Planning and Environmental Consultants

Environmental Impact Assessment Report (EIAR)

Killoshulan Wind Farm

Chapter 18 – Schedule of Mitigation and Monitoring Measures



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18. SCHEDULE OF MITIGATION & MONITORING PROPOSALS

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 Proposed Project are presented in Table 18-1 below. The mitigation measures have been grouped together according to their EIAR Chapter and Proposed Project phase and are presented under the following headings:

- Pre-Construction Phase
- Construction Phase
- Operational Phase
- Decommissioning Phase

The mitigation proposals in the below format provides an easy to audit list that can be reviewed and reported on during each phase of the Proposed Project. The proposals for site inspections and environmental audits are set out in the Construction and Environmental Management Plan (CEMP) which is included as Appendix 4-5 of this EIAR. The tabular format in which the below information is presented, can be further expanded upon during each Proposed Project phase to provide a reporting template for site compliance audits.

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

18.1 EIAR Mitigation Measures

Table 18-1 Schedule of Mitigation

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
Ch. 4: Description of the Proposed Project – Description of the Proposed Project					
Pre-Construction Phase					
MM1	Environmental Management	Ch. 4: Description of the Proposed Project	› All proposed activities on the site of the Proposed Project will be provided for in an environmental management plan. › The CEMP includes details sets out details of the environmental controls to be implemented on site, site drainage measures and a waste management plan. The CEMP also outlines the Emergency Response Procedure to be adopted in the event of an emergency in terms of site health and safety and environmental protection. In the event planning permission is granted for the Proposed Project, the CEMP will be updated prior to the commencement of the development, to address the requirements of any relevant planning conditions, including any additional mitigation measures which are conditioned and will be submitted to the Planning Authority for written approval		
MM2	Cement Based Deliveries	Ch. 4: Description of the Proposed Project Appendix 4-5: Surface Water Management Plan	› 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; › 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.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM3	Pre-Construction Drainage	Appendix 4-5: Surface Water Management Plan CEMP Section 3	› Prior to commencement of works in sub-catchments across the Site, main drain inspections will be completed to ensure ditches and streams are free from debris and blockages that may impede drainage. It is proposed to complete these inspections on a catchment-by-catchment basis as the construction works develop across the site, as works in all areas will not commence simultaneously. › Drainage and associated pollution control measures will be implemented on-site 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 › The routes of any natural drainage features will not be altered as part of the Proposed Project. Turbine locations have been selected to avoid natural watercourses. 3 no. new watercourse crossing are proposed within the Proposed Wind Farm site. Culvert upgrades at forestry drain crossings are also proposed. › There will be no direct discharges to natural watercourses. All discharges from the proposed works areas or from interceptor drains will be made over vegetated ground at an appropriate distance from natural watercourse and lakes. Buffer zones around the existing natural drainage features have informed the layout of the Proposed Project and are indicated on the drainage design drawings. › Where artificial drains are currently in place in the vicinity of proposed works areas, these drains may have to be diverted around the proposed works areas to minimise the amount of water in the vicinity of works areas. Where it may not be possible to divert artificial drains around proposed work areas, the drains will be blocked to ensure sediment laden water from the works areas has no direct route to other watercourses. Where drains have to be blocked, the blocking will only take place after an alternative drainage system to handle the same water has been put in place. › Existing artificial drains in the vicinity of existing site roads will be maintained in their present location where possible. If it is expected that these artificial drains will receive drainage water from works areas, check dams will be added (as specified below) to control flows and sediment loads in these existing artificial drains. If road widening or		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			improvement works are necessary along the existing roads, where possible, the works will take place on the opposite side of the road to the drain. › Along the Proposed 110kV Underground Cabling route there are 6 no. watercourse crossings, which includes natural stream/rivers and drains. No in-stream works are proposed at any of the 6 no. crossings where works are required to accommodate the Proposed 110kV Underground Cable.		
MM4	Watercourse Inspection	Ch. 4: Description of the Proposed Project CEMP Section 2	› Confirmatory inspections of the proposed new no. 3 watercourse crossing locations will be carried out by the Project Civil/Structural Engineer and the Project Hydrologist prior to the construction of the crossing.		
MM5	Drainage Maintenance	Ch. 9: Water Appendix 4-5: Surface Water Management Plan	› Any excess build-up of silt levels at check dams, the settlement ponds, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed.		
MM6	Earthworks	Appendix 4-5: Surface Water Management Plan CEMP Section 3	› Drainage and associated pollution control measures will be implemented on-site 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.		
MM7	Forestry Felling Drainage Measures	Ch. 4: Description of the Proposed Project Ch. 9: Water CEMP Section 3	› Before the commencement of any felling works, an Environmental Clerk of Works (ECoW) will be appointed to oversee the felling and extraction works. The ECoW will have the following functions: › Attend the site for the setup period when drainage protection works are being installed and be present on site during the remainder of the forestry felling works. › Prior to the commencement of works, review and agree the positioning by the Operator of the required Aquatic Buffer Zones (ABZs), silt traps, silt fencing (see		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			below), water crossings and on-site storage facilities for fuel, oil and chemicals (see further below). › Be responsible for preparing and delivering the Environmental Tool Box Talk (TBT) to all relevant parties involved in site operations, prior to the commencement of the works. › Conduct daily and weekly inspections of all water protection measures and visually assess their integrity and effectiveness. › Take representative photographs showing the progress of operation on-site, and the integrity and effectiveness of the water protection measures. › Collect water samples for analysis by a 3rd party accredited laboratory, adhering to the following requirements: › Surface water samples shall be collected upstream and downstream of the keyhole felling site at suitable sampling locations. › Sampling shall be taken from the stream / river bank, with no in-stream access permitted. › The following minimum analytical suite shall be used: pH, Electrical Conductivity, Total Suspended Solids, Biochemical Oxygen Demand, Total Phosphorus, Ortho-Phosphate, Total Nitrogen, and Ammonia. › Review of operator's records for plant inspections, evidence of contamination and leaks, and drainage checks made after extreme weather conditions. › Prepare and maintain a contingency plan. › Suspend work where potential risk to water from siltation and pollution is identified, or where operational methods and mitigation measures are not specified or agreed. › Prepare and maintain a Water Protection Measure Register. This document is to be updated weekly by the ECoW. › All relevant measures set out in the most recent versions of the Forestry & Water Quality Guidelines, Forest Harvesting & the Environment Guidelines and the Forest Protection Guidelines will apply. In particular, to protect watercourses, the following measures will be adhered to during all /tree felling activities. › Works will be overseen by an ECoW as described above.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			➢ The extent of all necessary tree felling will be identified and demarcated with markings on the ground in advance of any felling commencing. ➢ All roads and culverts will be inspected prior to any machinery being brought on site to commence the felling operation. No tracking of vehicles through watercourses will occur. Vehicles will only use existing road infrastructure and established watercourse crossings. ➢ Existing drains that drain an area to be felled towards surface watercourses will be blocked, and temporary silt traps will be constructed to ensure collection of all silt within felling areas. These temporary silt traps will be cleaned out and backfilled once felling works are complete. This ensures there is no residual collected silt remaining in blocked drains after felling works are completed. No direct discharge of such drains to watercourses will occur from within felling areas. ➢ New collector drains and sediment traps will be installed during ground preparation to intercept water upgradient of felling areas and divert it away. Collector drains will be excavated at an acute angle to the contour (0.3%-3% gradient), to minimise flow velocities. ➢ All silt traps will be sited outside of buffer zones and have no direct outflow into the aquatic zone. Machine access will be maintained to enable the accumulated sediment to be excavated. Sediment will be carefully disposed of away from all aquatic zones. ➢ Where felling is required inside the buffers, silt fences will be installed around existing watercourses. Silt fences will be installed as single, double or a series of triple silt fences, depending on the space available and the anticipated sediment loading. ➢ All new collector drains will taper out before entering the aquatic buffer zone to ensure the discharging water gently fans out over the buffer zone before entering the aquatic zone. ➢ Machine combinations, such as mechanical harvesters or chainsaw felling, will be chosen which are most suitable for ground conditions at the time of felling, and which will minimise soils disturbance; ➢ Mechanised operations will be suspended during and immediately after heavy rainfall. ➢ Where brash is required to form brash mats, it will be laid out at harvesting stage to prevent soil disturbance by machine movement.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Brash which has not been pushed into the soil will be moved within the Site to facilitate the creation of mats in more demanding locations. › Felling of trees will be pointed directionally away from watercourses. › Felling will be planned to minimise the number of machine passes in any one area. › Extraction routes, and hence brash mats, will be aligned parallel to the ground contours where possible. › Harvested timber will be stacked in dry areas, and outside any 50-metre watercourse buffer zone. Straw bales and check dams will be emplaced on the down gradient side of timber storage sites. › 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 removing of natural debris deflectors will be avoided.		
MM8	Felling License	Ch. 4: Description of the Proposed Project CEMP Section 2	› The commercial forestry felling activities required as part of the Proposed Project will be the subject of a Felling Licence application to the Forest Service, in accordance with the Forestry Act 2014, the Forestry Regulations 2017 (SI 191/2017) and as per the Forest Service's policy on granting felling licenses for wind farm developments. The policy requires that a copy of the planning permission for the wind farm be submitted with the felling licence applications; therefore, the felling licenses cannot be applied for until such time as planning permission is obtained for the Proposed Project.		
MM9	Traffic Management	Ch. 4: Description of the Proposed Project Ch. 15: Material Assets CEMP Section 3	› In the event planning permission is granted for the Proposed Project, the Traffic Management Plan will address the requirements of any relevant planning conditions, including any additional mitigation measures, should they be conditioned. Traffic management measures included the following: › Identification of a delivery schedule › Details of the alterations required to the infrastructure and any other minor alteration identified; › A dry run of the route using vehicles with similar dimensions.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› The deliveries of turbine components to the site will be made in convoys of five vehicles at a time, and at night when roads are quietest. › Convoys will be accompanied by escorts at the front and rear operating a "stop and go" system. Although the turbine delivery vehicles are large, they will not prevent other road users or emergency vehicles passing, should the need arise. › The delivery escort vehicles will ensure the turbine transport is carried out in a safe and efficient manner with minimal delay or inconvenience for other road users. › It is not anticipated that any section of the public road network will be closed during transport of turbines, although there will be some delays to local traffic at pinch points. During these periods it may be necessary to operate local diversions for through traffic. All deliveries comprising abnormally large loads where required will be made outside the normal peak traffic periods, at night, to avoid disruption to work and school-related traffic. › A full dry run of the transport operation along the proposed route will be completed using vehicles with attachments to simulate the dimensions of the wind turbine transportation vehicles. This dry run will inform the Traffic Management Plan submitted for agreement with Kilkenny County Council. › All turbine deliveries will be provided for in the Transport Management Plan which will be finalised in advance of the construction stage, when the exact transport arrangements are known, delivery dates confirmed and escort proposals in place. The finalised Transport Management Plan will be submitted to the Planning Authority for agreement in advance of any abnormal loads using the local roads, and will provide for all necessary safety measures, including a convoy and Garda escort as required, off-peak turning/reversing movements and any necessary safety controls.		
MM10	Waste Management	Ch. 4: Description of the Proposed Project CEMP Section 3.8	› Prior to the commencement of the development a Construction Waste Manager will be appointed by the Contractor. The Construction Waste Manager will be in charge of the implementation of the objectives of the plan, ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy is adhered to. The person nominated must have sufficient authority so that		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			they can ensure everyone working on the development adheres to the management plan		
			Construction Phase		
MM11	Refuelling	Ch. 4: Description of the Proposed Project Ch.9: Water CEMP Section 3 Appendix 4-5: Surface Water Management Plan	› Wherever possible, vehicles will be refuelled off-site, particularly for regular road-going vehicles. On-site refuelling of machinery will be carried out at designated refuelling areas at the temporary construction compounds. › 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. › 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. The following mitigation measures are proposed to avoid release of hydrocarbons at the site: › All plant will be inspected and certified to ensure that they are leak free and in good working order prior to use at the site. › Fuels stored on site will be minimised. › On-site refuelling will be carried out by trained personnel only; › All refuelling will be carried out outside of the designated hydrological buffer zones; › Mobile measures such as dip trays and fuel absorbent mats will be used during refuelling operations as required; › All plant and machinery will be equipped with fuel absorbent material and pads to deal with any accidental spillage; › The electrical substation compound will be bunded appropriately to 110% of the volume of oils that will be stored, and to prevent leakage of any associated chemicals to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor;		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Spill kits will be available to deal with any accidental spillage in and outside the re-fuelling area. › An emergency plan for the construction phase to deal with accidental spillages will be developed (refer to Section 6 of this CEMP); › All hazardous wastes will be stored in bunded containers/areas before being collected by an authorised waste contractor and brought to an EPA licensed waste facility; › Hazardous wastes will be kept separate from non-hazardous wastes so that contamination does not occur.		
MM12	Cement Based Products Deliveries and Management	Ch. 4: Description of the Proposed Project	› Only ready-mixed concrete will be used during the construction phase, with all concrete being delivered from local batching plants in sealed concrete delivery trucks. › The use of ready-mixed concrete deliveries will eliminate any potential environmental risks of on-site batching. › When concrete is delivered to site, only the chute of the delivery truck will be cleaned, using the smallest volume of water necessary, before leaving the site. › Chute cleaning water will be isolated in temporary lined wash-out pits located near the Proposed Wind Farm site entrance. These temporary lined wash-out pits will be removed from the Proposed Wind Farm site at the end of the construction phase. Concrete trucks will be washed out fully at the batching plant, where facilities are already in place. The risks of pollution arising from concrete deliveries will be further reduced by the following: › When concrete is delivered to the Site, only the chute of the delivery truck will be cleaned, using the smallest volume of water necessary, before leaving the Site. › Concrete trucks will not be washed out on the site but will be directed back to their batching plant for washout. › Site roads will be constructed to a high standard to allow transport of the turbine components around the Site, and hence, concrete delivery trucks will be able to access all areas where the concrete will be needed. No concrete will be transported around the Site in open trailers or dumpers so as to avoid spillage while in transport.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			All concrete used in the construction of turbine bases will be pumped directly into the shuttered formwork from the delivery truck. If this is not practical, the concrete will be pumped from the delivery truck into a hydraulic concrete pump or into the bucket of an excavator, which will transfer the concrete to the location where it is needed. › The arrangements for concrete deliveries to the Site will be discussed with suppliers before work starts, confirming routes, prohibiting on-site washout and discussing emergency procedures. › Clearly visible signage will be placed in prominent locations close to concrete pour areas specifically stating washout of concrete lorries is not permitted on the Site.		
MM13	Concrete Pouring	Ch. 4: Description of the Proposed Project Appendix 4-5: Surface Water Management Plan	› Using weather forecasting to assist in planning large concrete pours and avoiding large pours where prolonged periods of heavy rain is forecast. › Restricting concrete pumps and machine buckets from slewing over watercourses while placing concrete. › Ensuring that excavations are sufficiently dewatered before concreting begins and that dewatering continues while concrete sets. › Ensuring that covers are available for freshly placed concrete to avoid the surface washing away in heavy rain. › The small volume of water that will be generated from washing of the concrete lorry's chute will be directed into a temporary lined impermeable containment area, or a Siltbuster-type concrete wash unit (https://www.siltbuster.co.uk/sb_prod/siltbuster-roadside-concrete-washout-rcw/) or equivalent › Disposing of surplus concrete after completion of a pour in suitable off-site locations away from any watercourse or sensitive habitats.		
MM14	Road Cleanliness	Ch. 4: Description of the Proposed Project CEMP Section 3	› It is not anticipated that vehicle or wheel washing will be required as part of the construction phase of the Proposed Project because site roads will be already formed using on-site materials before other road-going trucks begin to make regular or frequent deliveries to the site (e.g. with steel or concrete). A road sweeper will be available if any section of the public roads were to be dirtied by trucks associated with the Proposed Project.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM15	Existing Drainage Features	Ch. 4: Description of the Proposed Project Appendix 4-5: Surface Water Management Plan CEMP Section 3	› 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. The distance will vary between 5-20m depending on local slope, the nature of local soil deposits and also the type of vegetation present. Buffer zones around the existing natural drainage features have been used to inform the layout of the Proposed Project. › Minimum buffer zones of 50m around the existing natural drainage features have informed the layout of the Proposed Wind Farm. › Where artificial drains are currently in place in the vicinity of proposed works areas, these drains may have to be diverted around the proposed works areas to minimise the amount of water in the vicinity of works areas. › Where it may not be possible to divert artificial drains around proposed work areas, the drains will be blocked to ensure sediment laden water from the works areas has no direct route to other watercourses. › Where drains have to be blocked, the blocking will only take place after an alternative drainage system to handle the same water has been put in place. Existing artificial drains in the vicinity of existing site roads will be maintained in their present location where possible. › If it is expected that these artificial drains will receive drainage water from works areas, check dams will be added (as specified below) to control flows and sediment loads in these existing artificial drains. › If road widening or improvement works are necessary along the existing roads, where possible, the works will take place on the opposite side of the road to the drain.		
MM16	Surface Water Drainage Measures	Appendix 4-5: Surface Water Management Plan	<u>Interceptor Drains</u> › Interceptor drains will be installed upgradient of any works areas to collect surface flow runoff and prevent it reaching excavations and construction areas of the Site		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			where it might otherwise have come into contact with exposed surfaces and picked up silt and sediment. The drains will be used to divert upslope runoff around the works area to a location where it can be redistributed over the ground surface as sheet flow. This will minimise the volume of potentially silty runoff to be managed within the construction area. Drainage Swales › Drainage swales (or collector drains) are shallow drains that will be used to intercept and collect run off from construction areas of the Site during the construction phase. › Drainage swales will remain in place to collect runoff from roads and hardstanding areas of the Proposed Project during the operational phase and channel it to infiltration area for sediment settling. › 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. › The velocity of flow in the interceptor drains and drainage swales, particularly on sloped sections of the channel, will be controlled by check dams, which will be installed at regular intervals along the drains to ensure flow in the swale is non-erosive. Check dams will also be installed in some existing artificial drainage channels that will receive waters from works areas of the Site. Level Spreaders › 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		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			locations where they will not contribute further to water ingress to construction areas of the Site. › The water carried in interceptor drains will not have come in contact with works areas of the Site and therefore should be free of silt and sediment. The level spreaders will distribute clean drainage water onto vegetated areas where the water will not be reconcentrated into a flow channel immediately below the point of discharge. The discharge point will be on level or only very gently sloping ground rather than on a steep slope so as to prevent erosion. › Clean four-inch stone can be placed on the outside of the spreader lip and pressed into the ground mechanically to further dissipate the flow leaving the level spreader over a larger area. <u>Vegetation Filters</u> › Vegetation filters are the existing vegetated areas of land that will be used to accept surface water runoff from upgradient areas. The selection of suitable areas to use as vegetation filters will be determined by the size of the contributing catchment, slope and ground conditions. › Vegetation filters will carry outflow from the level spreaders as overland sheet flow, removing any suspended solids and discharging to the groundwater system by diffuse infiltration. › Vegetation filters will not be used in isolation for waters that are likely to have higher silt loadings. In such cases, silt-bearing water will already have passed through stilling ponds prior to diffuse discharge to the vegetation filters via a level spreader. <u>Stilling and Settlement Ponds</u> › Stilling or settlement ponds will be used to attenuate runoff from works areas of the site of the Proposed Project during the construction phase and will remain in place to		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			handle runoff from roads and hardstanding areas of the Proposed Project during the operational phase › The embankment that forms the sloped sides of the stilling ponds will be stabilised with vegetated turves, which will have been removed during the excavation of the stilling ponds area. › Stilling ponds will be located towards the end of swales, close to where the water will be reconverted to diffuse sheet flow. Upon exiting the stilling pond system, water will be immediately reconverted to diffuse flow via a fan-shaped rock apron if there is adequate space and ground conditions allow. <u>Siltbusters</u> › A “siltbuster” 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 ponds or swales. <u>Dewatering Silt bags</u> › 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. <u>Culverts</u>		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› All new proposed culverts and proposed culvert upgrades will be suitably sized for the expected peak flows in the watercourse. › Some culverts will 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. › 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 doesn't occur above or below the culvert and water can continue to flow as necessary. <u>Silt Fences</u> › 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 natural watercourse, which is inevitable where existing roads in proximity to watercourses are to be upgraded as part of the Proposed Wind Farm. These areas include around existing culverts, around the headwaters of watercourses. › Silt fences will be installed as single, double or a series of triple silt fences, depending on the space available and the anticipated sediment loading. The silt fence designs follow the technical guidance document 'Control of Water Pollution from Linear		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Construction Projects' published by CIRIA (Ciria, No. C648, 1996). Up to three silt fences may be deployed in series. <u>Sediment Entrapment Mats</u> › Sediment entrapment mats, consisting of coir or jute matting, will be placed at the outlet of the silt bag to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure <u>Check Dams</u> › The velocity of flow in the interceptor drains and drainage swales, particularly on sloped sections of the channel, will be controlled by check dams, which will be installed at regular intervals along the drains to ensure flow in the swale is non-erosive. Check dams will also be installed in some existing artificial drainage channels that will receive waters from works areas of the Site. › Check dams will restrict flow velocity, minimise channel erosion and promote sedimentation behind the dam. The check dams will be installed as the interceptor drains are being excavated. › Check dams will be used along sections of access road drains to attenuate flows and intercept silts at source. Check dams will be constructed from a 4/40mm non-friable crushed rock. › Check dams will be used along sections of access road drains to intercept silts at source › Check dams will not be used in any natural watercourses, only artificial drainage channels and interceptor drains. The check dams will be left in place at the end of the		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			construction phase to limit erosive linear flow in the drainage swales during extreme rainfall events.		
MM17	Wastewater Management	Ch. 4: Description of the Proposed Project	› Temporary port-a-loo toilets located within a staff portacabin will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewater being tankered off site by permitted waste collector to wastewater treatment plants. The nearest licenced primary wastewater treatment plant is located in Clintstown, Co. Kilkenny approximately 5km east of the Site. › There will also be a water supply on-site for hygiene purposes, by way of a temporary storage tank. The construction compound will also include a bunded refuelling and containment area for the storage of oil, lubricants and site generators etc, and full retention oil interceptor.		
MM18	Clear-Span Watercourse Crossing	Ch. 4: Description of the Proposed Project Ch. 9: Water CEMP Section 2	It is proposed to construct a new clear-span watercourse crossing at one location within the Site and upgrade one existing crossing. The clear-span watercourse crossing methodology presented below will ensure that no instream works are necessary. The standard construction methodology for the installation of a clear-span watercourse crossing is as follows: › The access road on the approach either side of the watercourse will be completed to a formation level which is suitable for the passing of plant and equipment required for the installation of each watercourse crossing. › All drainage measures along the proposed road will be installed in advance of the works. › A foundation base will be excavated to rock or competent ground with a mechanical excavator with the foundation formed in-situ using a semi-dry concrete lean mix. The base will be excavated along the stream bank with no instream works required. › Access to the opposite side of the watercourse for excavation and foundation installation will require the installation of a temporary pre-cast concrete or metal bridge across the watercourse to provide temporary access for the excavator. Plant and equipment will not be permitted to track across the watercourse.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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. › Where the box culvert is installed in sections, the joints will be sealed to prevent granular material entering the watercourse, › Once the crossing is in position stone backfill will be placed and compacted against the structure up to the required level above the foundations. › Underground cabling ducting will be contained within the road make-up of the proposed crossing. The watercourse crossings will be constructed to the specifications of the OPW bridge design guidelines 'Construction, Replacement or Alteration of Bridges and Culverts - A Guide to Applying for Consent under Section 50 of the Arterial Drainage Act, 1945', and in consultation with Inland Fisheries Ireland. Abutments will be constructed from precast units combined with in-situ foundations, placed within an acceptable backfill material. Confirmatory inspections of the proposed new watercourse crossing locations will be carried out by the Project Civil/Structural Engineer and the Project Hydrologist prior to the construction of the crossing.		
