

Borrisbeg Grid Connection

Chapter 16: Schedule of Environmental Commitments

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Chapter 16 Schedule of Environmental Commitments

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All mitigation and monitoring measures relating to the pre-commencement, construction and the operation phases of the Proposed Grid Connection are set out in the relevant chapters of this Environmental Impact Assessment Report (EIAR).

All mitigation measures that will be undertaken during the respective phases of the Proposed Grid Connection are listed in Table 16-1.

All monitoring measures which will be implemented during the pre-commencement, construction and operational phases of the Proposed Grid Connection are outlined in Table 16-2. All monitoring measures have been proposed within Chapters 4-14 of this EIAR. The monitoring measures are presented in terms of the monitoring requirement, frequency of monitoring and the mechanism for reporting results where applicable. By presenting the monitoring measures in the below format, it is intended to provide a monitoring schedule that can be reviewed and tracked during all phases of the project to ensure all the required monitoring is completed as required.

The Construction Environmental Management Plan (CEMP) (See Appendix 3-2) provides an outline of the proposal for site inspections and environmental audits.

Should the Proposed Grid Connection receive a grant of permission, a consolidated CEMP incorporating all the recommended mitigation and monitoring measures of the Proposed Grid Connection and the Consented Wind Farm, updated with the respective planning Conditions and obligations will be produced and submitted to Tipperary Co. Council for review and agreement, prior to the commencement of any works.

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16.1 Mitigation Commitments

Table 16-1 Mitigation Commitments

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
EIAR Chapter 3 – Description of the Proposed Grid Connection					
Pre-Commencement Phase					
MM1	Environmental Management	EIAR Chapter 3: Development Description CEMP Section 3	All proposed activities on the site of the Proposed Grid Connection will be provided for in a Construction and Environmental Management Plan (CEMP), prepared prior to the commencement of any construction activities onsite. The CEMP will set out all measures necessary to ensure works are carried out in accordance with the mitigation measures set out in the EIAR and will set out the monitoring and inspections procedures and frequencies.		
MM2	Environmental Management	CEMP Section 4	- The Project Developer will be required to engage a qualified Environmental Engineer, Environmental Scientist, or equivalent, to fulfil the role of Environmental Clerk of Works (ECoW) to oversee the construction works and audit the implementation of the CEMP. The ECoW will report to the Project Developer and Project Contractor but will liaise closely with the Construction Manager in relation to the Project Contractor's day-to-day implementation of the CEMP onsite. - The Environmental Clerk of Works (ECoW) will be nominated by the Project Developer to oversee the Project Contractor's effective implementation of the Proposed Grid Connection environmental requirements and obligations, as captured in the Construction Environmental Management Plan (CEMP) and provide on-site advice on the mitigation measures necessary as necessary to ensure the project proceeds as intended. - 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 Grid Connection.		
MM3	Concrete Deliveries	EIAR Chapter 3: Development Description CEMP Section 3	- The arrangements for concrete deliveries to the site will be discussed with suppliers before work starts, agreeing routes, prohibiting on-site washout of trucks and discussing emergency procedures. - 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.		
MM4	Site Drainage Plan	EIAR Chapter 3: Development Description CEMP Section 4	A detailed drainage design for the Proposed Grid Connection will be prepared prior to the commencement of construction to by the Project Hydrologist to incorporate these site drainage principles and carry forward into the construction phase of the Proposed Grid Connection.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Prior to any works commencing on the upgrade of existing roads, the requirement for additional roadside drainage will be considered by the Project Hydrologist in line with the proposals outlined in Section 4 of the CEMP.		
MM5	Waste Management	EIAR Chapter 3: Development Description EIAR Chapter 14: Material Assets CEMP Section 3	Prior to the commencement of the development, a Construction Waste Manager will be appointed by the Contractor. The Construction Waste Manager will be in charge of the implementation of the objectives of the Waste Management Plan, ensuring that all hired waste contractors have the necessary authorisations and that the waste management hierarchy is adhered to		
MM6	Preparative Site Drainage Management	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3	- The Project Hydrologist will complete a detailed drainage design and maintenance plan before construction commences and will attend the site to set out and assist with micro-siting of proposed drainage controls as outlined in Section 3.5 of the EIAR. - An adequate quantity of straw bales, clean stone, terram, stakes, etc. will be kept on site at all times to implement the detailed drainage design measures as necessary. The detailed drainage measures will be installed prior to, or at the same time as the works they are intended to drain.		
MM7	Drainage Maintenance	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 4	Prior to commencement of works in sub-catchments across the site, main drain inspections will be completed to ensure ditches and streams are free from debris and blockages that may impede drainage. It is proposed to complete these inspections on a catchment-by-catchment basis as the construction works develop across the site, as works in all areas will not commence simultaneously.		
MM8	Watercourse Crossings	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 4	Confirmatory inspections of the proposed new watercourse crossing location will be carried out by the Project Civil/Structural Engineer and the Project Hydrologist prior to the construction of the crossing.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM9	Drainage Maintenance	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 4	An inspection and maintenance plan for the drainage system onsite will be prepared in advance of commencement of any works. Regular inspections of installed drainage features will be necessary, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water within the system where it is not intended. The inspection of the drainage system will be the responsibility of the environmental clerk of works or the supervising hydrologist		
MM10	Pre-Construction Drainage	EIAR Chapter 3: Development Description CEMP Section 3 EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3	Drainage and associated pollution control measures will be implemented onsite before the main construction works commence. Where possible, drainage controls will be installed during seasonally dry ground conditions. This will reduce the possibility of impact on surface waters by suspended sediment released during construction and entrained in surface run-off.		
MM11	Traffic Management	EIAR Chapter 3: Development Description Chapter 14: Material Assets CEMP Section 3	When the Grid Connection underground cabling route is located on public roads, a Traffic Management Plan will be prepared prior to any works commencing. A road opening licence will be obtained where required and all plant operators and general operatives will be inducted and informed as to the location of any services		
MM12	Spoil Management	EIAR Chapter 3: Development Description EIAR Chapter 7 Land, Soil Geology CEMP Section 2	- Placement of infrastructure in areas with suitable ground conditions. - All excavated spoil material will be managed on-site, either placed within the identified spoil management areas (i.e. linear berms along access roads) or within the substation field (up to 4m high creating a visual screening of the substation from the local roads during the operational phase). - Excavated soils/subsoils shall be excavated and managed separately to topsoil; this will prevent mixing of materials and facilitate reuse afterwards. - Depending on the road makeup along the underground cabling route, some of the excavated materials will go to an appropriate licenced facility as required. With regards to the placement of spoil alongside access roads during the construction of the Proposed Grid Connection:		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			- The placement of spoil will be restricted to a maximum height of 1.0m, subject to confirmation by the Geotechnical Engineer. - Where practical, the surface of the placed spoil is shaped to allow efficient run-off of surface water. Where possible, shaping of the surface of the spoil will be carried out as placement of spoil within the area progresses. This will reduce the likelihood of debris run-off and ensure stability of the placed spoil. - The surface of the deposited spoil will be profiled to a gradient to be agreed with the Geotechnical Engineer and vegetated or allowed to vegetate naturally as indicated by the Project Ecologist. All the above-mentioned general guidelines and requirements will be confirmed by the Geotechnical Engineer prior to construction.		
Construction Phase					
MM13	Refuelling	EIAR Chapter 3: Development Description EIAR Chapter 6 Major Accidents and Natural Disasters EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3	- Road-going vehicles will be refuelled off site wherever possible; - Fuels volumes stored on site should be minimised. Any fuel storage areas will be bunded appropriately for the fuel storage volume for the time period of the construction and fitted with a storm drainage system and an appropriate oil interceptor; - The substation transformer and oil interceptor will be on a bunded concrete plinth capable of holding 110% of the stored oil volume and to prevent leakage to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; - An emergency plan for the construction phase to deal with accidental spillages will be developed (refer to Section 6 of this Plan) Spill kits will be available to deal with and accidental spillage in and outside the refuelling area. - A programme for the regular inspection of plant and equipment for leaks and fitness for purpose will be developed at the outset of the construction phase. - The following mitigation measures are proposed to avoid release of hydrocarbons at the Site: - On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site. Heavy plant and machinery will be refuelled on-site by a fuel truck that will come to the Site as required on a scheduled and organised basis. - Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area on-site when not in use. - All refuelling will be carried out outside designated watercourse buffer zones. - Only designated trained and competent operatives will be authorised to refuel plant on-site. Mobile measures such as drip trays and fuel absorbent mats will used during refuelling operations as required. All plant and machinery will be equipped with fuel absorbent material and pads to deal with any event of accidental spillage.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM14	Concrete Deliveries	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3	- No batching of wet-cement products will occur on the Site. - Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place; - Where possible pre-cast elements for culverts and concrete works will be used; - Where concrete is delivered on Site, only the chute will need to be cleaned, using the smallest volume of water possible. No discharge of cement contaminated waters to the construction phase drainage system or directly to any artificial drain or watercourse will be allowed. Chute cleaning water is to be directed into a dedicated concrete wash out pit. Decommissioning of this pit will occur at the end of the construction phase and water, and solids will be tanked and removed from the site to a suitable, non-polluting, discharge location; - All concrete will be paced in shuttering and will not be in contact with soils or groundwater until after it has set; - Use weather forecasting to plan dry days for pouring concrete; and, - Ensure pour site is free of standing water and plastic covers will be ready in case of sudden rainfall event. - 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. - The 50 m wide watercourse buffer zone will be in place for the duration of the construction phase. No construction activity will occur within the buffer zone with the exception of clear span crossing construction. The buffer zone will: - Prevent any cement-based products accidentally entrained in the construction phase drainage system entering directly into watercourses, achieved in part by ending drain discharge outside the 50 m buffer zone and allowing percolation across the vegetation of the buffer zone; - Provide a buffer against accidental direct pollution of surface waters by any pollutants, or by pollutants entrained in surface water run-off.		
MM15	Vehicle Washing	EIAR Chapter 3: Development Description CEMP Section 3	- The site roads will be well finished with compacted hardcore, and so the public road-going vehicles will not be travelling over soft or muddy ground where they might pick up mud or dirt. - A road sweeper will be available if any section of the public roads requires cleaning due to construction traffic associated with the Proposed Grid Connection. - When necessary, sections of the haul route will be swept using a truck mounted vacuum sweeper. - A self-contained wheel wash system will be provided at the temporary construction compound for use during the construction phase of works. The contractor will be responsible for ensuring that all vehicles egressing the site have used the wheel wash facilities.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM16	Site Drainage	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology 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. - Buffer zones around the existing natural drainage features have been used to inform the layout of the Proposed Grid Connection. - Buffered outfalls which will be numerous over the site which will promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the Site. - Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the Site drainage into the existing site drainage network where possible. This will reduce the potential for any increased risk of downstream flooding or sediment transport/erosion. - Silt traps will be placed in the existing drains upgradient of where construction works / tree felling is taking place, and these will be diverted into proposed interceptor drains, or culverted under/across the works area		
MM17	Substation Temporary Construction Compound	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology	The construction compound will consist of temporary site offices, staff facilities and car-parking areas for staff and visitors. Temporary port-a-loo toilets and toilets located within a staff portacabin will be used during the construction phase. Wastewater from staff toilets will be directed to a sealed storage tank, with all wastewaters being tankered off site by permitted waste collector to wastewater treatment plants. There will also be a water supply on site for hygiene purposes, by way of a temporary storage tank.		
MM18	Swales	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3	Drainage swales will be installed downgradient of any works areas to collect surface flow runoff where it might have come into contact with exposed surfaces and picked up silt and sediment. Swales will intercept the potentially silt-laden water from the excavations and construction areas of the Site and prevent it reaching natural watercourses.		
MM19	Interceptor Drains	EIAR Chapter 3: Development Description	Interceptor drains will be maintained up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed over the ground by means of a level spreader.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3			
MM20	Check Dams	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3	Check dams will be maintained at regular intervals along interceptor drains and swales/roadside drains in order to reduce flow velocities and therefore minimise erosion within the system during storm rainfall events;		
MM21	Level Spreaders	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3	A level spreader will be constructed at the end of each interceptor drain to convert concentrated flows in the drain into diffuse sheet flow on areas of vegetated ground. The levels spreaders will be located downgradient of any proposed works areas in locations where they are not likely to contribute further to water ingress to construction areas of the site.		
MM22	Piped Slope Drains	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3	Piped slope drains will be used to convey surface runoff from diversion drains safely down slopes to flat areas without causing erosion. Once the runoff reaches the flat areas it will be reconverted to diffuse sheet flow. Level spreaders will only be established on slopes of less than 6% in grade. Piped slope drains will be used to transfer water away from areas where slopes are too steep to use level spreaders;		
MM23	Vegetation Filters	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology	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;		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		CEMP Section 3			
MM24	Stilling Ponds (Settlement Ponds)	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3	Stilling ponds/settlement ponds, emplaced downstream of swales and roadside drains, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses. The stilling ponds will be sized according to the size of the area they will be receiving water from but will be sufficiently large to accommodate peak flows storm events. Inspection and maintenance of all settlement ponds will be ongoing through the construction period.		
MM25	Silt Bag	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3	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. Sediments will be secured to the ground surface using stakes/pegs. The sediment will extend to the full width of the outfall to ensure all water passes through this additional treatment measure.		
MM26	Siltbuster	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3	- Siltbusters or similar equivalent piece of equipment will be available to filter any water pumped out of excavation areas, if necessary, prior to its discharge to stilling ponds or swales. Siltbusters are mobile silt traps that can remove fine particles from water using a proven technology and hydraulic design in a rugged unit. They are specifically designed for use on construction sites. - Siltbuster type concrete unit. This type of Siltbuster unit catches the solid concrete and filters and holds wash liquid for pH adjustment and further solids separation. The residual liquids and solids will be removed off-site by an appropriately authorised waste collector for disposal at an authorised waste facility. - The siltbuster system comprises an electronic in-line dosing system which provides an accurate means of adding reagents, so overdosing cannot occur; - Continued monitoring and water analysis of pre and post treated water by means of an inhouse lab and dedicated staff, means the correct amount of chemical is added by the dosing system; - Dosing rates of chemical to initiate settlement is small, being in the order of 2-10 mg/L and the vast majority of the chemical is removed in the deposited sediment; - Final effluent not meeting the discharge criteria is recycled and retreated, which has a secondary positive effect of reducing carryover; and,		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			- Use of biodegradable chemical agents can be used at very sensitive sites (i.e. upstream of SACs). - To prevent potential overdosing with chemical agents, the siltbuster system comprises an electronic in-line dosing system which provides an accurate means of adding reagents, so overdosing cannot occur.		
MM27	Culverts	EIA Chapter 3: Development Description EIA Chapter 8 Hydrology and Hydrogeology CEMP Section 2	- All new proposed culverts will be suitably sized for the expected peak flows in the watercourse. - Some culverts may be installed to manage drainage waters from works areas of the Proposed Grid Connection, 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 does not occur above or below the culvert and water can continue to flow as necessary.		
MM28	New Watercourse Crossing	EIA Chapter 3: Development Description CEMP Section 2 EIA Chapter 8 Hydrology and Hydrogeology	- 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. - Once the foundation base has been completed, the pre-cast clearspan watercourse crossing will be installed using a crane which will be set up on the bank of the watercourse and will be lifted into place from the bank with no contact with the watercourse. - The watercourse crossing will be constructed to the specifications of the OPW bridge design guidelines 'Construction, Replacement or Alteration of Bridges and Culverts - A Guide to Applying for Consent under Section 50 of the Arterial Drainage Act, 1945', and in consultation with Inland Fisheries Ireland. Abutments will be constructed from precast units combined with in-situ foundations, placed within an acceptable backfill material.		
MM29	Horizontal Directional Drilling	EIA Chapter 3: Development Description	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		

