Appendix 18.1: Summary of Mitigation Measures

18 INTRODUCTION

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

All mitigation which will be implemented during the various phases of the Project are presented in **Table 18.1** below. This provides an easy to audit list that can be reviewed and reported on during the project phases. The monitoring schedule for the Development is presented in **Table 18.2** below. The proposal for site inspections and environmental audits are set out in the Construction and Environmental Management Plan (CEMP) which is included as **Appendix 2.1** of this EIAR. Subject to planning permission being granted, **Table 18.1** serves as a reporting template for site compliance audits. It can be further developed, in consultation with the relevant statutory agencies and Limerick City and County Council, prior to the project start and during the course of the project phases.

Table 18.1: Summary of Mitigation Measures

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
Pre-Construction Phase					
Flora & Fauna	Chapter 6 Biodiversity	6.5.1	Within the Wind Farm Site all turbine locations and associated infrastructure have a buffer zone of at least 50 m from watercourses, with a 10 m buffer to drainage channels (see **Chapter 10: section 10.6.1**). No works will take place within these buffer zones except for the watercourse crossings on the access track network. Implementation of such buffer zones will result in the avoidance of sensitive hydrological features. Direct discharges to surface waters of dewatered loads will not be permitted under any circumstances. It is noted that an Ecological Clerk of Works (ECoW) with experience in overseeing wind farm construction projects will be appointed by the Contractor for the duration of the construction phase to ensure that the CEMP is effectively implemented and that all planning conditions relating to biodiversity are complied with. An Environmental Manager will be appointed by the Developer to oversee the environmental management of the project, advise on the environmental issues and ensure compliance by the Contractor.		
Flora & Fauna	Chapter 6 Biodiversity	6.5.2.2	Individual mature specimen trees will be protected from possible root damage by the implementation of an exclusion zone to the outer edge of the canopy (often termed the drip-point). This will be marked by a suitable temporary fence erected prior to the commencement of works.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			The Ecological Clerk of Works will ensure the implementation of the above protective measures, which will be maintained throughout the construction phase.		
Flora & Fauna	Chapter 6 Biodiversity	6.5.3	While there was no evidence of otter breeding sites within the site area, otter forages within the various watercourses associated with the site, as well as downstream of the site. A confirmatory survey for otter breeding sites will take place at the crossing locations (upstream and downstream on both banks) prior to the commencement of works on site to ensure that otter holts have not been established since the baseline survey (see **section 6.9.3**).		
Flora & Fauna	Chapter 6 Biodiversity	6.5.4	Whilst no signs of badger presence were found within the Proposed Project site during the baseline surveys, badger does occur in the wider area and distribution of local populations can change over time. Should more than 36 months have elapsed since the baseline surveys in 2023 and the projected date for commencement of construction, a pre-construction confirmatory survey will be undertaken in accordance with NRA Guidance (NRA 2006; NRA 2009b). This will focus on the areas of the site where works will take place (to a distance of approximately 100 m). Should an active sett be located within a 50 m distance of the works area, mitigation will require the closure of the sett (in consultation with NPWS) or the enforcement of a restrictive zone to prevent disturbance to underground tunnels. The ecologist would advise on the		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			appropriate mitigation taking into account the type of sett (i.e. main, secondary, outlier) and the proximity of any works. This procedure would be carried out in strict accordance with relevant legislation and guidance.		
Flora & Fauna	Chapter 6 Biodiversity	6.5.5	The common frog is widespread within the Wind Farm Site occurring in drains and wet fields. Areas where construction works are due to commence during the period February to August will be checked by the ECoW for the presence of frog spawn, tadpoles and adult frogs. If present, these will be removed under licence from NPWS and transferred to suitable ponds, drains or wetlands in the vicinity and away from the construction footprint.		
Flora & Fauna	Chapter 6 Biodiversity	6.5.6.1.3	In general, artificial light creates a barrier to bats so lighting should be avoided where possible. Construction operations within the Wind Farm Site will take place during the hours of daylight where possible to minimise disturbances to faunal species at night. However, some works may occur during hours of darkness but the Environmental Manager/ECoW shall limit night-time works to sections of the site which avoid sensitive features (e.g. mature treelines). Where lighting is required, directional lighting, i.e. lighting which only shines on work areas and not nearby countryside, will be used to prevent overspill. This will be achieved by the design of the luminaire and by using accessories such as hoods, cowls, louvers and shields to direct the light to the intended area only.		