MM19	Proposed Grid Connection – existing underground services, marker posts, joint bays and major	Ch. 4: Description of the Proposed Project	<u>Existing Underground Services</u> › Any underground services encountered along the grid cable routes will be surveyed for level and the ducting will pass over the service provided adequate cover is available. › A minimum clearance of 300 mm will be required between the bottom of the ducts and the service in question. If the clearance cannot be achieved the ducting will pass under the service and again 300 mm clearance between the top of the communications duct and bottom of the service will be achieved.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
	watercourse crossings		▪ In deeper excavations an additional layer of marker tape will be installed between the communications duct and top level yellow marker tape. If the required separation distances cannot be achieved then a number of alternative options are available such as using steel plates laid across the width of the trench and using 35N concrete surrounding the ESB ducts where adjacent services are within 600mm, with marker tape on the side of the trench. Back fill around any utility services will be with dead sand/pea shingle. <u>Marker Posts</u> ▪ In deeper excavations an additional layer of marker tape will be installed between the communications duct and top level yellow marker tape. If the required separation ▪ Surface cable markers will be placed along the route where cable depth is unavoidably shallow, due to constraints such as existing services, to indicate the precise location of the UGC. These markers will be metallic plates in accordance with ESBN and EirGrid standards. ▪ Marker posts will be used on non-roadway routes to delineate the cable route and joint bay positions. Corrosion proof aluminium triangular danger sign, with 700mm base, and with centred lightning symbol, on engineering grade fluorescent yellow background shall be installed in adequately sized concrete foundations. Marker post shall also be placed in the event that burial depth is not to standard. Siting of marker posts to be dictated by ESBN as part of the detailed design process. <u>Joint Bays</u> ▪ Joints Bays are to be installed approximately every 650m - 850m along the UGC route to facilitate the jointing of 2 No. lengths of 110kV UGC. Joint Bays are 6m x 2.5m x 2.05m pre-cast concrete structures installed below finished ground level. Joint Bays will be located in the non-wheel bearing strip of roadways, however given the narrow		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			profile of local roads this may not always be possible. Please refer to Section 4.8.2.4 of Chapter 4 for further details on joint bay construction and cable installation. › Where possible, joint bays will be located in areas where there is a natural widening/wide grass margin on the road in order to accommodate easier construction, cable installation and create less traffic congestion. During construction the joint bay locations will be completely fenced off, and once they have been constructed, they will be backfilled until cables are being installed. › In association with joint bays, Communication Chambers will be installed at every joint slab location to facilitate communication links. Earth Sheath Link Chambers are also be installed at every joint bay along the cable route. Earth Sheath Links are used for earthing and bonding cable sheaths of underground power cables, so that the circulating currents and induced voltages are eliminated or reduced. Earth Sheath Link Chambers and Communication Chambers are located in close proximity to joint bays. Earth Sheath Link Chambers and Communication Chambers will be pre-cast concrete structures with an access cover at finished surface level. <u>Major Watercourse Crossings</u> The cable route will involve 6-no. crossings, of which 1 no. will be horizontal directional drilling (HDD) crossings and will not interact with an existing bridge structure. Drawings of the bridge crossings and further details on culvert crossing methodology are included in Appendix 4-1 of this EIAR. The Proposed 110kV Underground Cabling route will encounter 5 no. water culverts along the route. Existing culverts will be crossed using open trenching with either an undercrossing or overcrossing. A confirmatory site survey of all culverts has been completed as part of this phase of the project prior to planning to confirm the crossing methods. › Inland Fisheries Ireland have published guidelines relating to construction works along water bodies entitled “Requirements for the Protection of Fisheries Habitats		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			during Construction and Development Works at River Sites (Eastern Regional Fisheries Board, 2004)", and these guidelines will be adhered to during the construction of the Proposed Project.		
MM20	Turbine Bases, Hardstanding and Infrastructure Foundations	Ch. 4: Description of the Proposed Project CEMP Section 2	› An embankment approximately 600 mm high will be constructed around the perimeter of each turbine foundation base and a fence will be erected to prevent construction traffic from driving into the excavated hole and to demarcate the working area. All necessary health and safety signage will be erected to warn of deep excavations etc. Access to and from excavated bases will be formed by excavating a pedestrian walkway to 1:12 grade. › There will be a minimum of 100 mm of binding concrete laid on the formation material positioned using concrete skip and 360o excavator to protect ground formation and to give a safe working platform.		
MM21	Temporary Construction Compound	Ch. 4: Description of the Proposed Project CEMP Section 2	The construction compounds will consist of temporary site offices, staff facilities and car-parking areas for staff and visitors. Construction materials and turbine components will be brought directly to the proposed turbine locations following their delivery to the site. The 2 no. temporary construction compounds will be constructed as follows: › The area to be used for each compound will be marked out at the corners using ranging rods or timber posts. Drainage runs and associated settlement ponds will be installed around the perimeter; › The compound platform will be established using a similar technique as the construction of the substation platform; › A layer of geo-grid will be installed where deemed necessary by the designer and compacted layers of well graded granular material will be spread and lightly compacted to provide a hard area for Site offices and storage containers; › A limited amount of fuel will have to be stored on the Proposed Project site and for the Proposed Grid Connection in appropriately bunded containers and a bunded area for oil storage will be constructed within the compound.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Areas within the compound will be constructed as site roads and used as vehicle hardstanding during deliveries and for parking; › A bunded containment area will be provided within the compound for the storage of lubricants, oils and site generators etc; › A waste storage area will be provided within the compounds; › The compounds will be fenced and secured with locked gates if necessary; and, › Upon completion of the Proposed Project the temporary construction compounds will be decommissioned, granular material will be removed and the area will be allowed to vegetate naturally.		
Operational Phase					
MM22	Wastewater Management	Ch. 4: Description of the Proposed Project	› The proposed wastewater storage tank will be fitted with an automated alarm system that will provide sufficient notice that the tank requires emptying. › The wastewater storage tank alarm will be part of a continuous stream of data from the site's turbines, wind measurement devices and electrical 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.		
MM23	Electrical Substation and BESS	Ch. 4: Description of the Proposed Project CEMP Section 2	› The area of the Proposed 110kV Substation will be marked out using ranging rods or wooden posts and the soil and overburden stripped and will be either temporarily stockpiled locally at the substation location, or transported immediately on excavation to one of the designated spoil management areas; › Perimeter fencing will be erected › The construction and components of the substation have been designed to EirGrid specifications. › The electrical substation and BESS compound will be bunded appropriately to the volume of oils likely to be stored, and to prevent leakage to groundwater or surface		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor;		
			Decommissioning Phase		
MM24	Decommissioning	Ch. 4: Description of the Proposed Project Appendix 4-6: Decommissioning Plan	› Prior to the end of the operational period the Decommissioning Plan will be updated in line with decommissioning methodologies that exist at the time and will agree with the competent authority at that time.		
MM25	Decommissioning	Ch. 4: Description of the Proposed Project Appendix 4-6: Decommissioning Plan	› The wind turbines proposed as part of the Proposed Project are expected to have a lifespan of 35 years. Following the end of their useful life, the wind turbines may be replaced with a new set of turbines, subject to planning permission being obtained, or the Proposed Project will be decommissioned fully. The Proposed 110kV Substation and Proposed 110kV Underground Cabling will remain in place as it will be under the ownership of the ESB and will form a permanent part of the national electricity grid. › Upon decommissioning of the Proposed Project, the wind turbines will be disassembled in reverse order to how they were erected. All above ground turbine components will be separated and removed off-site for recycling. › Turbine hardstands and foundations will remain in place underground and will be left to revegetate naturally. Leaving the turbine hardstands and foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in significant environment nuisances such as noise, dust and/or vibration.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Site roadways will be left in situ, as appropriate to facilitate on-going forestry operations. Underground cables, including grid connection, will be removed and the ducting left in place. › A decommissioning plan will be agreed with the local authorities three months prior to decommissioning the Proposed Project.		
MM26	Surface Water Drainage Measures	Appendix 4-5: Surface Water Management Plan	<u>Interceptor Drains</u> › On completion of the construction phase works, it is envisaged that the majority of the interceptor drains could be removed. At that stage, there will be no open excavations or large areas of exposed ground that are likely to give rise to large volumes of potentially silt-laden run off. › Any areas in which works were carried out to construct roads, turbine bases or hardstands, will have been built up with large grade hardcore, which even when compacted in place, will retain sufficient void space to allow water to infiltrate the subsurface of these constructed areas. › It is not anticipated that roadways or other installed site infrastructure will intercept ground-conveyed surface water runoff to any significant extent that would result in scouring or over-topping or spill over. › Where the drains are to be removed, they will be backfilled with the material from the diversion dike. Interceptor drains will be retained in certain locations, for example where roadways are to be installed on slopes, to prevent the roadways acting of conduits for water that might infiltrate the roadway sub-base. In these cases, interceptor drains will be maintained in localised areas along the roadway with culverts under the roadway, which will allow the intercepted water to be discharged to vegetation filters downgradient of the roadway. › Similarly, in localised hollows where water is likely to be funnelled at greater concentrations than on broader slopes, interceptor drains, and culverts may be left in situ following construction.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
Ch. 5: Population and Human Health: Population and Human Health					
Pre-construction Phase					
MM27	Human Health	Ch. 5: Population and Human Health	At the outset of the Proposed Project, during the constraints mapping process detailed in Ch. 3: Site Selection & Reasonable Alternatives of this EIAR, all sensitive receptors within c. 1.63km of the area suitable for siting wind turbines within the EIAR Site Boundary were identified and mapped. › This included all occupied and unoccupied dwellings, businesses, stud farms and schools. In addition, a planning history search to identify properties that may have been granted planning permission, but not yet been constructed, was carried out. Any property with a valid planning permission for a dwelling house was also added to the sensitive receptors' dataset. All inhabitable dwellings (existing, proposed and permitted) and other sensitive receptors (inclusive of schools, businesses and stud farms) within 1.63km of the proposed turbines have been considered as part of the following shadow flicker assessment. There are 110 no. sensitive receptors located within 1.63km of proposed turbine locations.		
MM28	Property Values	Ch. 5: Population and Human Health	› The Proposed Wind Farm has been designed in accordance with the parameters set out in the Guidelines and with cognisance of the draft Guidelines, adhering to the required setback distances from sensitive receptors set out in those documents.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM29	Traffic and Transport	Ch. 5: Population and Human Health Ch. 15 Material Assets	› 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. › A competent Traffic Management Coordinator 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. › 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 Coordinator, 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. › Liaison with the relevant local authorities including the roads sections of local authorities that the delivery routes traverse, and An Garda Siochana, during the delivery phase of the large turbine vehicles, when an escort for all convoys will be required.		
Construction Phase					
MM30	Human Health	Ch. 5: Population and Human Health CEMP Section 5	The Proposed Project will be constructed, operated and decommissioned in accordance with all relevant Health and Safety Legislation, including: › Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005); › Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2016 (S.I. No. 36 of 2016); › S.I. No. 291/2013 - Safety, Health and Welfare at Work (Construction) Regulations 2013 and › Safety, Health and Welfare at Work (Work at Height) Regulations 2006 (S.I. No. 318 of 2006).		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			The following measures will be taken: › A Health and Safety Plan covering all aspects of the construction process will address the Health and Safety requirements in detail. This will be prepared on a preliminary basis at the procurement stage and developed further at construction stage. › All hazards will be identified, and risks assessed. Where elimination of the risk is not feasible, appropriate mitigation and/or control measures will be established. The contractor will be obliged under the construction contract and current health and safety legislation to adequately provide for all hazards and risks associated with the construction phase of the project. Safepass registration cards are required for all construction, delivery and security staff. Construction operatives will hold a valid Construction Skills Certificate Scheme card where required. The developer is required to ensure a competent contractor is appointed to carry out the construction works. The 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. › The suitability of machinery and equipment for use near power lines will be risk assessed. › All staff will be trained on operating voltages of overhead electricity lines running the Site. All staff will be trained to be aware of the risks associated with underground cables. All contractors that may visit the Site are made aware of the location of lines before they come on to Site. › When activities must be carried out beneath overhead lines, e.g., component delivery or substation construction, a site-specific risk assessment will be undertaken prior to any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or equipment that will be used prior to any works. › Information on safe clearances will be provided to all staff and visitors. › Signage indicating locations and health and safety measures regarding electrical cables will be erected in canteens and on Site.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› All staff will be made aware of and adhere to the Health & Safety Authority's 'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021'. This will encompass the use of all necessary Personal Protective Equipment and adherence to the Site Health and Safety Plan. › The suitability of machinery and equipment for use near power lines will be risk assessed. › All staff will be trained on operating voltages of electricity cables 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. › When activities must be carried out beneath overhead lines, e.g., component delivery or substation construction, a site-specific risk assessment will be undertaken prior to any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or equipment that will be used prior to any works. › Information on safe clearances will be provided to all staff and visitors. › Signage indicating locations and health and safety measures regarding electrical cables will be erected in canteens and on Site. › All staff will be made aware of and adhere to the Health & Safety Authority's 'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021'. This will encompass the use of all necessary Personal Protective Equipment and adherence to the Site Health and Safety Plan. › The suitability of machinery and equipment for use near power lines will be risk assessed. › All staff will be trained on operating voltages of electricity cables 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. › When activities must be carried out beneath overhead lines, e.g., component delivery, a site-specific risk assessment will be undertaken prior to any works. The risk		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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. The scale and scope of the project requires that a Project Supervisor Design Process (PSDP) and Project Supervisor Construction Stage (PSCS) are required to be appointed in accordance with the provisions of the Health & Safety Authority's '*Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2013*'. The PSDP appointed for the construction stage shall be required to perform his/her duties as prescribed in the Safety, Health and Welfare at Work (Construction) Regulations. These duties include (but are not limited to): › When activities must be carried out beneath overhead lines, e.g., component delivery, 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. › Identify hazards arising from the design or from the technical, organisational, planning or time related aspects of the project; › Where possible, eliminate the hazards or reduce the risks; › Communicate necessary control measures, design assumptions or remaining risks to the PSCS so they can be dealt with in the Safety and Health Plan; › Ensure that the work of designers is coordinated to ensure safety; › Organise co-operation between designers; › Prepare a written Safety and Health Plan; › Prepare a safety file for the completed structure and give it to the client; and		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Notify the Authority and the client of non-compliance with any written directions issued.		
			Operational Phase		
MM31	Human Health	Ch. 5: Population and Human Health Appendix 4-4	› Prepare a safety file for the completed structure and give it to the client; and › Access to the turbines is through a door at the base of the structure, which will be locked at all times outside maintenance visits. The doors will only be unlocked as required for entry by authorised personnel and will be locked again following their exit. › Staff associated with the project will conduct frequent visits, which will include inspections to establish whether any signs have been defaced, removed, faded, or are becoming hidden by vegetation or foliage, with prompt action taken as necessary. › Signs will also be erected at suitable locations across the Site as required for the ease and safety of operation of the wind farm. These signs include: › Buried cable route markers at 50m (maximum) intervals and change of cable route direction; › Directions to relevant turbines at junctions; › "No access to Unauthorised Personnel" at appropriate locations; › Speed limits signs at Site entrance and junctions › "Warning these Premises are alarmed" at appropriate locations; › "Danger HV" at appropriate locations; › "Warning – Keep clear of structures during electrical storms, high winds or ice conditions" at Site entrance; › "No unauthorised vehicles beyond this point" at specific Site entrances; and › Other operational signage required as per Site-specific hazards. › The proposed substation, which will be operated by Eirgrid/ESBN will be locked and fenced off from public access. The substation will be operational remotely and manually 24 hours per day, 7 days a week. Supervisory operational and monitoring activities will be carried out remotely using a SCADA system, with the aid of computers connected via a telephone modem link.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Periodic service and maintenance work which include some vehicle movement. › For operational and inspection purposes, substation access is required. › Servicing of the substation equipment will be carried out in accordance with the manufacturer's specifications, which would be expected to entail the following: ○ Six-month service – three-week visit ○ Annual service – six-week visit ○ Weekly and daily visits as required. › 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. Access for emergency services will be available at all times. › A Fire Risk Management and Emergency Response Plan has been developed in relation to the effects on the environment and health and safety of the proposed Battery Energy Storage System following a fire emergency. The report outlines the mitigation design, procedures and actions to protect lives and safety of site and emergency services personnel, the protection of the environment, minimisation of damage and disruption and the return to normal operations. The report states the design factors which contribute to reducing the escalation in the severity of a potential incident, facilities for the emergency services and the safeguarding of the environment through fire water retention.		
MM32	Shadow Flicker	Ch. 5: Population and Human Health	<u>Screening Measures</u> In the event of an occurrence of shadow flicker exceeding guideline threshold values of 30 minutes per day at residential receptor locations, mitigation options will be discussed with the affected homeowner, including: › Installation of appropriate window blinds in the affected rooms of the residence; › Planting of screening vegetation;		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Other site-specific measures which might be agreeable to the affected party and may lead to the desired mitigation. If agreement can be reached with the homeowner, then it would be arranged for the required mitigation to be implemented in cooperation with the affected party as soon as practically possible and for the full costs to be borne by the wind farm operator. <u>Wind Turbine Control Measures</u> The draft Guidelines limit of zero shadow flicker occurrences at any sensitive receptors will be adhered to and shadow flicker control units will 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. All predicted incidents of shadow flicker will be pre-programmed into the wind farm's control software. The wind farm's SCADA control system can be programmed to shut down any particular turbine at any particular time on any given day to avoid any shadow flicker occurrences at properties which are not naturally screened nor can be screened in any other manner. In order to ensure that the model and SCADA system is accurate and working well a site visit will be carried out to verify the system. The shadow flicker prediction data will be used to select dates on which a shadow flicker event could be observed at one or multiple affected properties and the following process will be adhered to. *1. Recording the weather conditions at the time of the site visit, including wind speeds and direction (i.e. blue sky, intermittent clouds, overcast, moderate breeze, light breeze, still etc.).* *2. Recording the house number, time and duration of site visit and the observation point GPS coordinates.* *3. Recording the nature of the sensitive receptor, its orientation, windows, landscaping in the vicinity, any elements of the built environment in the vicinity, vegetation.*		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			4. In the event of shadow flicker being noted as occurring the details of the duration (times) of the occurrence will be recorded. *5. The data will then be sent to the wind farm operational team to confirm that the model and SCADA system are working.* *6. Following 12 months of full operation of the Proposed Project a report can be prepared for the Local Authority describing the shadow flicker mitigation measures used at the wind farm and confirming the implementation and successful operation of the system.*		
Chapter 6 Biodiversity					
Pre-Construction Phase					
MM33	Linear features	Ch. 6: Biodiversity Appendix 6-4	To facilitate the Proposed Project, there is requirement for permanent loss of 1.34 km of linear features within the Proposed Wind Farm site. To compensate these losses, a Biodiversity Enhancement and Management Plan has been prepared, included as Appendix 6-4, which provides for the bolstering and/or planting of native hedgerow throughout the site. These measures, as detailed in Appendix 6-4, will be undertaken prior to any felling works required to facilitate the Proposed Project. This will reduce and mitigate the proposed losses at the earliest possible time, mitigating the effects discussed in Chapter 6.		
MM34	Bats	Ch. 6: Biodiversity Appendix 6-4	To facilitate the Proposed Project, there is requirement for permanent loss of 1.34 km of linear features within the Proposed Wind Farm site. To compensate this loss of commuting and foraging habitat for bats, a Biodiversity Enhancement and Management Plan has been prepared, included as Appendix 6-4, which provides for the bolstering and/or planting of native hedgerow throughout the site. These measures, as detailed in Appendix 6-4, will be undertaken prior to any felling works required to facilitate the Proposed Project. This will reduce and mitigate the proposed losses at the earliest possible time, mitigating the effects discussed in Chapter 6.		
MM35	Otter	Ch. 6: Biodiversity	No significant effects are anticipated. However, taking a precautionary approach, and due to the time that can elapse between the original surveys, any future planning consent and		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			commencement of construction, a pre-construction otter survey will be carried out by a qualified ecologist to identify the presence of any breeding/ resting sites within 150m of proposed works, that may have been established in the intervening period. As such, prior to the commencement of construction works associated with the installation of watercourse crossings, particularly the proposed Grid Connection Route, the following measures will be undertaken for the avoidance of disturbance/displacement and direct mortality and to ensure that no otter holts/breeding sites have been established since the original surveys were undertaken (TII, 2008b): A pre-commencement otter survey will be undertaken in accordance with standard best practice guidance prior to the commencement of site works. Should the surveys identify the presence of an otter holt, the following measures will be undertaken. › A National Parks and Wildlife Service derogation licence will be applied for (although compliance with such a licence has not been relied on in this assessment). › No works will be undertaken within 150m of any holts at which breeding females or cubs are present. › No wheeled or tracked vehicles (of any kind) will be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance will also not take place within 15m of such holts, except under licence (TII, 2008b). › All of the above works will be undertaken or supervised by an appropriately qualified ecologist. Currently based on the finding of the surveys and current information regarding the Site, no derogation licence is required for this application, as no breeding/resting sites have been recorded in close proximity to the Site. However, should the pre-commencement surveys identify a new breeding/resting site and exclusion is required, a derogation licence will be obtained from the NPWS prior to any works being carried out.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM36	Badger	Ch. 6: Biodiversity	Prior to the commencement of any construction works associated with the Proposed Wind Farm, Proposed Grid Connection Route and Turbine Delivery Route, the following measures will be undertaken for the avoidance of disturbance and/or direct mortality to badger and to ensure no additional setts have been established since the original surveys undertaken. The following measures are in line with Guidelines For The Treatment Of Badgers Prior To The Construction Of National Road Schemes (TII 2009). From a precautionary basis, a pre-commencement badger survey will be undertaken in accordance with standard best practice guidance prior to the commencement of site works to determine whether the identified sett is still in use and to ensure that no additional setts in close proximity to proposed infrastructure have been established. In the event that a badger sett is identified within or immediately adjacent to the Proposed Project footprint, mitigations as per the above referenced TII document will be implemented for the new sett.		
MM37	Red Squirrel/ Pine Marten	Ch. 6: Biodiversity	Due to time that can elapse between the original surveys, any future planning consent and commencement of construction, a pre-construction survey for pine marten/red squirrel will be carried out to identify the presence of any breeding sites. These surveys will focus on areas of Conifer plantation (WD4) to be felled and all suitable habitat within 50m of the felling blocks. Any potential breeding sites should be monitored to ascertain if they are active breeding sites. Surveys will be undertaken in line with Nature Scot1 and TII2 guidelines. Should active dreys/dens be identified within the blocks to be felled, the following mitigations and best practice procedures will be followed to ensure that no breeding site for either red squirrel or pine marten are impacted:		