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		EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 2	the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI); Where works are necessary inside the 50m buffer double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase		
MM30	Silt Fences	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3	- Silt fences will be installed as an additional water protection measure around existing watercourses in certain locations, particularly where works are proposed within the 50-metre buffer zone of a stream. These areas include around existing culverts, around the headwaters of watercourses, and the proposed locations are indicated on the drainage design drawings included in Appendix 3-1. - Silt fences will be installed as single, double or a series of triple silt fences, depending on the space available and the anticipated sediment loading. The silt fence designs follow the technical guidance document 'Control of Water Pollution from Linear Construction Projects' published by Construction Industry Research and Information Association (CIRIA, No. C648, 1996). Up to three silt fences may be deployed in series. - All silt fencing will be formed using Terrastop Premium or equivalent silt fence product. Silt fences will be inspected regularly to ensure water is continuing to flow through the fabric, and the fence is not coming under strain from water backing up behind it.		
MM31	Sedimats	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology	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		
MM32	Oil Interceptors	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3	The limited amount of fuel to be stored on the Site will be in appropriately bunded containers and a bunded area for oil storage will be constructed within the temporary construction compounds.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM33	Grid Connection underground cabling route	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3	- Any underground services encountered along the cable route will be surveyed for level and the ducting will pass over the service provided adequate cover is available. - A minimum clearance of 300 mm will be required between the bottom of the ducts and the service in question. - If the clearance cannot be achieved the ducting will pass under the service and again 300 mm clearance between the top of the communications duct and bottom of the service will be achieved. - In deeper excavations an additional layer of marker tape will be installed between the communications duct and top-level yellow marker tape. - If the required separation distances cannot be achieved then a number of alternative options are available such as using steel plates laid across the width of the trench and using 35N concrete surrounding the proposed ducting, with marker tape on the side of the trench. - During construction the joint bay locations will be completely fenced off once they have been constructed, they will be backfilled until cables are being installed. - The precise siting of all Joint Bays, Earth Sheath Link Chambers and Communication Chambers within the corridor assessed is subject to approval by ESBN and EirGrid. - The crossing methodologies employed at the culvert and manmade drain crossings along the underground cabling route, will be selected from the suite of watercourse crossing options, as appropriate, depending on culvert type, depth, size and local ground conditions. - The use of a natural, inert and biodegradable drilling fluid such as Clear Bore™ is intended to negate any adverse impacts arising from the use of other, traditional polymer-based drilling fluids and will be used sparingly as part of the drilling operations. It will be appropriately stored prior to use and deployed in the required amounts to avoid surplus. Should any excess drilling fluid accumulate in the reception or drilling pits, it will be contained and removed from the Site in the same manner as other subsoil materials associated with the drilling process to a licensed recovery facility. - Backfilling of launch & reception pits will be conducted in accordance with the normal specification for backfilling excavated trenches. Sufficient controls and monitoring will be put in place during drilling to prevent frack-out, such as the installation of casing at entry points where reduced cover and bearing pressure exits. - Inland Fisheries Ireland have published guidelines relating to construction works along water bodies entitled "Requirements for the Protection of Fisheries Habitats during Construction and Development Works at River Sites", and these guidelines will be adhered to during the construction of the Proposed Grid Connection.		
MM34	Oversized Swales	EIAR Chapter 3: Development Description	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.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3	Swales will intercept the potentially silt-laden water from the excavations and construction areas of the Site and prevent it reaching natural watercourses.		
MM35	Water Discharge	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3	All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses. Buffer zones around the existing natural drainage features have been used to inform the layout of the Proposed Grid Connection.		
MM36	Wastewater Management	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3	Temporary toilets will be used during the construction phase as part of the welfare facilities for site staff and visitors. Wastewater from toilets will be directed to a sealed storage tank, with all wastewaters tankered off site by an appropriately consented waste collector to wastewater treatment plants.		
MM37	Collector Drains	EIAR Chapter 3: Development Description EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 3	Swales will be used to intercept and collect run off from construction areas of the site during the construction phase, and channel it to settlement ponds for sediment attenuation as per the drainage design.		
MM38	Excavations	EIAR Chapter 3: Development Description CEMP Section 4	- The extent of the excavation will be marked out and will include an allowance for trimming the sides of the excavation to provide a safe working area and slope batter; - Where practical, the soil will be stripped over the area of the excavation and stored locally for reuse, the subsoil will be excavated and stored to one side for reuse during the landscaping around the substation; - No material will be removed from site with excavated spoil being transported and stored in the identified spoil management area (substation berm) and along excavated access tracks within the Site.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Soil excavation shall be observed by a qualified archaeologist in accordance with a scheme of archaeological monitoring to identify any significant remains as they come to light; The foundations excavation will be raised to formation level by compacted layers of well graded granular material will be spread and compacted to provide a hard area for the substation and end mast foundations;		
MM39	Spoil Management	EIAR Chapter 3: Development Description CEMP Section 4	- The placement of spoil alongside the new access tracks and around the substation have been selected based on the locations of spoil generation, areas suitable for spoil management and environmentally constrained areas. - At the identified spoil management area beside the substation, the vegetative top-soil layer will be removed to allow for spoil to be placed and upon reaching the recommended height, the vegetative topsoil layer will be reinstated. - Where practical, it will be ensured that the surface of the placed spoil is shaped to allow efficient run-off of surface water. Where possible, shaping of the surface of the spoil will be carried out as placement of spoil within the area progresses. This will reduce the likelihood of debris run-off and ensure stability of the placed spoil. - Inspections of the spoil management areas will be made by a Geotechnical Engineer through regular monitoring of the works. The appointed contractor will review work practices at spoil management areas when periods of heavy rainfall are expected so as to prevent excessive dirty water runoff from being generated. - An interceptor drain will be installed upslope of the identified spoil management areas to divert any surface water away from these areas. - The surface of the deposited spoil will be profiled to a gradient to be agreed with the Geotechnical Engineer and vegetated or allowed to vegetate naturally as indicated by the Project Ecologist. - All the above-mentioned general guidelines and requirements will be confirmed by the Geotechnical Engineer prior to construction. - Inspections of the spoil management areas will be made by a geotechnical engineer through regular monitoring of the works. The appointed contractor will review work practices at spoil management areas when periods of heavy rainfall are expected so as to prevent excessive surface water runoff from being generated. - The surface of the spoil management area will be profiled to a gradient to be agreed with the Geotechnical Engineer and vegetated or allowed to vegetate naturally as indicated by the Project Ecologist. Where there is a risk of inadvertent access into spoil management areas fencing will be provided.		
Operational Phase					
MM40	Wastewater Management	EIAR Chapter 3: Development Description	The wastewater storage tank alarm will be part of a continuous stream of data from the Site's electricity substation that will be monitored remotely 24 hours a day, 7 days per week. Only waste		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		CEMP Section 4	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.		
MM41	Electrical Substation	EIAR Chapter 3: Development Description CEMP Section 7	- The substation transformer and oil interceptor will be on a bunded concrete plinth capable of holding 110% of the stored oil volume and to prevent leakage to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; - Lightning poles will be erected at appropriate locations adjacent to the substation. All lightning poles will be appropriately earthed. - Perimeter fencing will be erected around the substation and control buildings compound area.		
EIAR Chapter 4: Population and Human Health					
Pre-Construction Phase					
MM42	Human Health	EIAR Chapter 4: Population and Human Health	Prior to commencement of any works, the occupants of dwellings in the vicinity of the proposed works will be contacted and the scheduling of works will be identified in line with the engagement plan. Local access to properties will also be maintained throughout any construction works and local residents will also be supplied with the number of the works supervisor in order to ensure that disruption will be kept to a minimum		
Construction Phase					
MM43	Human Health	EIAR Chapter 4: Population and Human Health	The Proposed Grid Connection will be constructed and operated 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. 528/2021 - Safety, Health and Welfare at Work (Construction) (Amendment) Regulations 2021 and - Safety, Health and Welfare at Work (Work at Height) Regulations 2006 (S.I. No. 318 of 2006). - A Health and Safety Plan covering all aspects of the construction process will address the Health and Safety requirements in detail. - Fencing will be erected in areas of the Site where uncontrolled access is not permitted. Appropriate health and safety signage will also be erected on this fencing and at locations around the Site. - Health and safety guidelines for working within and around electrical substations and overhead lines will be adhered to on site.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			- 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 overhead lines. - All contractors that may visit the Sites are made aware of the location of lines before they come on to Site. - Barriers will run parallel to the overhead line at a minimum horizontal distance of 6 metres on plan from the nearest overhead line conductor wire. - 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. - The construction of the Proposed Grid Connection will be in phases along the proposed underground cabling route. Prior to commencing grid connection works in the agricultural fields in the townland of Strogue, goal posts will be established under the 110k overhead line for the remainder of the Grid Connection of the construction phase. The goal posts will not exceed a height of 4.2 metres, unless specifically agreed with ESB Networks. - When activities must be carried out beneath overhead lines, e.g., component delivery or end mast construction, a Site-specific risk assessment will be undertaken prior to any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or equipment that will be used prior to any works.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			- 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		
MM44	Human Health	EIAR Chapter 4: Population and Human Health CEMP Section 3.6 EIAR Chapter 11 Noise and Vibration	- 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 would be 'sound reduced' models fitted with properly lined and sealed acoustic covers, which would 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 on site, 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. - Where the BS5228 threshold levels are anticipated to be exceeded due to horizontal directional drilling activities along the underground cabling route, the following are examples of measures that will be considered, where necessary, to mitigate noise emissions from these activities are as follows: - Temporary boarding alongside the drilling rig or use of 'acoustic blanket panels' to hang from heras fencing or similar. Installation will be as close to the drilling rig as is practicable and fitted so as to interrupt any direct line of site between the drilling rig and the closest residential receptors. - Examples of appropriate products include Echo Noise Defender and Soundex DeciBloc.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM45	Human Health	EIAR Chapter 4: Population and Human Health	- Sporadic wetting of loose stone surface will be carried out during the construction phase to minimise movement of dust particles to the air. In periods of extended dry weather, dust suppression may be necessary along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored to avoid, insofar as reasonably possible, increased runoff. - All plant and materials vehicles shall be stored in dedicated areas within the Site. - The construction materials will be sourced locally from licenced quarries and transported on specified haul routes only. - The agreed haul route roads adjacent to the Site will be regularly inspected for cleanliness and cleaned as necessary. - The roads adjacent to the Site entrances will be checked weekly or damage/potholes and repaired as necessary. - Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the amount of emissions associated with vehicle movements.		
EIAR Chapter 5: Biodiversity					
Pre-Construction Phase					
MM46	Invasive Species Management	EIAR Chapter 5: Biodiversity CEMP Section 3	Pre-construction surveys by an experienced ecologist will be carried out for Third Schedule IAPS within the ZoI of the Proposed Grid Connection. These will be undertaken in a representative season to ensure accuracy. Invasive species will be carried out having regard to guidance of Transport Infrastructure Ireland (TII 2020a, TII 2020b).		