Aquatic Ecology	Chapter 7 Aquatic Ecology	7.5.1	Maintain set-backs of 50m for turbines and associated infrastructure from watercourses (IWEA, 2012) and 10 m from artificial drainage.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
Aquatic Ecology	Chapter 7 Aquatic Ecology	7.5.2.1	The Project layout was specifically designed to reduce the number of watercourse crossings to the absolute minimum, with only two (WC01 on the Maigue River and WC02 on the Charleville Stream) retained, both located where clear-span bridge designs can maintain hydrological and ecological continuity for an unimpeded fish pass. No construction activity will occur within the active watercourse. All water crossings will be clear-span bridges constructed from the bank using machinery operating outside the channel, thereby avoiding any disturbance to aquatic habitats or sediment release.		
Earthworks	Chapter 9: Soils and Geology	9.5.1	The following will also be implemented: • Any excavation and construction related works will be subject to a design risk assessment at detailed design stage to determine risk levels for the construction, operation and maintenance and decommissioning of the works. Identified impacts will be minimised by the application of principles of avoidance, prevention and protection. Information on residual impacts will be recorded and relayed to appropriate parties. • A detailed method statement for each element of the works will be prepared by the Contractor prior to any element of the work being conducted. • Given that the works comprise a sizeable proportion of excavation and earthworks, suitably qualified and experienced geotechnical personnel will be engaged on site to supervise the works.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• The Contract will require programming of the works such that earthworks are not scheduled during severe weather conditions or at times of prolonged high rainfall.		
Pre-emptive Site Drainage Management	Chapter 10 Hydrology and Hydrogeology	10.6.1.1	• The location of all infrastructure outside of the 50m hydrological buffer zones, with the exception of the 2 no. watercourse crossings; • The location of all infrastructure where possible outside of the 10m drain buffer; and, • The location of the substation, 4 no. turbines, the construction compound and all spoil storage area which are located above the 1 in 1,000-year flood level.		
Surface Water Management	Chapter 10 Hydrology and Hydrogeology	10.6.1.2	The descriptive mitigation measures outlined in this report will be applied to the Project design and construction methodologies with a view to avoiding and/or minimising any potential adverse effects to water quality in the receiving surface water network. Details on how such measures will be applied (objectives, design considerations, layout) will be contained in a Surface Water Management Plan (SWMP) (appended to the CEMP in **Appendix 2.1**).		
Flooding	Chapter 10 Hydrology and Hydrogeology	10.6.1.3	• The layout design is intended to minimise earthworks requirements, for hardstands, turbine bases, drainage management, and access tracks within the flood zones. • All turbines within the flood zones will be constructed with piled foundations, and this will reduce earthworks volumes at those		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			locations (as piled turbine bases are smaller than standard bases). • Minimise access roads and hardstands buildups (in flood zones, by keeping them as close to existing ground level as possible) during the construction phase, and increase to 1 in 20-year flood levels for operational phase. • Access tracks will be marked with snow poles to allow for emergency vehicular access. • The final operational phase hardstand area at each of the turbines in flood zones will be as small as possible (the large construction phase hardstand areas will be reinstated). • All existing flood zone drainage pathways will be maintained, either by avoidance, by culverting, or by diverting existing drains locally. • Bespoke construction phase and operational phase drainage has been designed to maximise water quality protection, and minimize flooding effects. • Detailed emergency response procedures have been outlined for potential flood events during the construction phase and during the operational phase. • Certain biodiversity enhancement have been designed to avoid mapped flood zones. • Critical electrical components at turbines, such as transformers in nacelles, and other sensitive electrical components are proposed above 1000-yr flood levels.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• The proposed substation is located in Flood Zone C (i.e. above the 1000-yr flood level). • As per Section 50 requirements, the river crossings will be located at a height which includes a 300mm freeboard above the 1 in 100-year flood event plus climate change. Additional culverts will be constructed on the access roads on approach to the river crossings to minimise flow disruption during flood events.		
