil being transported and stored in the identified spoil management areas within the Site.<br>> 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;<br>> Soil excavation shall be observed by a qualified archaeologist in accordance with a scheme of archaeological monitoring to identify any significant remains as they come to light; The foundations excavation will be raised to formation level by compacted layers of well graded granular material will be spread and compacted to provide a hard area for the turbine foundation; | | |
| MM54 | Spoil Management | EIAR Chapter 4<br><br>CEMP Section 4 | > The spoil management areas and placement of spoil alongside access roads have been selected based on the locations of spoil generation, areas suitable for spoil management and environmentally constrained areas such as identified site-specific flood modelled zones as detailed in Chapter 9: Water. | | |

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| | | | > Placement of spoil alongside access roads will consist of a 3m wide berm on either side of the road as appropriate. Spoil placement alongside access roads will take place outside of watercourse buffers and of the site-specific flood modelled zone within the Site.<br>> At the identified spoil management areas, the vegetative top-soil layer will be removed to allow for spoil to be placed and upon reaching the recommended height, the vegetative topsoil layer will be reinstated.<br>> The identified spoil management areas will be developed in a phased approach, with the topsoil removed and temporarily stockpiled within the defined area while the spoil it being placed. The stockpiled topsoil will then be reinstated over the placed spoil, and the exercise will continue within the same spoil management area until the area is full.<br>> In the case of T06 where spoil management areas will be within areas of felled forestry, no topsoil will be excavated. The tree stumps will be left in-situ, and the spoil will be placed on top of the existing ground and finished with a layer of topsoil from within the site.<br>> The placement of spoil will be restricted to a maximum height of 1.0m, subject to confirmation by the Geotechnical Engineer.<br>> Where practical, it will be ensured that the surface of the placed spoil is shaped to allow efficient run-off of surface water. Where possible, shaping of the surface of the spoil will be carried out as placement of spoil within the area progresses. This will reduce the likelihood of debris run-off and ensure stability of the placed spoil.<br>> Finished/shaped side slopes of the placed spoil will be not greater than 1 (v): 2 (h) in the dedicated spoil management zones and not greater than 1 (v): 1 (h) alongside access tracks.<br>> Inspections of the spoil management areas will be made by a Geotechnical Engineer through regular monitoring of the works. The appointed contractor will review work practices at spoil management areas when periods of heavy rainfall are expected so as to prevent excessive dirty water runoff from being generated.<br>> An interceptor drain will be installed upslope of the identified spoil management areas to divert any surface water away from these areas.<br>> Silt fences and double silt-fences will be emplaced down-gradient of spoil management areas and will remain in place throughout the entire construction phase, or until reseeding has been established to a sufficient level. | | |

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| | | | > The surface of the deposited spoil will be profiled to a gradient to be agreed with the Geotechnical Engineer and vegetated or allowed to vegetate naturally as indicated by the Project Ecologist.<br>> All the above-mentioned general guidelines and requirements will be confirmed by the Geotechnical Engineer prior to construction.<br>> Inspections of the spoil management areas will be made by a geotechnical engineer through regular monitoring of the works. The appointed contractor will review work practices at spoil management areas when periods of heavy rainfall are expected so as to prevent excessive surface water runoff from being generated.<br>> The surface of the spoil management area will be profiled to a gradient to be agreed with the Geotechnical Engineer and vegetated or allowed to vegetate naturally as indicated by the Project Ecologist. Where there is a risk of inadvertent access into spoil management areas fencing will be provided. | | |
| MM55 | Archaeological Conservation | EIAR Chapter 4, 13 | A 20m buffer will be established around an unrecorded crop mark located approx. 20 m northeast of the borrow pit location. It will be closed off with fencing and signage for the duration of the construction phase | | |
| MM56 | Borrow Pit | EIAR Chapter 4, CEMP Section 2 | The borrow pit will be excavated and backfilled as follows:<br>> Drainage runs, and associated settlement ponds will be installed around the perimeter;<br>> The initial borrow pit excavation will involve removal of soil to the top of bedrock. These materials will be stored temporarily in selected spoil management areas, see Figure 4-21 for details;<br>> All drainage measures prescribed in the detailed drainage design for the Proposed Project will be implemented around the works area;<br>> The bedrock material will be extracted by breaking and blasting (section 4.9.7.1.1 and 4.9.7.1.2 above) from the borrow pit and stockpiled or used as required;<br>> The use of material won from the borrow pit will be sequential with new road construction or turbine foundation formations;<br>> Temporary stockpiling of aggregates will be required to accommodate the cut and fill operations within the borrow pit, and the progression of access roads and turbine excavations; | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | | > When extraction ceases within the borrow pit, the borrow pit will be backfilled with excavated spoil and its associated drainage measures will be removed.<br>> The access track through the borrow pit providing access to T1 will be completed; and,<br>> The extraction area of the borrow pit will be permanently secured and a stock-proof fence with appropriate health and safety signage will be erected around any unsafe areas of the borrow pit to prevent access to these areas.<br><br>Two extraction methods have been assessed for breaking out the useful rock, rock breaking and blasting. As the predicted construction noise levels for both breaking and blasting are well within the construction noise criterion outlined in Table 12 1 of Chapter 12, no specific mitigation measures are required. However, should blasting be required:<br><br>> The blast engineer will arrange for the necessary quantity of explosive to be brought to site to undertake a single blast. The management of explosives on-site and the actual blasting operation will be agreed in advance with and supervised by An Gardaí Siochána. The blast engineer sets the explosives in place in the boreholes, sets the charges, and fires the blast.<br>> Restriction of hours within which blasting can be conducted (e.g. 09:00 – 18:00hrs).<br>> Notification to nearby residents before blasting starts (e.g. 24-hour written notification).<br>> The firing of blasts at similar times to reduce the 'startle' effect.<br>> On-going circulars informing people of the progress of the works.<br>> The implementation of an onsite documented complaints procedure.<br>> The use of independent monitoring by external bodies for verification of results.<br>> Trial blasts in less sensitive areas to assist in blast designs and identify potential zones of influence. | | |
| MM57 | River Restoration | EIAR Chapter 4<br><br>CEMP Section 2 | > All stream work to be performed "in the dry" either by pump-around or stream diversion with silt curtain.<br>> Impervious dikes or sandbags are to be used to isolate work from stream flow.<br>> The contractor shall not disturb more area than can be stabilised the same working day. | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | Appendix 6-4 | > Maintenance of stream flow operation shall be incidental to the work. This includes pumps and hoses.<br>> Pumps and hoses shall be of sufficient size to dewater the work area.<br>> Graded stream banks shall be stabilised, with matting, prior to predicted rain fall events.<br>> Silt bags and stilling basins shall be used to collect silt and sediment from work area dewatering.<br>> Work area to be stabilised at the end of each day. | | |
| **Operational Phase** | | | | | |
| MM58 | Wastewater Management | EIAR Chapter 4<br><br>CEMP Section 3 | > The wastewater storage tank alarm will be part of a continuous stream of data from the Site's turbines, wind measurement devices and electricity substation that will be monitored remotely 24 hours a day, 7 days per week. Only waste collectors holding valid waste collection permits under the Waste Management (Collection Permit) Regulations, 2007(as amended), will be employed to transport wastewater away from the Site. | | |
| MM59 | Electrical Substation | EIAR Chapter 4,<br><br>CEMP Section 7 | > The electrical substation compound will be bunded appropriately to the volume of oils likely to be stored, and to prevent leakage to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor;<br>> Lightning poles will be erected at appropriate locations adjacent to the substation. All lightning poles will be appropriately earthed.<br>> Perimeter fencing will be erected around the substation and control buildings compound area. | | |
| MM60 | Surface water Flooding | EIAR Chapter 4, Chapter 9 | > Turbine bases T3, T4, T7, T8 and T9 will have finished floor levels +500mm above the 1000-year flood level. | | |

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| **Decommissioning Phase** | | | | | |
| MM61 | Decommissioning | 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. | | |
| MM62 | Decommissioning | EIAR Chapter 4<br><br>DP Section 2 | > Upon decommissioning of the Site, all above ground turbine components will be separated and removed off-site for recycling. Turbine foundations will remain in place underground and will be covered with earth and reseeded as appropriate.<br>> On removal of turbines, the covering of the foundation will be completed using locally sourced material imported to site as the required quantity of material does not currently exist at the site. The imported soil will be spread and graded over the foundation using a tracked excavator and revegetation enhanced by spreading of an appropriate seed mix to assist in revegetation.<br>> The underground cabling route connecting the turbines to the on-site substation will be removed from the cable ducts. The cable ducting will be left in-situ as it is considered the most environmentally prudent option, avoiding unnecessary excavation and soil disturbance. The cable materials will be transferred to a suitable recycling or recovery facility. | | |
| MM63 | Decommissioning | EIAR Chapter 4<br><br>DP Section 3 | The following mitigation measures are proposed to avoid release of hydrocarbons at the Site:<br>> Wherever possible, vehicles will be refuelled off-site, particularly for regular road-going vehicles.<br>> On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site.<br>> 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.<br>> Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area on-site when not in use.<br>> All refuelling will be carried out outside designated watercourse buffer zones. | | |

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| | | | > Only designated trained and competent operatives will be authorised to refuel plant on-site.<br>> Mobile measures such as drip trays and fuel absorbent mats will used during refuelling operations as required.<br>> All plant and machinery will be equipped with fuel absorbent material and pads to deal with any event of accidental spillage<br>> A programme for the regular inspection of plant and equipment for leaks and fitness for purpose will be developed at the outset of the decommissioning phase. | | |
| **Chapter 5: Population and Human Health** | | | | | |
| **Pre-Construction Phase** | | | | | |
| MM64 | Human Health | EIAR Chapter 5 | Prior to commencement of any works, the occupants of dwellings in the vicinity of the proposed works will be contacted and the scheduling of works will be identified in line with the engagement plan. Local access to properties will also be maintained throughout any construction works and local residents will also be supplied with the number of the works supervisor in order to ensure that disruption will be kept to a minimum. | | |
| **Construction Phase** | | | | | |
| MM65 | Human Health | EIAR Chapter 5 | > The Proposed Project will be constructed, operated and decommissioned in accordance with all relevant Health and Safety Legislation, including:<br>> Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005);<br>> Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2016 (S.I. No. 36 of 2016);<br>> S.I. No. 528/2021 - Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021 and<br>> Safety, Health and Welfare at Work (Work at Height) Regulations 2006 (S.I. No. 318 of 2006).<br>> A Health and Safety Plan covering all aspects of the construction process will address the Health and Safety requirements in detail. | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | | > Fencing will be erected in areas of the Site where uncontrolled access is not permitted. Appropriate health and safety signage will also be erected on this fencing and at locations around the Site.<br>> Health and safety guidelines for working within and around electrical substations and overhead lines will be adhered to on site.<br>> 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.<br>> All hazards will be identified, and risks assessed. Where elimination of the risk is not feasible, appropriate mitigation and/or control measures will be established. The contractor will be obliged under the construction contract and current health and safety legislation to adequately provide for all hazards and risks associated with the construction phase of the project. Safepass registration cards are required for all construction, delivery and security staff. Construction operatives will hold a valid Construction Skills Certificate Scheme card where required. The developer is required to ensure a competent contractor is appointed to carry out the construction works. The contractor will be responsible for the implementation of procedures outlined in the Safety and Health Plan. Public safety will be addressed by restricting Site access during construction. Fencing will be erected in areas of the Site where uncontrolled access is not permitted.<br>> Goal posts will be established under the 38kV overhead line for the entirety of the construction phase of the Proposed Wind Farm.<br>> The suitability of machinery and equipment for use near power lines will be risk assessed.<br>> 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.<br>> 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.<br>> Information on safe clearances will be provided to all staff and visitors.<br>> Signage indicating locations and health and safety measures regarding overhead lines will be erected in canteens and on Site. | | |

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| | | | > 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.<br>> The construction of the Grid Connection will be in phases along the proposed underground cabling route. Prior to commencing grid connection works in the agricultural fields in the townland of Strogue, goal posts will be established under the 110k overhead line for the remainder of the Grid Connection of the construction phase. The goal posts will not exceed a height of 4.2 metres, unless specifically agreed with ESB Networks.<br>> The suitability of machinery and equipment for use near power lines will be risk assessed.<br>> 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 Site are made aware of the location of lines before they come on to Site.<br>> 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.<br>> When activities must be carried out beneath overhead lines, e.g., component delivery or end mast 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.<br>> Overhead line proximity detection equipment will be fitted to machinery when such works are required.<br>> The scale and scope of the project requires that a Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) are required to be appointed in accordance with the provisions of the Health & Safety Authority's '*Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013*'.<br>> 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 | | |