MM47	Mammals	EIAR Chapter 5: Biodiversity	- Pre-construction surveys by an experienced ecologist will be carried out for otter. This includes a survey of any otter breeding/resting sites identified in the current baseline within the ZoI of the Proposed Grid Connection (150 m for breeding sites, where access allows; noting that TII guidance recommends 20 m for non-breeding sites). These will be undertaken in a representative season to ensure accuracy. Otter surveys will be carried out in accordance with NRA guidance (NRA, 2008a). The findings of the pre-construction survey will be reviewed with respect to the Proposed Grid Connection in relation to whether the updated findings trigger a requirement for a species derogation licence from NPWS. - Pre-construction surveys by an experienced ecologist will be carried out for badger. This includes a survey of all areas within 150 m of the Proposed Grid Connection. These will be undertaken in a representative season to ensure accuracy. Badger surveys will be carried out in accordance with NRA guidance (NRA, 2008b). The findings of the pre-construction survey will be reviewed with		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			respect to the Proposed Grid Connection in relation to whether the updated findings trigger a requirement for a species derogation licence from NPWS. Breeding bird surveys will be undertaken to identify nest sites which are to be marked and avoided by construction if found until such time that the site is vacated by fledglings. Where bird or bat species are detected to be nesting or roosting, an exclusion zone will be determined by the EcoW, using best practice guidelines specific to the species. Breeding bird surveys shall be conducted with reference to the methodology described by Bibby et al. (2000) and the Countryside Bird Survey Manual – Guidelines for Countryside Bird Survey participants (BirdWatch Ireland, 2012).		
MM48	Bats	EIAR Chapter 5: Biodiversity	Pre-construction surveys by an experienced ecologist will be carried out for Bat species. This includes a survey of any trees schedule to be removed in the current baseline within the Proposed Grid Connection. These will be undertaken in a representative season to ensure accuracy. These surveys will be carried out in accordance with BCT Guidance (Collins, 2023). The findings of the pre-construction survey will be reviewed with respect to the Proposed Grid Connection in relation to whether the updated findings trigger a requirement for a species derogation licence from NPWS.		
Construction Phase					
MM49	Vegetation Clearance-Watching Brief	EIAR Chapter 5: Biodiversity	- All vegetation removal will be completed outside the breeding bird season (March to August, inclusive) unless no breeding birds are confirmed present by the Project Ecologist immediately prior to the vegetation or structure being removed. - All vegetation removal shall be monitored by the Project Ecologist to ensure there is no disturbance of any protected species e.g. otter, badger, birds, bats, stoat, hedgehog etc. If disturbance occurs, the EcoW will treat each species appropriately, e.g. contact NPWS for otter and bats, relocate hedgehogs, translocation of frog spawn or tadpoles etc. - Where dense vegetation or inaccessibility prevents adequate determination of the presence or absence of otter holts or badger setts as part of the pre-construction surveys, these areas will require monitoring during vegetation clearance to ensure that any holts or setts present will be found and treated appropriately.		
MM50	Water Quality Protection/Aquatic Habitats and Fauna	EIAR Chapter 5: Biodiversity	The key mitigation measure during the construction phase is the avoidance of sensitive hydrological features where possible, by application of suitable buffer zones (i.e. 50m to main watercourses). Infrastructure elements of the Proposed Grid		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
		EIAR Chapter 8 Hydrology and hydrogeology	Connection areas are located significantly away from the delineated 50m watercourse buffer zones with the exception of the HDD for an existing watercourse crossing on the Clonmore River within the underground cabling route and a new clear span bridge watercourse crossing on the Strogue River within the underground cabling route. Additional control measures, which are outlined further on in this section, will be undertaken at these locations - The large setback distance from sensitive hydrological features means that adequate room is maintained for the proposed drainage mitigation measures (discussed below) to be properly installed and operate effectively - As per measures MM56-MM64 inclusive.		
EIAR Chapter 7 Land Soils & Geology					
Construction Phase					
MM51	Earthworks	EIAR Chapter 7 Land Soils & Geology	- The excavated soil/subsoil will be placed/spread locally alongside the excavations; - 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 will be stockpiled at low angles (< 5-10°) to ensure their stability and secured using silt fencing where necessary. This will help to mitigate erosion and unnecessary additions of suspended solids to the drainage system; - Spoil will be deposited, in layers of 0.50m and will not exceed a total thickness of 1m; - Soil/subsoil excavated along the underground cabling route, will only be stored in low mounds (~0.5m high) directly adjacent to the excavated trench, and will be stored for no more than 24 hours before being backfilled where possible. The soil/subsoil will be covered or sealed with excavator bucket in the event of heavy rainfall which would suspend further construction works along the underground cabling route. Only tar from the underground cabling route works will be disposed at an offsite licenced facility.		
MM52	Contamination of Soils	EIAR Chapter 7 Land Soils & Geology	- Where possible maintenance of construction vehicles or plant will take place off-site. - On-site refuelling of machinery will be carried out at designated refuelling areas at various locations throughout the Site. - Heavy plant and machinery will be refuelled on-site by a fuel truck that will come to the Site as required on a scheduled and organised basis. - Other refuelling will be carried out using mobile double skinned fuel bowser. The fuel bowser will be parked on a level area on-site when not in use. - All refuelling will be carried out outside designated watercourse buffer zones. - Only designated trained and competent operatives will be authorised to refuel plant on-site.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			- Mobile measures such as drip 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 event of accidental spillage. - The substation transformer and oil interceptor will be on a bunded concrete plinth capable of holding 110% of the stored oil volume and to prevent leakage to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; - All waste tar and chip material arising from the chipping and resurfacing of the roads during construction of the underground cabling route will be removed off-site and taken to an appropriately licenced facility; - 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 contained within the CEMP. Spill kits will be available to deal with accidental spillage in and outside of re-fuelling areas.		
MM53	Erosion of soils	EIAR Chapter 7 Land Soils & Geology	- Soil/subsoil removed from the construction areas will be used for landscaping or managed in linear berms along access roads and surrounding the substation. - Temporary drainage systems will be required to limit runoff impacts during the construction phase. - Soils removed from the cable trench will be accommodated in linear berms or removed to an appropriately licenced facility.		
Operational Phase					
MM54	Soils and Geology	EIAR Chapter 7 Land Soils & Geology	- The substation transformer and oil interceptor will be on a bunded concrete plinth capable of holding 110% of the stored oil volume. This mitigation measure is considered sufficient to eliminate potential risks to ground/peat/soils and subsoils, and groundwater and surface water quality. An emergency plan for the operational phase to deal with accidental spillages will be contained in the Environmental Management Plan. - Vehicles used during the operational phase will be refuelled off site before entering the site; - No fuels will be stored on-site during the operational phase; and - Spill kits will be available in all site vehicles to deal with an accidental spillage and breakdowns; - An emergency plan for the operational phase to deal with accidental spillages and breakdowns will be contained in the CEMP.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			In relation to indirect impacts a small amount of granular material may be required to maintain access tracks during operation which will place intermittent minor demand on local quarries.		
EIAR Chapter 8 Hydrology & Hydrogeology					
Pre- Construction Phase					
MM55	Earthworks	EIAR Chapter 8 Hydrology and Hydrogeology	<u>Mitigation by Avoidance</u> - The key mitigation measure during the construction phase is the avoidance of sensitive hydrological features where possible, by application of suitable buffer zones (i.e. 50m to main watercourses). All of the key Proposed Grid Connection areas are located significantly away from the delineated 50m watercourse buffer zones. No natural drainage routes will be modified as part of the Proposed Grid Connection. The foundations for the substation and end masts, as well as the proposed new tracks, are designed to avoid crossing natural watercourses. Where the cabling route for the underground grid connection crosses watercourses, this will be undertaken via horizontal directional drilling (HDD) and clear span crossings, thereby avoiding in-stream work. - The large setback distance from sensitive hydrological features means that adequate room is maintained for the proposed drainage mitigation measures (discussed below) to be properly installed and operate effectively. - The proposed buffer zone will: - Avoid physical damage (river/stream banks and river/stream beds) to watercourses and associated release of sediment; - Avoid excavations within close proximity to surface watercourses; - Avoid the entry of suspended sediment from earthworks into watercourses; and, - Avoid the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone. <u>Mitigation by Design</u> Source controls: - Interceptor drains, diversion drains, 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.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			In-Line controls: • Interceptor drains, oversized swales, erosion and velocity control measures such as check dams, sand bags, oyster bags, straw bales, flow limiters, weirs, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems. Treatment systems: • Temporary sumps and ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as Siltbuster, and/or other similar/equivalent or appropriate systems. • There will be no direct discharges into any natural watercourses or land drains; instead, all drainage water will be managed as overland flows. All discharges from the proposed work areas will be directed over vegetation filters at an appropriate distance from natural watercourses and drains. • It should be noted for this site that a network of drains already exists, and these will be integrated and enhanced as required and used within the proposed drainage system. The integration of the existing drainage network and the proposed network is relatively simple. The key elements being the upgrading and improvements to existing water treatment elements, such as in line controls and treatment systems, including silt traps, settlement ponds and buffered outfalls. The main elements of interaction with existing drains will be as follows: • There will be no direct discharges into natural watercourses or drains. All discharges from the proposed works areas or interceptor drains will be directed over vegetated ground at a suitable distance from watercourses. This will reduce the potential for any increased risk of downstream flooding or sediment transport/erosion. • Where artificial drains currently exist near the proposed work sites, these drains may need to be redirected to minimize water accumulation in the vicinity of the work areas. If it is not feasible to divert the artificial drains, drains will be blocked to prevent sediment-laden water from flowing directly into other watercourses. Blocking of the drains will only occur after an alternative drainage system to manage the same water has been established. • Existing artificial drains near the L-7039/1, L7038 and R433 will be preserved in their existing locations where possible. If it is expected that these artificial drains will receive drainage water from works areas post treatment, check dams will be added to control flows and sediment loads in these existing artificial drains. If road widening or improvement works are necessary		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			along the existing roads, where possible, the works will take place on the opposite side of the road to the drain. - 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. - 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. Pre-commencement Temporary Drainage Works Prior to the commencement of road upgrades (or new road) the following key temporary drainage measures will be installed: - All existing dry land drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using check dams/silt traps; - Clean water interceptor drains will be installed upgradient of the works areas; - Check dams/silt fence arrangements (silt traps) will be placed in all land drains that have surface water flows and also along existing farm track roadside drains; and, - A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone. - Refer to Mitigation Measures: MM 18-26, MM30-37.		
Construction Phase					
MM56	Earthworks	EIAR Chapter 8 Hydrology and Hydrogeology	In addition to MM55, the following will be implemented: Silt Fences: Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids such as those present in the subsoils/sandstone tills that overlie the site. This will act to prevent entry to water courses of sand and gravel sized sediment, released from excavation of mineral sub-soils of glacial and glacio-fluvial origin, and entrained in surface water runoff. Inspection and maintenance of these of these structures during construction phase is critical to their functioning to stated purpose. They will remain in place throughout the entire construction phase. Double silt fences will be placed within drains down-gradient of all construction areas inside the 50m buffer zones. 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		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			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. Sediments will be secured to the ground surface using stakes/pegs. The sediment will extend to the full width of the outfall to ensure all water passes through this additional treatment measure. Settlement Ponds: The Proposed Grid Connection footprint has been divided into drainage catchments (based on topography, outfall locations, catchment size) and stormwater runoff rates based on the 10-year return period rainfall event were calculated for each catchment. These flows were then used to design settlement ponds for each drainage catchment. The settlement ponds are designed for 11hr retention times used to settle out medium silt (0.006mm) (EPA, 2006)¹. Settlement ponds along access roads and the substation hardstand will have 11hr retention as there is additional in-line drainage controls proposed along access tracks and at hardstands. Level Spreaders and Vegetation Filters: The purpose of level spreaders is to release treated drainage flow in a diffuse manner, and to prevent the concentration of flows at any one location thereby avoiding erosion. Level spreaders are not intended to be a primary treatment component for development surface water runoff. They are not stand alone but occur as part of a treatment train of systems that will reduce the velocity of runoff prior to be released at the level spreader. In 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 sand alone but are intended as part of a treatment train of water quality improvement/control systems (i.e. source controls→check dams→silt traps→settlement ponds→level spreaders →silt fences→vegetation filters). Piped Slope Drains: Piped slope drains will be used to safely convey surface runoff from diversion drains down slopes to flat areas, without causing erosion. Once the runoff reaches these flat areas, it will be converted back into diffuse sheet flow. Level spreaders will only be installed on slopes of less than 6% in grade. Piped slope drains will be used to transfer water away from areas where slopes are too steep to use level spreaders.		