Electricity Networks	Chapter 16 Material Assets & Other Issues	16.6.5	• Confirmatory drawings for all existing services will be sought upon consultation with ESB Networks. • Immediately prior to construction taking place, the area where excavation is planned will be surveyed by CAT scan (sub-surface survey technique to locate any below-ground utilities) and all existing services will be verified. Temporary warning signs will be erected. • The as-built location of the installed ducts will be surveyed and recorded using a total station/GPS before the trench is backfilled to record the exact location of the ducts. The co-ordinates will be plotted on as-built record drawings for the grid connection cable operational phase. • Clear and visible temporary safety signage will be erected all around the perimeter of the live work area to visibly warn members of the public of the hazards of ongoing construction works.		
Air Navigation	Chapter 16 Material Assets & Other Issues	16.7.6	The IAA will be consulted and upon request, the turbine with the highest elevation above sea level (mOD) or turbines at the extremities		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			of the Project, and any obstacle 100m or greater, will be installed with a warning light system under direct specification and in accordance with ICAO Annex 15. It should be noted that infra-red lights are not visible to the naked eye. The IAA and the Local Authority will be informed of the coordinates of the constructed positions of the turbines and the highest point of turbines or any infrastructure greater than 100m at least 30 days prior to erection. The IAA and Local Planning Authority will be notified at least 30 days in advance of intended crane erection. An aeronautical lighting scheme for the Project will be agreed and installed in consultation with IAA and Shannon Airport. The following data will be supplied to the IAA airspace team and Shannon Airport • The WGS84 coordinates (In degrees, minutes and seconds) for each turbine • Height above ground level (to blade tip) and elevation above mean sea level (to blade tip) in both meters and feet. • Horizontal extent (rotor diameter) of turbines and blade length where applicable in both meters and feet. • Lighting of the wind farm and turbines and the type of lighting.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			Construction Phase		
Health & Safety	Chapter 5 Population and Human Health	5.5.7.1	*Accidents to Personnel* The construction, operation and decommissioning of the Project shall be managed in accordance with the Safety, Health and Welfare at Work Act 2005 (as amended), the Safety, Health and Welfare at Work (General Application) Regulations 2007 (as amended), and the Safety Health and Welfare at Work (Construction) Regulations 2013 (as amended). As required under the Safety, Health and Welfare at Work (Construction) Regulations 2013, the Developer shall appoint a Project Supervisor for the Design Process (PSDP) and a Project Supervisor for the Construction Stage (PSCS). The PSDP shall compile a Preliminary Safety and Health Plan (PSHP), which details general information about the Project and envisaged health and safety risks. The PSHP shall be made available to the PSCS. The PSCS shall develop a Construction Stage Health and Safety Plan (CSHSP) which incorporates the information contained in the PSHP and details how safety and health will be managed during the construction of the Project. The PSCS may also develop the following documents during the pre-construction stage of the Project, for implementation during the construction stage: • Construction and Environmental Management Plan (updated from the CEMP in **Appendix 2.1**) • Emergency Response Plan		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Detailed Traffic Management Plan *Accidents to Infrastructure* The PSDP shall see that the General Principles of Prevention, outlined under the safety design advice provided by the Health and Safety Authority (HSA) are taken into account for all designs relating to the Project.		