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| MM66 | Human Health | EIAR Chapter 5, 12 | > Keep local residents informed of the proposed working schedule, where appropriate, including the times and duration of any abnormally noisy activity that may cause concern;<br>> Ensure that any extraordinary site work occurring outside of the core working hours (for example, crane operations lifting components onto the tower) will be programmed, when appropriate, so that haulage vehicles would not arrive at or leave the site between 19:00 and 05:00, with the exception of abnormal loads that would be scheduled to avoid anticipated periods of high traffic flows;<br>> All vehicles and mechanical plant will be fitted with effective exhaust silencers and be subject to programmed maintenance;<br>> Select inherently quiet plant where appropriate - all major compressors would be 'sound reduced' models fitted with properly lined and sealed acoustic covers, which would be kept closed whenever the machines are in use;<br>> All ancillary pneumatic percussive tools will be fitted with mufflers or silencers of the type recommended by the manufacturers;<br>> Machines will be shut down between work periods (or when not in use) or throttled down to a minimum;<br>> Regularly maintain all equipment used on site, including maintenance related to noise emissions;<br>> Vehicles will be loaded carefully to ensure minimal drop heights so as to minimise noise during this operation; and<br>> 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.<br>> Where the BS5228 threshold levels are anticipated to be exceeded due to directional drilling activities along the underground cabling route , the following are examples of measures that will be considered, where necessary, to mitigate noise emissions from these activities are as follows:<br>> Temporary boarding alongside the drilling rig or use of 'acoustic blanket panels' to hang from heras fencing or similar. Installation will be as close to the drilling rig as is practicable and fitted so as to interrupt any direct line of site between the drilling rig and the closest residential receptors.<br>> Examples of appropriate products include Echo Noise Defender and Soundex DeciBloc. | | |

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| MM67 | Human Health | EIAR Chapter 5, 10 | > 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.<br>> All plant and materials vehicles shall be stored in dedicated areas within the Site.<br>> Turbines and construction vehicles will be transported to the Site on specified haul routes only.<br>> The majority of construction materials for the Proposed Wind Farm will be sources at the onsite borrow pit. The remaining construction materials for the Proposed Wind Farm and Proposed Grid Connection will be sourced locally from licenced quarries and transported on specified haul routes only.<br>> The agreed haul route roads adjacent to the Site will be regularly inspected for cleanliness and cleaned as necessary.<br>> The roads adjacent to the Site entrances will be checked weekly or damage/potholes and repaired as necessary.<br>> Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the amount of emissions associated with vehicle movements. | | |
| | | | **Operational Phase** | | |
| MM68 | Human Health | EIAR Chapter 5 | > The build-up of ice on turbines is unlikely to present problems. The wind turbines will be fitted with anti-vibration sensors, which will detect any imbalance caused by icing of the blades. The sensors will cause the turbine to wait until the blades have been de-iced prior to beginning operation.<br>> Lightning conduction cables, encased in protection conduits, will follow the electrical cable run, from the nacelle to the base of the turbine. The conduction cables will be earthed adjacent to the turbine base. The earthing system will be installed during the construction of the turbine foundations. | | |

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| | | | > Access to the turbines is through a door at the base of the structure, which will be locked at all times outside maintenance visits.<br>> Safety Signate will be erected around the Site: These signs include:<br>o Buried cable route markers at 50m (maximum) intervals and change of cable route direction;<br>o Directions to relevant turbines at junctions;<br>o "No access to Unauthorised Personnel" at appropriate locations;<br>o Speed limits signs at site entrance and junctions;<br>o "Warning these Premises are alarmed" at appropriate locations;<br>o "Danger HV" at appropriate locations;<br>o "Warning – Keep clear of structures during electrical storms, high winds or ice conditions" at site entrance;<br>o "No unauthorised vehicles beyond this point" at specific site entrances; and<br>o Other operational signage required as per site-specific hazards.<br>> An operational phase Health and Safety Plan will be developed to fully address identified Health and Safety issues associated with the operation of the site and providing for access for emergency services at all times. | | |
| MM69 | Shadow Flicker | EIAR Chapter 5 | Where daily or annual shadow flicker exceedances are predicted at any inhabitable dwelling, a site visit will be undertaken firstly to determine the existing screening and window orientation. This will determine if the receptor has an actual line of sight to any turbine. Once this is completed and all of the potential receptors identified, the following measures will be employed;<br><br>**Screening Measures**<br><br>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:<br><br>> Installation of appropriate window blinds in the affected rooms of the residence;<br>> Planting of screening vegetation; | | |

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| | | | > Other site-specific measures which might be agreeable to the affected party and may lead to the desired mitigation.<br><br>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.<br><br>**Wind Turbine Control Measures**<br><br>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.<br><br>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.<br><br>A shadow flicker control unit allows a wind turbine to be programmed and controlled using the wind farm's SCADA control system to change a particular turbine's operating mode during certain conditions or times, or even turn the turbine off if necessary. | | |
| **Chapter 6: Biodiversity** | | | | | |
| **Pre-Construction Phase** | | | | | |
| MM70 | Invasive Species Management | EIAR Chapter 6<br><br>CEMP Section 3 | A baseline invasive species survey will be carried out at the site to identify the presence and location of any invasive species (listed under the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) by a suitably qualified ecologist. If the presence of such species is found at or adjacent to the site, particularly in areas where its excavation may be required, an invasive species management plan will be prepared for the site to prevent the introduction or spread of any invasive species within the footprint of the works. | | |

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| MM71 | Fauna | EIAR Chapter 6 | **Otter:**<br>> As otter are known to occur within watercourses within the Site, a pre-commencement otter survey will be undertaken upstream and downstream of all proposed watercourse crossings/culvert upgrades within the Site and in accordance with standard best practice guidance prior to the commencement of site works. In the unlikely event that an otter holt is identified within or immediately adjacent to the Proposed Project footprint, consultation will be undertaken with the National Parks and Wildlife Service and a derogation licence applied for.<br>> All conditions of a derogation licence will be implemented in full.<br>> No works should be undertaken within 150m of any holts at which breeding females or cubs are present.<br>> No wheeled or tracked vehicles (of any kind) should be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance should also not take place within 15m of such holts, except under licence (TII, 2006[1]).<br>**Badger:**<br>> A pre-construction badger survey will be carried out in order to assess activity levels at setts and to identify any additional sett entrances that may have been excavated in the intervening period.<br>> Any active setts recorded within 50m of the Proposed Project footprint 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, and to assess the requirement for specific mitigation measures to limit disturbance. All badger survey work will be undertaken in line with current best practice guidance[2].<br>> Should any setts within 50m of the Proposed Project be found to be in active use by badgers during the pre-construction badger monitoring, it would be necessary to ensure that the risk of disturbance to badgers is mitigated appropriately. Any badger mitigation required would be undertaken following published best practice guidelines for the treatment of badgers (NRW, 2009) and in consultation with | | |

[1] *NRA, 2006. Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes. Dublin: Transport Infrastructure Ireland. Available at: www.tii.ie/tii-library/environment/construction-guidelines/Guidelines-for-the-Treatment-of-Otters-prior-to-the-Construction-of-National-Road-Schemes.pdf*

[2] *National Roads Authority (2006) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes.*

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| | | | NPWS. Any setts that could potentially be subject to direct impacts would be excluded and closed in consultation with NPWS, and wherever possible subsequently re-opened following completion of construction to allow badgers to recolonise them. If any works within 50m of an active sett are to take place during the badger breeding season (i.e. July 1st – November 30th) temporary exclusion of these setts during the construction phase would be required prior to the breeding season commencing. The setts would be excluded and closed in consultation with NPWS, and subsequently re-opened following completion of construction to allow badgers to recolonise them.<br>> Taking a precautionary approach, the following measures will be undertaken for the avoidance of disturbance/displacement and will be implemented during the construction phase of the Proposed Project to avoid heavy machinery access or materials storage in close proximity to the identified badger sett within the forestry that occurs within 30 metres of the proposed forestry felling:<br>> Exclusion zone fencing and appropriate signage will be put in place to prevent any activity that could directly impact the sett.<br><br>**Pine Marten:**<br>> A pre-construction mammal survey will be carried out in order to assess activity levels at the den location used by the species during 2020, and to identify any additional dens within the Site that may have been created or become occupied in the intervening period. Any active dens recorded within 100m of the Proposed Project will subsequently be monitored for a minimum period of 2 weeks using remote cameras in order to ascertain use by pine marten and levels of activity, and to assess the requirement for additional mitigation measures. All survey work will be undertaken in line with current best practice guidance[3].<br>> Should any active pine marten dens within 30m of the Proposed Project footprint (or breeding dens within 100m), including felling buffers, be found to be in active use by the animals during the pre-construction monitoring, it would be necessary to ensure that the risk of direct mortality and disturbance to pine marten is mitigated appropriately. Any pine marten mitigation required would be undertaken following published best practice guidelines and in consultation, and where required under | | |

[3] *National Roads Authority (2006) Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes.*

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| | | | licence from, NPWS. Where any breeding is found to be occurring at dens that could potentially be directly or indirectly affected, no works within 100m will be carried during the breeding season (March – June inclusive), and monitoring with camera traps will be required to ensure until all animals have left the den following breeding prior to any commencement of works within 100m of a breeding den. A derogation licence would be required for any works that could potentially cause disturbance to an occupied pine marten den. | | |
| MM72 | Bats | EIAR Chapter 6<br><br>Appendix 6-2 | NatureScot recommends that a distance of 50m between turbine blade tip and nearest woodland (or other key habitat features) is adequate mitigation. This 50m buffer will be implemented from the outset and monitored as per the post construction monitoring.<br><br>As such, the trees with potential roosting features have been considered as a "roost resource" and compensation will be provided to cover for the loss of the resource. The following procedures are proposed prior to felling trees with PRFs:<br>› A bat derogation licence will be obtained from the NPWS for the loss of the roost resource, prior to felling, and the felling activity will be supervised by a qualified ecologist.<br>› Tree-felling of mature deciduous trees will be carried out according to the following standard mitigating procedures:<br>○ Trees with suitable potential roost features proposed for felling will be checked for bats by a suitably qualified arborist at the time of felling.<br>○ Trees will be nudged two or three times prior to limb removal, with a pause of 30 seconds in between, to allow bats to wake and move.<br>○ Rigged felling shall be used to lower the limbs and trunk carefully to ground level and cavities searched by a qualified ecologist.<br>○ Felled trees will be left in-situ for a minimum of 24 hours prior to sawing or mulching, to allow any bats present to escape (National Roads Authority, 2006).<br>○ Any tree felling will be undertaken outside the bat maternity season (May-August) and the hibernation period (December-February) (Marnell, Kelleher and Mullen, 2022). | | |

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| | | | Where the potential for indirect effects (i.e. disturbance) on bats potentially roosting within watercourse, drain and culvert crossing infrastructure has been identified, the following mitigating procedures are proposed:<br>○ An inspection survey will be carried out prior to the commencement of the works to ensure no bats are roosting within the infrastructure.<br>○ If the inspection survey cannot provide sufficient data to exclude the presence of a roost (i.e. due to lack of access), an activity survey will also be conducted prior to commencement.<br>○ Where evidence of bats is identified during the above pre-commencement surveys, a Derogation Licence will be required from NPWS for the continuation of the works.<br>○ The works will be carried out outside the maternity (May-August) and hibernation (November-March) seasons to avoid the potential for disturbance on bats during sensitive periods of their lifecycle. | | |
| MM73 | Amphibians | EIAR Chapter 6 | > A pre-commencement Common Frog survey will be undertaken in accordance with standard best practice guidance prior to the commencement of works for Turbine 6. Any amphibians found will be translocated to suitable habitat within the Site, outside of construction areas, under licence from the National Parks and Wildlife Service.<br>> All conditions of a derogation licence will be implemented in full.<br>> All of the above works will be undertaken or supervised by an appropriately qualified ecologist. | | |
| **Construction Phase** | | | | | |
| MM74 | Flora & Fauna | EIAR Chapter 6 | <u>Noise Restriction</u><br>> During the construction phase, plant machinery will be turned off when not in use and all plant and equipment for use will comply with the Construction Plant and Equipment Permissible Noise Levels Regulations (S.I. No. 632 of 2001). | | |

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| | | Appendix 6-2 | <u>Lighting Restriction</u><br><br>Exterior lighting, during construction and post construction, shall be designed to minimize light spillage, thus reducing the effect on areas outside the Proposed Project, and consequently on bats i.e. Lighting will be directed away from mature trees/treelines around the periphery of the site boundary to minimize disturbance to bats. Directional accessories can be used to direct light away from these features, e.g. through the use of light shields (Stone, 2013). The luminaries will be of the type that prevent upward spillage of light and minimize horizontal spillage away from the intended lands.<br><br>The proposed lighting around the site shall be designed in accordance with the Institute of Lighting Professionals Guidance Note 08/18 Bats and artificial lighting in the UK.<br><br>In addition, the applicant commits to the use of lights during construction (such that they are necessary) in line with the following guidance that is provided in the Dark Sky Ireland Lighting Recommendations:<br><br>> Every light needs to be justifiable,<br>> Limit the use of light to when it is needed,<br>> Direct the light to where it is needed,<br>> Reduce the light intensity to the minimum needed,<br>> Use light spectra adapted to the environment,<br>When using white light, use sources with a "warm" colour temperature (less than 3000K). | | |
| MM75 | Aquatic Habitats and Fauna | EIAR Chapter 6, Chapter 9<br><br>CEMP Section 3 | > Inland Fisheries Ireland (IFI) will be consulted a minimum of four weeks in advance of watercourse crossing works. The Inland Fisheries Ireland (2016): *Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*; and the Scottish Natural Heritage (SNH) *Good Practice During Wind Farm Construction* (SNH, 2019, 4th Edition) will also be adhered to. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI).<br>> With the implantation of the drainage design, surface water quality will be protected during the construction phase. | | |