[1] https://www.nature.scot/sites/default/files/2018-09/Species%20Planning%20Advice%20-%20red%20squirrel.pdf
[2] *TII guidance (TII, 2009, Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes. Dublin: National Roads Authority).*

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Felling works to be undertaken in October–January inclusive, this will avoid the main breeding season (February-September) when vulnerable young are most likely to be found within breeding sites for both species. › Any breeding sites identified within the 50m buffer that wouldn't be directly affected by felling works or disturbance related activity should be clearly marked out with an exclusion zone and works/access through these areas avoided as much as possible. › Plant machinery will be turned off when not in use. Operating machinery will be restricted to the Proposed Project works site area (and outside any exclusion zone)		
MM38	Reptiles and Amphibians	Ch. 6: Biodiversity	Prior to construction of the Proposed Project, pre-commencement surveys for viviparous lizard, common frog, and smooth newt will be undertaken within potential supporting habitat identified within the Site. Surveys will be undertaken by a suitably qualified ecologist and during the optimal season for each species, as per TII (2008) guidelines. Any individuals or population of these species will then be translocated outside of the works area to other areas of suitable habitat. An Ecological Clerk of Works will also be appointed for the construction works, who will translocate any further individuals recorded during the construction works.		
Construction Phase					
MM39	Assessment of Potential Effects on Groundwater, Surface Watercourses, and	Ch. 4: Description of the Proposed Project	Mitigation measures addressing surface watercourses and sensitive aquatic faunal species during construction are dealt with in Section MM19.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
	Sensitive Aquatic Faunal Species				
MM40	Bats	Ch. 6: Biodiversity Appendix 6-2	The below describes the best practice and site-specific mitigation measures that are in place to avoid and reduce the potential for significant effects on local bat populations. **Noise Restrictions** 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, as amended). **Lighting Restrictions** In accordance with the Institute of Lighting Professionals Guidance Note 08/23 (ILP, 2023), lighting associated with the Proposed Project will be designed to maintain dark commuting corridors and minimise light spill onto woodland, treelines, hedgerows, roost features and other habitats used by bats. During the construction phase, lighting requirements will be temporary and limited to areas where required for health, safety and security purposes, including temporary compounds and works associated with the Proposed 110kV substation. Where works are required during hours of darkness, lighting will be directed away from retained treelines, hedgerows, roost features and bat commuting or foraging habitats. Directional accessories, including baffles, hoods, cowls and louvres, will be used where appropriate to reduce light spill and focus illumination only where required. The same restrictions will apply during decommissioning. **Bat Felling Buffers**		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			In accordance with NatureScot (2021) and NIEA (2021) guidance, a minimum 50 m buffer is applied between turbine blade tips and habitat features used by bats (e.g. hedgerows, treelines). Although increased buffers of 100–200m are recommended around woodland by Eurobats Publication No. 6 and NIEA, these recommendations are not currently supported by empirical evidence from the UK or Ireland and are not routinely applied in wind farm planning. For the Proposed Wind Farm, a 50 m buffer between turbine blade tip and the nearest habitat feature has been implemented, based on a conservative worst-case turbine specification (the turbine model to be installed on the Proposed Wind Farm site will have an overall ground-to-blade tip height of 185m, rotor diameter of 163m, and hub height of 103.5m). Buffer distances were calculated using the Natural England formula (NatureScot, 2021) and have been incorporated into the turbine layout. Note: Due to the proximity of T2 to the confirmed bat roosts within the Farm Complex, existing linear habitat features surrounding this turbine will be retained to the north-west and south-east to maintain connectivity between the identified roosts and suitable commuting and foraging habitats within the wider landscape. The retention of these features is intended to avoid the severance of established commuting routes and minimise potential disturbance to bats associated with the roosts.		
MM41	Otter	Ch. 6: Biodiversity	An ecological clerk of works will supervise the proposed HDD works required to cross the River Nore. They will ensure that all best practice noise measures are correctly implemented.		
Operational Phase					
MM42	Assessment of Potential Effects on Groundwater, Surface	Ch. 4: Description of the Proposed Project	Mitigation measures addressing surface watercourses and sensitive aquatic faunal species during operation are dealt with in Section MM19.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
	Watercourses, and Sensitive Aquatic Faunal Species				
MM43	Bats	Ch. 6: Biodiversity	**Blade Feathering** In accordance with current best practice guidance (NatureScot, 2021; NIEA, 2021; BCI, 2026), blade feathering will be implemented across all turbines as a standard embedded mitigation measure. When wind speeds fall below the turbine cut-in speed, turbine blades will be pitched parallel to the wind (i.e. feathered) to minimise rotation, thereby reducing the risk of bat collisions during periods when turbines would otherwise idle. Blade feathering will be applied at all turbines throughout the operational life of the Proposed Wind Farm and will not be limited spatially. In addition to blade feathering, a site-specific curtailment strategy will be implemented to reduce collision risk to Leisler's bat. This approach has been selected because the residual collision risk for Leisler's bat cannot be addressed through habitat-based mitigation alone, given the species' open-air foraging behaviour, higher flight profile and widespread activity across the Proposed Wind Farm. Although activity for this species was classified as Low Risk at median levels, it was classified as Medium Risk at peak levels, thereby triggering the requirement for site-specific mitigation in accordance with BCI (2026) guidance for Medium Risk (Amber) scenarios. **Operational Monitoring** A programme of post-construction monitoring (PCM) will be implemented to assess the effects of the Proposed Wind Farm on bat activity and collision mortality, and to evaluate the		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			effectiveness of the mitigation measures described above, including blade feathering and site-specific curtailment. The primary objective of the monitoring programme is to evaluate the effectiveness of the mitigation strategy and to ensure that the Favourable Conservation Status of local bat populations is maintained, as required under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended). The monitoring programme has been designed in accordance with NatureScot (2021), NIEA (2021) and BCI (2026) guidance and will follow an adaptive management approach. In accordance with NatureScot (2021) and BCI (2026), PCM will comprise two integrated components: › Fatality monitoring (carcass searches) to quantify collision mortality; and › Acoustic monitoring to assess bat activity patterns and potential displacement or attraction effects.		
Decommissioning Phase					
MM44	Decommissioning Phase	Ch. 6: Biodiversity	› 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. It can be concluded that following the implementation of preventative mitigation, there is no potential for the decommissioning of the Proposed Project to result in significant effects on biodiversity.		
Chapter 7 Ornithology					
Construction Phase					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM45	Ornithology	EIAR Chapter 7	› To minimise the potential for disturbance to breeding kingfisher, construction works at the River Nore crossing will be undertaken outside the core breeding season (April to July, inclusive). In addition, targeted kingfisher surveys will be undertaken at the Proposed 110kV Underground Cabling crossing of the River Nore if the works are to commence here between February and September. This precautionary period accounts for early courtship and the potential for multiple/late broods. Full details are provided in Appendix 7-7.		
MM46	Ornithology	EIAR Chapter 7	› It is proposed that construction works at the Proposed 110kV Underground Cabling crossing of the River Nore will be conducted outside the kingfisher core nesting season (April to July inclusive), as described in Section 7.6.3 of Chapter 7 of the EIAR.		
Chapter 8: Land, Soils & Geology					
Construction Phase					
MM47	Soil, Subsoil and Bedrock Excavation	Chapter 8 Section 8.5.2.2	**Proposed Mitigation Measures by Design:** › Placement of turbines and associated infrastructure in areas with suitable ground conditions/avoidance of karst features (based on detailed iterative site investigation data); › During earthworks, emphasis on FILL rather than CUT at proposed turbine locations T1 to T3 to preserve the topography in areas of shallow limestone; › Excavated soils/subsoils shall be excavated and stored separately to topsoil; this will prevent mixing of materials and facilitate reuse afterwards; › All materials which require storage shall be stockpiled at low angles (< 5-10°) to ensure their stability and secured using silt fencing where necessary. This will help to mitigate erosion and unnecessary additions of suspended solids to the drainage system;		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Spoil disposal shall take place within a minimal distance of each turbine to avoid excessive transport of materials within the site; › Spoil shall be deposited, in layers of 0.50m and will not exceed a total thickness of 1m and 2m as indicated on the drawings; › Spoil shall only be deposited on slopes of less than 5 degrees to the horizontal and greater than 10m from the top of a cutting; and, No turbines or Proposed Wind Farm infrastructure shall be constructed within 300m of any European designated sites such as SACs or SPAs.		
MM48	Contamination of Soils by Leakages and Spillages of Hydrocarbons or Chemicals	Chapter 8 Section 8.5.2.3	**Proposed Mitigation Measures:** › On-site re-fuelling shall be undertaken using a fuel truck with spill kits kept on site for accidental leakages or spillages; › Only designated trained operatives shall be authorised to refuel plant on-site; › Taps, nozzles or valves associated with refuelling equipment shall be fitted with a lock system; › All fuel storage areas will be bunded appropriately for the duration of the construction phase. All bunded areas shall be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes shall be contained within the bunded area; › Fuel, oil and chemical stores including tanks and drums shall be regularly inspected for leaks and signs of damage; › The electrical control building (at the substation) shall be bunded appropriately to the volume of oils likely to be stored and to prevent leakage of any associated chemicals to groundwater or surface water. The bunded area shall be fitted with a storm drainage system and an appropriate oil interceptor; › The plant used during construction shall be regularly inspected for leaks and fitness for purpose; › Safety data sheets for all chemicals used shall be kept on-site; › No storage of fuels, oils or chemicals will be permitted within the Clomantagh/Killoshulan Group Water Scheme source protection area (SPA);		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Refuelling of mobile plant (i.e. diggers, dumpers etc) will only be permitted outside the SPA; › Refuelling of large immobile plant (i.e. cranes) will only be carried out with a refuelling truck that will be removed from SPA immediately after use; › Spill kit stations will be present at each turbine location (T1 to T4); and, › An emergency response plan for the construction phase to deal with accidental spillages is contained within the Construction and Environmental Management Plan (which is contained in **Appendix 4-5**).		
MM49	Erosion of Exposed Soils and Subsoils and During Construction of Infrastructure	Chapter 8 Section 8.5.2.4	**Proposed Mitigation Measures:** › The upper vegetative layer (where still present) of excavated soil shall be stored with the vegetation part of the sod facing the right way up to encourage growth of plants and vegetation at the surface of the stored soil within the spoil storage areas; › Re-seeding and spreading/planting shall also be carried out in these areas; and, › Brash/bog mats shall be put in place to support vehicles on soft ground, reducing soil and mineral soils erosion and avoiding the formation of rutted areas, in which surface water ponding can occur		
MM50	Karst Related Ground Instability	Chapter 8 Section 8.5.2.5 Appendix 8-3	**Proposed Mitigation Measures:** Mitigation measures for karst related ground instability are shown in the karst Assessment Report (FT, 2026) (**Appendix 8-3**). The measures are summarised below. Mitigation by Design: ***Karst Protocol:*** A karst protocol for the Proposed Project is provided in the FT Karst Assessment and is presented below. The karst risk or potential for karst features along the access road alignments and at turbine locations has been characterised in the Karst Assessment. The designer will further review the		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			risk of features affecting works and outline any change to risk and locations during construction. A standard set of solutions is available in the SED drawings for typical features and dimensions encountered. A karst protocol, provided in Appendix E [of the Karst Assessment Report], has been developed to translate the karst risk to the construction stage. In all cases the formation level is to be checked by the Resident Engineer (RE) for any local soft / weak or loose areas. The RE is to be notified if any soft / weak or loose areas are identified. Due to potential karst risks around turbines T1 and T2 and extending along the access road towards turbine T4, the following investigations shall be carried out: › Formations for embankments or cuttings to be proof rolled and observed for signs of weakness; and, › Formations for structure (turbine) foundations to be proof rolled as above. The excavation shall be extended to rock head (where feasible) in areas where the karst risk is high or where evidence of karst features is encountered during overburden excavation. Karst features identified within the works areas shall be investigated as shown in the flowchart in Appendix E [of the Karst Assessment Report – **Appendix 8-3**]. The results will be documented for each feature. Where karstic features are encountered, they shall be investigated by excavating a trial pit. Following the findings of this trial excavation the RE shall consider if further additional ground investigation is required. The RE will direct the Contractor on which SED to employ. Where the feature is more extensive than shown on the SEDs the designer shall design the remediation measures. The design will be certified by an independent Cat III checker before implementation. Each karstic feature and the remediation measures shall be documented and included in the Safety File for the operational phase of the project. Features identified will be investigated by probing or further rolling as appropriate to be agreed between the RE and the		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Contractor. The RE may request additional ground investigation such as geophysics, rotary boreholes or other intrusive methods, to be agreed on site. Where karst features are identified the details as shown on the standard earthworks drawings (SED's) (as illustrated on drawings (P26-112-FT-XX-XX-SD-GE-0001 to 0004 – Appendix B of the Karst Assessment Report- **Appendix 8-3**) will be used as instructed by the RE. Where a significant karst feature is suspected below a turbine foundation, a structural solution, such as a raft footing spanning over the feature, or a piled foundation, will be considered. ***Piled Foundations:*** Where small-scale dissolution and voiding are encountered at turbine foundations during detailed ground investigation, one potential mitigation strategy is the use of drilled or grouted piles. The use of piles transfers structural loads to competent rock beneath karst-affected zones. This approach bypasses voids and weak soils, reducing the risk of differential settlement or collapse. ***Rock Infill:*** This methodology involves 'choking' the throat of the sinkhole with coarse granular fill, and progressive backfilling upwards with progressively finer granular fill. All backfill is to be placed in layers 150mm deep and compacted. Soil around the sinkhole is to be excavated to a radius of 3-5m, before being replaced and compacted with or without incorporation of anchored geogrid. ***Grouting:*** Pressure grouting can be employed to stiffen soil over limestone and prevent its movement into fissures, to fill localised fissures, and to stabilise fractured rock. It is worth noting that the injection of a fluid grout can result in significant losses into adjacent caves before sealing karstic fissures. The detailed designer/contractor shall consider which grouting method shall be most appropriate and the potential negative consequences for contamination and pollution of the aquifer.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Binding Layers and Geo-grids: One of the most effective and widely adopted engineering solutions to mitigate the risks of unacceptable settlement and unexpected collapse at access tracks is the use of bridging layers reinforced with geogrids. Bridging layers are designed to span across potential voids or weak zones, redistributing loads and preventing localised collapse. When combined with geogrid reinforcement, these layers gain enhanced tensile strength and load-spreading capacity, allowing them to maintain structural integrity even in the event of subsurface failure. ***Drainage Control:*** Surface and subsurface drainage systems will be designed to prevent water ingress into karst features, reducing the potential for solutional enlargement and subsidence. This includes the installation of sub-drainage systems, the use of impermeable liners or membranes, and pumping and dewatering during construction. As described in the Chapter 9: Hydrology and Hydrogeology, all Proposed Wind Farm site surface water drainage outfalls at level spreaders will be placed outside the 30m karst feature buffer zones (enclosed depressions and sink holes).		
MM51	Turbine Delivery Route Works	Chapter 8 Section 8.5.2.6	**Proposed Mitigation Measures:** › All works are minor and localised and cover very small areas; › These works are distributed over a wide area; › All works are temporary in nature; and, › Excavations will be reinstated		
Operational Phase					
MM52	Operational Phase	Chapter 8	Mitigation measures for land, soils and geology during the operational phase include the use of aggregate from authorised quarries for use in road and hardstand maintenance. Oil used in		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		Section 8.5.3	transformers (at the substation and within each turbine) and storage of oils in tanks at the substation could leak during the operational phase and impact on ground/soil and subsoils and groundwater or surface water quality. The substation transformer shall be in a concrete bunded area, capable of holding 110% of the stored oil volume. Turbine transformers are located within the turbines, so any leaks shall be contained within the turbine. These mitigation measures are considered sufficient to eliminate potential risks to ground/soils and subsoils, and groundwater and surface water quality		
Decommissioning Phase					
MM53	Decommissioning Phase	Chapter 8 Section 8.5.4	Mitigation measures applied during decommissioning activities will be similar to those applied during construction phase. Some of the impacts will be avoided by leaving elements of the Proposed Project in place where appropriate. The substation will be retained by EirGrid. The turbine bases will be rehabilitated by covering with local topsoil in order to regenerate vegetation which will reduce runoff and sedimentation effects. Internal roads will remain as amenity pathways and forestry access roads. Mitigation measures to avoid contamination by accidental fuel leakage and compaction of soil by on-site plant will be implemented as per the construction phase mitigation measures		
Chapter 9: Hydrology & Hydrogeology					
Pre-Construction Phase					
MM54	Earthworks (Removal of Vegetation Cover,	Chapter 9: Section 9.5.2.3	**Pre-commencement Temporary Drainage Works** Prior to the commencement of new road/hardstand (or road upgrades) the following key temporary drainage measures will be installed:		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
	Excavations and Stock Piling) Resulting in Suspended Solids Entrainment in Surface Waters		› All existing dry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using temporary check dams/silt traps; › Clean water diversion drains will be installed upgradient of the works areas; › Check dams/silt fence arrangements (silt traps) will be placed in all existing drains that have surface water flows and also along existing roadside drains; and, › A double silt fence perimeter will be placed down-slope of works areas that are located inside the 50m watercourse and 10m drain buffer zones such as at watercourse crossings		
			Construction Phase		
MM55	Potential Effects on the Clomantagh/Killoshulan (Balief) Group Water Scheme and Other Local Wells	Chapter 9: Section 9.5.2.1	**Impact Assessment/Proposed Mitigation Measures:** **Assessment of Quantitative Effect (i.e. flow volumes to the source springs) and Proposed Mitigation Measures** Groundwater level monitoring carried out at the Proposed Wind Farm site, show that groundwater levels are deep in the limestone, approximately 10 to 20mbgl. The proposed turbine base excavations (gravity base foundation) will be a maximum 3mbgl. As stated previously, the proposed borrow pit is not located inside the SoPA (source protection area). and therefore, no excavations deeper than 3m will be required within the SoPA Therefore, there is no potential for disruption of groundwater flows towards the spring source by turbine base excavations. **Assessment of Quality Effect and Proposed Mitigation Measures**		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			In order for potential contaminants (i.e. oils, fuels, cements, sediments etc) to reach the source abstraction point from the Proposed Wind Farm site construction areas, a groundwater flowpath (pathway) must be present. Karst features, which are present on the southern portion of the Proposed Wind Farm site, are potential pathways that have been thoroughly investigated; and avoided as part of Proposed Wind Farm layout. **Mitigation By Design:** **Avoidance of Ground Surface Karst features:** All mapped enclosed depressions and swallow holes at the Proposed Wind Farm site have been avoided by the Proposed Wind Farm infrastructure. All Proposed Wind Farm infrastructure surface water drainage outfalls at level spreaders will be located outside the 30m karst feature buffer zones. During the construction phase all runoff from works areas (i.e. dirty water) will be attenuated and treated to a high quality prior to being released outside of 30m karst feature buffer zones. Refer to Section 9.5.2.3 below for drainage mitigation details. **Avoidance of Subsurface Karst features:** Detailed drilling and geophysical surveys have been carried out to investigate the potential presence of sub surface karst features at proposed turbines T1 to T4. Investigations carried out at the proposed turbines T1 to T2 identified potential subsurface karst features (clay infills) near both turbines (refer to in Section 9.3.9.3 above for commentary on the investigations. No evidence of karst was found at turbine location T3. However, as illustrated on the annotated ERT and Seismic Refraction profile (**Appendix 8-5**), the T1 and T2 turbine foundations can be constructed on competent limestone and will have no		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			interaction with any potential subsurface karst feature. The required cut and fill at each turbine location will also have no interaction with any potential subsurface karst feature (see following mitigation below). Turbine T3 will be constructed on competent limestone and turbine T4 on mudstone bedrock. **Cut and Fill Design Measures:** Due to the presence of shallow limestone bedrock in the areas around T1, T2, T3 and locally at T4, the proposed earthworks associated with the access roads and hardstands has been designed in such a way as to minimise the cutting (excavation) extents and depths. Where possible infilling is emphasised out over cut. Refer to **Table 8-13** of Chapter 8 (Land, Soils and Geology) which show that infill volumes significantly exceed cut volumes and therefore this mitigation approach has been achieved. This preserves the existing overburden cover present above the limestone bedrock, maintaining the current topographic regime, and as such does not increase the risk of karst reactivation or exposure. This has included a bespoke hardstand layout for turbine T3 which omits the blade fingers, in order to avoid significant cutting at this location. The alignment of the access roads has also avoided the mapped karst features in this area which lowers the risk of drainage associated with the access roads leading to reactivation of karst. **Construction Phase Karst Protocol:** A karst protocol, provided in Appendix E [of the FT Karst Assessment Report shown in **Appendix 8-3** of the EIAR], has been developed to translate the karst risk to the construction stage. In all cases the formation level is to be checked by the Resident Engineer (RE) for any local soft / weak or loose areas. The RE is to be notified if any soft / weak or loose areas are identified.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Due to potential karst risks around turbines T1 and T2 and extending along the access road towards turbine T4, the following investigations shall be carried out: › Formations for embankments or cuttings to be proof rolled and observed for signs of weakness; and, › Formations for structure (turbine) foundations to be proof rolled as above. The excavation shall be extended to rock head (where feasible) in areas where the karst risk is high or where evidence of karst features is encountered during overburden excavation. **Water Quality Protection/Pollution Prevention Measures:** The following mitigation is proposed at all construction works areas inside the Clomantagh/Killoshulan (Balief) GW SoPA: › No storage of fuels, oils, cements, or chemicals will be permitted within the SoPA; › Refuelling of mobile plant (i.e. diggers, dumpers etc) will only be permitted outside the SoPA; › Refuelling of large immobile plant (i.e. cranes) will only be carried out with a refuelling truck that will be removed from SoPA immediately after use; › Spill kit stations will be present at each turbine location (T1 to T4); › A geotextile liner will be placed below the founding layer (lean mix concrete) where concrete is to be poured. These both prevent vertical loss of wet concrete at turbine bases; › Use of perimeter shuttering at turbine bases to prevent lateral loss of wet concrete; › All temporary cement washout lagoons will be located outside the SoPA; › No wind farm drainage will be released inside the 30m karst buffer;		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› There will be clear signage in place inside the refined SoPA to remind construction workers that the area is inside a drinking water protection area; and, › A double silt fence perimeter will be placed around all nearby karst features.		