¹ Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals) (EPA, 2006).

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			The piped slope drains will consist of semi-rigid corrugated pipes with a stabilised entrance and a rock apron at the outlet to capture sediment and dissipate water energy. Piped slope drains will remain in place only for the duration of the construction phase. Upon completion of the works, the pipes and rock aprons will be removed, and all channels will be backfilled with the original excavated material. Piped slope drains will be inspected weekly and after rainfall events. Inlets and outlets will be checked for sediment accumulation and blockages. Stake anchors or fill over the pipe will be checked for settlement, cracking, and stability. Any seepage holes where pipe emerges from the drain at the top of the pipe will be repaired promptly. 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. Drainage Management along the Cable Trench: Cable trenches are typically constructed in short, controlled sections, thereby minimising the amount of ground disturbed at any one time and minimising the potential for drainage runoff to pick up silt or suspended solids. Each short section of trench is excavated, ducting installed and bedded, and backfilled with the appropriate materials, before work on the next section commences. This operation normally occurs over a period of 2-4 hours. To efficiently control drainage runoff from cable trench works areas, excavated material is stored on the up-gradient side of the trench and is temporarily sealed/smoothed over, using the back of the excavator bucket. Should any rainfall cause runoff from the excavated material, the material is therefore collected and contained in the downgradient cable trench. Some of the excavated materials from the Grid Connection underground electrical cabling route will go to an appropriate licenced facility as required. This is dependent on the road makeup at locations along the underground electrical cabling route. The remaining spoil will be managed into linear berms alongside the new access tracks proposed along the grid connection cable route within agricultural fields. Management of Runoff from Spoil Storage Areas: It is proposed that all excavated spoil material will be managed on-site, either placed within the identified spoil management areas (<i>i.e.</i> linear berms along access roads) or temporarily stockpiled locally for reuse for landscaping purposes. Proposed surface water quality protection measures regarding the spoil storage areas are as follows: - During the initial emplacement of spoil, silt fences, straw bales and biodegradable matting will be used to control surface water runoff. - Discharge from the storage areas will be intermittent and will depend on preceding rainfall amounts.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Once the storage areas have been seeded and vegetation is established the risk to downstream surface water is significantly reduced. 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		
MM57	New Watercourse Crossing	EIAR Chapter 8: Hydrology and Hydrogeology	- The proposed new stream crossing will be a clear span bridge crossing and the existing banks will remain undisturbed. No in-stream excavation works are proposed at this location and therefore there will be no direct impact on the stream at the proposed crossing location. Abutments will be constructed from precast units combined with in-situ foundations. - All guidance / mitigation measures required by the OPW and/or the Inland Fisheries Ireland (IFI) is incorporated into the design of the proposed crossing. - All drainage measures will be installed in advance of the works. - Plant and equipment will not be permitted to track across the watercourse. - Once the foundations have been completed at both sides of the watercourse, the pre-cast clear span crossing will be installed using a crane and there will be no contact with the watercourse. - Where the pre-cast clear span crossing is installed in sections, the joint will be sealed to prevent granular material entering the watercourse; - As a further precaution, near stream construction work, will only be carried out during the period permitted by IFI for in-stream works according to the IFI (2016) guidance document “Guidelines on protection of fisheries during construction works in and adjacent to waters”, i.e., July to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses (any deviation from this will be done in discussion with the IFI); - Where works are necessary inside the 50m buffer double row silt fences will be emplaced immediately down-gradient of the construction area for the duration of the construction phase; and, - All new river/stream crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM58	Directional Drilling at watercourse crossings	EIAR Chapter 3 Development Description, EIAR Chapter 8: Hydrology and Hydrogeology CEMP Section 3	- Although no in-stream works are proposed, the drilling works will only be done over a dry period between July and September (as required by IFI for in-stream works) to avoid the salmon spawning season and to have more favourable (drier) ground conditions. 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). - Before any ground works are undertaken, double silt fencing will be placed upslope of the watercourse channels. - Silt fencing will be embedded into the local soils to ensure all site water is captured and filtered. - The area around the batching, pumping and recycling plant will be bunded using terram (as it will clog) and sandbags in order to contain any spillages. - Drilling fluid returns will be contained within a sealed tank / sump to prevent migration from the works area. - Spills of drilling fluid will be cleaned up immediately and contained in an adequately sized skip before been taken off-site. - Any sediment laden water from the works area will not be discharged directly to a watercourse or drain. - Works shall not take place during periods of heavy rainfall and will be scaled back or suspended if heavy rain is forecasted. - Daily monitoring of the compound works area; the water treatment and pumping system and the percolation area will be completed by a suitably qualified person during the construction phase. All necessary preventative measures will be implemented to ensure no entrained sediment, or deleterious matter is discharged to the watercourse. - If high levels of silt or other contamination is noted in the pumped water or the treatment systems, all construction works will be stopped. No works will recommence until the issue is resolved and the cause of the elevated source is remedied. - The silt fencing upslope of the river will be left in place and maintained until the disturbed ground has re-vegetated. - There will be no batching of cement along the underground cabling route. - There will be no refuelling allowed within 100m of the watercourse crossing. - All plant will be checked for purpose of use prior to mobilisation at the watercourse crossing.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Fracture Blow-out (Frac-out) Prevention and Contingency Plan: - The drilling fluid will be non-toxic and naturally biodegradable (i.e., Clear Bore Drilling Fluid or similar will be used). - Spills of drilling fluid will be cleaned up immediately and transported off-site for disposal at a licensed facility. - 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 recommencing with a higher viscosity drilling fluid mix. - If the risk of further frac-out is high, a new drilling alignment will be sought at the crossing location.		
MM59	Pre-Emptive Site Drainage Management	EIAR Chapter 3 Development Description, EIAR Chapter 8: Hydrology and Hydrogeology CEMP Section 3	The works programme for the groundworks part of the construction phase of the Proposed Grid Connection will also take account of weather forecasts and predicted rainfall in particular. The site Construction Manager is responsible for making the decision to postpone or abandon works. Movements of overburden or large-scale soil stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to the amount of rainfall forecast. The following forecasting systems are available and will be used on a daily basis at the site to direct proposed construction activities: - General Forecasts: Available on a national, regional and county level from the Met Eireann website (www.met.ie/forecasts). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates; - MeteoAlarm: Alerts to the possible occurrence of severe weather for the next 2 days. Less useful than general forecasts as only available on a provincial scale; 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events; - Rainfall Radar Images: Images covering the entire country are freely available from the Met Eireann website (www.met.ie/latest/rainfall_radar.asp). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive; and, • Consultancy Service: Met Eireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best available forecast for the area of interest. • Earthworks will be suspended in the event of an orange or red warning for rainfall. Prior to works being suspended the following control measures will be completed: ○ All active excavations will be secured and sealed off; ○ Temporary or emergency drainage will be installed to prevent back-up of surface runoff; and, ○ No works will be completed during heavy rainfall and for up to 24 hours after heavy events to ensure drainage systems are not overloaded. • Management of Runoff from Spoil Storage Areas: It is proposed that all excavated spoil material will be managed on-site, either placed within the identified spoil management areas (i.e. linear berms along access roads) or temporarily stockpiled locally for reuse for landscaping purposes. • Proposed surface water quality protection measures regarding the spoil storage areas are as follows: • During the initial emplacement of spoil, silt fences, straw bales and biodegradable matting will be used to control surface water runoff. • Discharge from the storage areas will be intermittent and will depend on preceding rainfall amounts. • Once the storage areas have been seeded and vegetation is established the risk to downstream surface water is significantly reduced. • 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. • 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		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			drainage systems will be undertaken, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water in parts of the systems where it is not intended. - Any excess build-up of silt levels at dams, the settlement pond, or any other drainage features that may decrease the effectiveness of the drainage feature, will be removed. 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		
MM60	Potential Impacts on Surface Water Quality	EIAR Chapter 8: Hydrology and Hydrogeology CEMP Section 3	- Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations will be put in place; - If required, pumping of excavation inflows will prevent build-up of water in the excavation; - The interceptor drainage will be discharged to the site constructed drainage system or onto natural vegetated surfaces and not directly to surface waters; - The pumped water volumes will be discharged via volume and sediment attenuation ponds adjacent to excavation areas, or via specialist treatment systems such as a Siltbuster unit or silt bag; - There will be no direct discharge to surface watercourses, and therefore no risk of hydraulic loading or contamination will occur; - Daily monitoring of excavations by the Environmental Clerk of Works will occur during the construction phase. If high levels of seepage inflow occur, excavation work will immediately be stopped and a geotechnical assessment undertaken; and, - A mobile 'Siltbuster' or similar equivalent specialist treatment system will be available on-site for emergencies in order to treat sediment polluted waters from settlement ponds or excavations should they occur. Siltbusters are mobile silt traps that can remove fine particles from water using a proven technology and hydraulic design in a rugged unit. The mobile units are specifically designed for use on construction-sites. They will be used as final line of defence if needed		
MM61	Groundwater and Surface Water Contamination from wastewater disposal/Impacts to local private groundwater wells	EIAR Chapter 8: Hydrology and Hydrogeology CEMP Section 3	- During the construction phase, a self-contained port-a-loo with an integrated waste holding tank will be used at each of the site construction compounds, maintained by the providing contractor, and removed from site on completion of the construction works; - Water supply for the site office and other sanitation will be brought to site and removed after use from the Site to be discharged at a suitable off-site treatment location; - No water or wastewater for sanitation will be sourced on the Site, nor discharged to the Site.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM62	Potential Release of Hydrocarbons/ Impacts to local private groundwater wells	EIAR Chapter 8: Hydrology and Hydrogeology EIAR Chapter 6 Major Accidents and Natural Disasters CEMP Section 3	- Where possible maintenance of construction vehicles and refuelling will be completed off-site. - On-site refuelling will take place in designated refuelling areas located throughout the Site. Heavy plant and machinery will be refuelled on-site by a fuel truck that will arrive to Site as required on a scheduled basis. Other refuelling will be carried out using a mobile double-skinned fuel bowser, with spill kits on the ready for any minor accidental leakages or spillages. When not in use the fuel bowser, will be parked only on a level area within the Site. - Fuels stored on Site will be minimised but will be in bunded locations. - Only trained and authorised personnel will be permitted to refuel equipment on-site. - Mobile measures, such as dip trays and fuel absorbent mats, will be used during refuelling activities as necessary. - The substation transformer and oil interceptor will be on a bunded concrete plinth capable of holding 110% of the stored oil volume and to prevent leakage to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; - All waste tar material arising from the public roads during construction of the underground electrical cabling route will be removed off-site and taken to an appropriately licenced facility; - The plant used during construction will be regularly inspected for leaks and fitness for purpose; - An emergency plan for the construction phase to deal with accidental spillages will be contained within the CEMP. - Spill kits will be available to deal with accidental spillage in and outside of re-fuelling areas.		