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| MM76 | Woodlands and Linear vegetation | EIAR Chapter 6 | It is proposed that approximately 5.17 linear kilometres of new replacement treeline/ hedgerow planting and existing hedgerow/ treeline bolstering will be carried out throughout the Site. This will result in a net gain in this habitat within the site. Tree/shrub species planted in these locations will be of a similar composition to those occurring onsite, will be native and of local provenance. Planting of 1.8ha of woodland native species along the Eastwood river will be carried out by hand as prescribed in the Forestry Schemes Manual and will be done with Forest Service Technical Approval | | |
| MM77 | Invasive Species | EIAR Chapter 6<br><br>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, if they are identified prior to the commencement of the construction phase:<br>> A risk assessment and method statement must be provided by the Contractor prior to commencing works.<br>> Fences will be erected around areas of infestation, as confirmed by test pits, and warning signs shall be erected.<br>> A designated wash-down area will be created, where power-washed material from machinery can be contained, collected and disposed of with other contaminated material. This area will contain a washable membrane or hard surface.<br>> Stockpile areas will be chosen to minimise movement of contaminated soil.<br>> Stockpiles will be marked and isolated.<br>> 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.<br>> The use of vehicles with caterpillar tracks within contaminated areas will be avoided to minimise the risk of spreading contaminated material.<br>> An ECoW/suitably qualified ecologist will be on site to monitor and oversee the implementation of invasive species management plans.<br>> Plant and equipment which is operated within an area for the management of materials in contaminated areas should be decontaminated prior to relocating to a different works area. The decontamination procedures should take account of the following:<br>> Personnel may only clean down if they are familiar with the plant and rhizome material and can readily identify it. | | |

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| | | | > Decontamination will only occur within designated wash-down areas.<br>> 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.<br>> All run-off will be isolated and treated as contaminated material. This will be disposed of in already contaminated areas. | | |
| MM78 | Wood Bitter-vetch | EIAR Chapter 6 | > An Ecologist will fence off a 10m buffer of the Treeline habitat east of Turbine 1 where the wood-bitter vetch was recorded to ensure that no works happen within 10m of the Treeline where the species was recorded growing.<br>> No machinery or site works will be allowed within this 10m buffer of recorded plants/ hedgerow habitat.<br>> Follow up surveys of the buffer area will be conducted post erection of the fence and during the construction phase to ensure that wood bitter-vetch distribution has not been impacted on.<br>> After completion of the construction phase of the Proposed Project, fencing will be removed. | | |
| **Operational Phase** | | | | | |
| MM79 | Bats | EIAR Chapter 6<br><br>Appendix 6-2 | In accordance with NatureScot Guidance, a minimum 50m buffer to all habitat features used by bats (e.g., hedgerows, treelines etc.) will be applied to the siting of all wind turbines.<br><br>**Lighting Restrictions**<br><br>Where lighting is required, directional lighting will be used to prevent overspill on to woodland/forestry edges. Exterior lighting, during construction and post construction, shall be designed to minimize light spillage, thus reducing the effect on areas outside the Site, and consequently on bats i.e. Lighting will be directed away from mature trees/treelines around the periphery of the site boundary to minimize disturbance to bats. Directional accessories can be used to direct light away from these features, e.g. through the use of light shields (Stone, 2013). | | |

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| | | | The luminaries will be of the type that prevent upward spillage of light and minimize horizontal spillage away from the intended lands.<br><br>The proposed lighting around the Site shall be designed in accordance with the Institute of Lighting Professionals Guidance Note 08/23 Bats and artificial lighting at night.<br><br>In addition, the applicant commits to the use of lights during construction, operation and decommissioning (such that they are necessary) in line with the following guidance that is provided in the Dark Sky Ireland Lighting Recommendations:<br><br>› Every light needs to be justifiable,<br>› Limit the use of light to when it is needed,<br>› Direct the light to where it is needed,<br>› Reduce the light intensity to the minimum needed,<br>› Use light spectra adapted to the environment.<br>› When using white light, use sources with a "warm" colour temperature (less than 3000K).<br><br>**Blade Feathering**<br><br>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). In accordance with NIEA Guidelines, blade feathering will be implemented as a standard across all proposed turbines when wind speeds are below the cut-in speed of the turbine. | | |
| **Decommissioning Phase** | | | | | |
| MM80 | Decommissioning | EIAR Chapter 6 | The same mitigation to prevent significant impacts on water quality and associated aquatic fauna and other terrestrial fauna during construction will be applicable to the decommissioning phase. An outline decommissioning plan is contained in the CEMP, Appendix 4-3 of the EIAR. The | | |

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| | | Appendix 4-3 | CEMP for the project provides the details of the mitigation and best practice that will be employed to avoid any potential for significant residual effects on biodiversity during decommissioning of the proposed wind farm. | | |
| **Chapter 7 Birds (Appendix 7-1)** | | | | | |
| **Pre- Construction Phase** | | | | | |
| MM81 | Birds | EIAR Chapter 7<br><br>Appendix 7-7 | > Pre-construction surveys will be undertaken prior to the initiation of works at the Site. The survey will include a thorough walkover survey to a 500m radius of the Proposed Project footprint and all works areas, where access allows. If winter roosting or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring at the beginning of the first winter or breeding season of the construction phase. | | |
| MM82 | Birds | EIAR Chapter 7<br><br>Appendix 7-7 | Prior to implementing the Bird mitigation programme:<br><br>> A meeting will be held with individual landowners to outline the general aims, objectives and requirements of the Bird Mitigation Plan.<br>> A Growing Schedule will be provided to the landowner for each individual field based on the current agricultural management practices, stocking rates and habitat conditions. The Growing Schedule will comprise a list of actions to be undertaken and an action date for when they should be undertaken.<br>> A bird control kite (including tether and pole) will be provided for each individual field. Instructions on deployment of the kite will be included in the Growing Schedule | | |

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| **Construction Phase** | | | | | |
| MM83 | 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 earmarked for monitoring at the beginning of the first winter or breeding season of the construction phase. If it is found to be active during the construction phase, no works shall be undertaken within a disturbance buffer in line with industry best practice (e.g. Forestry Commission Scotland, 2006; Ruddock and Whitfield, 2007). No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied. | | |
| MM84 | Birds | EIAR Chapter 4 | > Works will commence outside the bird nesting season (1st of March to 31st of August inclusive). Any requirement for construction works to run into the subsequent breeding season following commencement will be informed by pre-construction bird surveys.<br>> The removal of woody vegetation will be undertaken in full compliance with Section 40 of the Wildlife Acts 1976 – 2022. Where sections of woody vegetation are removed for the purposes of the junction and road upgrades, these will be replaced with suitable hedge/tree species which are common in the local context.<br>> During the construction phase, noise limits, noise control measures, hours of operation (i.e. dusk and dawn is high faunal activity time) and selection of plant items will be considered in relation to disturbance of birds. All plant and equipment for use will comply with the European Communities (Noise Emission By Equipment For Use Outdoors) Regulations, 2001, as amended (SI 632/2001). Plant machinery will also be turned off when not in use.<br>> Silt fences will be installed as an additional water protection measure around existing watercourses.<br>> If bird breeding activity of species of conservation concern are identified during the works, the nest sites will be located, and no works shall be undertaken within 500m buffer in line with industry best practice.<br>> An Environmental Clerk of Works and Project Ecologist will be appointed. Duties will include: | | |

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| | | | ○ Organise the undertaking of a pre-construction walkover bird survey to ensure that significant effects on birds will be avoided.<br>○ Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Site.<br>○ Oversee management of ornithological issues during the construction period and advise on ornithological issues as they arise.<br>○ Provide guidance to contractors to ensure legal compliance with respect to protected species onsite.<br><br>Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress as necessary. | | |
| **Operational Phase** | | | | | |
| MM85 | Birds | EIAR Chapter 7 | A Bird Mitigation Plan (Appendix 7-7) has been prepared for the Proposed Project to mitigate the potential effects of collision risk for lapwing and golden plover during the operational phase of the Proposed Wind Farm.<br><br>> Grass sward length throughout the field will exceed 15cm between 1st October and 31st March inclusive each winter;<br>> A bird control kite will be erected near the centre of the field between 1st October and 31st March inclusive each winter inclusive.<br>> Grazing livestock will be removed from the field before the action date to allow the grass time to regrow;<br>> Fertiliser will be applied to the field before the action date to allow the grass time to grow;<br>> Any farming activities that will reduce the sward height cannot begin until after the 31st of March.<br>> Bird control kites will be imitations of raptor birds (e.g. hawks, falcons) and attached to a tether approximately 8m in length, in turn attached to a pole approximately 10m in length, that is secured to the ground near the centre of the field to maximise | | |

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| | | | the effect. This will create weaving and hovering movements akin to hunting raptor birds c. 2-18m above the ground and will be suitable for a range of wind speeds (O'Shea et al., 2020). This representation of a hunting predator will provide additional deterrents to lapwing and golden plover landing in the field. Bird control kites are widely used to deter birds from crops and gardens and have been shown to reduce the number of birds present in agricultural fields and airfields (O'Shea et al., 2020).<br>> If the agricultural management practices, stocking rates and habitat conditions in any mitigation field change, the Growing Schedule will be revised accordingly by the overseeing environmental scientist, ornithologist or ecologist.<br>> If bird control kites become damaged or no longer function, they will be replaced by the wind farm operator in a timely manner.<br>> During each year of the operational phase, the Growing Schedule actions will be undertaken by each landowner.<br>> During each year of the operational phase, the overseeing environmental scientist, ornithologist or ecologist will monitor and evaluate the mitigation fields. Full details of the monitoring and evaluation are outlined in the following Section 3. | | |
| **Decommissioning Phase** | | | | | |
| MM86 | Birds | EIAR Chapter 7 | During the decommissioning phase, disturbance limitation measures will be as per the construction phase described. | | |
| **EIAR Chapter 8 Land Soils & Geology** | | | | | |
| **Construction Phase** | | | | | |
| MM87 | Earthworks | EIAR Chapter 8 | > 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 | | |

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| | | | placed/spread locally alongside the excavations or stored within the spoil management areas;<br>> Excavated soils/subsoils shall be excavated and stored separately to topsoil; this will prevent mixing of materials and facilitate reuse afterwards;<br>> All materials which require storage 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;<br>> Spoil will be deposited, in layers of 0.50m and will not exceed a total thickness of 1m;<br>> No turbines or related infrastructure will be constructed in any designated sites such as NHAs or SACs;<br>> Soil/subsoil excavated along the underground cabling route, will only be stored in low mounds (~0.5m high) directly adjacent to the excavated trench, and will be stored for no more than 24 hours before being backfilled where possible. The soil/subsoil will be covered or sealed with excavator bucket in the event of heavy rainfall which would suspend further construction works along the underground cabling route . Only tar from the underground cabling route works will be disposed at an offsite licenced facility. | | |
| MM88 | Contamination of Soils | EIAR Chapter 8 | > Where possible maintenance of construction vehicles or plant will take place off-site. This applies to the construction activities for both the Proposed Wind Farm and the Proposed Grid Connection. Minimal maintenance of construction vehicles or plant will take place on-site;<br>> On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site.<br>> 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.<br>> Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area on-site when not in use.<br>> All refuelling will be carried out outside designated watercourse buffer zones.<br>> Only designated trained and competent operatives will be authorised to refuel plant on-site. | | |

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| | | | • Mobile measures such as drip trays and fuel absorbent mats will used during refuelling operations as required. All plant and machinery will be equipped with fuel absorbent material and pads to deal with any event of accidental spillage.<br>> The electrical control building at the onsite 110kV substation will be bunded appropriately to the volume of oils likely to be stored, and to prevent leakage of any associated chemicals and to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor;<br>> All waste tar and chip material arising from the chipping and resurfacing of the roads during construction of the underground cabling route will be removed off-site and taken to an appropriately licenced facility;<br>> The plant used during construction will be regularly inspected for leaks and fitness for purpose; and,<br>> An emergency plan for the construction phase to deal with accidental spillages will be contained within the Construction Environmental Management Plan (CEMP) Appendix 4-3 of this EIAR. Spill kits will be available to deal with accidental spillage in and outside of re-fuelling areas. | | |
| MM89 | Erosion of soils | EIAR Chapter 8 | > Soil/subsoil removed from the turbine locations and associated access roads will be used for landscaping or placed/spread locally alongside the excavation (no excavated material will be placed/spread inside the modelled fluvial flood zones).<br>> Site drainage systems will be installed to limit runoff impacts during the construction phase, see Chapter 9 for proposed drainage measures.<br>> In forestry areas (near T9) brash mats will be used to support vehicles on soft ground, reducing soil erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal will take place when they become heavily used and worn. Provision will be made for brash mats along all off-road routes, to protect the soil from compaction and rutting.<br>> Soils removed from the cable trenching within the Site will be used to reinstate the trench where possible, reinstatement/landscaping works or removed to one of the designated spoil management areas or to an appropriately licenced facility as necessary. | | |
| **Operational Phase** | | | | | |