MM56	Clear Felling of Coniferous Plantation and Potential Surface Water Quality Effects	Chapter 9: Section 9.5.2.2	**Proposed Mitigation Measures:** All felling operations will conform to current best practice Forest Service regulations, policies and strategic guidance documents as well as Coillte and DAFM guidance documents, including the specific guidelines listed below, to ensure that felling, planting and other forestry operations result in minimal potential negative effects to the receiving environment. › Forestry Standards Manual (Forest Service, 2015) › Environmental Requirements for Afforestation (Forest Service, 2016a) › Land Types for Afforestation (Forest Service, 2016b) › Forest Protection Guidelines (Forest Service, 2002) › Forest Operations and Water Protection Guidelines (Coillte, 2013) › Forestry and Water Quality Guidelines (Forest Service, 2000b) › Forestry and the Landscape Guidelines (Forest Service, 2000c) › Forestry and Archaeology Guidelines (Forest Service, 2000d) › Forest Biodiversity Guidelines (Forest Service, 2000e) › Forests and Water, Achieving Objectives under Ireland's River Basin Management Plan 2018-2021 (DAFM, 2018) › A Guide to Forest Tree Species Selection and Silviculture in Ireland (Horgan et al., 2003) › Management Guidelines for Ireland's Native Woodlands. Jointly published by the National Parks & Wildlife Service (Cross and Collins, 2017) › Native Woodland Scheme Framework (Forest Service, 2018) › Code of Best Forest Practice (Forest Service, 2000) **Mitigation by Avoidance:**		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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 at planting stage. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document *"Forestry and Water Quality Guidelines"* are shown in Table 9-21 During the Proposed Wind Farm construction phase a self-imposed buffer zone of 50 metres will be maintained for the Foyle South Stream where possible. These buffer zones are shown on Figure 9 16 above. Only approximately 0.0471ha of tree felling is required inside a 50m buffer zone. **Mitigation by Design**: Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods which are set out as follows: › Machine combinations (i.e., handheld or mechanical) will be chosen which are most suitable for ground conditions and which will minimise soils disturbance; › 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; › 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 (approximately 0.3%-3% gradient), to minimise flow velocities. Main drains to take the discharge from collector drains will include water drops and rock armour, as required, where there are steep gradients, and will avoid being placed at right angles to the contour; › 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		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			carefully disposed of in the peat disposal areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground; › All drainage channels will taper out before entering the 50m 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; › 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; › Brash mats will be used to support vehicles on soft ground, reducing peat and mineral soils 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. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall; › Timber will be stacked in dry areas, and outside a local 50 metre watercourse buffer. Straw bales and check dams to be emplaced on the down gradient side of timber storage/processing sites; › 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; › Checking and maintenance of roads and culverts will be on-going through the felling operation; › Refuelling or maintenance of machinery will not occur within 50m of a watercourse. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; › A permit to refuel system will be adopted; › 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; › Crossing of streams will not be permitted;		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			• Trees will be cut manually from along streams and using machinery to extract whole tree; and, • Travel only perpendicular to and away from stream. **Silt Traps**: Silt traps will be strategically placed down-gradient within forestry drains near streams. The main purpose of the silt traps and drain blocking is to slow water flow, increase residence time, and allow settling of silt in a controlled manner. **Drain Inspection and Maintenance**: The following items shall be carried out during pre-felling inspections and after: • Communication with tree felling operatives in advance to determine whether any areas have been reported where there is unusual water logging or bogging of machines; • Inspection of all areas reported as having unusual ground conditions; • Inspection of main drainage ditches and outfalls. During pre-felling inspections the main drainage ditches shall be identified. Ideally the pre-felling inspection shall be carried out during rainfall; • Following tree felling all main drains shall be inspected to ensure that they are functioning; • Extraction tracks near drains need to be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground; • Culverts on drains exiting in the Site will be unblocked; and, • All accumulated silt will be removed from drains and culverts, and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall. **Surface Water Quality Monitoring**:		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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 commencing, preferably in medium to high water flow conditions. The "during" sampling will be undertaken once a week 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). Criteria for the selection of water sampling points include the following: › Avoid man-made ditches and drains, or watercourses that do not have year-round flows, i.e. avoid ephemeral ditches, drains or watercourses; › Select sampling points upstream and downstream of the forestry activities; › It is advantageous if the upstream location is outside/above the forest in order to evaluate the impact of land-uses other than forestry; › Where possible, downstream locations will be selected: one immediately below the forestry activity, the second at exit from the forest, and the third some distance from the second (this allows demonstration of no impact through dilution effect or contamination by other land-uses where impact increases at third downstream location relative to second downstream location); and, › The above sampling strategy will be undertaken for all on-site sub-catchments streams where tree felling is proposed. Also, daily surface water monitoring forms will also be utilised at every works site near any watercourse. These will be taken daily and kept on site for record and inspection.		
MM57	Earthworks (Removal of Vegetation Cover,	Chapter 9: Section 9.5.2.3	**Mitigation by Avoidance:** The key mitigation measure during the construction phase of the Proposed Wind Farm is the avoidance of sensitive aquatic areas where possible from **Figure 9-16** it can be seen that all of the key areas of the Proposed Wind Farm infrastructure are actually significantly away from the		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
	Excavations and Stock Piling) Resulting in Suspended Solids Entrainment in Surface Waters		50m delineated buffer zones with the exception of proposed new roads, 3 no. proposed crossings on the Foyle South Stream. Additional control measures, which are outlined further on in this section, will be undertaken at these locations within buffers. 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 operated effectively. The proposed buffer zone will: › Avoid physical damage to watercourses, and associated release of sediment; › Avoid excavations within close proximity to surface water courses; › Avoid the entry of suspended sediment from earthworks into watercourses; and, › Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone. **Mitigation by Design:** › Source controls: ○ Interceptor drains, vee-drains, diversion drains, flume pipes, erosion and velocity control measures such as use of sand bags, oyster bags filled with gravel, filter fabrics, and other similar/equivalent or appropriate systems. ○ Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas or other similar/equivalent or appropriate measures. › In-Line controls: ○ Interceptor drains, vee-drains, oversized swales, erosion and velocity control measures such as check dams, sand bags, oyster bags, straw		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			bales, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps/attenuation lagoons, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems. › Treatment systems: ○ Temporary sumps and attenuation ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbuster, and/or other similar/equivalent or appropriate systems. It should be noted for the northern portion of the Proposed Wind Farm site is that an extensive network of forestry agricultural drains already exist, and these will be integrated and enhanced as required and used within the Proposed Project drainage system. The integration of the existing drainage network and the Proposed Project network is relatively simple. The key elements being the upgrading and improvements to water treatment elements, such as in line controls and treatment systems, including silt traps, stilling ponds and buffered outfalls. The main elements of interaction with existing drains will be as follows: › Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system, there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the Proposed Project drainage into the existing site drainage network. This will reduce the potential for any increased risk of downstream flooding or sediment transport/erosion; › 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;		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Runoff from individual turbine hardstanding areas will be not discharged into the existing drain network but discharged locally at each turbine location through stilling ponds and buffered outfalls onto vegetated surfaces; › Buffered outfalls which will be numerous over the site will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the site; and, › Drains running parallel to the existing roads requiring widening will be upgraded, widening will be targeted to the opposite side of the road. Velocity and silt control measures such as check dams, sand bags, 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. **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. **Silt Fences:** Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids. This will act to prevent entry to water courses of sand and gravel sized sediment, released from excavation of mineral sub-soils of glacial and glacio-fluvial origin, and entrained in surface water runoff. Inspection and maintenance of these of these structures during construction phase is critical to their functioning to stated purpose. They will remain in place throughout the entire construction phase. Double silt fences will be		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			placed within drains down-gradient of all construction areas inside the 50m hydrological buffer zones. **Silt Bags:** Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, the majority of the sediment is retained by the geotextile fabric allowing filtered water to pass through. Silt bags will be used with natural vegetation filters or sedimats Sediment entrapment mats, consisting of coir or jute matting, will be placed at the silt bag location to provide further treatment of the water outfall from the silt bag. Sedimats will be secured to the ground surface using stakes/pegs. The sedimat will extend to the full width of the outfall to ensure all water passes through this additional treatment measure. **Settlement Ponds:** The Proposed Wind Farm infrastructure footprint has been divided into drainage catchments (based on topography, outfall locations, and catchment size) and stormwater runoff rates based on the 10-year return period rainfall event were calculated for various catchment areas in order to size the settlement ponds as shown in Table 9-22. The 10-year return period rainfall event is a recommendation of the IFI relating to other recent wind farm projects (i.e. Cahermurphy Wind Farm, Co. Clare - Planning Ref P20/658). The location and dimensions of proposed settlement ponds are shown on the Proposed Wind Farm site drainage plan drawings (Appendix 4-3). **Level Spreaders and Vegetation Filters:** The purpose of level spreaders is to release treated drainage flow in a diffuse manner, and to prevent the concentration of flows at any one location thereby avoiding erosion. Level spreaders are not intended to be a primary treatment component for development surface water runoff. They are not stand-alone but occur as part of a treatment train of systems that will reduce the velocity o		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			runoff prior to be released at the level spreader. In the absence of level spreaders, the potential for ground erosion is significantly greater than not using them. Vegetation filters are essentially end-of-line polishing filters that are located at the end of the treatment train. In fact, vegetation filters are ultimately a positive consequence of not discharging directly into watercourses which is one of the mitigation components of the drainage philosophy. This makes use of the natural vegetation of the Site to provide a polishing filter for the Wind Farm drainage prior to reaching the downstream watercourses. Again, vegetation filters are not intended to be a single or primary treatment component for treatment of works area runoff. They are not standalone but are intended as part of a treatment train of water quality improvement/control systems (i.e. source controls → check dams → silt traps→ settlement ponds→ level spreaders →silt fences → vegetation filters). **Pre-emptive Site Drainage Management** The works programme for the entire construction stage of the Proposed Project will also take account of weather forecasts, and predicted rainfall in particular. Large excavations and movements of peat/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. The following forecasting systems are available and will be used on a daily basis at the site to direct proposed construction activities: › General Forecasts: Available on a national, regional and county level from the Met Eireann website (www.met.ie/forecasts). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates; › MeteoAlarm: Alerts to the possible occurrence of severe weather for the next 2 days. Less useful than general forecasts as only available on a provincial scale;		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events; › Rainfall Radar Images: Images covering the entire country are freely available from the Met Eireann website (www.met.ie/latest/rainfall_radar.asp). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive; and, › Consultancy Service: Met Eireann provides a 24-hour telephone consultancy service. The forecaster will provide an interpretation of weather data and give the best available forecast for the area of interest. Using the safe threshold rainfall values will allow work to be safely controlled (from a water quality perspective) in the event of forecasting of an impending high rainfall intensity event. Works will be suspended if forecasting suggests either of the following is likely to occur: › >10 mm/hr (i.e., high intensity local rainfall events); › >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or, › >half monthly average rainfall in any 7 days. › Prior to works being suspended the following control measures will be completed: › Secure all open excavations; › Provide temporary or emergency drainage to prevent back-up of surface runoff; and, › Avoid working during heavy rainfall and for up to 24 hours after heavy events to ensure drainage systems are not overloaded. **Management of Runoff from the Spoil Management Area:** It is proposed that excavated spoil will be used for landscaping where required. The excess material will then be placed in 1 no. Spoil Management Area.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			The Spoil Management Area is located outside of 50m watercourse buffers and also outside of 30m karst feature buffers (enclosed depression or sink holes). During the initial construction of deposition area, silt fences, straw bales and biodegradable geogrids will be used to control surface water runoff from works areas. Where applicable, the vegetative top-soil layer of the soil and spoil management areas will be rolled back to facilitate placement of excavated spoil, following which the vegetative-top soils layer will be reinstated. Where reinstatement is not possible, spoil management areas will be sealed with a digger bucket and seeded as soon possible to reduce sediment entrainment in runoff. Drainage from spoil storage areas will ultimately be routed to an oversized swale and a number of stilling ponds with appropriate storage and settlement designed for a 1 in 10-year return period before being discharged to the on-site drains. Subsoil reinstatement areas will be sealed with a digger bucket and vegetated as soon possible to reduce sediment entrainment in runoff. Once re-vegetated and stabilised peat/subsoil reinstatement areas will no longer be a potential source of silt laden runoff. **Timing of Site Construction Works:** Construction of the site drainage system will only be carried out during periods of low rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses. Construction of the drainage system during this period will also ensure that attenuation features associated with the drainage system will be in place and operational for all subsequent construction works.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM58	Excavation Dewatering and Potential Impacts on Surface Water Quality	Chapter 9: Section 9.5.2.5	**Proposed Mitigation Measures:** Management of excavation inflows and subsequent treatment prior to discharge into the drainage network will be undertaken as follows: › Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations will be put in place; › If required, pumping of excavation inflows will prevent build-up of water in the excavation; › The interceptor drainage will be discharged to the site constructed drainage system or onto natural vegetated surfaces and not directly to surface waters; › The pumped water volumes will be discharged via volume and sediment attenuation ponds adjacent to excavation areas, or via specialist treatment systems such as a silt bags or silt buster; › There will be no direct discharge to surface watercourses, and therefore no risk of hydraulic loading or contamination will occur; › Daily monitoring of excavations by a suitably qualified person will occur during the construction phase. If high levels of seepage inflow occur, excavation work will immediately be stopped and a geotechnical assessment undertaken; › At the turbine locations adequately sized settlement ponds will be constructed to treat pumped water prior to discharge into a local manmade drain; › mobile 'Siltbuster' or similar equivalent specialist treatment system can be made available at turbine locations 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		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM59	Potential Release of Hydrocarbons During Construction and Storage	Chapter 9: Section 9.5.2.6	**Proposed Mitigation Measures:** Mitigation measures proposed to avoid release of hydrocarbons at the site are as follows: › On site re-fuelling of machinery will be carried out using a dedicated fuel truck. The fuel truck will also carry fuel absorbent material and pads in the event of any accidental spillages; › Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations; › On-site refuelling will be carried out by trained personnel only; › A permit to fuel system will be put in place; › Fuels stored on site will be minimised. Fuel storage areas if required will be bunded appropriately for the fuel storage volume for the time period of the construction and fitted with a storm drainage system and an appropriate oil interceptor; › The plant used during construction will be regularly inspected for leaks and fitness for purpose; and, › An emergency plan for the construction phase to deal with accidental spillages will be included within the Construction and Environmental Management Plan (Appendix 4.5). Spill kits will be available to deal with and accidental spillage in and outside the re-fuelling area.		
MM60	Groundwater and Surface Water Contamination from Wastewater Disposal	Chapter 9: Section 9.5.2.7	**Proposed Mitigation Measures:** › It is proposed to manage wastewater from the staff welfare facilities in the control buildings by means of a sealed storage tank, with all wastewater being tankered off site by permitted waste collector to wastewater treatment plants. It is not proposed to treat wastewater on-site		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM61	Release of Cement-Based Products	Chapter 9: Section 9.5.2.8	**Proposed Mitigation Measures:** › No batching of wet-cement products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place; › Where possible pre-cast elements for culverts and concrete works will be used; › Where concrete is delivered on site, only the chute will be cleaned, using the smallest volume of water practicable. No discharge of cement 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 cement washout ponds located outside of Clomantagh/Killoshulan Group Water Scheme ZoC; › Weather forecasting will be used to plan dry days for pouring concrete; and, › The pour site will be kept free of standing water and plastic covers will be ready in case of a sudden rainfall event		
MM62	Morphological and Hydrological Effects due to New Watercourse Crossing Works	Chapter 9: Section 9.5.2.9	**Proposed Mitigation Measures:** › All proposed 3 no. new stream crossings will be bottomless or clear span structures 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; › Where the proposed cable route follows an existing road or road proposed for upgrade, the cable will pass over or below the culvert within the access road; › All guidance / mitigation measures proposed by the OPW or the Inland Fisheries Ireland3 is incorporated into the design of the proposed crossings;		