Flora & Fauna	Chapter 6 Biodiversity	6.5.7	While the baseline surveys did not record the presence of any Third Schedule invasive species within the site, best practice measures will be taken throughout the construction phase to prevent the introduction or spread of invasive alien species. The commencement of works will be preceded by a confirmatory survey for invasive species, especially Japanese knotweed, Giant Hogweed and Gunnera species. During construction, the following best practice measures will be implemented: • Good construction site hygiene will be employed to prevent introduction of invasive plant species by thoroughly washing vehicles prior to entering site • Any soil or topsoil required on the site will be sourced only from a stock that has been screened for the presence of invasive species Should the presence of an invasive species be detected, the treatment and control of same will follow guidelines issued by the National Roads Authority - The Management of Noxious Weeds and Non-native Invasive Plant Species on National Roads (NRA 2010).		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
NIS	Natura Impact Statement (NIS)	3.4.1	A Construction and Environmental Management Plan (CEMP) is appended to the EIAR in **Appendix 2.1**. This document will be a key construction contract document, which will ensure that all mitigation measures, which are considered necessary to protect biodiversity and the environment, are implemented. The CEMP includes a Surface Water Management Plan, a Water Quality Management Plan and a Waste Management Plan. Prior to commencement of construction works, the Contractors will identify a core Environmental Management Group, comprising of specific project personnel and an Ecological Clerk of Works (ECoW). The group will draw on technical expertise from relevant specialists where required and will liaise with other relevant external bodies as required (such as Inland Fisheries Ireland). The Ecological Clerk of Works will be responsible for coordination, compliance monitoring and continued development of the CEMP and any other surveys, reports or method statements required. The ECoW will also review the Contractors' method statements and environmental plans as required by the CEMP, carry out compliance auditing during the construction phase and coordinate the Environmental Management Group and required liaisons between Limerick County Council, the Contractors, and other statutory authorities. The ECoW will have appropriate experience of working on large scale renewable energy projects and with relevant		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			qualifications, *e.g.* BSc in ecology or environmental management and accreditation such as CIEEM. There is an existing drainage network at the Site which comprises agricultural drains. The following drainage control measures will be used during the construction phase in conjunction with the existing drainage network to ensure the protection of all rivers and downstream watercourses. <u>Source controls</u>: • Interceptor drains, diversion drains, erosion and velocity control measures such as the use of sand bags, oyster bags filled with gravel, filter fabrics and other similar/equivalent or appropriate systems. • Small working areas, covering temporary stockpiles, weathering off temporary stockpiles, cessation of works in certain areas or other similar/equivalent or appropriate measures. <u>In-Line controls</u>: • Interceptor drains/swales, erosion and velocity control measures such as check dams, sand bags, oyster bags, straw bales, baffles, silt bags, silt fences, sedimats, filter fabrics, and collection sumps, temporary sumps, sediment traps, temporary pumping systems, settlement ponds, or other similar/equivalent or appropriate systems. <u>Treatment systems</u>:		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Temporary sumps and attenuation ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as "Siltbuster", and/or other similar/equivalent or appropriate systems. It should be noted that the existing network of drains present in some areas will be integrated and enhanced as required and used within the Project drainage system. The integration of the existing drainage network and the proposed wind farm network is relatively simple. The key elements are the upgrading and improvements to water treatment elements, such as in-line controls and treatment systems, including silt traps, settlement ponds and buffered outfalls. Prior to the commencement of road upgrades (or new road/hardstand or turbine base installs) the following key temporary drainage measures will be installed: • All existing dry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using check dams/silt traps. • Clean water diversion drains will be installed upgradient of the works areas. • Check dams/silt fence arrangements (silt traps) will be placed in all existing forestry drains that have surface water flows and also along existing forestry roadside drains.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50 m buffer zone. The following silt control measures will be used as required throughout the construction phase of the Project: **Silt Fences**: Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids. This will act to prevent entry to the existing drainage network of sand and gravel-sized sediment, released from the excavation of mineral sub-soils of glacial and glacio-fluvial origin and entrained in surface water runoff. Inspection and maintenance of these structures during the construction phase are critical to their functioning to stated purpose. They will remain in place throughout the entire construction phase. **Silt Bags**: Silt bags will be used where small to medium volumes of water need to be pumped from excavations. As water is pumped through the bag, most of the sediment is retained by the geotextile fabric allowing filtered water to pass through. **Settlement Ponds**: The Project footprint will be divided into drainage catchments and stormwater runoff rates based on the 10-year return period rainfall event will be calculated for each catchment. These flows will then be used to design settlement ponds for each drainage catchment. The settlement ponds will