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| MM90 | Soils and Geology | EIAR Chapter 8 | > The substation transformer and oil interceptor will be on a bunded concrete plinth capable of holding 110% of the stored oil volume. Turbine transformers are located within the turbines, so any leaks would be contained within the turbine. These mitigation measures are considered sufficient to eliminate potential risks to ground/peat/soils and subsoils, and groundwater and surface water quality.<br>> 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. | | |
| **Decommissioning Phase** | | | | | |
| MM91 | Decommissioning Phase | EIAR Chapter 8 | Mitigation measures applied during decommissioning activities will be similar to those applied during construction where relevant. Some of the effects associated with reinstatement of the Site (excavation of turbine bases, access tracks etc.) will be avoided by leaving these in place. The bases will be rehabilitated by covering with local topsoil in order to regenerate vegetation which will reduce runoff and sedimentation effects. 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. | | |
| **EIAR Chapter 9 Hydrology** | | | | | |
| **Pre- Construction Phase** | | | | | |
| MM92 | Earthworks | EIAR Chapter 9 | **Mitigation by Avoidance:**<br><br>The key mitigation measure during the construction phase is the avoidance of sensitive aquatic areas where possible, by application of suitable buffer zones (i.e. 50m to main watercourses). The large setback distance from sensitive hydrological features means that adequate room is maintained for the proposed drainage mitigation measures (discussed below) to be properly installed and operate effectively. The proposed buffer zone will:<br><br>> Avoid physical damage to watercourses, and associated release of sediment;<br>> Avoid excavations within close proximity to surface watercourses;<br>> Avoid the entry of suspended sediment from earthworks into watercourses; and, | | |

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| | | | > Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone;<br><br>**Timing of Site Construction Works:**<br><br>> Construction of the Site drainage system will only be carried out during periods of low rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses. Construction of the drainage system during this period will also ensure that attenuation features associated with the drainage system will be in place and operational for all subsequent construction works.<br><br>**Pre-commencement Temporary Drainage Works**<br><br>Prior to the commencement of road upgrades (or new road/hardstand or turbine base installs) the following key temporary drainage measures will be installed:<br>> All existing dry land drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using check dams/silt traps;<br>> Clean water interceptor drains will be installed upgradient of the works areas;<br>> Check dams/silt fence arrangements (silt traps) will be placed in all land drains that have surface water flows and also along existing farm track roadside drains; and,<br>> A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone.<br>> An inspection and maintenance plan for the on-site construction drainage system will be prepared in advance of commencement of any works | | |
| | | | **Construction Phase** | | |
| MM93 | Earthworks | EIAR Chapter 9 | **Proposed Mitigation by Avoidance:** | | |

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| | | | › Avoid physical damage (river/stream banks and river/stream beds) to watercourses and associated release of sediment;<br>› Avoid excavations within close proximity to surface watercourses;<br>› Avoid the entry of suspended sediment from earthworks into watercourses; and,<br>› Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone.<br><br>**Mitigation by Design:**<br><br>Source controls:<br><br>› Interceptor drains, vee-drains, diversion drains, flume pipes, erosion and velocity control measures such as use of sandbags, oyster bags filled with gravel, filter fabrics, and other similar/equivalent or appropriate systems.<br>› Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas.<br><br>In-Line controls:<br><br>› Interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sandbags, oyster bags, straw bales, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems.<br><br>Treatment systems:<br><br>› Temporary sumps and ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbuster, and/or other similar/equivalent or appropriate systems. | | |

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| | | | The main elements of interaction with existing drains will be as follows:<br><br>> Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system, there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the Proposed Project drainage into the existing site drainage network. This will reduce the potential for any increased risk of downstream flooding or sediment transport/erosion;<br><br>> Silt traps will be placed in the existing drains upstream of any streams where construction works / tree felling is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area;<br>> Runoff from individual turbine hardstanding areas will be not discharged into the existing drain network but discharged locally at each turbine location through settlement ponds and buffered outfalls onto vegetated surfaces;<br>> Buffered outfalls which will be numerous over the Site will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the Site; and,<br>> Drains running parallel to the existing roads requiring widening will be upgraded, widening will be targeted to the opposite side of the road. Velocity and silt control measures such as check dams, sandbags, oyster bags, straw bales, flow limiters, weirs, baffles, silt fences will be used during the upgrade construction works. Regular buffered outfalls will also be added to these drains to protect downstream surface waters.<br><br>**Silt Fences:**<br><br>Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids such as those present in the subsoils/sandstone tills that overlie the Site. This will act to prevent entry to water courses of sand and gravel sized sediment, released from excavation of mineral sub-soils of glacial and glacio-fluvial origin, and entrained in surface water runoff. Inspection and maintenance of these of these structures during construction phase is critical to their functioning to stated purpose. They will remain in place | | |

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| | | | throughout the entire construction phase. Double silt fences will be placed within drains down-gradient of all construction areas inside the 50m buffer zones.<br><br>**Silt Bags:**<br><br>Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, the majority of the sediment is retained by the geotextile fabric allowing filtered water to pass through. Silt bags will be used with natural vegetation filters or sedimats Sediment entrapment mats, consisting of coir or jute matting, will be placed at the silt bag location to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure.<br><br>**Settlement Pond Design:**<br><br>During the initial construction of roads, silt fences, straw bales and biodegradable geogrids will be used to control surface water runoff from works areas.<br><br>**Level Spreaders and Vegetation Filters:** The purpose of level spreaders is to release treated drainage flow in a diffuse manner and to prevent the concentration of flows at any one location thereby avoiding erosion. Level spreaders are no intended to be a primary treatment component for development surface water runoff. They are not standalone but occur as part of treatment train of systems that will reduce the velocity of runoff prior to being released at the level spreader. In the absence of levelspreaders, the potential for ground erosion is significantly greater than not using them.<br>Vegetation filters are end of line polishing filter that are located at the end the treatment train.<br><br>In fact, vegetation filters are ultimately a positive consequence of not discharging directly into watercourses which is one of the mitigation components of the drainage philosophy. This makes use of the natural vegetation of the site to provide a polishing filter for the wind farm drainage prior to reaching the downstream watercourses. | | |

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| | | | **Water Treatment Train:** A final line of defence will be provided by a water treatment train such as a "Siltbuster". If the discharge water from construction areas fails to be of a high quality during regular inspections, then a filtration treatment system (such as a 'Siltbuster' or similar equivalent treatment train (sequence of water treatment processes) will be used to filter and treat all surface discharge water collected in the dirty water drainage system. This will apply for all of the construction phase. | | |
| MM94 | Tree Felling | EIAR Chapter 9 | **Mitigation by Avoidance:**<br>There is a requirement in the Forest Service Code of Practice and in the FSC Certification Standard for the installation of buffer zones adjacent to aquatic zones. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document "Forestry and Water Quality Guidelines".<br>**Mitigation by Design:**<br>Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods which are set out as follows:<br>> Machine combinations will be chosen which are most suitable for ground conditions at the time of felling, and which will minimise soils disturbance;<br>> Checking and maintenance of roads and culverts will be on-going through any felling operation. No tracking of vehicle through watercourses will occur, as vehicles will use road infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during felling works;<br>> Ditches which drain from the proposed area to be felled towards existing surface watercourses will be blocked, and temporary silt traps will be constructed. No direct discharge of such ditches to watercourses will occur. Drains and sediment traps will be installed during ground preparation. Collector drains will be excavated at an acute angle to the contour (~0.3%-3% gradient), to minimise flow velocities;<br>> Sediment traps will be sited in drains downstream of felling areas. Machine access will be maintained to enable the accumulated sediment to be excavated. Sediment will be carefully disposed of in the spoil management | | |

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| | | | areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground;<br>> In areas particularly sensitive to erosion, it may be necessary to install double or triple sediment traps. This measure will be reviewed on site during construction;<br>> All drainage channels will taper out before entering the aquatic buffer zone. This ensures that discharged water gently fans out over the buffer zone before entering the aquatic zone, with sediment filtered out from the flow by ground vegetation within the zone. On erodible soils, silt traps will be installed at the end of the drainage channels, to the outside of the buffer zone;<br>> Drains and silt traps will be maintained throughout all felling works, ensuring that they are clear of sediment build-up and are not severely eroded. Correct drain alignment, spacing and depth will ensure that erosion and sediment build-up are minimized and controlled;<br>> Brash mats will be used to support vehicles on soft ground, reducing mineral soils erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal should take place when they become heavily used and worn. Provision should be made for brash mats along all off-road routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction should be suspended during periods of high rainfall;<br>> Timber will be stacked in dry areas, and outside a local 50m watercourse buffer. Straw bales and check dams to be emplaced on the down gradient side of timber storage/processing sites;<br>> Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water run-off;<br>> Checking and maintenance of roads and culverts will be on-going through the felling operation;<br>> Any diesel or fuel oils stored at the temporary site compounds will be bunded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity;<br>> Refuelling or maintenance of machinery will not occur within 100m of a watercourse. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; and, | | |

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| | | | > Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors.<br><br>**Drain Inspection and Maintenance:**<br><br>The following items shall be carried out during inspection pre-felling and after:<br><br>> Communication with tree felling operatives in advance to determine whether any areas have been reported where there is unusual water logging or bogging of machines;<br>> Inspection of all areas reported as having unusual ground conditions;<br>> Inspection of main drainage ditches and outfalls. During pre-felling inspection, the main drainage ditches shall be identified. Ideally the pre-felling inspection shall be carried out during rainfall;<br>> Following tree felling all main drains shall be inspected to ensure that they are functioning;<br>> Extraction tracks near drains need to be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground;<br>> Culverts on drains exiting the site will be unblocked; and,<br>> All accumulated silt will be removed from drains and culverts, and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall. | | |
| MM95 | Impacts on Groundwater Levels during Excavation Works | EIAR Chapter 9 | **Mitigation by Best Practice**<br><br>> Environmental management guidelines from the EPA quarry 2006 guidance document – *"Environmental Management in the Extractive Industry"* in relation to groundwater issues will be implemented during the construction phase.<br><br>In order to avoid excavation and dewatering of alluvial deposits, it is proposed that a piled foundation design will be considered at turbine locations T1, T2, T3 and T8. Ground conditions | | |

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| | | | at proposed turbine location T9 will be determined by additional site investigations at the detailed design phase. If deep, groundwater saturated alluvial deposits are present at T9, the piled turbine base option will also be considered. Piling of Turbine T9. Proposed mitigation measures relative to piling works will comprise:<br><br>› Strict QA/QC procedures for piling works will be followed;<br>› Piles will be kept vertical during piling works;<br>› Good workmanship will be employed during all piling works; and,<br><br>Where required use bentonite seal to prevent upward/downward movement of surface water/groundwater | | |
| MM96 | Earthworks Works at Watercourse Crossings | | › No stock-piling of construction materials at the crossing locations;<br>› No refuelling of machinery or overnight parking of machinery is permitted in this area;<br>› No concrete truck chute cleaning is permitted in this area;<br>› Works will not take place at periods of high rainfall, and will be scaled back or suspended if heavy rain is forecast;<br>› All machinery operations will take place away from the stream and ditch banks, apart from where crossings occur. Although no instream works are proposed or will occur;<br>› Any excess construction material will be immediately removed from the area and placed in dedicated spoil management areas ;<br>› No stockpiling of materials will be permitted in the constraint zones;<br>› Spill kits will be available in each item of plant required to complete the stream crossing;<br>› The area around the Clear Bore™ (or similar alternative) batching, pumping and recycling plants will be bunded using terram and sandbags in order to contain any spillages;<br>› Accidental spillage of fluids will be cleaned up immediately and transported off site for disposal at a licensed facility; and,<br>› Adequately sized skips will be used for temporary storage of drilling arisings during directional drilling works. This will ensure containment of drilling arisings and drilling flush. | | |

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| MM97 | Directional Drilling at watercourse crossings | EIAR Chapter 4, CEMP Section 2 | > Near stream construction work, will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works according to the Eastern Regional Fisheries Board (2004) guidance document "Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites", i.e., May to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI);<br>> The area around the Clear Bore™ (or similar alternative) batching, pumping and recycling plants will be bunded using terram and sandbags in order to contain any spillages;<br>> Accidental spillage of fluids will be cleaned up immediately and transported off site for disposal at a licensed facility; and,<br>> Adequately sized skips will be used for temporary storage of drilling arisings during directional drilling works. This will ensure containment of drilling arisings and drilling flush. | | |
| MM98 | Site Drainage Management | EIAR Chapter 9<br><br>CEMP Section 3 | **Pre-emptive Site Drainage Management:**<br><br>The works programme for the entire construction stage of the development will also take account of weather forecasts and predicted rainfall in particular. Large excavations and movements of soil/subsoil or vegetation stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast.<br><br>The following forecasting systems are available and will be used on a daily basis at the Site to direct proposed construction activities:<br><br>> General Forecasts: Available on a national, regional and county level from the Met Eireann website (www.met.ie/forecasts). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates; | | |