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

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› 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); › During the near stream construction work double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase. There will be no batching or storage of cement allowed in the vicinity of the crossing construction areas; and, › 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		
MM63	Potential Hydrological Effects on Designated Sites	Chapter 9: Section 9.5.2.10	**Impact Assessment & Proposed Mitigation Measures:** Drainage mitigation measures for surface water quality protection during the construction phase are summarised again below: (Please refer to Sections 9.5.2.2, 9.5.2.3 & 9.5.2.5 above for the full description of these measures and how they will be applied). › The proposed mitigation measures which will include 50m buffer zones for avoidance of sensitive hydrological features (streams and rivers); › 30m karst feature buffers; › Pre-construction drainage control measures; › Robust drainage control measures (i.e. interceptor drains, swales, settlement ponds and treatment trains such as Siltbuster) will ensure that the quality of runoff from Proposed Project areas will be very high; › Best practice measures with regard use of oils, fuels (Section 9.5.2.6) and cement-based compounds (Section 9.5.2.8); and,		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Mitigation relating to HDD works are presented in Section 9.5.2.15 which will be applied during the River Nore crossing,		
MM64	Potential Effects on Local Groundwater Well Supplies from Excavations	Chapter 9: Section 9.5.2.11	It has been assessed that the Proposed Project site will not impact in any significant way on any potential down-gradient private wells to the northeast of the Proposed Wind Farm site for the following reasons: › The large set back distances between turbine locations and downstream potential well locations (740m); › The proposed project will involve relatively shallow excavations (3 – 10mbgl) where ground elevations are high (>200m OD); › The low permeability of the glacial deposits in which the turbine gravity base foundations will be constructed; › The low recharge characteristics of the underlying SILTSTONE/MUDSTONE aquifer that underlies the north of the Proposed Wind Farm site; › Localised groundwater flow patterns in the glacial deposits which is towards local streams that flow through the Site; › Groundwater flow patterns are expected towards the watercourses that drain the Proposed Wind Farm site; and, › The shallow excavation depths required for Proposed Grid Connection cable, Substation and BESS.		
MM65	Turbine Delivery Route Works	Chapter 9: Section 9.5.2.12	**Proposed Mitigation Measures:** › All works are minor and localised and cover very small areas; › These works are distributed over a wide area; › All works are temporary in nature; and, › Application of the Pre-Construction Drainage Measures (see Section 9.5.2.3) for surface water quality protection		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM66	Effects of Construction Works on the WFD Status of Downstream Waterbodies	Chapter 9: Section 9.5.2.13	**Proposed Mitigation Measures:** Project design measures and comprehensive groundwater mitigation and drainage control measures for works within the Clomantagh/Killoshulan Group Water Scheme ZoC are provided in Section 9.5.2.1. Comprehensive surface water mitigation and drainage controls are outlined in Section 9.5.2.2 (Felling of Coniferous Plantations), Section 9.5.2.3 (Earthworks), Section 9.5.2.5 (Excavation Dewatering), Section 9.5.2.6 (Hydrocarbons), Section 9.5.2.8 (Cement-based Products) and Section 9.5.2.9 (Morphological Changes to Watercourses). These will ensure the protection of surface water quality and flows in all downstream receiving watercourses		
MM67	Use of Siltbuster and Impacts on Downstream Surface Water Quality	Chapter 9: Section 9.5.2.14	**Mitigation Measures:** Measures employed to prevent overdosing and potential chemical carryover: › The siltbuster system comprises an electronic in-line dosing system which provides an accurate means of adding reagents, as a result the risk of over dosing is minimised; › Continued monitoring and water analysis of pre and post treated water by means of an inhouse lab and dedicated staff, means the correct amount of chemical is added by the dosing system; › Dosing rates of chemical to initiate settlement is small, being in the order of 2-10 mg/L and the vast majority of the chemical is removed in the deposited sediment; › Final effluent not meeting the discharge criteria is recycled and retreated, which has a secondary positive effect of reducing carryover; and, › Use of biodegradable chemical agents can be used at very sensitive sites (i.e. upstream of SACs)		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM68	Potential Surface Water Quality Effects of the Proposed Grid Connection Earthworks and Watercourse Crossings	Chapter 9: Section 9.5.2.15	**Proposed Mitigation Measures:** Pre-commencement Temporary Drainage Works: Prior to the commencement of substation, cable trenching or access road works the following key temporary drainage measures will be installed: › All existing roadside drains (where present) that intercept the proposed works area will be temporarily blocked down-gradient of the works using check dams/silt traps; › Culverts, manholes and other drainage inlets (where present) will also be temporarily blocked; and, › A double silt fence perimeter will be placed along the road verge on the down-slope side of works areas that are located inside a watercourse 50m buffer zone The following mitigation measures are proposed for the underground cabling watercourse crossing works: › No stockpiling of construction materials will take place along the grid route; › No refuelling of machinery or overnight parking of machinery is permitted in this area; › No concrete truck chute cleaning is permitted in this area; › Works will not take place at periods of high rainfall, and will be scaled back or suspended if heavy rain is forecast; › Local road drainage, culverts and manholes will be temporarily blocked during the works; › Machinery deliveries will be arranged using existing structures along the public road; › All machinery operations will take place away from the stream and ditch banks, apart from where crossings occur. No instream works are proposed; › Any excess construction material will be immediately removed from the area and sent to a licenced waste facility;		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› No stockpiling of materials will be permitted in the constraint zones; › Spill kits will be available in each item of plant required to complete the stream crossing; and, › Silt fencing will be erected on ground sloping towards watercourses at the stream crossings if required. Fracture Blow-out (Frac-out) Prevention and Contingency Plan for HDD: › The drilling fluid/bentonite will be non-toxic and naturally biodegradable (i.e. Clear Bore Drilling Fluid or similar will be used); › The area around the drilling fluid batching, pumping and recycling plants will be bunded using terram and/or sandbags to contain any potential spillage; › One or more lines of silt fencing will be placed between the works area and the adjacent river; › Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility; › Adequately sized skips will be used where temporary storage of arisings are required; › The drilling process / pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse; › This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur, then drilling will be immediately stopped; › Any frac-out material will be contained and removed off-site; › The drilling location will be reviewed, before re-commencing with a higher viscosity drilling fluid mix; and, › If the risk of further frac-out is high, a new drilling alignment will be sought at the crossing location		
MM69	Biodiversity Enhancem	Chapter 9: Section 9.5.2.16	**Mitigation Measures:** A site-specific monitoring and evaluation programme will be implemented to ensure that the success of the proposed measures remains long-term. It will also assist in situations where the		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
	ent and Management Plan		habitat establishment may not have been successful by providing evidence of shortcomings, allowing a revised management plan to be formulated. Monitoring results will be reported by the Project Ecologist within an Annual Environmental Report. 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. The enhancement plan will be updated and amended where required to improve the efficacy of the enhancement work		
			Operational Phase		
MM70	Removal of Vegetation Cover and Progressive Replacement of Natural Surface with Low Permeability Surfaces	Chapter 9: Section 9.5.3.1	**Proposed Mitigation by Design:** The proposed drainage philosophy outlined in Section 9.4.1 states that runoff control and drainage management are key elements in terms of mitigation against impacts on surface water bodies. Two distinct methods will be employed to manage drainage water within the Proposed Project. The first being 'keeping clean water clean' and the second involving the collection of any drainage waters from work area and to route them towards stilling ponds prior to controlled diffuse release over vegetated surfaces. The second method relates to proposed design measures that will prevent road surface and other hardstand areas acting as preferential flowpaths. All development site runoff will be collected, attenuated, treated and then released in a diffuse and regular manner that does not significantly change the natural drainage regime/hydrology of the site. The operational phase drainage system of the Proposed Project will be installed and constructed in conjunction with the road and hardstanding construction work as described below and as shown on the drainage drawings (Appendix 4-2) submitted with this planning application: › 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 will be re-distributed over the ground by means of a level spreader;		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› Swales/road side drains will be used to collect runoff from access roads and turbine hardstanding areas of the site, likely to have entrained suspended sediment, and channel it to settlement ponds for sediment settling; › On steep sections of access road transverse drains ('grips') will be constructed in the surface layer of the road to divert any runoff off the road into swales/road side drains; › Check dams will be used along sections of access road drains to intercept silts at source. Check dams will be constructed from a 4/40mm non-friable crushed rock; › Settlement ponds, emplaced downstream of road swale sections and at turbine locations, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses; and, › Settlement ponds will be designed in consideration of the greenfield runoff rate. These measures will ensure all surface water runoff from upgraded roads and new road surfaces (including hardstands and turbine base areas) will be captured and treated prior to discharge/release. Settlement ponds, check dams and buffered outfalls will prevent roads acting as preferential flowpaths by providing attenuation and water quality treatment.		
MM71	Runoff Resulting in Suspended Solids Entrainment in Surface Waters	Chapter9: Section 9.5.3.2	**Proposed Mitigation Measures:** The mitigation measures outlined in Sections 9.5.2.3 & 9.5.3.1 will ensure all surface water runoff from upgraded roads and new road surfaces (including hardstand and turbine base areas) will be captured and treated prior to discharge/release. Settlement ponds, check dams and buffered outfalls will prevent roads acting as preferential flowpaths by providing attenuation and water quality treatment. It is proposed that bedrock from off-site sources will be used to construct the sub-base layer of proposed upgraded and new access roads, hardstand areas and turbine base areas. Once		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			installed the subbase layer will be overlain by a clean capping layer of high-grade stone material which will be sourced from local quarries also		
MM72	Potential Effects on the Clomantagh/Killoshulan Group Water Scheme and Other Local Wells	Chapter 9: Section 9.5.3.3	During the operational phase of the Proposed Project, the only regular plant which will be required on site will be maintenance/inspection vehicles (jeeps/vans/quads) and these will not be refuelled on-site. Any hydrocarbons (oil) present within the turbine generator and gear box will be enclosed within a bund with 110% capacity. There will be no storage of fuels, oils and chemicals inside any of the turbines. Automated oil leak detectors will be placed in each of the turbines which will allow early detection of even the smallest leaks of oil or hydraulic fluid that may arise from components such as the transformer or gearbox. The automated detection system will then rapidly notify the wind farm operator by cloud-based systems. This early detection system will prevent large leaks of oil or hydraulic fluid		
Decommissioning Phase					
MM73	Decommissioning Phase	Chapter 9: Section 9.5.4	The turbine bases will be rehabilitated by covering with local topsoil/peat 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		
Chapter 10: Air Quality					
Construction Phase					
MM74	Exhaust Emissions:	Ch 10 Air Quality	› Proposed Project Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
	Construction of Proposed Project Infrastructure		minimising any emissions that arise. The Site Supervisor/Construction Manager will produce and follow a site inspection and machinery checklist which will be followed and updated as required. › All construction vehicles and plant used onsite during the construction phase will be maintained in good operational order. If a vehicle requires repairs this work will be caried out, thereby minimising any emissions that arise. › Turbines components will be transported to the Site on specified routes only, unless otherwise agreed with the Planning Authority. Please see Chapter 15 Material Assets for details. › All machinery will be switched off when not in use. › Users of the Site will be required to ensure that all plant and vehicles are suitably maintained to ensure that emissions of engine generated pollutants are kept to a minimum. › The majority of aggregate materials for the construction of the Proposed Project will be obtained from the borrow pit on site. This will significantly reduce the number of delivery vehicles accessing the site, thereby reducing the amount of emissions associated with vehicle movements. › Aggregate materials for the construction of the Proposed Project will be sourced from local quarries. › The Materials Recovery Facility (MRF) facility will be local to the Proposed Wind Farm site to reduce the amount of emissions associated with vehicle movements. The nearest licensed waste facility to the Proposed Wind Farm site is Dunmore Recycling and Waste Disposal located approximately 14.5km to the southeast of the site of the Proposed Project. › A Construction and Environmental Management Plan (CEMP Appendix 4-3) will be in place throughout the construction phase.		
MM75	Dust Emissions	Ch 10 Air Quality	› 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.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› All plant and materials vehicles shall be stored in dedicated areas within the Proposed Wind Farm site. › Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction. › Turbines and construction traffic will be transported to the Site on specified haul routes only. › Proposed Grid Connection infrastructure will be transported to the Site on specified haul routes only. › Construction materials for the Proposed Grid Connection and a small volume for the proposed Wind Farm site will be sourced locally from licenced quarries. › The agreed haul route road adjacent to the Proposed Wind Farm site will be regularly inspected for cleanliness and cleaned as necessary. › The roads adjacent to the Site entrances will be checked weekly for damage/potholes and repaired as necessary. › The transportation of materials from the borrow pits around the Proposed Wind Farm site will be covered by tarpaulin or similar covered vehicles where necessary. › The transportation of construction materials from locally sourced quarries for the Proposed Grid Connection infrastructure and a small volume for the Proposed Wind Farm site will be covered by tarpaulin where necessary. › If necessary, excavated material will be dampened prior to transport to the spoil management areas. › Waste material will be transferred to a licensed/permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Proposed Project to reduce the amount of emissions associated with vehicle movements. › A Construction and Environmental Management Plan (CEMP) will be in place throughout the construction phase (see Appendix 4-3). The CEMP includes dust suppression measures		
Operational Phase					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM76	Exhaust Emissions	Ch. 10: Air Quality	› Any vehicles or plant brought on-site during the operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any emissions that arise. › When stationary, delivery and on-site vehicles will be required to turn off engines		
MM77	Dust Emissions	Ch. 10: Air Quality	› Maintenance vehicles brought on-site during the operational phase will be maintained in good operational order, thereby minimising any dust emissions that arise.		
Decommissioning Phase					
MM78	Decommissioning	Ch. 10: Air Quality	› 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					
MM79	Greenhouse Gas Emissions	Ch. 10: Air Quality Ch.11: Climate Ch. 15: Material Assets Appendix 4-3	› All construction vehicles and plant will be maintained in good operational order while on-site, thereby minimising any emissions that arise. › When stationary, delivery and on-site vehicles will be required to turn off engines. › Turbines and construction materials will be transported to the Site on specified routes only unless otherwise agreed with the Planning Authority. Please see Chapter 15 Material Assets for details. › It is intended to obtain the majority of materials for the construction of the Proposed Wind Farm from the proposed on-site borrow pits (with some material being imported from local licenced quarries as needed). This will significantly reduce the number of delivery vehicles accessing the Site, thereby reducing the amount of emissions associated with vehicle movements.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› A Construction and Environmental Management Plan (CEMP) (Appendix 4-3) will be in place throughout the construction phase. › The CEMP (Appendix 4-3) includes a Waste Management Plant (WMP) which outlines the best practice procedures that will occur during the construction phase relating to waste material. • 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. • Section 4.3.4.7 of Chapter 4 for this EIAR refers to the methodology that will be utilised to manage on-site waste. This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor, • The MRF facility will be local to the Proposed Project site to reduce the amount of emissions associated with vehicle movements. › Where applicable, low carbon intensive construction materials will be sourced and utilised on-site.		
Operational Phase					
MM80	Greenhouse Gas Emissions	Ch. 11: Climate Appendix 6-1	› Ensure that all maintenance and monitoring vehicles will be maintained in good operational order while on-site, and, when stationary, be required to turn off engines thereby minimising any emissions that arise. › As detailed in Appendix 6-1, a BEMP, for the Proposed Wind Farm has identified biodiversity enhancement and management activities such as the protection and maintenance of species rich grassland habitat and linear connectivity.		