MM63	Release of Cement-Based Products/ Impacts to local private groundwater wells	EIAR Chapter 8: Hydrology and Hydrogeology	- No batching of wet-concrete products will occur on site. Ready-mixed supply of wet concrete products and where possible, emplacement of pre-cast elements, will take place; - 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 concrete washout pond. 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 Silbuster-type concrete wash unit or equivalent.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			- Concrete trucks bodies will be washed out at batching plants only. - The arrangements for concrete deliveries to the Site will be discussed with suppliers before work starts, agreeing 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 at the Site. - Weather forecasting will be used to assist in planning large concrete pours and avoiding large pours where prolonged periods of heavy rain is forecast. - The pour site will be kept free of standing water and plastic covers will be ready in case of sudden rainfall event. Ensuring that excavations are sufficiently dewatered before concreting begins and that dewatering continues while concrete sets. - Restricting concrete pumps and machine buckets from slewing over watercourses (including drains and ditches) while placing concrete. - Ensuring that covers are available, and used, when necessary, for freshly placed concrete to avoid the surface washing away in heavy rain. - Placement of any potential, small surplus of concrete after completion of a pour in suitable locations away from any watercourse or sensitive habitats.		
MM64	WFD Water Body Status	EIAR Chapter 8: Hydrology and Hydrogeology	- Proposed Mitigation Measures (By Avoidance) - A self-imposed 50m buffer will be maintained where possible for all streams with the exception of existing road crossings and proposed stream crossings; - Works will be completed during periods of no or low rainfall. Proposed Mitigation Measures (By Design) - Machine combinations will be chosen to minimise soil disturbance; - Crossing of streams will not be permitted; - Removing soil from roads during wet periods and dust suppression during dry periods; - Travel will only be permitted perpendicular to and away from a watercourse; and, - Using small working areas - Covering of stockpiles - Implementation of Measure MM 56- MM64 inclusive will ensure the maintenance of a high quality of surface water runoff from the development and groundwater protection will ensure that the status of both surface water and groundwater bodies in the vicinity of the site will be maintained. There will be no deterioration in the status of any WFD waterbody, and the Proposed Grid Connection will not impact the ability of any waterbody to achieve its WFD objective.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
MM65	Hydrologically Connected Designated Sites	EIAR Chapter 8: Hydrology and Hydrogeology	- The proposed mitigation measures which will include 50m buffer zones for avoidance of sensitive hydrological features; - Pre-construction drainage control measures; - Robust drainage control measures (i.e. interceptor drains, swales, settlement ponds) will ensure that the quality of runoff from Proposed Grid Connection areas will be very high; and, - Best practice measures with regard use of oils, fuels and cement-based compounds		
Operational Phase					
MM66	Progressive Replacement of Natural Surface with Lower Permeability Surfaces	EIAR Chapter 8: Hydrology and Hydrogeology	Mitigation by Design: The operational phase drainage system will be in place from the construction stage. Drainage from the operational site will comprise: - Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed over the ground by means of a level spreader; - Swales/road side drains will be used to collect runoff from access roads of the Site, likely to have entrained suspended sediment, and channel it to settlement ponds for sediment settling; - 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 have been designed in consideration of the greenfield runoff rate.		
MM67	Flooding	EIAR Chapter 8: Hydrology and Hydrogeology	- The substation and construction compound are located outside of the NIFM mapped and modelled flood zones. - The foundations of the end masts will be constructed as close to ground level as possible. - All access roads proposed within the floodplain will be constructed as close to existing ground level as possible		
MM68	WFD Water Body Status	EIAR Chapter 8: Hydrology and Hydrogeology	- There is no direct discharge from the Proposed Grid Connection site to downstream receiving waters. Mitigation for the protection of surface water during the operational phase of the Proposed Grid Connection will ensure the qualitative status of the receiving waters will not be altered by the Proposed Grid Connection - Onsite re-fuelling of normal operational vehicles will not be carried out during the operational phase of the development. These vehicles will be refuelled offsite;		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			- Fuels stored on site will be minimised and any hydrocarbons stored on-site will be bunded. The bund capacity will be sufficient to contain 110% of the storage tank's maximum capacity; - The substation transformer and oil interceptor will be on a bunded concrete plinth capable of holding 110% of the stored oil volume and to prevent leakage to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; - Any plant used during the operational phase will be regularly inspected for leaks and fitness for purpose; - Spill kits will be available to deal with accidental spillages		
EIAR Chapter 9 Air Quality					
Construction Phase					
MM69	Exhaust Emissions	EIAR Chapter 9 Air Quality	- Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required. - All plant and materials vehicles shall be stored in dedicated areas (on-site). Machinery will be switched off when not in use. - All plant and materials vehicles shall be stored in dedicated areas (on-site). - Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction. - The expected waste volumes generated onsite are unlikely to be large enough to warrant source segregation at the Site. Therefore, all wastes streams generated onsite will be deposited into a single waste skip which will be covered. - This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements. There are several licenced waste treatment facilities located outside of Thurles, approximately 18km to the south of the Site. - Aggregate materials for the construction of site access tracks and all associated infrastructure will all be locally sourced, where appropriate, which will further reduce potential emissions. - Construction materials will be transported to the site on specified haul routes only. - CEMP will be in place throughout the construction phase		
MM70	Dust Emissions	EIAR Chapter 9 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		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			suppression may be necessary along haul roads to ensure dust does not cause a nuisance. Water bowser movements will be carefully monitored to avoid, as far as reasonably possible, increased runoff. • All plant and materials vehicles shall be stored in dedicated areas within the Site. • Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction. • Construction traffic will be transported to the site on specified haul routes only. • The agreed haul route road adjacent to the Site will be regularly inspected for cleanliness and cleaned, as necessary. • The roads adjacent to the site entrances will be checked weekly for damage/potholes and repaired, as necessary. • The transportation of construction materials from locally sourced quarries will be covered by tarpaulin where necessary. • A CEMP will be in place throughout the construction phase. The CEMP includes dust suppression measures.		
Operation Phase					
MM71	Exhaust Emissions	EIAR Chapter 9 Air Quality	• During the Operational Phase, vehicles or plant brought onsite shall be maintained in good operational condition and must comply with the Road Traffic Acts 1961, as amended. • When a vehicle is stationary, vehicles must turn off engines. • Waste material shall be transferred to a licensed/permitted MRF by a fully licensed waste contractor. The waste will be organised into separate waste streams for recycling, recovery or disposal. The MRF will be located within relatively close proximity to the Proposed Grid Connection.		
EIAR Chapter 10 Climate					
Construction Phase					
MM72	GHG Emissions & Climate Change Vulnerability	EIAR Chapter 10 Climate EIAR Chapter 6 Major Accidents and Natural Disasters	• Construction staff will be trained how to inspect and maintain construction vehicles and plant to ensure good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection and machinery checklist which will be followed and updated if/when required. • All plant and materials vehicles shall be stored in dedicated areas (on Site). Machinery will be switched off when not in use. • Construction materials will be transported to the site on specified routes only, unless otherwise agreed with the Planning Authority. • Areas of excavation will be kept to a minimum, and stockpiling will be minimised by coordinating excavation, spreading and compaction.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			- The expected waste volumes generated onsite are unlikely to be large enough to warrant source segregation at the Site. Therefore, all wastes streams generated onsite will be deposited into a single waste skip which will be covered. This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements. There are several licenced waste treatment facilities located outside of Thurles, approximately 18km to the south of the Site. - A CEMP will be in place throughout the construction phase. - Aggregate materials for the construction of site access tracks and all associated infrastructure will all be locally sourced, where possible, which will further reduce potential emissions. - Where possible, low carbon intensive construction materials will be sourced and utilised onsite. - Section 6 of the CEMP details the Emergency Response Procedure to be adopted in the event of an emergency in terms of site health and safety and environmental protection. Upon a grant of planning permission for the Proposed Grid Connection, the CEMP will be updated 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. - The Proposed Grid Connection is designed and will be constructed in line with current best practice and, as such, mitigation against the risk of natural or climate related disasters such as flooding and fire will be embedded through the design. In accordance with the provision of the European Commission 'Guidance on the preparation of Environmental Impact Assessment Reports' 2017, a Risk Management Plan will be prepared and implemented on site to ensure an effective response to disasters or the risk of accidents. The plan will include sufficient preparedness and emergency planning measures.		
Operational Phase					
MM73	Greenhouse Gas Emissions	EIAR Chapter 10 Climate EIAR Chapter 6 Major Accidents and Natural Disasters	- Any vehicles or plant brought onsite during the operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any emissions that arise. - When stationary, delivery and on-site vehicles will be required to turn off engines. - Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements. - In accordance with the provision of the European Commission 'Guidance on the preparation of Environmental Impact Assessment Reports' 2017, a Risk Management Plan will be prepared and implemented on site to ensure an effective response to natural or climate related disasters or the		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			risk of accidents during the operational phase. The plan will include sufficient preparedness and emergency planning measures.		
EIAR Chapter 11 Noise and Vibration					
Pre- Construction Phase					
MM74	Construction Noise	EIAR Chapter 11 Noise and Vibration	Local residents will be kept informed of the proposed working schedule, where appropriate, including the times and duration of any abnormally noisy activity that may cause concern		
Construction Phase					