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| | | | > MeteoAlarm: Alerts to the possible occurrence of severe weather for the next 2 days. Less useful than general forecasts as only available on a provincial scale;<br>> 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events;<br>> Rainfall Radar Images: Images covering the entire country are freely available from the Met Eireann website (www.met.ie/latest/rainfall_radar.asp). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive; and,<br>> Consultancy Service: Met Eireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest.<br>> quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive; and,<br>> Consultancy Service: Met Eireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest.<br><br>Using the safe threshold rainfall values will allow work to be safely controlled (from a water quality perspective) in the event of forecasting of an impending high rainfall intensity event.<br><br>Works will be suspended if forecasting suggests either of the following is likely to occur:<br><br>> >10 mm/hr (i.e. high intensity local rainfall events);<br>> >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or,<br>> >half monthly average rainfall in any 7 days.<br><br>Prior to works being suspended the following control measures will be completed:<br><br>> All active excavations will be secured and sealed off;<br>> Temporary or emergency drainage will be installed to prevent back-up of surface runoff; and, | | |

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| | | | > No works will be completed during heavy rainfall and for up to 24 hours after heavy events to ensure drainage systems are not overloaded. | | |
| MM99 | Excavation Pumping/Drainage and Potential Impacts on Surface Water Quality | | > Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations will be put in place;<br>> If required, pumping of excavation inflows will prevent build-up of water in the excavation;<br>> The interceptor drainage will be discharged to the site constructed drainage system or onto natural vegetated surfaces and not directly to surface waters;<br>> 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;<br>> The borrow pit settlement ponds have been designed to allow a 24hr retention time as per EPA guidance (2006) which is highest level of protection recommended by the EPA with regard to retention time;<br>> There will be no direct discharge to surface watercourses, and therefore no risk of hydraulic loading or contamination will occur;<br>> Daily monitoring of excavations by the Environmental Clerk of Works 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,<br>> 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. | | |
| MM100 | Groundwater and Surface Water Contamination from wastewater disposal | EIAR Chapter 9 | > During the construction phase, a self-contained port-a-loo with an integrated waste holding tank will be used at each of the site construction compounds, maintained by the providing contractor, and removed from site on completion of the construction works;<br>> 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, | | |

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| | | | > No water or wastewater for sanitation will be sourced on the Site, nor discharged to the Site. | | |
| MM101 | Potential Release of Hydrocarbons | EIAR Chapter 9<br><br>CEMP Section 3 | All refuelling will be carried out outside designated watercourse buffer zones.<br>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.<br>All plant and machinery will be equipped with fuel absorbent material and pads to deal with any event of accidental spillage<br><br>> A permit to fuel system will be put in place;<br>> Taps, nozzles or valves associated with refuelling equipment will be fitted with a lock system;<br>> All fuel storage areas will be bunded appropriately for the duration of the construction phase. All bunded areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area;<br>> Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage;<br>> The electrical control building (at the substation) will be bunded appropriately to 110% of the volume of oils that will be stored, and to prevent leakage of any associated oils to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor;<br>> The plant used during construction will be regularly inspected for leaks and fitness for purpose; and,<br>> An emergency plan for the construction phase to deal with accidental spillages is included within the Construction and Environmental Management Plan (Appendix 4-3). Spill kits will be available to deal with any accidental spillage in and outside the re-fuelling area. | | |
| MM102 | Release of Cement-Based Products | EIAR Chapter 9 | > No batching of wet-concrete products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place;<br>> Where possible pre-cast elements for culverts and concrete works will be used; | | |

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| | | | > Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water will be undertaken at lined concrete washout ponds;<br>> Weather forecasting will be used to plan dry days for pouring concrete; and<br>> The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event. | | |
| MM103 | Morphological Changes to Surface Watercourses and Drainage Patterns | EIAR Chapter 9 | > All proposed new watercourse crossings will be bottomless or clear span culverts and the existing banks will remain undisturbed. No in-stream excavation works are proposed and therefore there will be no direct impact on the stream at the proposed crossing location;<br>> All proposed drain crossing culverts will be minimum 900mm in diameter;<br>> New access roads in mapped flood zones will be placed close to ground level to maintain the hydrology of the Site. Culverts will be placed along access roads accordingly (i.e. low points and depressions) to facilitate drainage of flood waters;<br>> All guidance / mitigation measures proposed by the OPW or the Inland Fisheries Ireland[4] is incorporated into the design of the proposed crossings;<br>> As a further precaution, near stream construction work, will only be carried out during the period permitted by Inland Fisheries Ireland for in-stream works according to the Eastern Regional Fisheries Board (2004) guidance document "Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites", i.e., May to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI);<br>> 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, | | |

[4] *Inland Fisheries Ireland (2016): Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters*

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| | | | > All new river/stream crossings will require a Section 50 application (Arterial Drainage Act, 1945). The river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent.<br><br>Mitigation Measures relating to the use of a mixture of a natural, inert and fully biodegradable drilling fluid such as Clear Bore™ and water for directional drilling include:<br><br>> The area around the Clear Bore™ batching, pumping and recycling plants will be bunded using terram and sandbags in order to contain any spillages;<br>> One or more lines of silt fences will be placed between the works area and adjacent rivers and streams on both banks;<br>> Accidental spillage of fluids will be cleaned up immediately and transported off site for disposal at a licensed facility; and,<br>> Adequately sized skips will be used for temporary storage of drilling arisings during directional drilling works. This will ensure containment of drilling arisings and drilling flush. | | |
| | River Restoration | EIAR Chapter 4, Chapter 9, Appendix 6-4 | > All stream work to be performed "in the dry" either by pump-around or stream diversion with silt curtain;<br>> Impervious dikes or sandbags are to be used to isolate work from stream flow;<br>> The contractor shall not disturb more area than can be stabilised the same working day;<br>> Maintenance of stream flow operation shall be incidental to the work. This includes pumps and hoses;<br>> Pumps and hoses shall be of sufficient size to dewater the work area;<br>> Graded stream banks shall be stabilised, with matting, prior to predicted rain fall events;<br>> Silt bags and stilling basins shall be used to collect silt and sediment from work area dewatering;<br>> coir fibre matting shall be installed on the outside of all meander bends where shear stress is likely to be highest, and in other locations where erosion control may be necessary;<br>> Live willow cuttings (live stakes) shall be installed through the coir fibre matting along both sides of the stream channel following the installation of coir fibre matting to provide bank stability through the establishment of fast-growing native willows; and, | | |

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| | | | > Installation of cross vanes to prevent erosion of the riverbanks. | | |
| MM104 | WFD Water Body Status | EIAR Chapter 9 | **Proposed Mitigation Measures (By Avoidance)**<br>> A self-imposed 50m buffer will be maintained where possible for all streams with the exception of existing road crossings and proposed stream crossings;<br>> No felling is required inside 50m buffer zone;<br>> The large separation distance between the proposed felling areas and sensitive aquatic zones means that potential poor runoff can be adequately managed and attenuated prior to reaching sensitive watercourses;<br>> Works will be completed during periods of no or low rainfall.<br>**Proposed Mitigation Measures (By Design)**<br>> Machine combinations will be chosen to minimise soil disturbance;<br>> Crossing of streams will not be permitted;<br>> Removing soil from roads during wet periods and dust suppression during dry periods;<br>> Ditches draining from the proposed felling area towards existing watercourses will be blocked and temporary silt traps constructed i.e. no direct discharge to surface watercourses will occur.<br>> Double silt traps will be installed where felling is inside the 50m aquatic buffer zone;<br>> Discharge channels will taper out before entering 50m buffer zone allowing for further sediment filtration by ground vegetation'.<br>> All drains and sediment traps will be maintained during the felling works;<br>> Brash mats will be used to support vehicles on soft ground;<br>> Timber will be stacked in dry areas outside of the buffer zone with straw bales and check dams' places downstream of these storage areas;<br>> Trees will be cut manually from along streams and using machinery to extract the tree;<br>> Travel will only be permitted perpendicular to and away from a watercourse; and,<br>> Using small working areas;<br>> Covering stockpiles; and,<br>> Timber will be stacked in dry areas outside of the buffer zone with straw bales and check dams' places downstream of these storage areas | | |

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| MM105 | Hydrologically Connected Designated Sites | EIAR Chapter 9, Chapter 6 | › The proposed mitigation measures which will include 50m buffer zones for avoidance of sensitive hydrological features;<br>› Pre-construction drainage control measures;<br>› Robust drainage control measures (i.e. interceptor drains, swales, settlement ponds) will ensure that the quality of runoff from Proposed Project areas will be very high; and,<br>› Best practice measures with regard use of oils, fuels and cement-based compounds | | |
| **Operational Phase** | | | | | |
| MM106 | Progressive Replacement of Natural Surface with Lower Permeability Surfaces | EIAR Chapter 9 | **Mitigation by Design:**<br><br>The operational phase drainage system will be *in place from the construction stage. Drainage from the operational site will comprise:*<br><br>> Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed over the ground by means of a level spreader;<br>> Swales/roadside drains will be used to collect runoff from access roads and turbine hardstanding areas of the Site, likely to have entrained suspended sediment, and channel it to settlement ponds for sediment settling;<br>> Settlement ponds, emplaced downstream of road swale sections and at turbine locations, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses;<br>> Regular culverts will be placed along access roads in areas prone to flooding; and,<br>> Settlement ponds have been designed in consideration of the greenfield runoff rate. | | |
| MM107 | Flood Risk | | Measures to reduce flood risk with regard the Proposed Project include:<br><br>› Turbine bases T3, T4, T7, T8 and T9 will have finished floor levels +500mm above the 1000-year flood level; | | |

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| | | | > Proposed new roads in flood zones will be kept close to existing ground level to avoid alteration of surface water flows For the proposed new Eastwood River Crossing and upgrade of the existing crossing on the River Suir a Section 50 consent will be sought under Section 50 of the Arterial Drainage Act, 1945 to install a new culvert/bridge with the hydraulic capacity to accommodate a 100-year flood flows while maintaining at least a 300mm freeboard above the flood level. | | |
| MM108 | WFD Water Body Status | EIAR Chapter 9 | There is no direct discharge from the Proposed Project site to downstream receiving waters. Mitigation for the protection of surface water during the operational phase of the Proposed Project will ensure the qualitative status of the receiving waters will not be altered by the Proposed Project | | |
| **Decommissioning Phase** | | | | | |
| MM109 | Decommissioning | EIAR Chapter 9 | There is no direct discharge from the Proposed Project site to downstream receiving waters. Mitigation for the protection of surface water during the decommissioning phase of the Proposed Project will ensure the qualitative status of the receiving waters will not be altered by the Proposed Project. | | |
| **Chapter 10 Air Quality** | | | | | |
| **Construction Phase** | | | | | |
| MM110 | Exhaust Emissions | EIAR Chapter 10 | > Proposed Project Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required.<br>> All plant and materials vehicles shall be stored in dedicated areas (on-site). Machinery will be switched off when not in use.<br>> 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.<br>> All plant and materials vehicles shall be stored in dedicated areas (on-site). | | |

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| | | | > Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction.<br>> The expected waste volumes generated onsite are unlikely to be large enough to warrant source segregation at the Site. Therefore, all wastes streams generated onsite will be deposited into a single waste skip which will be covered. This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements. There are several licenced waste treatment facilities located outside of Thurles, approximately 18km to the south of the Site.<br>> Aggregate materials for the construction of the Proposed Wind Farm infrastructure will be predominantly sourced onsite.<br>> Aggregate materials for the construction of site access tracks and all associated infrastructure will all be locally sourced, where possible, which will further reduce potential emissions.<br>> Turbines and construction materials will be transported to the site on specified haul routes only.<br>> Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the amount of emissions associated with vehicle movements.<br>> A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase | | |
| MM111 | Dust Emissions | EIAR Chapter 10 | > 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.<br>> All plant and materials vehicles shall be stored in dedicated areas within the Site.<br>> Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction. | | |