Decommissioning Phase					
MM81	Decommissioning Phase	Ch. 11: Climate	› Any impact and consequential effect that occurs during the decommissioning phase are similar to that which occur during the construction phase, be it of less impact. The mitigation measures prescribed for the construction phase of the Proposed Project will be		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			implemented during the decommissioning phase thereby minimising any potential impacts.		
Chapter 12: Noise & Vibration					
Construction Phase					
MM82	Noise & Vibration	Chapter 12: Section 12.7.1 Appendix 12-1: Section 5	No Mitigation measures proposed, though good practice during construction is recommended; Section 8 of BS 5228-1:2009+A1:2014 recommends a number of simple control measures as summarised below that shall be employed onsite: › 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; › All vehicles and mechanical plant will be fitted with effective exhaust silencers and be subject to programmed maintenance; › Select inherently quiet plant where appropriate - all major compressors will be 'sound reduced' models fitted with properly lined and sealed acoustic covers, which will be kept closed whenever the machines are in use; › All ancillary pneumatic percussive tools will be fitted with mufflers or silencers of the type recommended by the manufacturers; › Machines will be shut down between work periods (or when not in use) or throttled down to a minimum; › Regularly maintain all equipment used onsite, including maintenance related to noise emissions; › Vehicles will be loaded carefully to ensure minimal drop heights so as to minimise noise during this operation; and › 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.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			At any location within 50m of a residential receptor where jointing bay activities are required for the Proposed Grid Connection Route, the installation of temporary boarding or 'acoustic blanket panels' hanging from Heras fencing (or similar) can be considered to minimise noise.		
			Operational Phase		
MM83	Noise & Vibration	Chapter 12	No mitigation proposed for noise during the operational phase. The assessment shows the predicted wind turbine noise emission levels meet the Site Specific Noise Limits under all conditions and at all locations for both daytime and night-time periods. Whilst it is not possible to predict if Other Amplitude Modulation (OAM) will occur, in the event that complaints are received regarding OAM, mitigation measures are available. The design of such mitigation measures can only be determined once the wind farm is operational if OAM is found to occur frequently and at sustained levels. For the Proposed Project, the developer is committed to investigating noise complaints, inclusive of any complaint which may relate to OAM. To deal with the eventuality of a complaint, the developer proposes the following: › A community liaison officer will be appointed prior to first generation of electricity and contact details made publicly available; › Any complaint relating to noise can be reported to the community liaison officer, who will undertake an initial screening of the complaint (review of logs submitted, review of wind conditions and turbine data etc.) and speak to the complainant in person, with an eventual visit to the complainant location if possible; › Following initial screening, the community liaison officer will be responsible for commissioning a detailed noise complaint investigation. This will include appointing a qualified acoustic consultant to undertake noise measurements at the complaint location and quantify the occurrence and depth (in dB) of OAM for every 10 minutes of the measurement campaign. The measured 10-minute noise levels and OAM depth		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			will also be correlated with 10-minute wind conditions and operational data to find patterns and potential character penalties in accordance with good practice at the time of the assessment; and, › If frequent and sustained OAM is found, then appropriate mitigation will be designed and implemented and the complainant informed by the community liaison officer. Mitigation measures considered will include changes to the operation of the relevant wind turbine(s) by changing software parameters such as blade pitch for specific wind conditions and time periods, addition of blade furniture (such as vortex generators) to alter the flow of air over the wind turbine blades; and, in extreme cases, targeted wind turbine shutdowns in specific conditions		
			Decommissioning Phase		
MM84	Noise & Vibration	Chapter 12: Section 12.7.1 Appendix 12-1: Section 5	No mitigation measures proposed, however the same good practice measures proposed during the construction phase are recommended.		
			Chapter 13 - Landscape and Visual		
			Construction Phase		
MM85	Landscape Effects during Construction	Chapter 13	The above predicted landscape effects during construction assume the implementation of the following mitigation measures for the Proposed Wind Farm and Proposed Grid Connection Route. All construction activities will follow best practice methods to reduce impacts upon the environment and landscape of the Site. Further details are presented in the Construction and Environmental Management Plan (CEMP) contained in Appendix 4-3 of this EIAR. The following measures should be implemented to mitigate landscape effects during the construction phase of the Proposed Project:		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› In all circumstances, excavation depths and volumes will be minimised, and excavated material will be re-used where possible. › For the proposed Grid Connection, where the cable trench is to be located in the road verge, subsoil will be piled on-site and re-used after cabling works. Should any medium planting be removed, it should be replaced with the same or similar species whenever it is not possible to salvage and reinstate. › Any areas of bare soil remaining after the landscaping phase will be seeded as soon as possible with a grass-seed mix to minimise sediment run-off.		
MM86	Visual Effects during Construction	Chapter 13	General housekeeping measures, necessary for Health & Safety requirements, will ensure that the active construction areas will be kept tidy, mitigating localised visual impacts during the construction phase		
Operational Phase					
MM87	Landscape Effects during Operation	EIAR Chapter 13	Regarding mitigation measures to help reduce landscape effects of the Proposed Wind Farm, this LVIA points to the Biodiversity Enhancement and Management Plan (BEMP) which has been prepared as part of this EIAR (see Appendix 6-4). The BEMP will have the dual effect of providing ecological enhancement to the landscape area of the Proposed Wind Farm site as well as potential visual screening of some lower lying infrastructure of the Proposed Wind Farm, thereby also mitigating effects on landscape character during the Operational Phase. The following measures from the BEMP which have been included in the Proposed Wind Farm design are deemed to have the effect of avoiding or reducing direct effects on landscape receptors, meaning individual landscape features and the landscape character of the Proposed Wind Farm site as a whole:		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› New planting and management of native hedgerow habitat within the Proposed Wind Farm site, including new planting of advance native stock. › Protection and maintenance of high diversity dry grassland habitat which occurs outside the development footprint within the Proposed Wind Farm site.		
Chapter 14: Cultural Heritage					
Construction Phase					
MM88	Recorded Monuments	Chapter 14: Section 14.4.3.3	› The location of all recorded monuments located within the Site shall be shown on the site layout drawings in the CEMP. › A 30m buffer/exclusion zone shall be established around the outer enclosing elements of Enclosure KK009-051— prior to the commencement of the construction stage of the Proposed Project. The buffer/exclusion zone shall comprise durable fencing and display 'Keep Out' signage. No tracking of machinery, storage of topsoil or other materials shall take place within the buffer/exclusion zone. The requirement for the buffer/exclusions zone shall be included in the CEMP.		
MM89	Sub-surface Archaeological Potential	Chapter 14: Section 14.4.3.5	› Archaeological monitoring under licence from the NMS of any geotechnical / engineering trial pits or investigations shall be carried out by a suitably qualified archaeologist. A report detailing the results of the monitoring shall be compiled on completion of the work and submitted to the NMS and Planning Authority/Body. › Pre-development testing, under licence from the NMS, shall be carried out. Testing will only be undertaken in areas where ground disturbance will take place as part of the Proposed Project. The areas to be tested will be chosen by the appointed archaeologist and the number of test trenches agreed between the archaeologist and the NMS through the licensing system. A report on the testing will be compiled on completion of the work. Should archaeological finds, structures or deposits be uncovered as a result of the testing further mitigation measures such as preservation in situ or preservation by record		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			(excavation) may be required and will be decided in consultation with the NMS. Such mitigation measures will be implemented, where relevant, following consultation with the NMS. › Archaeological monitoring of ground works during the construction stage of the Proposed Project under licence from the NMS shall be carried out by a suitably qualified archaeologist. Should archaeological finds, structures or deposits be uncovered as a result of the monitoring further mitigation measures such as preservation in situ or preservation by record (excavation) may be required and will be decided in consultation with the NMS. Such mitigation measures will be implemented where relevant following consultation with the NMS. A report detailing the results of the monitoring and/or any further necessary mitigation as referred to above will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body. › A walk-over survey of any areas currently forested and where infrastructure is proposed shall be carried out post-clear-felling but prior to any other works. › The location of any potential Cultural Heritage features therein will be recorded and a photographic record made of same. A report on the results of the walk-over survey shall be compiled on completion of same and will include any further required mitigation measures such as buffer zones, etc, deemed necessary.		
MM90	Items of Local Cultural Heritage Merit	Chapter 14: Section 14.4.3.8	› The location of all items of local cultural heritage merit located within the Site shall be shown on the site layout drawings in the CEMP. › A methodology for clear-felling of forestry around CH5 and CH6 shall be devised prior to the commencement of this phase of the Proposed Project. The methodology shall ensure that trees are removed from around the structures while ensuring that direct effects to same do not occur. › A post clear-felling walk-over survey of the area of CH5 and CH6 shall be undertaken. A full descriptive and photographic record of the surviving remains shall be carried out.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› A 10m buffer/exclusion zone shall be established around CH5 and CH6 post clear-felling and prior to the commencement of ground works. The buffer/exclusion zone shall comprise durable fencing with 'Keep Out' signage and be maintained for the duration of the construction stage of the Proposed Project		
Decommissioning Phase					
MM91	Decommissioning Phase	Chapter 14: Section 14.5	› There will be no significant potential effects to the archaeological, architectural and cultural heritage environment during the decommissioning phase of the Proposed Project. Any potential direct effects will already have been resolved through mitigation measures during the construction phase. Therefore, there is no potential for any cumulative effects to arise during the decommissioning phase		
Chapter 15: Material Assets (Traffic)					
MM92	Mitigation by Design	Chapter 15: Section 15.1.13.5	**Mitigation by Design** Mitigation by design measures include the following: › Selection of the most appropriate delivery route to transport the wind turbine components, requiring the minimum remedial works to accommodate the vehicles as set out in Section 15.1.9. › Selection of the shortest underground grid connection route, minimising the impacts on the existing road network and traffic.		
Construction Phase					
MM93	Construction Stage	Chapter 15: Section 15.1.13.5	The successful completion of the Proposed Project will require significant coordination and planning, and a comprehensive set of mitigation measures will be put in place before and during the construction stage of the Proposed Project in order minimize the effects of the additional traffic generated. A detailed TMP incorporating all the mitigation measures included		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			as Appendix 15-2 of this EIAR, will be finalised and confirmatory detailed provisions in respect of traffic management agreed with the roads authority and An Garda Síochána prior to construction works commencing on Site. In addition, the traffic management measures proposed for the following construction traffic scenarios are set out for the Proposed 110kV Underground Cabling in Appendix 15-2: **Traffic Management Plan for Killoshulan Wind Farm;** › Delivery of Abnormally sized loads, › Traffic management measures during construction of the Proposed 110kV Underground Cabling. The detailed TMP will include the following: **Traffic Management Coordinator –** a competent Traffic Management Co-ordinator will be appointed for the duration of the construction of the Proposed Project, and this person will be the main point of contact for all matters relating to traffic management. **Delivery Programme –** a programme of deliveries will be submitted KCC and other relevant authorities in advance of deliveries of turbine components to the Site. Liaison with the relevant local authorities including the roads sections of local authorities that the delivery routes traverse and An Garda Siochana, during the delivery phase of the large turbine vehicles, when an escort for all convoys will be required. **Information to locals** – Locals in the area will be informed of any upcoming traffic related matters e.g. delivery of turbine components at night, via letter drops and posters in public places. Information will include the contact details of the Contract Project Co-ordinator, who will be the main point of contact for all queries from the public or local authority during normal working hours. An "out of hours" emergency number will also be provided.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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. Implementation of temporary alterations to road network at critical junctions – At locations where required highlighted in Section 15.1.9. **Identification of delivery routes** – These routes will be agreed and adhered to by all contractors. **Travel plan for construction workers to Proposed Project site–** While the assessment above has assumed the worst case that construction workers will drive to the Proposed Project site, the construction company will be required to provide a travel plan for construction staff, which will include the identification of a routes to / from the site and identification of an area for parking. **Travel plan for construction workers to underground electric cabling route –** Due to the transient nature of the proposed underground grid connection construction site which will generally be on a section of the public road, construction workers will be transported to and from the site by the construction company at the beginning and end of each shift. **Drivers conduct** – All drivers will follow normal rules of the road and will receive toolbox talk regarding the delivery route and planned holding points prior to any deliveries. **Standard permitted axial loads** – This will ill not be exceeded. **Temporary traffic signs** – As part of the traffic management measures temporary traffic signs will be put in place at all key junctions, including the access junction on the R693 during the 18 month construction period. All measures will be in accordance with the *"Traffic Signs Manual,*		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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). **Delivery times of large turbine components** - The management plan will include the delivery of large wind turbine plant components at night in order to minimise disruption to general traffic during the construction stage. **Re-instatement works** - All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers. All works will be done in accordance with the Guidelines for the Opening, Backfilling and Reinstatement of Openings in Public Roads, DTToS, September 2015. **Additional measures** - Various additional measures will be put in place in order to minimise the effects of the development traffic on the surrounding road network including wheel washing facilities on Site and sweeping / cleaning of local roads as required. It is confirmed that details for the TMP for the Proposed Project will be agreed with TII and the Road Section of KCC prior to construction and contact will be maintained with the Road and Traffic Section throughout the construction phase.		
Operational Phase					
MM94	Operational Phase	Chapter 15: Section 15.1.13.5	Due to the very low volumes of traffic forecast to be generated during this stage no mitigation measures are required		
Decommissioning Phase					

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM95	Decommissioning Phase	Chapter 15: Section 15.1.13.5	In the event that the Proposed Project is decommissioned after the 35 years of operation, a decommissioning plan, will be prepared for agreement with the local authority, as described in Chapter 4 and Appendix 4-6 Decommissioning Plan. This plan will include a material recycling / disposal and traffic management plan will be prepared for agreement with the local authority prior to decommissioning, in accordance with Scottish Natural Heritage (SNH) report *Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms* (SNH, 2013).		
Chapter 15 Material Assets (Other)					
Construction Phase					
MM96	Electricity	Chapter 15 Section 15.3.3.2.1	› Goal posts will be established under overhead lines for the entirety of the construction phase. They will not exceed a height of 4.2 metres, unless specifically agreed with ESB Networks[4] › The suitability of machinery and equipment for use near power lines will be risk assessed. › All staff will be trained on the routes and operating voltages of OHLs running across the proposed main site entrance. All staff will be trained to be aware of the risks associated with overhead lines. All contractors that may visit the sites are made aware of the location of lines before they come on to site. › Barriers will run parallel to the OHL at a minimum horizontal distance of 6 metres on plan from the nearest overhead line conductor wire. › Prior to the delivery of turbines to the Proposed Wind Farm site, a dry run of the route using vehicles with similar dimensions will occur. Please see Section 15.1.9 for details.		