MM75	Construction Noise	EIAR Chapter 11 Noise and Vibration	The contractor undertaking the construction works will be required to undertake noise abatement measures where necessary and comply with the recommendations of BS5228-1:2009+A1:2014. It is proposed that various practices be adopted during construction as required, including the following: • Selection of quieter plant: The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. The least noisy item should be selected wherever possible. Should a particular item of plant already on the site be found to generate high noise levels, the first action will be to identify whether or not said item can be replaced with a quieter alternative. • Noise control at source: If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control “at source”. This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact. Referring to the potential noise generating sources for the works under consideration, the following best practice migration measures will be considered: ○ The lifting of bulky items, dropping and loading of materials will be restricted to normal working hours. ○ Mobile plant will be switched off when not in use and not left idling. ○ For concrete mixers, control measures will be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum. ○ For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials. ○ Demountable enclosures can also be used to screen operatives using hand tools and will be moved around site as necessary.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			○ All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures. • Liaison with the public: A designated environmental liaison officer should be appointed to site during construction works. Any noise complaints should be logged and followed up in a prompt fashion by the liaison officer. In addition, where a particularly noisy construction activity is planned or other works with the potential to generate high levels of noise, or where noisy works are expected to operate outside of normal working hours etc., the liaison officer will inform the nearest noise sensitive locations of the time and expected duration of the noisy works. • The phasing programme will be arranged so as to control the amount of disturbance in noise and vibration sensitive areas at times that are considered of greatest sensitivity. The majority of construction works will be rolling in nature, i.e. works will take place in a given location and will move on to the next location after approximately 1 no. day, over a 31-day construction period for the underground grid connection cabling route. In this way, potential noise impacts on nearby NSLs are limited to days instead of weeks		
EIAR Chapter 12 Cultural Heritage					
Pre-construction Phase					
MM76	Sub Surface Archaeological Potential	EIAR Chapter 12 Cultural Heritage	• Pre-development archaeological testing of the Proposed Grid Connection infrastructure in previously undisturbed greenfield areas of the site under licence from the National Monuments Service. This is in order to identify any archaeological features at the earliest stage possible in the project to allow time to deal with any requirements such as preservation in situ (redesign / avoidance) or preservation by record (archaeological excavation). • A report on the testing will be compiled on completion of the work and submitted to the NMS and the Planning Authority. • Further mitigation such as preservation in situ (avoidance), preservation by record (excavation), buffer zones may be required depending on the results of the testing. • Archaeological monitoring of all groundworks during the construction stage of the Proposed Grid Connection by a licensed archaeologist. • A report on the monitoring will be compiled on completion of the work and submitted to the NMS and the Planning Authority.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Further mitigation such as preservation in situ (avoidance), preservation by record (excavation), buffer zones may be required depending on the results of the monitoring.		
Construction Phase					
MM77	Recorded Monuments and Protected Structures		- Pre-development archaeological testing of the Proposed Grid Connection infrastructure in previously undisturbed greenfield areas of the site under licence from the National Monuments Service. This is in order to identify any archaeological features at the earliest stage possible in the project to allow time to deal with any requirements such as preservation in situ (redesign / avoidance) or preservation by record (archaeological excavation). - A report on the testing will be compiled on completion of the work and submitted to the NMS and the Planning Authority. - Further mitigation such as preservation in situ (avoidance), preservation by record (excavation), buffer zones may be required depending on the results of the testing. - Archaeological monitoring of all groundworks during the construction stage of the Proposed Grid Connection by a licensed archaeologist. - A report on the monitoring will be compiled on completion of the work and submitted to the NMS and the Planning Authority. - Further mitigation such as preservation in situ (avoidance), preservation by record (excavation), buffer zones may be required depending on the results of the monitoring.		
Chapter 13 Landscape and Visual					
Pre-Commencement, Construction and Operation					
MM78		EIAR Chapter 13 Landscape and Visual	- Aside from two end masts, the intended connection to the national electricity grid is located underground, thereby eliminating the majority of potential landscape and visual effects during the operational phase. - The proposed 110 kV on site substation is sited within an agricultural field, strategically sited over 100m from nearby receptors and will be further screened by 4m soil berm, hedgerows bordering the field and roadside vegetation, as well as vegetation surrounding nearby properties. - During initial vegetation stripping, all topsoil material will be temporarily stored on the Site and used for 'dressing' the edges of the development infrastructure during reinstatement/regrading, including that of the spoil management areas and borrow pit. This will be particularly important in areas of cut and fill. The stripped topsoil will contain a natural seed source of local provenance and result in the re- establishment of baseline vegetation.		
Chapter 14 Material Assets					
Pre-Construction, Construction and Operation					
MM79		EIAR Chapter 14: Material Assets	Mitigation by Design		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			A detailed Traffic Management Plan (TMP), incorporating all the mitigation measures set out in this CEMP, will be finalised and confirmatory detailed provisions in respect of traffic management agreed with the roads authority and An Garda Síochána prior to construction works commencing on Site. The detailed TMP will include the following: • Construction and Delivery Programme – A programme of construction and deliveries will be submitted to Tipperary County Council in advance of deliveries of material to the Site. Liaison with the relevant departments will be carried out where required regarding requirements such as delivery timetabling, road closures and diversions. • A Pre and Post Construction Condition Survey – A pre-condition survey of roads associated with the Proposed Grid Connection will be carried out immediately prior to construction commencement to record an accurate condition of the road network at the time. A post construction survey will be carried out after works are completed to ensure that any remediation works are carried out to a satisfactory standard. The timing of these surveys will be agreed with the local authority. All road surfaces and boundaries will be re-instated to pre-development condition, as agreed with the local authority engineers. • Liaison with the roads departments of Tipperary County Council. Once the surveys have been carried out and “prior to commencement” status of the relevant roads established, (and in compliance with the provisions of the CEMP), the Roads Section will be informed of the name and contact number of the Project Supervisor of the construction stage as well as the Site Environmental Manager. • Traffic Management Coordinator – a competent Traffic Management Co-ordinator will be appointed for the duration of the project and this person will be the main point of contact for all matters relating to traffic management. • Information to locals – Locals in the area will be informed of any upcoming traffic related matters e.g. temporary road closures and diversions, 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. Local access to all properties located on the Proposed Grid Connection underground cabling route will be maintained at all times. • Identification of delivery routes – These routes, as show in Figure 14-3, will be agreed and adhered to by all contractors. • Travel plan for construction workers – The proceeding assessment is based on construction staff being transported to the point of construction along the Proposed Grid Connection underground cabling route by minibus. The construction company will be required to provide a travel plan for		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			construction staff, which will include the identification of routes to / from the Site and identification of an area for parking in the temporary construction compound. • Temporary traffic signs – As part of the traffic management measures temporary traffic signs will be put in place at the location where works are being undertaken along the Proposed Grid Connection underground cabling route, and at locations where temporary local diversions are in place. All measures will be in accordance with the 'Traffic Signs Manual, Section 8 – Temporary Traffic Measures and Signs for Road Works' (DoT, 2019) and 'Guidance for the Control and Management of Traffic at Roadworks' (DoT). A member of construction staff (flagman) will be present at each construction site location along the route. • 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 at the entrance to the site and sweeping / cleaning of local roads as required. • Road Opening Licence – Roads works associated with the Proposed Grid Connection underground cabling route will be undertaken in line with the requirements of a road opening licence as agreed with Tipperary County Council. • Diversions and road closures – Reasonable access to residences, farms and businesses will be maintained at all times during any road closures associated with the Proposed Grid Connection underground cabling route works. The details of this will be agreed with each impacted resident/business and the Roads Section of Tipperary County Council in advance of works taking place. The network of local roads in the area will be used for traffic diversions for local traffic in order to expedite the works and limit the duration of the impact owing to the works • Trench Reinstatement - Trenches on public roads, once backfilled, will be reinstated to the relevant standard and satisfaction of the local authority. The roads conditions survey, which will be undertaken immediately prior to construction commencement of the project, will ensure that any section of road along the Proposed Grid Connection underground cabling route is not left in a degraded condition. The repetition of the survey immediately after completion of the construction phase of the project will ensure that any reinstatement works are carried out to a satisfactory standard.		
Construction Phase					
MM80	Irish Rail	EIAR Chapter 14: Material Assets	Cognisance of requirements for third parties as set out in 'CCE Department Technical Guidance Document CCE-TMS-310 Guidance on Third Party Works' and 'CCE Departmental and Multidisciplinary Standard I-DEP-0121 Third Party Works: Additional Details of Railway Safety Requirements' will be adhered to.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			Contact will be made to IEDR 30 days prior to the works that will take place at a minimum of 20m northwest of CIE infrastructure.		
MM81	Overhead Lines	EIAR Chapter 14: Material Assets	- The construction of the Proposed Grid Connection cable route will be in phases along the proposed grid route, to minimise the duration of outage whilst making the connection to the OHL. - Prior to commencing Grid Connection works in the agricultural fields goal posts will be established under the 110k overhead line for the remainder of the construction phase. The goal posts will not exceed a height of 4.2 metres, unless specifically agreed with ESB Networks - The suitability of machinery and equipment for use near power lines will be risk assessed. - All staff will be trained on operating voltages of overhead electricity lines running the Site. All staff will be trained to be aware of the risks associated with overhead lines. All contractors that may visit the sites are made aware of the location of lines before they come on to site. - Barriers will run parallel to the overhead line at a minimum horizontal distance of 6 metres on plan from the nearest overhead line conductor wire. - When activities must be carried out beneath overhead lines, e.g., component delivery or end mast construction, a site-specific risk assessment will be undertaken prior to - any works. The risk assessment must take into account the maximum potential height that can be reached by the plant or equipment that will be used prior to any works. Overhead line proximity detection equipment will be fitted to machinery when such works are required. - 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 the Construction Environment Management Plan and Chapter 4 Population and Human Health will be adhered to during the construction and operation phases.		
MM82	Waste Management	EIAR Chapter 14: Material Assets	- The CEMP includes a Waste Management Plan (WMP) which outlines the best practice procedures during the construction phases of the project. - Waste management will be carried out in accordance with Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects (2021) produced by the EPA. The WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of construction of the Proposed Grid Connection. Disposal of waste will be seen as a last resort.		