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| | | | > Turbines and construction traffic will be transported to the site on specified haul routes only.<br>> The agreed haul route road adjacent to the Site will be regularly inspected for cleanliness and cleaned as necessary.<br>> The roads adjacent to the site entrances will be checked weekly or damage/potholes and repaired as necessary.<br>> The transportation of materials form the borrow pit around the Site will be covered by tarpaulin or similar covered vehicles where necessary.<br>> The transportation of construction materials from locally sourced quarries for the Proposed Grid Connection infrastructure and a small volume for the Proposed Wind Farm to the Site will be covered by tarpaulin where necessary.<br>> If necessary, excavated material will be dampened prior to transport to the spoil management areas.<br>> A CEMP will be in place throughout the construction phase.<br>> Turbines and construction vehicles will be transported to the site on specified haul routes only.<br>> Grid connection infrastructure will be transported to the site on specified haul routes only.<br>> Construction materials for the Proposed Grid Connection and a small volume for the Proposed Wind Farm will be sourced locally from licenced quarries.<br>> The agreed haul route roads adjacent to the site will be regularly inspected for cleanliness and cleaned as necessary.<br>> The roads adjacent to the site entrances will be checked weekly or damage/potholes and repaired as necessary.<br>> The transport of construction materials around the Site from the onsite borrow pit and to the Site for the Proposed Grid Connection will be covered by tarpaulin where necessary.<br>> Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the amount of emissions associated with vehicle movements | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| **Operational Phase** | | | | | |
| MM111 | Exhaust and Dust Emissions | EIAR Chapter 10 | > Maintenance vehicles brought onsite during the operational phase will be maintained in good operational order, thereby minimising any dust emissions that arise.<br>> 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.<br>> When stationary, delivery and on-site vehicles will be required to turn off engines.<br>> Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements. | | |
| **Decommissioning Phase** | | | | | |
| MM112 | Decommissioning Phase | EIAR Chapter 10 | The mitigation measures prescribed for the construction phase of the Proposed Project will be implemented during the decommissioning phase thereby minimising any potential impacts. | | |
| **Chapter 11 Climate** | | | | | |
| **Construction Phase** | | | | | |
| MM113 | Greenhouse Gas Emissions | EIAR Chapter 11 | Greenhouse Gas Emissions during construction of turbine and other infrastructure:<br>> Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required.<br>> All plant and materials vehicles shall be stored in dedicated areas (on Site). Machinery will be switched off when not in use.<br>> 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.<br>> Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction. | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | | > The expected waste volumes generated onsite are unlikely to be large enough to warrant source segregation at the Site. Therefore, all wastes streams generated onsite will be deposited into a single waste skip which will be covered. This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements. There are several licenced waste treatment facilities located outside of Thurles, approximately 18km to the south of the Site.<br>> A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-3).<br>> Aggregate materials for the construction of site access tracks and all associated infrastructure will all be locally sourced, where possible, which will further reduce potential emissions.<br>> Where applicable, low carbon intensive construction materials will be sourced and utilised onsite. | | |
| **Operational Phase** | | | | | |
| MM114 | Greenhouse Gas Emissions | EIAR Chapter 11<br><br>Appendix 6-4 | > 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.<br>> When stationary, delivery and on-site vehicles will be required to turn off engines.<br>> Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements.<br>> As detailed in Appendix 6-4 a Biodiversity Enhancement Plan for the Proposed Project has identified enhancement activities such as the planting of native woodland and hedgerows | | |
| **Decommissioning Phase** | | | | | |
| MM115 | Decommissioning Phase | EIAR Chapter 11 | The mitigation measures prescribed for the construction phase of the Proposed Project will be implemented during the decommissioning phase thereby minimising any potential impacts. | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| **EIAR Chapter 12 Noise** | | | | | |
| **Pre- Construction Phase** | | | | | |
| MM116 | Construction Noise | EIAR Chapter 12 | Local residents will be kept informed of the proposed working schedule, where appropriate, including the times and duration of any abnormally noisy activity that may cause concern; | | |
| **Construction Phase** | | | | | |
| MM117 | Construction Noise | EIAR Chapter 12 | Good site practices will be implemented to minimise the likely effects. Section 8 of BS5228-1:2009+A1:2014 recommends a number of simple control measures as summarised below that will be employed onsite:<br>> 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;<br>> No plant used on site will be permitted to cause an on-going public nuisance due to noise.<br>> The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations.<br>> All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of the contract.<br>> Compressors will be attenuated models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers.<br>> Machinery that is used intermittently will be shut down during periods when not in use.<br>> Any plant, such as generators or pumps, which is required to operate close to NSL's outside of general construction hours will be surrounded by an acoustic enclosure or portable screen.<br>> During the course of the construction programme, supervision of the works will include ensuring compliance with the limits detailed in Section 12.3.2.1 using methods outlined in British Standard BS 5228-1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Noise*.<br>> The hours of construction activity will be limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 7:00hrs | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | | and 19:00hrs Monday to Saturday. However, to ensure that optimal use is made of good weather periods or at critical periods within the programme (i.e. concrete pours, rotor/tower deliveries) it will be necessary on occasion to work outside of these hours.<br>**Construction Noise along the Proposed Grid Connection underground cabling route:**<br>> Monitoring typical levels of noise and vibration during critical periods and at sensitive locations;<br>> Selection of plant with low inherent potential for generation of noise and/ or vibration, and;<br>> Placing of noisy / vibratory plant as far away from sensitive properties as permitted by site constraints.<br>**Blasting:**<br>> Restriction of hours within which blasting can be conducted (e.g. 09:00 – 18:00hrs).<br>> Notification to nearby residents before blasting starts (e.g. 24-hour written notification).<br>> The firing of blasts at similar times to reduce the 'startle' effect.<br>> On-going circulars informing people of the progress of the works.<br>> The implementation of an onsite documented complaints procedure.<br>> The use of independent monitoring by external bodies for verification of results.<br>> Trial blasts in less sensitive areas to assist in blast designs and identify potential zones of influence. | | |
| **Operational Phase** | | | | | |
| MM118 | Operational Phase Noise | EIAR Chapter 12 | Modern wind turbines can be programmed to run in reduced modes of operation (or low noise modes) to achieve the attenuation required in the specific wind conditions (i.e. wind speed and direction). Operating the turbines in reduced noise modes is referred to as curtailment, which typically results in a corresponding reduction in energy generation capacity for the turbine(s).<br><br>Within 6 months of full commissioning of the Proposed Wind Farm, noise monitoring shall be carried out in accordance with any noise conditions applied Should predicted exceedances be confirmed at the commissioning stage of the Proposed Wind Farm, the prescribed turbine curtailment measures shall be implemented to reduce any identified exceedance of the permitted noise limits. If an exceedance of the noise criteria is identified as part of the commissioning assessment, the guidance outlined in the IOA GPG, specifically Supplementary | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | | Guidance Note 5: Post Completion Measurements (July 2014) will be followed, and relevant corrective actions taken. For example, implementation of noise reduced operational modes resulting in curtailment of turbine operation can be implemented for specific turbines in specific wind conditions to ensure predicted noise levels are within the relevant 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. | | |
| **Decommissioning Phase** | | | | | |
| MM119 | Noise | EIAR Chapter 12 | Activities that occur during the decommissioning of the Proposed Project are unlikely to produce higher noise levels than those produced during construction and many of the activities will be similar in nature. As such it is considered that if construction noise levels are predicted to be below the threshold levels, then decommissioning noise will also be within the threshold levels. | | |
| **EIAR Chapter 13 Cultural Heritage** | | | | | |
| **Pre-construction Phase** | | | | | |
| MM120 | Features of Local Cultural Heritage Merit | **EIAR Chapter 13** | No upstanding features of local cultural heritage merit were identified within the Site therefore no direct impacts to same are anticipated | | |
| MM121 | Sub Surface Archaeological Potential | EIAR Chapter 13 | > Pre-development archaeological testing of the Proposed Project infrastructure in previously undisturbed greenfield areas of the Site will be carried under licence from the National Monuments Service. This is in order to identify any archaeological features at the earliest stage possible to allow time to deal with any requirements such as preservation in situ (redesign / avoidance) or preservation by record (archaeological excavation).<br>> A report on the testing will be compiled on completion of the work and submitted to the relevant authorities.<br>> Further mitigation such as preservation in situ (avoidance), preservation by record (excavation), buffer zones may be required depending on the results of the testing.<br>> Archaeological Monitoring of all groundworks during construction by a licensed archaeologist. | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | | > A report on the monitoring will be compiled on completion of the work and submitted to the relevant authorities.<br>> Further mitigation such as preservation in situ (avoidance), preservation by record (excavation), buffer zones may be required depending on the results of the monitoring. A buffer zone of 20m should be established around the outer extent of the crop mark, as visible on aerial photography, prior to the commencement of any construction works. The buffer should comprise fencing with keep out signage capable of lasting the duration of the construction phase of the Proposed Project. Further mitigation such as preservation in situ (avoidance), preservation by record (excavation), buffer zones may be required depending on the results of the monitoring. | | |
| **Construction Phase** | | | | | |
| MM122 | Recorded Monuments and Protected Structures | | > No ground works, storage of topsoil or movement of machinery will take place within the buffer.<br>> Service. This is in order to identify any archaeological features at the earliest stage possible in the project to allow time to deal with any requirements such as preservation in situ (redesign / avoidance) or preservation by record (archaeological excavation). Testing deemed necessary within forested areas may only be possible once clear-felling has taken place.<br>> A report on the testing will be compiled on completion of the work and submitted to the NMS and the Planning Authority.<br>> Further mitigation such as preservation in situ (avoidance), preservation by record (excavation), buffer zones may be required depending on the results of the testing.<br>> Archaeological monitoring of all groundworks during the construction stage of the Proposed Project by a licensed archaeologist.<br>> A report on the monitoring will be compiled on completion of the work and submitted to the NMS and the Planning Authority. | | |
| **Chapter 14 Landscape and Visual** | | | | | |
| **Pre-Commencement, Construction and Operation** | | | | | |
| MM123 | Landscape Effects | EIAR Chapter 14 | The following measures have been included in the Proposed Project design in order to avoid or reduce direct effects on landscape receptors of the Site: | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | | **Mitigation by Design:**<br><br>Wind Farm:<br><br>> Strategic siting of the proposed turbines on a flat site, reducing their visual prominence and visual effects in this relatively flat and heavily vegetated landscape. The proposed turbines are strategically sited within a modified working landscape where there is limited visibility from the wider study area and designated landscape and visual receptors of high sensitivity.<br>> The turbine layout has been designed to create a coherent arrangement of turbines, contiguous and connected to each other visually and with consistent spacing in line with the guidance for design and sitting of wind farms within Hilly and Flat Farmland Landscape Types in the Wind Energy Development Guidelines for Planning Authorities (Department of the Environment, Heritage, and Local Government (DoEHLG), 2006, (hereafter referred to as the '2006 WEDGs'), and regard to the Draft Revised Wind Energy Development Guidelines (Department of Housing, Planning and Local Government (DoHPLG, 2019) (hereafter referred to as the '2019 draft WEDGs').<br>> Siting of proposed turbines adheres to the minimum 500m set back distance in the current 2006 WEDGs and also the recommended 4 times tip height set back distance to third party properties, explicitly set out for residential visual amenity, prescribed by the 2019 draft WEDGs.<br>> The layout of the Proposed Project has been designed to ensure minimal loss of valuable landscape receptors and biodiversity corridors such as woodland and hedgerows along field boundaries, with the proposal to plant approximately 1.8 hectares of natural woodland within the Wind Farn Site along a segment of the Eastwood River. Please see Chapter 6 Biodiversity and Appendix 6-4 Biodiversity Management and Enhancement Plan for details.<br>Ancillary Infrastructure – Proposed Grid Connection , Met Mast, and Access Roads:<br>> Aside from two end masts, the intended connection to the national electricity grid is located underground, thereby eliminating the majority of potential landscape and visual effects during the operational phase. | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | | > The proposed 110 kV on site substation, along with other elements of the Proposed Grid Connection , including the lightening towers, are sited within an agricultural field, strategically sited over 100m from nearby receptors and will be further screened by hedgerows bordering the field and roadside vegetation, as well as vegetation surrounding nearby properties.<br>> The proposed end masts are located within a landscape of low sensitivity and appear only as additional towers within an existing electricity line.<br>> The internal site road layout makes use of the existing roads wherever possible, to minimise the requirement for new tracks within the Site.<br>> To minimise cut and fill activities required to construct the Proposed Project, the proposed access roads, and other infrastructure such as hardstands have been designed to align with the existing terrain within the landscape of the Site.<br>> In all circumstances, excavation depths and volumes will be minimised, and excavated material will be re-used where possible.<br>> During initial vegetation stripping, all topsoil material will be temporarily stored on the Site and used for 'dressing' the edges of the development infrastructure during reinstatement/regrading, including that of the spoil management areas and borrow pit. This will be particularly important in areas of cut and fill. The stripped topsoil will contain a natural seed source of local provenance and result in the re-establishment of baseline vegetation.<br>> The layout and design of the Proposed Project has been designed to ensure minimal loss of valuable landscape receptors and biodiversity corridors such as woodland and hedgerows along field boundaries. | | |
| **Chapter 15 Material Assets - Traffic** | | | | | |
| **Chapter 15 – Traffic** | | | | | |
| **Pre-Construction, Construction and Operation** | | | | | |
| MM124 | Traffic | EIAR Chapter 15 | **Mitigation by Design** | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | | The most appropriate delivery route to transport the wind turbine components to Site requiring the minimum remedial works to accommodate the vehicles was selected.<br><br>**Delivery of abnormal sized loads**<br><br>A detailed **Traffic Management Plan (TMP)**, incorporating all the mitigation measures set out in the TMP submitted as part of the CEMP, included as Appendix 4-3 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. The detailed TMP will include the following:<br><br>**Traffic Management Coordinator –** a competent Traffic Management Co-ordinator will be appointed for the duration of the construction of the Proposed Project and this person will be the main point of contact for all matters relating to traffic management.<br><br>**Delivery Programme –** a programme of deliveries will be submitted to Tipperary County Council and other relevant authorities in advance of deliveries of turbine components to the Site.<br><br>**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.<br><br>**A Pre and Post Construction Condition Survey –** A pre-condition survey of roads associated with the Proposed Project will be carried out prior to construction commencement to record the condition of the road. A post construction survey will be carried out after works are completed. Where required the timing of these surveys will be agreed with the local authority.<br><br>**Liaison with the relevant local authorities** - Liaison with the relevant local authorities including the roads sections of local authorities that the delivery routes traverse, and An Garda Siochana, | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | | during the delivery phase of the large turbine vehicles, when an escort for all convoys will be required.<br><br>**Implementation of temporary alterations to road network at critical junctions** – At locations where required highlighted in Section 15.2.9.<br><br>**Identification of delivery routes** – These routes will be agreed and adhered to by all contractors.<br><br>**Travel plan for construction workers to Site–** While the assessment above has assumed the worst case that construction workers will drive to the 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.<br><br>**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 junctions on the L-3248 and L-7039 and L-7039-1. 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 key junctions during peak delivery times.<br><br>**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.<br><br>**Additional measures** - Various additional measures will be put in place in order to minimise the effects of the development traffic on the surrounding road network including sweeping / cleaning of local roads as required.<br><br>**Re-instatement works** - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers. | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| **Chapter 15 Other Material Assets** | | | | | |
| **Pre-Construction** | | | | | |
| | Public Water Supply and Infrastructure | EIAR Chapter 15 | Prior to Grid Connection works, confirmatory surveys of the proposed route to confirm the presence services such as water supply will be undertaken. If encountered, the utility provider will be contacted to determine the requirement for specific excavation or relocation methods and to schedule a suitable time to carry out works. Any works undertaken will be carried out in accordance with the specifications of the relevant utility provider. | | |
| **Construction Phase** | | | | | |
| MM125 | Irish Rail | EIAR Chapter 15 | > Cognisance of requirements for third parties as set out in 'CCE Department Technical Guidance Document CCE-TMS-310 Guidance on Third Party Works' and 'CCE Departmental and Multidisciplinary Standard I-DEP-0121 Third Party Works: Additional Details of Railway Safety Requirements' will be adhered to.<br>> Contact will be made to IEDR 30 days prior to the works that will take place at a minimum of 20m northwest of CIE infrastructure. | | |
| MM126 | Overhead Lines | EIAR Chapter 15 | > Goal posts will be established under the 38kV overhead line for the entirety of the construction phase of the Proposed Project.<br>> The construction of the Proposed Grid Connection cable route will be in phases along the proposed grid route, to minimise the duration of outage whilst making the connection to the OHL.<br>> Prior to commencing Grid Connection works in the agricultural fields in the townlands of Strogue and Clonmore, goal posts will be established under the 110k overhead line for the remainder of the Grid Connection of the construction phase. The goal posts will not exceed a height of 4.2 metres, unless specifically agreed with ESB Networks<br>> The suitability of machinery and equipment for use near power lines will be risk assessed.<br>> 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. | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | | All contractors that may visit the sites are made aware of the location of lines before they come on to site.<br>> 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.<br>> When activities must be carried out beneath overhead lines, e.g., component delivery or end mast 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.<br>> Information on safe clearances will be provided to all staff and visitors.<br>> Signage indicating locations and health and safety measures regarding overhead lines will be erected in canteens and on site.<br>> 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.<br>> All health and safety measures as detailed in the Construction Environment Management Plan and Chapter 5 Population and Human Health will be adhered to during the construction, operation and decommissioning phases. | | |
| MM127 | Waste Management | EIAR Chapter 15 | > The CEMP includes a Waste Management Plan (WMP) which outlines the best practice procedures during the construction and decommissioning phases of the project.<br>> Waste management will be carried out in accordance with Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects (2021) produced by the EPA. The WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Project. Disposal of waste will be seen as a last resort.<br>> All hazardous wastes will be stored in bunded containers/areas before being collected by an authorised waste contractor and brought to an EPA licensed waste facility. Hazardous wastes will be kept separate from non-hazardous wastes that | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | | contamination does not occur. Please see the CEMP for best practise measures to prevent the creation of waste materials.<br>> All non-hazardous waste generated on-site by the Proposed Project will be contained in waste skips at a waste storage area on-site. This waste storage area will be kept tidy with skips clearly labelled to indicate the allowable material to be disposed of therein.<br>> The expected waste volumes generated on-site are unlikely to be large enough to warrant source segregation at the Site. Therefore, all waste streams generated on-site will be deposited into a single waste skip. This waste material will be transferred to a Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal.<br>> The waste generated from the turbine erection will be limited to the associated protective covers which are generally reusable. Considering the specialist nature of this packaging material the majority will be taken back by suppliers for their own reuse. Any other packaging waste generated from the turbine supply will be deposited into the on-site skips and subsequently transferred to the MRF.<br>> It is not envisaged that there will be any waste material arising from the materials used to construct the site roads as only the quantity of stone necessary will be sourced from local quarries and brought on site on an 'as needed' basis.<br>> Site personnel will be instructed at induction that under no circumstances can waste be brought to site for disposal in the on-site waste skip. It will also be made clear that the burning of waste material on-site is forbidden | | |
| | | | **Operational Phase** | | |
| MM128 | Irish Rail | EIAR Chapter 15 | > There will be no operational impact on properties (residential or other uses) as the ICNIRP guidelines will not be exceeded at any distances even directly above the cables.<br>> As illustrated in the ESB EMF booklet 2017 (section 15.3.5.2.2 below), EMF from 110kV underground cables diminishes quickly with distance from cable dropping from 4µT to 0.5µT at 10m away, reducing to almost 0µT at 20m.The proposed Grid Connection cable route will be sited at a minimum 20m from the railway track.<br>> Engagement with Irish Rail will continue during the operational phase. The implementation of a retranmsitter may be implemented at the Site if required, in agreement with Irish Rail. The French Study states that 95% approximately cases are | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | | settled amicably with the installation of a rebroadcaster by the wind developer, should any interference be detected. The 2006 WEDGs also acknowledges that wind turbines produce electromagnetic radiation which can interfere with communications but that '*electromagnetic interference can be overcome*' by installation of deflectors or repeaters. | | |
| MM129 | Telecommunications | EIAR Chapter 15 | > An Operator required buffer has been incorporated into the design for the link that passes through the Site, therefore no further mitigation measures during the operational phase are required.<br>> A signed protocol agreement between 2rn and the Developer can be found in Appendix 15-2. The protocol document ensures that in the event of any interference occurring to television or radio reception due to operation of the wind farm, the required measures, as set out in the document, will be carried out by the Developer to rectify this. The Protocol Document ensures that the appropriate mitigation is carried out in the event of unanticipated broadcast interference arising to television or radio reception as a result of the proposed Wind Farm. | | |
| MM130 | Aviation | EIAR Chapter 15 | > Notification will be given to the IAA Air Navigation Services Division( ANSD) of the intended crane erection at least thirty days in advance, as a crane operating at or above this height may constitute an obstacle to air navigation. The IAA ANSD can be contacted via airspace@iaa.ie.<br>> Electronic terrain and obstacle data (eTOD) in accordance with International Civil Aviation Organisation (ICAO) Annex 15 requirements which shall be surveyed by Ordnance Survey Ireland (OSi).<br>> The following will also be supplied:<br>> The WGS84 coordinates (In degrees, minutes and seconds) for each turbine<br>> Height above ground level (to blade tip) and elevation above mean sea level (to blade tip)<br>> Verification it's a standalone wind farm and provision of any alternative names.<br>> Horizontal extent (rotor diameter) of turbines and blade length where applicable<br>> Lighting of the wind farm, which turbine(s) is/are lit, and type of lighting. | | |
| MM131 | Waste Management | EIAR Chapter 15 | > General waste produced at welfare facilities will be removed from site by maintenance personnel for disposal at Eirgrid and Developer headquarters. | | |