[4] *https://www.esbnetworks.ie/docs/default-source/publications/code-of-practice-for-avoiding-danger-from-overhead-electricity-lines.pdf*

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			› When activities must be carried out beneath overhead lines, e.g. component delivery or grid cable laying, a site-specific risk assessment will be undertaken prior to any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or equipment that will be used is undertaken prior to any works. OHL proximity detection equipment will be fitted to machinery when such works are required. › Information on safe clearances will be provided to all staff and visitors. › Signage indicating locations and health and safety measures regarding overhead lines will be erected in canteens and on site. › All staff will be made aware of and adhere to the Health & Safety Authority's 'Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021'. This will encompass the use of all necessary Personal Protective Equipment and adherence to the site Health and Safety Plan. › All health and safety measures as detailed in Section 5 of Construction Environment Management Plan and Chapter 5 Population and Human Health will be adhered to during the construction, operation and decommissioning phases. › Any area where excavations are planned will be surveyed and all existing services will be identified prior to commencement of any works. › Liaison will be had with the relevant sections of the Local Authority including all the relevant area engineers to ensure all services are identified. › Excavation permits will be completed, and all plant operators and general operatives will be inducted and informed as to the location of any services. › The contractor must comply with and standard construction codes of practice in relation to working around electricity, gas, water, sewage and telecommunications networks		
MM97	Water	Chapter 15	› In advance of any construction activity, the contractor will undertake pre-commencement surveys to confirm the presence or otherwise of any services		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		Section 15.3.3.2.2	such as water supply. If found to be present, the relevant service provider will be consulted with in order to determine the requirement for specific excavation or relocation methods and to schedule a suitable time to carry out works. In the event that water mains are encountered the water supply will be turned off by the utility so work can commence on diverting the service. The section of existing pipe will be removed and will be replaced with a new pipe along the new alignment of the service. The works will be carried out in accordance with the specifications of the relevant utility provider.		
MM98	Broadband Services	Chapter 15 Section 15.3.3.2.3	Specific measures are incorporated into the CEMP, included as Appendix 4-3 of this EIAR, to ensure that the construction of the Proposed Project will not have effect on underground electrical cables and built services at the Site. The mitigation measures include the following: › Any area where excavations are planned will be surveyed and all existing services will be identified prior to commencement of any works. › Liaison will be had with the relevant sections of the Local Authority including all the relevant area engineers to ensure all services are identified. › Excavation permits will be completed, and all plant operators and general operatives will be inducted and informed as to the location of any services. › The contractor must comply with and standard construction codes of practice in relation to working around electricity, gas, water, sewage and telecommunications networks.		
Decommissioning Phase					
MM99	Decommissioning Phase	Chapter 15 Section 15.3.3.2.5	The wind turbines proposed as part of the Proposed Wind Farm are expected to have a lifespan of approximately 35 years. Following the end of their useful life, the wind turbines may be replaced with a new set of turbines, subject to planning permission being obtained, or the Proposed Wind Farm will be decommissioned fully as described in Chapter 4 and the accompanying decommissioning plan in Appendix 4-6.		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			It is not intended that the Proposed 110kV Underground Cabling will be removed at the end of the useful life of the Proposed Wind Farm. By the time the decommissioning of the Proposed Wind Farm is to be considered, the Proposed 110kV Substation and Proposed 110kV Underground Cabling will likely form an integral part of the local electricity network. Therefore, it is intended that the Proposed Grid Connection (including the proposed new access and maintenance tracks) will be retained as permanent structures and will not be decommissioned. The works required during the decommissioning phase are described in Section 4.10 in Chapter 4 of this EIAR. Any impact and consequential effect that occurs during the decommissioning phase will be similar to that which occurs during the construction phase, however to a lesser extent. Based on the assessment outlined above in Section 15.3.3.2, there will be no significant effects on existing and built services, or waste management as part of the decommissioning phase		
Chapter 16 Major Accidents & Natural Disasters					
MM100	Mitigation Measures During Construction, Operation and Decommissioning	Chapter 16 Section 16.4.3	The Proposed Project will be designed and built in line with current best practice and, as such, mitigation against the risk of major accidents and/or disasters will be embedded through the design. In accordance with the provision of the European Commission "*Guidance on the preparation of Environmental Impact Assessment Reports*"[5], a Risk Management Plan (RMP) will be prepared and implemented on the Site to ensure an effective response to disasters or the risk of accidents. The RMP will include sufficient preparedness and emergency planning measures		

[5] *European Commission, 2017. Guidance on the preparation of Environmental Impact Assessment Reports. Available at: https://op.europa.eu/en/publication-detail/-/publication/2b399830-cb4b-11e7-a5d5-01aa75ed71a1*

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM101	Contamination Events	Chapter 16 Section 16.4.3.1	Potential effects associated with contamination during construction, operation and decommissioning are addressed fully in in Section 8.5 of Chapter 8: Land, Soils and Geology and Section 9.5 of Chapter 9: Hydrology & Hydrogeology. The mitigation measures outlined in Chapter 8 and Chapter 9 to protect environmental receptors as well as the procedures and measures described in the CEMP will ensure that the risk from these sources is low. A CEMP has been prepared for the Proposed Project and is included in Appendix 4-3 of this EIAR. The above Major Accidents and Natural Disaster Risk Assessment forms the basis of the Emergency Response Plan (ERP) which is contained within the CEMP. Upon a grant of planning permission for the Proposed Project, the CEMP will be updated to reflect the conditions stipulated in the consent prior to the commencement of the development. The CEMP will be a live document, maintained by the contractor, that will work to ensure that potential risks of major accident and/or disaster are identified, avoided and mitigated, as necessary. Refer to Appendix 4-3 for the CEMP that sets out the minimum standards to be employed by the contractor.		
MM102	Major Fire	Chapter 16 Section 16.4.3.2	The Proposed Project will also be subject to a fire safety risk assessment in accordance with Chapter 19 of the Safety, Health and Welfare at Work Acts 2005 to 2021, which will assist in the identification of any major risks of fire on the Site, and mitigation of the same during construction, operation and decommissioning. The ERP includes hazard identification procedures and mitigation measures which the site Supervisor/Construction Manager will carry out in case of a fire/explosion at the Site. Refer to Appendix 4-3 for an outline CEMP that sets out the minimum standards to be employed by the contractor. Appendix 4-4 of the EIAR details the Fire Risk Management and Emergency Response Plan in relation to the Proposed Project. The Plan has been developed in relation to the effects on the environment and health and safety of the BESS following a fire emergency. The report outlines the mitigation design, procedures and actions to protect lives and safety of site and emergency services personnel, the protection of the environment, minimisation of damage and disruption and the return to normal operations. The report states the design factors which contribute to		

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			reducing the escalation in the severity of a potential incident, facilities for the emergency services and the safeguarding of the environment through fire water retention.		
MM103	Karst Risk	Chapter 16 Section 16.4.3.3	The potential risk associated with ground instability subsidence and localised ground collapse during the construction phase is addressed fully in in Section 8.5 of Chapter 8: Land, Soils and Geology and Section 9.5 of Chapter 9 Hydrology & Hydrogeology. The mitigation measures outlined in Chapter 8 and Chapter 9 to protect environmental receptors as well as the procedures and measures described in the Karst Assessment Report (Appendix 8-3) will ensure that the residual effect is considered negative, imperceptible to slight, direct, long term, unlikely effect. A Karst Risk Assessment has been prepared for the Proposed Project and is included in Appendix 8-3 of this EIAR. A Karst Protocol has been developed and will be implemented during the construction phase to ensure that any potential karst features encountered are appropriately identified, investigated and mitigated. The protocol includes geotechnical supervision, inspection of excavation formation levels, additional ground investigations where required, and the implementation of suitable engineering solutions to ensure ground stability. Subject to the implementation of these measures, the risk of ground instability or localised collapse affecting the Proposed Project during the construction phase is considered to be low. Refer to the Karst Assessment Report in Appendix 8-3 for further details on the assessment, proposed mitigation measures and Karst Protocol.		

18.2 EIAR Monitoring Measures

Table 18-2 Schedule of Monitoring

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
Chapter 4 Description of the Proposed Project						
MX1	Drainage Maintenance	Ch. 4: Description of the Proposed Project, 9 Appendix 4-3 CEMP Section 3,4 Appendix 4-5: Surface Water Management Plan	› Prior to commencement of works in sub-catchments across the site, main drain inspections will be competed to ensure ditches and streams are free from debris and blockages that may impede drainage. It is proposed to complete these inspections on a catchment-by-catchment basis as the construction works develop across the site, as works in all areas will not commence simultaneously. › Drainage and associated pollution control measures will be implemented on-site 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. › The routes of any natural drainage features will not be altered as part of the Proposed Project. Turbine locations have been selected to avoid natural watercourses. It is proposed that 3 no. new clear span watercourse crossings are required within the Proposed Wind Farm site. › There will be no direct discharges to natural watercourses. All discharges from the proposed works areas or from interceptor drains will be made over vegetated ground at an appropriate distance from natural watercourse and lakes. Buffer zones around the existing natural drainage features have informed the layout of the Proposed Project and are indicated on the drainage design drawings.	On going	Monthly	Project Hydrologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			› Where artificial drains are currently in place in the vicinity of proposed works areas, these drains may have to be diverted around the proposed works areas to minimise the amount of water in the vicinity of works areas. Where it may not be possible to divert artificial drains around proposed work areas, the drains will be blocked to ensure sediment laden water from the works areas has no direct route to other watercourses. Where drains have to be blocked, the blocking will only take place after an alternative drainage system to handle the same water has been put in place. › Existing artificial drains in the vicinity of existing site roads will be maintained in their present location where possible. If it is expected that these artificial drains will receive drainage water from works areas, check dams will be added (as specified below) to control flows and sediment loads in these existing artificial drains. If road widening or improvement works are necessary along the existing roads, where possible, the works will take place on the opposite side of the road to the drain.			
MX2	Surface Water Management Plan	Appendix 4-5: Surface Water Management Plan Ch. 9: Hydrology & Hydrogeology	› Water quality field testing and laboratory analysis will be undertaken prior to commencement of felling and construction at the Site. › Analysis will be for a range of parameters with relevant regulatory limits along with Environmental Quality Standard's (EQSs) and sampling will be undertaken for each stream that drains from the construction site. › Baseline sampling will be completed on at least two occasions, and these will coincide with low flow and high flow stream conditions. The high flow sampling event will be undertaken after a period of	As required	As required	Project Hydrologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			sustained rainfall, and the low flow event will be undertaken after a dry spell. › There is an existing drainage network across the Site and runoff drains relatively freely to local watercourses and streams. This existing drainage system will continue to function as it is during the pre-construction phase. › However, 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. These inspections will be done on a catchment-by-catchment basis as the construction works develop across the Site, as works in all areas will not commence simultaneously.			
MX3	Environmental Management	Appendix 4-3 CEMP Section 4	› The Project Developer will be required to engage a qualified Environmental Engineer, Environmental Scientist, or equivalent, with experience in wind farm construction to fulfil the role of Environmental Clerk of Works (ECoW) to oversee the construction works and audit the implementation of the CEMP. The ECoW will report to the Project Developer and Project Contractor but will liaise closely with the Construction Manager in relation to the Project Contractor's day-to-day implementation of the CEMP on site. › The Environmental Clerk of Works (ECoW) will be nominated by the Project Developer to oversee the Project Contractor's effective implementation of the Proposed Project's environmental requirements and obligations, as captured in the CEMP. The ECoW will be responsible for monitoring the works of the Project Contractor from an environmental perspective on behalf of the Project Developer. For the sake of expediency, the ECoW will report their ongoing audit	As required	As required	ECoW

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			findings, monitoring results and site observations to both the Project Developer and the Proposed Contractor, having been nominated by the developer to fulfil the role. › The level, detail and frequency of reporting expected from the ECoW for the Construction Manager, Developer's Project Manager, and any Authorities or other Agencies, will be agreed by all parties prior to commencement of construction, and may be further adjusted as required during the course of the Proposed Project.			
MX4	Decommissioning	Appendix 4-6	As noted in the Scottish Natural Heritage report (SNH) *Research and Guidance on Restoration and Decommissioning of Onshore Wind Farms* (SNH, 2013) reinstatement proposals for a wind farm are made approximately 30 years in advance, so within the lifespan of the wind farm, technological advances and preferred approaches to reinstatement are likely to change. According to the SNH guidance, it is therefore: *"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".* In this regard, the Decommissioning Plan (DP) (Appendix 4-7) will be reviewed and updated prior to commencement of decommissioning works to take account of the relevant conditions of the planning permission and current health and safety standards.	End of Operational Life	As Required	Developer Appointed/ Contractor
MX5	Decommissioning	Appendix 4-6	› The ECoW will maintain responsibility for monitoring the decommissioning works and Contractors/Sub-contractors from an environmental perspective. The ECoW will act as the regulatory interface on environmental matters. The Site Manager will be	End of Operational Life	As Required	Site Manager/ ECoW

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			responsible for reporting to and liaising with Kilkenny County Council and other statutory bodies as required.			
MX6	Decommissioning	Appendix 4-6	› 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.	End of Operational Life	As Required	Site Manager/ ECoW
MX7	Decommissioning	Appendix 4-6	› Prior to decommissioning, a suitably qualified ecologist will complete an invasive species survey of the site to identify invasive species where any minor excavation will be required. If present in these areas, the ecologist will propose suitable management measures.	End of Operational Life	As Required	Project Ecologist
MX8	Health and Safety	Appendix 4-6	› Report on site activities to include but not limited to information on accidents and incidents, disciplinary action taken and PPE compliance; › Monitor the compliance of contractors and others and take corrective action where necessary; and › Notify the Authority and the client of non-compliance with any written directions issued.	End of Operational Life	As Required	PSCS
			Chapter 5: Population and Human Health			
MX9	Noise and Vibration	Chapter 5: Section 5.10.2.2.4	› Monitoring typical levels of noise and vibration during critical periods and at sensitive locations;	As required	As required	ECoW

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
MX10	Health and Safety	Chapter 5: Section 5.10.3.2.1	› Staff associated with the project will conduct frequent visits, which will include inspections to establish whether any signs have been defaced, removed, faded, or are becoming hidden by vegetation or foliage, with prompt action taken as necessary › The Proposed 110kV Substation, which will be operated by EirGrid/ESBN will be locked and fenced off from public access. The Proposed 110kV Substation will be operational remotely and manually 24 hours per day, 7 days a week. Supervisory operational and monitoring activities will be carried out remotely using a Supervisory Control and Data Acquisition (SCADA) system, with the aid of computers connected via a telephone modem link.	As required	As required	ECoW
MX11	Shadow Flicker	Chapter 5: 5.10.3.2.7	› Should shadow flicker associated with the Proposed Wind Farm be perceived to cause nuisance at any home, the affected homeowner is invited to engage with the Wind Farm operator. Should a complaint or query in relation to shadow flicker be received within 12 months of commissioning of the Proposed Wind Farm, field investigation/monitoring will be carried out by the wind farm operator at the affected property. The homeowner will be asked to log the date, time and duration of shadow flicker events occurring on at least five different days. The provided log will be compared with the predicted occurrence of shadow flicker at the residence, and if necessary, a field investigation will be carried out. Likewise, the Proposed Project can be brought in line with the requirements of the Draft 2019 Guidelines (DoHPLG, 2019) should they be adopted during the planning application process for this development	As required	As required	CLO

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
Chapter 6: Biodiversity						
Operational Phase						
MX12	Bats	Ch. 6: Biodiversity Appendix 6-2	**Operational Monitoring** A programme of post-construction monitoring (PCM) will be implemented to assess the effects of the Proposed Wind Farm on bat activity and collision mortality, and to evaluate the effectiveness of the mitigation measures described above, including blade feathering and site-specific curtailment. The primary objective of the monitoring programme is to evaluate the effectiveness of the mitigation strategy and to ensure that the Favourable Conservation Status of local bat populations is maintained, as required under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended). The monitoring programme has been designed in accordance with NatureScot (2021), NIEA (2021) and BCI (2026) guidance and will follow an adaptive management approach. In accordance with NatureScot (2021) and BCI (2026), PCM will comprise two integrated components: › Fatality monitoring (carcass searches) to quantify collision mortality; and	As required	As required	ECoW