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Ref. MM no.	Reference Heading	Reference Location	Mitigation Measure	Audit Result	Action Required
			- 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. Please see the CEMP for best practise measures to prevent the creation of waste materials. - All non-hazardous waste generated on-site by the Proposed Grid Connection will be contained in waste skip at a waste storage area on-site. - The expected waste volumes generated on-site are unlikely to be large enough to warrant source segregation at the Site. Therefore, all waste streams generated on-site will be deposited into a single waste skip. This waste material will be transferred to a Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. - It is not envisaged that there will be any waste material arising from the materials used to construct the site roads as only the quantity of stone necessary will be sourced from local quarries and brought on site on an 'as needed' basis. - Site personnel will be instructed at induction that under no circumstances can waste be brought to site for disposal in the on-site waste skip. It will also be made clear that the burning of waste material on-site is forbidden.		
Operational Phase					
MM83	Irish Rail	EIAR Chapter 14: Material Assets	- There will be no operational impact on properties (residential or other uses) as the ICNIRP guidelines will not be exceeded at any distances even directly above the cables. - As illustrated in the ESB EMF booklet 2017, EMF from 110kV underground cables diminishes quickly with distance from cable dropping from 4µT to 0.5µT at 10m away, reducing to almost 0µT at 20m. The proposed Grid Connection cable route will be sited at a minimum 20m from the railway track. - Engagement with Irish Rail will continue during the operational phase. The implementation of a retransmitter may be implemented at the Site if required, in agreement with Irish Rail.		
MM84	Waste Management	EIAR Chapter 14: Material Assets	- General waste produced at welfare facilities will be removed from site by maintenance personnel for disposal at EirGrid and Developer headquarters. - All hazardous wastes from the maintenance of the substation will be stored securely in bunded containers/areas before being collected by an authorised waste contractor and brought to an EPA licensed waste facility. - The wastewater holding tank at the substation will be emptied when required by a licenced contractor. - Operational personnel will be instructed at induction that under no circumstances can waste be disposed of on-site. It will also be made clear that the burning of waste material on-site is forbidden		