| Ref. MM no. | Reference Heading | Reference Location | Mitigation Measure | Audit Result | Action Required |
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| | | | > All hazardous wastes from the maintenance of the turbines and substation (including transformers) will be stored securely in bunded containers/areas before being collected by an authorised waste contractor and brought to an EPA licensed waste facility.<br>> The wastewater holding tank at the substation will be emptied when required by a licenced contractor.<br>> Operational personnel will be instructed at induction that under no circumstances can waste be disposed of on-site. It will also be made clear that the burning of waste material on-site is forbidden | | |
| **Decommissioning** | | | | | |
| MM132 | Decommissioning | EIAR Chapter 15 | The measures outlined for the construction phase are considered the same for the decommissioning phase. | | |

## 18.3 EIAR Monitoring Measures

*Table 18-2 Schedule of Monitoring*

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

| Ref. No. | Reference Heading | Reference Location | Monitoring Measure | Frequency | Reporting Period | Responsibility |
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| | | | during the construction phase, no works shall be undertaken within a disturbance buffer in line with industry best practice (e.g. Forestry Commission Scotland, 2006; Ruddock and Whitfield, 2007). No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied. | | | |
| **Construction Phase** | | | | | | |
| MX5 | Health and Safety | EIAR Chapter 5, CEMP 5 | > The PSCS will monitor the compliance of contractors and others and take corrective action where necessary; and<br>> Notify the Authority and the client of non-compliance with any written directions issued.<br>> | Daily | Daily | PSCS |
| MX6 | Water Quality and Monitoring | EIAR Chapter 9 CEMP Section 4 | The effectiveness of drainage measures designed to minimise runoff entering works areas and capture and treat silt-laden water from the works areas, will be monitored continuously by the ECoW or supervising hydrologist on-site. The contractor is solely responsible for the implementation of the detailed drainage design on site. The ECoW is responsible for monitoring the effectiveness of the drainage design as it is implemented on-site. The ECoW or supervising hydrologist will respond to changing weather, ground or drainage conditions on the ground as the Proposed Project proceeds, to ensure the effectiveness of the drainage design is maintained in so far as is possible.<br><br>The drainage measures installed on-site should be inspected at least weekly by the contractor and maintained as required during the construction phase of the Proposed Project to ensure good performance. | Daily | As Necessary | ECoW |
| MX7 | Water Quality and Monitoring | EIAR Chapter 9 CEMP Section 4 | > 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; | Daily | As Necessary | ECoW |

| Ref. No. | Reference Heading | Reference Location | Monitoring Measure | Frequency | Reporting Period | Responsibility |
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| | | | > Water bowser movements will be carefully monitored to avoid, insofar as reasonably possible, increased runoff;<br>> Inspections to include all elements of drainage infrastructure to ensure the system is operating correctly and to identify and maintenance that is required. Any changes, such as discolouration, odour, oily sheen or litter will be noted, and corrective action will be implemented. High risk locations such as settlement ponds will be inspected daily. Daily inspections checks will be completed on plant and equipment, and whether materials such as straw bales or oil absorbent materials need replacement;<br>> Event based inspections by the ECoW as follows:<br>> >10 mm/hr (i.e. high intensity localised rainfall event);<br>> >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or,<br>> Rainfall depth greater than monthly average in 7 days (prolonged heavy rainfall over a week).<br>> Monthly site inspections by the Project Hydrologist/ ECoW during construction phase | | | |
| MX8 | Turbidity Monitoring | EIAR Chapter 9 CEMP Section 4 | > Turbidity monitors or sondes can be installed where required at locations surrounding the Site. The sondes will provide continuous readings for turbidity levels in the watercourse | | | |

| Ref. No. | Reference Heading | Reference Location | Monitoring Measure | Frequency | Reporting Period | Responsibility |
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| MX9 | Reactive Site Drainage Management | EIAR Chapter 9 CEMP Section 4 | The effectiveness of drainage measures designed to minimise runoff entering works areas and capture and treat silt-laden water from the works areas, will be monitored continuously by the Environmental Clerk of Works (ECoW) or supervising hydrologist on-site. The ECoW or supervising hydrologist will respond to changing weather, ground or drainage conditions on the ground as the project proceeds, to ensure the effectiveness of the drainage design is maintained in so far as is possible. This may require the installation of additional check dams; interceptor drains or swales as deemed necessary on-site. The drainage design may have to be modified on the ground as necessary, and the modifications will draw on the various features outlined above in whatever combinations are deemed to be most appropriate to situation on the ground as a particular time.<br><br>In the event that works are giving rise to siltation of watercourses, the ECoW or supervising hydrologist will stop all works in the immediate area around where the siltation is evident. The source of the siltation will be identified and additional drainage measures such as those outlined above will be installed in advance of works recommencing. | Daily | Daily | ECoW |
| MX10 | Water Quality and Monitoring | EIAR Chapter 9 | Daily surface water monitoring forms will be utilised at every works site near any watercourse. These will be taken daily and kept on site for record and inspection. | Daily | As Necessary | ECoW |
| MX11 | Surface Water Quality | EIAR Chapter 9 CEMP Section 4 | Baseline water quality field testing and laboratory analysis will be undertaken where required prior to commencement of felling and construction at the site. The baseline monitoring programme will be subject to agreement with Tipperary County Council.<br><br>Analysis will be for a range of parameters with relevant regulatory limits along with Environmental Quality Standards (EQSs) and sampling will be undertaken at designated locations as outlined in Figure 9-5 of the EIAR. | As Required | Monthly | ECoW |