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			Acoustic monitoring to assess bat activity patterns and potential displacement or attraction effects.			
Chapter 7: Ornithology						
Pre-Construction Phase						
MX13	Proposed Wind Farm site	Appendix 7-7	It is proposed that construction works at the Proposed Wind Farm site will commence outside the bird nesting season (1st of March to 31st of August inclusive) to avoid the most sensitive time of the year for most bird species with the potential to use the Site and its environs. Pre-commencement confirmatory surveys will be undertaken prior to the initiation of works at the Proposed Wind Farm site. This survey will be conducted a maximum of three weeks before the commencement of works. Following commencement, construction phase surveys will be conducted during works. These surveys will be conducted once per month during the breeding season (April to July) and once at the start of the winter season (October). These surveys will continue to be conducted each season for the duration of the construction period. The aim of the pre-commencement and construction phase surveys is to identify sensitive sites (e.g., nests or roosts) in proximity to works. The surveys will be undertaken by a suitably qualified ornithologist. The survey will include a thorough walkover survey to a 500m radius of the development footprint and/or all works areas. If winter roosts or breeding activity of birds of high conservation concern is identified, the roost or nest site will be located and earmarked for monitoring at the beginning of the	Once	As required	Project Ornithologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			first winter or breeding season of the construction phase. If the roost/nest is found to be active during the construction phase works will cease within a species-specific buffer of this location in line with best practice guidance (e.g., Forestry Commission Scotland, 2006; Goodship and Furness 2022; Ruddock and Whitfield, 2007). No works shall be permitted within the buffer until it can be demonstrated that the roost or nest is no longer occupied. All site staff and subcontractors will be made aware of any restrictions to be imposed by means of a toolbox talk and a map of the 'no-work zone' will be made available to all construction staff. The restricted area will also be marked off to alert all personnel on site to the suspension of works within that area			
MX14	Proposed 110kV Underground Cabling crossing of the River Nore	Appendix 7-7	It is proposed that construction works at the Proposed 110kV Underground Cabling crossing of the River Nore will be conducted outside the kingfisher core nesting season (April to July inclusive), as described in Section 7.6.3 of Chapter 7 of the EIAR. In addition, targeted kingfisher surveys will be undertaken at the Proposed 110kV Underground Cabling crossing of the River Nore if the works are to commence here between February and September. This precautionary period accounts for early courtship and the potential for multiple/late broods. The survey will be conducted a maximum of two weeks before the commencement of works at the River Nore, and preferably within one week if possible. Surveys will follow the transect routes established during the pre-planning surveys. The aim is to establish if active nesting is occurring or if the surrounding river corridor is being utilised for foraging by adults provisioning dependent young. The surveys will be undertaken by a suitably qualified ornithologist. If a kingfisher breeding site is identified, works will cease within a species-	Once	As required	Project Ornithologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			specific buffer of this location in line with current best practice guidance (e.g., NatureScot, 2022). No works shall be permitted within the buffer until it can be demonstrated that the nest is no longer occupied. The ornithologist will also monitor foraging routes of the breeding kingfisher and if works are found to interfere with adults provisioning dependent young, works will cease within a species-specific buffer of foraging routes until it can be demonstrated that the nest is no longer occupied			
Construction Phase						
MX15	Ornithology	EIAR Chapter 7	› Targeted kingfisher surveys will be undertaken at the Proposed 110kV Underground Cabling crossing of the River Nore if the works are to commence here between February and September.	Once	As required	Project Ornithologist
Operational Phase						
MX16	Ornithology	EIAR Chapter 7	› Vantage point surveys will be undertaken to monitor flight activity within a 500m radius of the Proposed Turbines. › Breeding raptor surveys will be undertaken to establish whether a raptor breeding attempt was initiated and subsequently, whether it was successful. › Breeding woodcock surveys will be undertaken to monitor breeding woodcock activity during the operational phase. › Carcass searches for bird casualties shall be conducted at each turbine.	As required	As required	Project Ornithologist
MX17	Vantage Point Surveys	Appendix 7-7 Section 2.2.1	Vantage point surveys will be undertaken to monitor flight activity within a 500m radius of the Proposed Turbines. The objective of the surveys is to provide information on bird use of the area and interactions with turbines	As required	As required	Project Ornithologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			after construction of the Proposed Wind Farm that can be compared to pre-planning data. Vantage point surveys will be conducted from four fixed locations that were used during pre-planning surveys (VP1, VP2, VP4, and VP5) in order to provide complete coverage of all Proposed Turbines. Should vantage point locations need to be moved, a viewshed analysis will be conducted to ensure there is still comprehensive coverage of the 500m radius of Proposed Turbines at the new locations. Surveys will be conducted monthly. Survey methodology should follow NatureScot (2025) and any revisions to the same. Behavioural categories for the observation of bird interactions with operational wind farms will be in line with terminology outlined by Meredith *et al.,* (2002). The surveyor should collect data on bird observations and flight activity from the scanning arc of 180° to a 2km radius at the fixed vantage point locations for two 3-hour watches separated by a minimum 30-minute break (i.e., 6 hours total) per month. Surveys should be spread over the full daylight period, including dawn and dusk watches to coincide with the highest periods of bird activity. Flight activity of target species will be mapped and recorded as per three defined flight bands chosen in relation to the dimensions of the turbines as built: below rotor swept height, at the rotor swept height and above rotor swept height, in this case 0-22m, 22-185m, and 185+m. When a target species is detected, the location of the bird will be recorded on a map and the surveyor will provide the following details: time, species, number of birds, activity/behaviour, the primary habitat used (and secondary and tertiary habitat if applicable) and any other notes of interest			

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
MX18	Breeding Raptor Surveys	Appendix 7-7 Section 2.2.2	Breeding raptor surveys will be undertaken to establish whether a raptor breeding attempt was initiated and subsequently, whether it was successful. The objective of the surveys is to provide information on the raptor (in particular KOR species) use of the area for breeding after construction of the Proposed Wind Farm that can be compared to their breeding activity in pre-planning data. Surveys should be conducted at the territories with nest sites identified within 500m of the Proposed Wind Farm site during pre-planning surveys in each monitoring year, or at additional locations if it is believed that the raptor nest may have moved to a new location within 500m of the Proposed Wind Farm site. Surveys should be undertaken from April to July inclusive and from at least four breeding raptor vantage points. Survey methods should follow Hardey *et al.* (2013) or any revisions to the same or updated guidance. Up to four visits are necessary: (1) to establish occupancy, (2), to establish if an active nest is present, (3) to check if young have hatched and (4) to check if young have fledged. During any visit, when a raptor is detected, the location of the bird will be recorded on a map and the following details will be recorded: time, species, number of birds, breeding activity/behaviour, the primary habitat used (secondary and tertiary habitat if applicable) and any other notes of interest (such as male or female.	As required	As required	Project Ornithologist
MX19	Breeding Woodcock Surveys	Appendix 7-7 Section 2.2.3	Breeding woodcock surveys will be undertaken to monitor breeding woodcock activity during the operational phase. Survey methods should follow Gilbert et al. (1998) or any revisions to the same or updated guidance. Three visits should be undertaken in May and June inclusive. Surveys should be undertaken from one hour before sunset to one hour after sunset or until it is too dark to see. The same transect routes (or as close as possible)) as those used during preplanning surveys should be	As required	As required	Project Ornithologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			followed to provide comparable data. All woodcock activity, in particular breeding behaviour, should be recorded			
MX20	Breeding Kingfisher Surveys	Appendix 7-7 Section 2.2.4	Breeding kingfisher surveys will be undertaken in the first year of the operational lifetime of the River Nore underground cable crossing. This is to establish that kingfisher continue to breed along the watercourse post-construction. If potential breeding kingfisher are found to be utilising the river in Year 1 there is no requirement for further surveys. If potential breeding kingfisher are not found to be utilising the river, surveys are to be undertaken in the subsequent monitoring year, and so forth. Three survey visits should be undertaken between March and May, following the same transects routes as the pre-planning surveys. Survey methodology follows Cummins et al. (2010), and are to take place between 08:00 and 18:00, the surveyor should walk as close as is safe to the watercourse searching for kingfisher, signs of kingfisher nesting holes, and suitable kingfisher nesting habitat.	As required	As required	Project Ornithologist
MX21	Collision Monitoring	Appendix 7-7 Section 2.2.5	Carcass searches for bird casualties as a result of collision with turbines will follow survey methods broadly based on guidelines issued by the SNH (2009) and search methods adopted by Duffy and Steward (2008). The study area will be visited once per month during operational Years 1, 2, 3, 5, 10 and 15 of the lifetime of the Proposed Wind Farm. During each visit, the base of each operating turbine will be searched for bird carcasses. The area to be searched will be based on the turbine size and surrounding landscape. A trained dog and handler should be used to locate carcasses. If a bird carcass is found, the following details will be recorded: GPS location of each bird carcass, photographic record, carcass condition (intact - carcass that is completely intact or not badly composed; scavenged - evidence that the carcass was fed upon by a scavenger/predator; or feather spot - ten or more feathers indicating predation or scavenging or two or	As required	As required	Project Ornithologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			more primary feathers must be present to consider the carcass a casualty), distance from the turbine, date and time. Carcass removal trials and searcher efficiency trials will be undertaken to account for the ability of the dog to find bird carcasses and the likelihood of scavenging of carcasses by animals. This is done to ensure a more accurate estimation of the total number of collision victims. During carcass removal trials, a carcass is placed in a study area periodically and is monitored for a set number of days or until scavengers remove the carcass. A determination on carcass removal is made when no body parts containing flesh or bone or >10 disarticulated feathers can be found. During searcher efficiency trials, a number of carcasses are placed in a study area by one worker, then searched for by the dog later. The result of these trials is a correction factor that can be applied to the results of the carcass searches			
Decommissioning Phase						
MX22	Decommissioning Monitoring	Appendix 7-7 Section 2.3	An appropriate decommissioning plan will be prepared in advance of the decommissioning of the Proposed Turbines. This plan will include the measures proposed for the construction monitoring (Section 2.1 of Appendix 7-7) and will be developed in consultation with the Planning Authority and the NPWS. The aim of the plan will be to identify and protect sensitive nests, roosts or other key areas in proximity to decommissioning works. The requirements of the plan will be informed by the findings of the operational monitoring, along with the findings of other relevant ornithological surveys conducted in the interim where available. Methodologies should follow the current best practice guidance at the time the plan is prepared.	As required	As required	Project Ornithologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			Chapter 8 Land, Soils & Geology			
MX23	Biodiversity Enhancement and Management Plan (BEMP)	Chapter 8 Section 8.5.2.7	A site-specific monitoring and evaluation programme will be implemented to ensure that the success of the proposed measures remains long-term. It will also assist in situations where the habitat establishment may not have been successful by providing evidence of shortcomings, allowing a revised management plan to be formulated. Monitoring results will be reported by the Project Ecologist within an Annual Environmental Report. 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. The enhancement plan will be updated and amended where required to improve the efficacy of the enhancement work	As required	As required	ECoW
			Chapter 9 Hydrology & Hydrogeology			
			Construction Phase			
MX24	Clear Felling of Coniferous Plantation and Potential Surface Water Quality Effects	Chapter 9 Section 9.5.2.2	**Surface Water Quality Monitoring**: 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 commencing, preferably in medium to high water flow conditions. The "during" sampling will be undertaken once a week 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	As Required	Project Hydrologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			Criteria for the selection of water sampling points include the following: › Avoid man-made ditches and drains, or watercourses that do not have year-round flows, i.e. avoid ephemeral ditches, drains or watercourses; › Select sampling points upstream and downstream of the forestry activities; › It is advantageous if the upstream location is outside/above the forest in order to evaluate the impact of land-uses other than forestry; › Where possible, downstream locations will be selected: one immediately below the forestry activity, the second at exit from the forest, and the third some distance from the second (this allows demonstration of no impact through dilution effect or contamination by other land-uses where impact increases at third downstream location relative to second downstream location); and, › The above sampling strategy will be undertaken for all on-site sub-catchments streams where tree felling is proposed. Also, daily surface water monitoring forms will also be utilised at every works site near any watercourse. These will be taken daily and kept on site for record and inspection			
MX25	Earthworks (Removal of Vegetation Cover, Excavations and Stock Piling) Resulting in	Chapter 9: Section 9.5.2.3	**Monitoring:** An inspection and maintenance plan for the on-site construction drainage system will be prepared in advance of commencement of any works. Regular inspections of all installed drainage systems will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is	On-going	As Required	Project Hydrologist

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
	Suspended Solids Entrainment in Surface Waters		no build-up of standing water in parts of the systems where it is not intended. Inspections will also be undertaken after tree felling. Any excess build-up of silt levels at dams, the settlement pond, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed. Checks will be carried out on a daily basis. During the construction phase field testing and laboratory analysis of a range of parameters with relevant regulatory limits and EQSs will be undertaken for each primary watercourse and specifically following heavy rainfall events (as per the CEMP is included in Appendix 4-3 of this EIAR).			
MX26	Excavation Dewatering and Potential Impacts on Surface Water Quality	Chapter 9 Section 9.5.2.5	Daily monitoring of excavations by a suitably qualified person will occur during the construction phase. If high levels of seepage inflow occur, excavation work will immediately be stopped and a geotechnical assessment undertaken	Daily	Monthly	Project Hydrologist
MX27	Use of Siltbuster and Impacts on Downstream Surface Water Quality	Chapter 9 Section 9.5.2.14	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	On-going	Monthly	Project Hydrologist
MX28	Potential Surface Water Quality Effects of the Proposed Grid Connection Earthworks and Watercourse Crossings	Chapter 9 Section 9.5.2.15	The drilling process / pressure will be constantly monitored to detect any possible leaks or breakouts into the surrounding geology or local watercourse; This will be gauged by observation and by monitoring the pumping rates and pressures. If any signs of breakout occur, then drilling will be immediately stopped;	On-going	Monthly	Project Hydrologist
MX29	Biodiversity Enhancement and Management Plan	Chapter 9	A site-specific monitoring and evaluation programme will be implemented to ensure that the success of the proposed measures remains long-term. It will also assist in situations where the habitat establishment may not have	As required	As required	ECoW

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		Section 9.5.2.16	been successful by providing evidence of shortcomings, allowing a revised management plan to be formulated. Monitoring results will be reported by the Project Ecologist within an Annual Environmental Report. 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. The enhancement plan will be updated and amended where required to improve the efficacy of the enhancement work			
Chapter 10: Air Quality						
Construction Phase						
MX30	Dust Emissions	Chapter 10 Section 10.3.2.3	Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored to avoid, insofar as reasonably possible, increased runoff	As required	As required	ECoW
Chapter 12 Noise & Vibration						
Operational Phase						
MX31	Mitigation during Operation	Chapter 12 Section 12.7.2	› A community liaison officer will be appointed prior to first generation of electricity and contact details made publicly available; › Any complaint relating to noise can be reported to the community liaison officer, who will undertake an initial	As Required	As Required	CLO

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			screening of the complaint (review of logs submitted, review of wind conditions and turbine data etc.) and speak to the complainant in person, with an eventual visit to the complainant location if possible; › Following initial screening, the community liaison officer will be responsible for commissioning a detailed noise complaint investigation. This will include appointing a qualified acoustic consultant to undertake noise measurements at the complaint location and quantify the occurrence and depth (in dB) of OAM for every 10 minutes of the measurement campaign. The measured 10-minute noise levels and OAM depth will also be correlated with 10-minute wind conditions and operational data to find patterns and potential character penalties in accordance with good practice at the time of the assessment; and, › If frequent and sustained OAM is found, then appropriate mitigation will be designed and implemented and the complainant informed by the community liaison officer. Mitigation measures considered will include changes to the operation of the relevant wind turbine(s) by changing software parameters such as blade pitch for specific wind conditions and time periods, addition of blade furniture (such as vortex generators) to alter the flow of air over the wind turbine blades; and, in extreme cases, targeted wind turbine shutdowns in specific conditions.			

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
Chapter 14 Cultural Heritage						
Construction Phase						
MX32	Sub-surface Archaeological Potential	Chapter 14 Section 14.4.3.5	› Archaeological monitoring under licence from the NMS of any geotechnical / engineering trial pits or investigations shall be carried out by a suitably qualified archaeologist. A report detailing the results of the monitoring shall be compiled on completion of the work and submitted to the NMS and Planning Authority/Body. › Archaeological monitoring of ground works during the construction stage of the Proposed Project under licence from the NMS shall be carried out by a suitably qualified archaeologist. Should archaeological finds, structures or deposits be uncovered as a result of the monitoring further mitigation measures such as preservation in situ or preservation by record (excavation) may be required and will be decided in consultation with the NMS. Such mitigation measures will be implemented where relevant following consultation with the NMS. A report detailing the results of the monitoring and/or any further necessary mitigation as referred to above will be compiled on completion of the work and submitted to the NMS and Planning Authority/Body.	On-going	As Required	Project Archaeologist
Chapter 16 Major Accidents & Natural Disasters						

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			Construction Phase			
MX33	Monitoring During Construction	Chapter 16 Section 16.4.5.1	The CEMP will be prepared/revised prior to the commencement of any works and will be a live document maintained by the contractor that will work to ensure that potential risks of major accident and/or disaster are identified, avoided and mitigated, as necessary. Refer to Appendix 4-3 for the CEMP that sets out the minimum standards to be employed by the contractor	As required	As required	ECoW
MX34	Monitoring During Operation	Chapter 16 Section 16.4.5.2	The operator of the Proposed Project will continue to assess the risk of major accidents and/or disasters on site on an ongoing basis during operation. The maintenance programme, record of reported incidents, as well as general site activities will be monitored on an ongoing basis to ensure risk of major accidents does not increase over time.	As required	As required	ECoW
MX35	Monitoring During Decommissioning	Chapter 16 Section 16.4.5.3	A Decommissioning Plan has been prepared (Appendix 4-6) the detail of which will be agreed with the local authority prior to any decommissioning. The Decommissioning Plan will be updated before the end of the 35-year operational period of the Proposed Wind Farm, in line with best practice decommissioning methodologies that are in place at the time of decommissioning and will be agreed with the competent authority prior to implementation. The Decommissioning Plan includes mitigation and monitoring measures that will be in place during the decommissioning phase. These can also be found in a Chapter 18: Schedule of Mitigation and Monitoring Measures which sets out all proposed Mitigation and Monitoring Measures for all three phases of the Proposed Project.	As required	As required	ECoW