either be designed for 4.1hr or		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			24hr retention times used to settle out medium silt (0.01mm) and fine silt (0.004mm) respectively (EPA, 2006). **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 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. Vegetation filters are essentially end-of-line polishing filters that are located at the end of the treatment train. This makes use of the natural vegetation of the Wind Farm Site to provide a polishing filter for the wind farm drainage prior to reaching the downstream watercourses. **Water Treatment Train**: If the discharge water from construction areas fails to be of a high quality, then a filtration treatment system (such as a 'Siltbuster' or similar equivalent treatment train) will be used to filter and treat all surface discharge water collected in the dirty water drainage system. This will apply to all of the construction phase. **Weather Warnings:** The works programme for the construction stage of the Proposed Development will also take account of weather forecasts and predicted rainfall in particular. Large excavations and movements of peat/subsoil or peat stripping will be suspended or scaled back if heavy rain is forecast. The extent to which works will be		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			scaled back or suspended will relate directly to the amount of rainfall forecast. (available forecasting systems are detailed in **Chapter 9: section 9.7.2.1**) **Management of Runoff from Spoil Storage Areas**: It is proposed that excavated excess soil and subsoil will be stored in six no. temporary spoil deposition areas within the Site (see **EIAR: Chapter 2: section 2.5.16**). There is a 1no. permanent spoil storage area (berm) next to the Substation that can hold 8,100m^3 of spoil. During the initial placement of subsoil, silt fences, straw bales and biodegradable matting will be used to control surface water runoff from the deposition areas. Drainage from these areas will ultimately be routed to an oversized swale and a number of stilling ponds and a 'Siltbuster' with appropriate storage and settlement designed for a 1 in 10 year return period before being discharged to the onsite watercourses. Soil/subsoil reinstatement areas will be sealed with a digger bucket and vegetated as soon possible to reduce sediment entrainment in runoff. Once re-vegetated and stabilised soil/subsoil reinstatement areas will no longer be a potential source of silt laden runoff. A detailed Spoil Management Plan (**Appendix 2.1, Management Plan 4**) will be prepared and will address the re-use, reinstatement, storage and restoration of all material excavated during the		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			construction phase including detailed methodologies regarding the establishment and management of the spoil deposition area for the entire Project, including the Project **Additional Measures for Works within Buffer Zone**: In addition to the above mitigation measures, where works are proposed within the delineated hydrological buffer zones the following additional mitigation measures will be implemented: • Double row silt fences will be emplaced immediately down-gradient of the construction areas. **Mitigation for use of Cement-based Products** As already noted, the release to local drains and watercourses of run-off from cement-based products during the construction phase could have serious effects on aquatic life and ultimately on the interests of the European sites with connectivity to the Project Area. The following measures will be implemented throughout the construction phase. • No batching of wet-cement products will occur onsite. Ready-mixed supply of wet concrete products and emplacement of pre-cast elements will take place. • Where possible pre-cast elements for culverts and concrete works will be used.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Vehicles will undergo a visual inspection prior to being permitted to the wind farm Site to ensure that there is no excess cementitious material which could be deposited on site. • Where concrete is delivered onsite, only the chute will 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. A dedicated bunded area will be created to cater for concrete wash-out and this will be located in the Temporary Construction Compound. • The contractor will use weather forecasting to plan dry days for pouring concrete. • The contractor will ensure the pour site is free of standing water and plastic covers will be ready in case of a sudden rainfall event. • No surplus concrete will be stored or deposited anywhere on Site. • Raw or uncured waste concrete will be disposed of by removal from the Site and returned to the source location or disposed of appropriately at a suitably licensed facility. • Where shuttering is required to be installed in order contain the concrete during pouring, it will be installed to a high standard with minimal potential for leaks. Additional measures will be taken to ensure minimal potential of leaking,		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			these measures are the use of plastic sheeting and the use of sealing products at joints. **Mitigation for use of Hydrocarbons** The following measures will be implemented during the construction phase to ensure that hydrocarbon based products do not enter drains or watercourses: • During construction, where possible, all refuelling on site will be within the temporary compound within the dedicated re-fuelling area. • All plant will be inspected and certified to ensure they are leak free and in good working order prior to use onsite. • Site vehicles will be refuelled offsite where possible. • Only essential refuelling will be completed outside of the dedicated re-fuelling area but not within 50m of any watercourses. Onsite re-fuelling of plant and machinery will be carried out using a mobile double skinned fuel bowser: • Onsite refuelling will be carried out by trained personnel only; • A permit to fuel system will be put in place; • Taps, nozzles or valves associated with refuelling equipment will be fitted with a lock system; • All fuel storage areas will be bunded appropriately