| Ref. No. | Reference Heading | Reference Location | Monitoring Measure | Frequency | Reporting Period | Responsibility |
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| | | | Baseline sampling will be completed on at least two occasions, and these should coincide with low flow and high flow stream conditions. The high flow sampling event will be undertaken after a period of sustained rainfall, and the low flow event will be undertaken after a dry spell.<br><br>Daily monitoring of excavations by a suitably qualified person will occur during the construction phase. If high levels of seepage inflow occur, excavation work should immediately be stopped, and a geotechnical assessment undertaken. | | | |
| MX12 | | | Daily monitoring of excavations by a suitably qualified person will occur during the construction phase. If high levels of seepage inflow occur, excavation work should immediately be stopped, and a geotechnical assessment undertaken. | Daily | | ECoW/Hydrologist |
| MX13 | Tree Felling | EIAR Chapter 9 | Checking and maintenance of roads and culverts will be on-going through any felling operation. No tracking of vehicle through watercourses will occur, as vehicles will use road infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during felling works.<br><br>Also, daily surface water monitoring forms (for visual inspections and field chemistry measurements) will also be utilised at every works site near any watercourse. These will be taken daily and kept on site for record and inspection. | As Required | Monthly | ECoW |
| MX14 | Plant and Equipment Inspections | EIAR Chapter 9 | The plant used will be regularly inspected for leaks and fitness for purpose. | As Required | Monthly | ECoW |

| Ref. No. | Reference Heading | Reference Location | Monitoring Measure | Frequency | Reporting Period | Responsibility |
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| | | CEMP Section 4 | | | | |
| MX15 | Traffic and Transport | CEMP Section 3 | The designated public roads outside the site and along the main transport routes to the site will be regularly inspected by the ECoW for cleanliness, and cleaned as necessary; | Daily | Monthly | ECoW |
| MX16 | Biodiversity | CEMP Section 4 | A Project Ecologist will be appointed. The responsibilities and duties of the Project Ecologist will include the following:<br>> Undertake a pre-construction transect/walkover bird survey to ensure that significant effects on breeding birds will be avoided.<br>> Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Proposed Project area.<br>> Oversee management of ornithological and ecological issues during the construction period and advise on ornithological issues as they arise.<br>> Provide guidance to contractors to ensure legal compliance with respect to protected species onsite.<br>> An Ecologist will monitor the one-way exclusion gates established at any badger sett discovered during pre-construction surveys that are within 50m of excavation works. The gates will be checked every 3 to 5 days during the 21-day period to ensure badgers do not succeed in re-entering the sett.<br>> Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress. | As required | As required | Project Ecologist |
| MX17 | Spoil Management | EIAR Chapter 4, CEMP Section 2 | Inspections of the spoil management areas will be made by a Geotechnical Engineer through regular monitoring of the works. The appointed contractor will review work practices at spoil management areas when periods of heavy rainfall are expected so as to prevent excessive dirty water runoff from being generated. | As required | As required | Geotechnical Engineer |

| Ref. No. | Reference Heading | Reference Location | Monitoring Measure | Frequency | Reporting Period | Responsibility |
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| MX18 | Archaeological Monitoring | EIAR Chapter 13 | > Archaeological Monitoring of all groundworks during construction by a licensed archaeologist.<br>> A report on the monitoring should be compiled on completion of the work and submitted to the relevant authorities.<br>> Further mitigation such as preservation in situ (avoidance), preservation by record (excavation) may be required depending on the results of the monitoring.<br>> 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. | As Required | As Required | Project Archaeologist |
| **Operational Phase** | | | | | | |
| MX19 | Surface Water Quality | CEMP Section 4 | > Monthly water sampling and laboratory analysis will be undertaken for the first six months during the operational phase.<br>> Quarterly site inspections by the Project Hydrologist/ ECoW after construction for a period of one year following the construction phase | Monthly | Monthly | ECoW |
| MX20 | Drainage Inspections | CEMP Section 4 | The drainage system will be monitored in the operational phase until such a time that all areas that have been reinstated become re-vegetated and the natural drainage regime has been restored. | Monthly | Monthly | ECoW |
| MX21 | Bats | EIAR Chapter 6<br><br>Appendix 6-2 | At least 3 years of post-construction monitoring is proposed. Post-construction monitoring will include static detector surveys, walked survey transects and corpse searching to record any bat fatalities resulting from collision. | Years 1, 2, 3 | Annually | Project Ecologist |

| Ref. No. | Reference Heading | Reference Location | Monitoring Measure | Frequency | Reporting Period | Responsibility |
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| | | Appendix 6-4 BMEP | Results of Year 1 surveys will assess whether adaptations to the monitoring plan are required, and further mitigations such as curtailment will be considered. See Appendix 6-2 for the Bat Monitoring Plan.<br><br>**Bat Boxes**<br><br>> 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. Monitoring will be carried out a suitable time of year (i.e. Sept/Oct) to ensure no disturbance to any roosting bats, particularly in the case of a Maternity Roost.<br>> Evidence or presence of nesting birds will be flagged and removed outside the bird nesting season. If a bird nest is found, a secondary bat roosting source must be erected to replace the bat roosting source lost.<br>> 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.<br>> Monitoring results will be reported after each monitoring instance with any criteria failures identified and corrective actions implemented. | | | |
| MX22 | Biodiversity | EIAR Chapter 6<br><br>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. | As required. | As required. | Project Ecologist |

| Ref. No. | Reference Heading | Reference Location | Monitoring Measure | Frequency | Reporting Period | Responsibility |
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| | | | **Woodland Replanting:**<br>> To confirm that habitat creation and enhancement has been successful the above outlined woodland replanting scheme will be monitored by a qualified ecologist after 6 months of planting and then annually for the first 5 years.<br>> The monitoring proposed requires the Project Ecologist to conduct inspections and relevés of the planting area at the above outlined temporal intervals following the main growing season (i.e. in September).<br>> These inspections and relevés will be recorded and entered into a monitoring report.<br>> Monitoring will be undertaken in partnership between the developer, the Project Ecologist and the Landowner. The proposed management actions will be conveyed to the developer and the relevant landowner, and management alterations implemented as required to achieve the targets of the management plan.<br>> At the end of the 5-year monitoring plan, the Project Ecologist will assess the need for, and frequency of, further monitoring of the woodland replanting area in agreement with the wind farm operator. | 6 months, Year 1-5 | Annually | Project Ecologist |
| | | | **Linear Habitat Replanting:**<br>> Hedgerows and replanted trees will be inspected following the main growing season (i.e. in September) for the first five years of growth, where the requirement for replacement planting will be assessed. If any shrubs are dead or damaged, these will be replaced using the same species within the next planting season.<br>> Recommendations for ongoing or remedial management required will be specified within an Environmental and Ecological Report, produced by a suitably experienced | September of Year 1-5 | Annually | Project Ecologist |

| Ref. No. | Reference Heading | Reference Location | Monitoring Measure | Frequency | Reporting Period | Responsibility |
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| | | | ecologist, with any criteria failures identified and corrective actions implemented.<br>> Monitoring results will be reported after each growing season.<br><br>**Pine Marten Den Boxes**<br><br>> Monitoring of den boxes will take place yearly after installation of the Pine Marten Den Boxes for the first three years of the operational Proposed Wind Farm. The results of the first three years of monitoring will inform the need for and frequency of further monitoring and maintenance of the Pine Marten Den Boxes, to be reviewed by the Project Ecologist and agreed with the wind farm operator. Monitoring should be carried out using non-invasive methods where possible.<br>> Monitoring results will be reported after each monitoring instance. 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 will be prepared<br><br>**River Restoration**<br><br>A minimum of two bankfull flow events will be documented during the 5-year monitoring period. If less than two bankfull events occur during the first 5 years, annual monitoring will continue until the second bankfull event is documented. The bankfull events must occur during separate monitoring years.<br><br>Monitoring data collected will include the following:<br><br>> reference photos (twice yearly – summer and winter)<br>> plant survival analysis | Year 1-3 | Annually | Project Ecologist |

| Ref. No. | Reference Heading | Reference Location | Monitoring Measure | Frequency | Reporting Period | Responsibility |
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| | | | › channel stability analysis<br><br>Yearly data will be collected during the same season. Photo documentation will be required twice a year, once in the summer and again in the winter. The monitoring events will be conducted at the same time of year during mid-growing season. The monitoring report will be prepared and will include photographs, vegetation survival counts, stream stability documentation, and a narrative describing current site conditions. Photographs will be taken from no fewer than four established monitoring positions. The exact locations will be determined, marked with a stake, and recorded with a GPS receiver in the field during the first monitoring event and used in each of the following monitoring events.<br><br>Vegetation survival counts will be collected from established plots within each monitored area. The plot locations will be randomly determined in the office using GIS. The plots for stream restoration sites extend from the toe of bank to the furthest edge of the outside planting zone. The total area of plots is equal to 10% of the specific restoration site. The vegetation monitoring plots for the project will total 1,800 square metres, with 900 square metres on the left bank and 900 square metres on the right bank. Within these vegetation plots, all planted vegetation will be counted, identified to the species level, and survival rate will be calculated. | | | |
| MX23 | Ornithology | EIAR Chapter 7<br><br>Appendix 7-8<br>Appendix 6-4 BMEP | The programme of works will monitor parameters associated with collision, displacement/barrier effects and habituation during the operational phase of the Proposed Project. Surveys will be scheduled to coincide with Years 1-5. At the end of this period, the results will be reviewed in consultation with the National Parks and Wildlife Service and future monitoring needs and gaps will be identified to determine the frequency of monitoring in subsequent years of the lifetime of the wind farm. Monitoring measures are broadly based on | Years 1-5 followed by a Review. | Monthly | Project Ornithologist |

| Ref. No. | Reference Heading | Reference Location | Monitoring Measure | Frequency | Reporting Period | Responsibility |
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| | | Appendix 7-7 | guidelines issued by SNH (2009). The following individual components are proposed:<br><br>> Vantage point surveys to monitor flight activity in the vicinity of the turbines;<br>> Breeding walkover surveys to monitor breeding bird activity at the Site;<br>Collision monitoring, including carcass searches with trained dogs to monitor bird fatalities due to collision. These will include searcher efficiency and scavenger removal trails as a best practice measure.<br><br>**Bird Mitigation Plan:**<br>All of the mitigation fields will be monitored and evaluated each year. Monitoring will comprise:<br>> A field inspection;<br>> Monitoring adherence to the Growing Schedule;<br>> Assessment of the Growing Schedule;<br>> Reporting.<br><br>The mitigation fields will be visited by the overseeing environmental scientist, ornithologist or ecologist each year of operation to assess the habitat for its suitability for and attractiveness to lapwing and golden plover. Four visits will be undertaken between October and March. The first visit will be in October to ensure that the sward is at an appropriate height at the beginning of the winter season. Please see Appendix 7-7 and 7-8 for details | | | |
| MX24 | Noise and Vibration | Chapter 12 | An operational noise survey will be undertaken to ensure compliance with any noise conditions applied to the development. It is common practice to commence surveys within six months of the Proposed Wind Farm being commissioned. If an exceedance of the noise criteria is identified as part of the commissioning assessment, the guidance outlined in the IOA GPG, specifically Supplementary Guidance Note 5: Post Completion Measurements (July 2014) will be | Once within six months | As required | Noise Consultant |

| Ref. No. | Reference Heading | Reference Location | Monitoring Measure | Frequency | Reporting Period | Responsibility |
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| | | | followed, and relevant corrective actions taken. For example, implementation of noise reduced operational modes resulting in curtailment of turbine operation can be implemented for specific turbines in specific wind conditions to ensure predicted noise levels are within the relevant 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. | | | |
| **Decommissioning Phase** | | | | | | |
| | 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 updated prior to the end of the operational period in line with decommissioning methodologies that may exist at the time and will agree with the competent authority at that time | End of operational life | As required | Developer/ Appointed Contractor |
| MX25 | Decommissioning | DP Section 3 | The Site Manager in consultation with the ECoW will be responsible for employing the services of a suitably qualified ecologist and any other suitably qualified professionals as required throughout the decommissioning works. | As required | As required | Site Manager |
| MX26 | Decommissioning | DP Section 3 | Prior to decommissioning, a suitably qualified ecologist will complete an invasive species survey of any material proposed for use as part of foundation backfilling. | As required | As required | Project Ecologist |
| MX27 | Decommissioning | DP Section 7 | Decommissioning monitoring surveys will be undertaken prior to works associated with decommissioning at the wind farm. The survey will include a thorough walkover survey to a 500m radius of the Proposed Project footprint and all works areas, where access allows. If winter roosting or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring at the beginning of the first winter or breeding season of the decommissioning phase. If it is found to be active during the decommissioning phase, no works shall be | As required | As required | Project Ornithologist |

| Ref. No. | Reference Heading | Reference Location | Monitoring Measure | Frequency | Reporting Period | Responsibility |
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| | | | undertaken within a disturbance buffer (Forestry Commission Scotland, 2006; Ruddock and Whitfield, 2007) in line with industry best practice. No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied. | | | |