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16.2 Monitoring Commitments

Table 16-2 Monitoring Commitments

Ref No.	Reference Heading	Reference Location	Monitoring Measures	Frequency	Reporting Period	Responsibility
Pre-Construction Phase						
MX1	Drainage Maintenance	EIAR Chapter 3 Development Description EIAR Chapter 8 Hydrology and Hydrogeology EIAR Chapter 5 Biodiversity CEMP Section 4	The Project Hydrologist will complete a detailed drainage design and maintenance plan before construction commences and will attend the site to set out and assist with micro-siting of proposed drainage controls. An inspection and maintenance plan for the drainage system on site will be prepared in advance of commencement of any works. Regular inspections of all installed drainage systems will be necessary, especially after heavy rainfall, to check for blockages, and ensure there is no build-up of standing water at parts of the systems where it is not intended. The inspection of the drainage system will be the responsibility of the site ECoW or the Project Hydrologist.	On going	Monthly	Project Hydrologist
Construction Phase						
MX2	Health and Safety	EIAR Chapter 5 Biodiversity CEMP 5	The PSCS will monitor the compliance of contractors and others and take corrective action where necessary; and Notify the Authority and the client of non-compliance with any written directions issued.	Daily	Daily	PSCS
MX3	Water Quality and Monitoring	EIAR Chapter 8 Hydrology and Hydrogeology EIAR Chapter 5 Biodiversity CEMP Section 4	The effectiveness of drainage measures designed to minimise runoff entering works areas and capture and treat silt-laden water from the works areas, will be monitored continuously by the ECoW or supervising hydrologist on-site. The contractor is solely responsible for the implementation of the detailed drainage design on site. The ECoW is responsible for monitoring the effectiveness of the drainage design as it is implemented on-site. The ECoW or supervising hydrologist will respond to changing weather, ground or drainage conditions on the ground as the Proposed Grid Connection proceeds, to ensure the effectiveness of the drainage design is maintained in so far as is possible.	Daily	As Necessary	ECoW

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Ref No.	Reference Heading	Reference Location	Monitoring Measures	Frequency	Reporting Period	Responsibility
			The drainage measures installed on-site should be inspected at least weekly by the contractor and maintained as required during the construction phase of the Proposed Grid Connection to ensure good performance.			
MX4	Water Quality and Monitoring	EIAR Chapter 8 Hydrology and Hydrogeology EIAR Chapter 5 Biodiversity CEMP Section 4	- Daily general visual inspections of site operations and inspections of all watercourses within the site and in the surrounding area by the ECoW or a suitably qualified and competent person as delegated by the ECoW; - Water bowser movements will be carefully monitored to avoid, insofar as reasonably possible, increased runoff; - Inspections to include all elements of drainage infrastructure to ensure the system is operating correctly and to identify and maintenance that is required. Any changes, such as discolouration, odour, oily sheen or litter will be noted, and corrective action will be implemented. High risk locations such as settlement ponds will be inspected daily. Daily inspections checks will be completed on plant and equipment, and whether materials such as straw bales or oil absorbent materials need replacement; - Event based inspections by the ECoW as follows: >10 mm/hr (i.e. high intensity localised rainfall event); >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or, - Rainfall depth greater than monthly average in 7 days (prolonged heavy rainfall over a week). - Monthly site inspections by the Project Hydrologist/ EcoW during construction phase	Daily	As Necessary	ECoW
MX5	Turbidity Monitoring	EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 4	Turbidity monitors or sondes can be installed where required at locations surrounding the Site. The sondes will provide continuous readings for turbidity levels in the watercourse			

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Ref No.	Reference Heading	Reference Location	Monitoring Measures	Frequency	Reporting Period	Responsibility
MX6	Reactive Site Drainage Management	EIAR Chapter 8 Hydrology and Hydrogeology EIAR Chapter 5 Biodiversity CEMP Section 4	- The effectiveness of drainage measures designed to minimise runoff entering works areas and capture and treat silt-laden water from the works areas, will be monitored continuously by the Environmental Clerk of Works (ECoW) or supervising hydrologist on-site. The ECoW or supervising hydrologist will respond to changing weather, ground or drainage conditions on the ground as the project proceeds, to ensure the effectiveness of the drainage design is maintained in so far as is possible. This may require the installation of additional check dams; interceptor drains or swales as deemed necessary on-site. The drainage design may have to be modified on the ground as necessary, and the modifications will draw on the various features outlined above in whatever combinations are deemed to be most appropriate to situation on the ground as a particular time. - In the event that works are giving rise to siltation of watercourses, the ECoW or supervising hydrologist will stop all works in the immediate area around where the siltation is evident. The source of the siltation will be identified and additional drainage measures such as those outlined above will be installed in advance of works recommencing.	Daily	Daily	ECoW
MX7	Water Quality and Monitoring	EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 4	Daily surface water monitoring forms will be utilised at every works site near any watercourse. These will be taken daily and kept on site for record and inspection.	Daily	As Necessary	ECoW
MX8	Surface Water Quality	EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 4	- Baseline water quality field testing and laboratory analysis will be undertaken where required prior to commencement of construction at the site. The baseline monitoring programme will be subject to agreement with Tipperary County Council. - Analysis will be for a range of parameters with relevant regulatory limits along with Environmental Quality Standards (EQSs) and sampling will be undertaken at designated locations as outlined in Figure 8-3 of the EIAR. - Daily monitoring of excavations by a suitably qualified person will occur during the construction phase. If high	As Required	Monthly	ECoW

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Ref No.	Reference Heading	Reference Location	Monitoring Measures	Frequency	Reporting Period	Responsibility
			levels of seepage inflow occur, excavation work should immediately be stopped, and a geotechnical assessment undertaken.			
MX9	Excavations	EIAR Chapter 7 Land, Soil, Geology CEMP Section 4	Daily monitoring of excavations by a suitably qualified person will occur during the construction phase. If high levels of seepage inflow occur, excavation work should immediately be stopped, and a geotechnical assessment undertaken.	Daily	As Necessary	ECoW/Hydrologist
MX10	Plant and Equipment Inspections	EIAR Chapter 8 Hydrology and Hydrogeology CEMP Section 4	The plant used will be regularly inspected for leaks and fitness for purpose.	As Required	Monthly	ECoW
MX11	Traffic and Transport	EIAR Chapter 14 Material Assets CEMP Section 3	The designated public roads outside the site and along the main transport routes to the site will be regularly inspected by the ECoW for cleanliness, and cleaned as necessary;	Daily	Monthly	ECoW
MX12	Biodiversity	EIAR Chapter 5 Biodiversity CEMP Section 4	- The Developer shall appoint a suitably experienced and competent Environmental Clerk of Works (EcoW) before the commencement of works. The EcoW will supervise all pre-construction ecological surveying, implementation and overseeing of ecological mitigation measures, and ensure that activities on site are conducted in accordance with the planning permission as they pertain to ecological matters and specifically any works that could impact protected habitats or species. - The ECoW will be the liaison for the purposes of consulting with environmental bodies including the NPWS. In advance of works commencing on site, all personnel will receive on-site induction by the EcoW and Contractor relating to the ecological constraints and mitigation measures associated with the site. It will be the responsibility of the Contractor to ensure that any new personnel who are employed during the construction work also receive the on-site induction. Post-construction linear habitat restoration monitoring: Monitoring of minor segments of restored hedgerow which	As required	As required	Project Ecologist

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Ref No.	Reference Heading	Reference Location	Monitoring Measures	Frequency	Reporting Period	Responsibility
			was removed to facilitate the construction of the access track within agricultural lands in the townland of Strogue. Monitoring will occur following the main growing season (i.e., in September) in a given year for the first five years of growth. The Project Ecologist will be available to support the ECoW on matters relating to the protection of sensitive habitats and species encountered prior to or during the construction phase of the Proposed Grid Connection. The Project Ecologist will not be full time on site but will undertake pre-commencement surveys (MM 70,71,72) and visit the site as required. The responsibilities and duties of the Project Ecologist will include the following: 1. Inform and educate on-site personnel of the ecological sensitivities within the Site. 2. Oversee management of ecological issues during the construction period and advise on ecological issues as they arise. 3. Provide guidance to contractors to ensure legal compliance with respect to protected species onsite. 4. Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to construction progress			
MX13	Spoil Management	EIAR Chapter 3 Development Description CEMP Section 2	• Inspections of the spoil management areas (substation berm and linear berms along access tracks) will be made by a Geotechnical Engineer through regular monitoring of the works. The appointed contractor will review work practices at spoil management areas when periods of heavy rainfall are expected so as to prevent excessive dirty water runoff from being generated.	As required	As required	Geotechnical Engineer
MX14	Archaeological Monitoring	EIAR Chapter 12 Cultural Heritage	• Archaeological Monitoring of all groundworks during construction by a licensed archaeologist. • A report on the monitoring should be compiled on completion of the work and submitted to the relevant authorities.	As Required	As Required	Project Archaeologist

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Ref No.	Reference Heading	Reference Location	Monitoring Measures	Frequency	Reporting Period	Responsibility
			- Further mitigation such as preservation in situ (avoidance), preservation by record (excavation) may be required depending on the results of the monitoring. - Soil excavation shall be observed by a qualified archaeologist in accordance with a scheme of archaeological monitoring to identify any significant remains as they come to light.			
Operational Phase						
MX15	Drainage Inspections	CEMP Section 4	The drainage system will be monitored in the operational phase until such a time that all areas that have been reinstated become re- vegetated and the natural drainage regime has been restored.	Monthly	Monthly	ECoW
MX16	Linear Habitat restoration	EIAR Chapter 5 Biodiversity	Post-construction linear habitat restoration monitoring: Monitoring of minor segments of restored hedgerow which was removed to facilitate the construction of the access track within agricultural lands in the townland of Strogue. Monitoring will occur following the main growing season (i.e., in September) in a given year for the first five years of growth.	As Required	As Required	Project Ecologist