for the duration of the construction phase. Fuels will be stored in the Temporary Construction Compound and bunded to at least		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			110% of the storage capacity of fuels to be stored. All bunded areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area; • Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage; • The electrical control building (at the substation) will be bunded appropriately to 110% of the volume of oils that will be stored, and to prevent leakage of any associated chemicals to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; • The plant used during construction will be regularly inspected for leaks and fitness for purpose; • An emergency plan for the construction phase to deal with accidental spillages is included within the Construction and Environmental Management. Spill kits will be available to deal with any accidental spillage in and outside the re-fuelling area. **Mitigation for Watercourse Crossings** Mitigation measures for the proposed new watercrossings (no. 2) are detailed below:		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• The new proposed watercourse crossings will be via a bottomless or clear span culverts and the existing banks will remain undisturbed as much as possible. • No instream excavation works are proposed and therefore there will be no direct effect on the stream at the proposed crossing locations. • Any guidance / mitigation measures proposed by the OPW or the Inland Fisheries Ireland will be incorporated into the design of the proposed crossings. • As a further precaution, construction work near streams 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", that is, May to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum runoff rates and the risk of entrainment of suspended sediment in runoff. • During the near stream construction work double row silt fences will be emplaced immediately down-gradient of the construction area. • All new river/stream crossings will require a Section 50 application (Arterial Drainage Act, 1945). The river/stream crossings will be designed in accordance with OPW		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			guidelines/requirements on applying for a Section 50 consent. **Mitigation for Turbine Delivery Route Works** While works along the TDR are required at a number of locations, it is considered that no significant effects will occur on surface waters, for the following reasons (see EIAR **Chapter 10: section 10.6.2.11**): • All works are relatively minor and localised and cover very small areas. • Excavation/earthworks will all be small scale. • These works are distributed over a wide area. • All works are temporary in nature. Nevertheless, on a precautionary basis, key temporary drainage measures will be installed, as follows: • All existing dry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using silt traps. • Clean water diversion drains will be installed upgradient of the works areas. • Check dams/silt fence arrangements (silt traps) will be placed in all existing drains that have surface water flows and also along existing roadside drains.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50 m buffer zone.		
Aquatic Ecology	Chapter 7 Aquatic Ecology	7.5.2	A comprehensive suite of drainage measures has been developed to protect all receiving waters from potential significant effects during the construction of the Project in the catchment, and along the proposed TDR. They are outlined in full in **Chapter 10: Hydrology and Hydrogeology** and are also referenced in the accompanying NIS document. These measures are aimed at preventing sediments or other pollutants from entering watercourses through the containment and treatment of all surface water run-off from areas of works. The developer will appoint an Ecological Clerk of Works (ECoW) to ensure compliance during the construction stage with all mitigation measures, planning conditions and legislative requirements related to ecology. They will consult and assist with the Client in evaluating compliance with applicable legislation by means of a monthly Environmental Audit The mitigation measures have been incorporated into a Construction and Environmental Management Plan (CEMP) in **Appendix 2.1** of the EIAR, for the Project which includes construction method statements for key works. The CEMP includes a Surface Water Management Plan (SWMP). The CEMP and SWMP will require mandatory adherence by all parties involved in		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			the construction of the Project (including any sub-contractors) in order to protect aquatic conservation interests within the Study Area. The development of the mitigation measures and all method statements for watercourse crossings follows all relevant guidance and current best practice as detailed in: • Construction Industry Research and Information Association (CIRIA) (2006) Control of Water Pollution from Construction Sites - Guidance for Consultants and Contractors. CIRIA C532. London. • CIRIA (2006) Guidance on 'Control of Water Pollution from Linear Construction Projects' (CIRIA Report No. C648, 2006). • COFORD (2004) Forest Road Manual – Guidelines for the Design, Construction and Management of Forest Roads. • CIRIA (2015) SuDS Manual, (CIRIA Report C753, 2015) • Coillte (2009): Forest Operations & Water Protection Guidelines. • Department of Agriculture, Food and the Marine (2018) DRAFT Plan for Forests & Freshwater Pearl Mussel in Ireland – Consultation Document. • Forestry Commission (2004) Forests and Water Guidelines, Fourth Edition. Publ. Forestry Commission, Edinburgh. • Forest Services (2006) Draft Plan for Forestry and Freshwater Pearl Mussel Requirements – Site Assessment and Mitigation Measures.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Forest Service (2000) Forestry and Water Quality Guidelines. Forest Service, DAF, Johnstown Castle Estate, Co. Wexford. • IFI (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters. • GPP1 (2020) Understanding your Environmental Responsibilities – Good environmental Practices, NetRegs. • GPP 5 (2018) Works and Maintenance in or Near Water, NetRegs. • GPP21 (2021) Pollution Incident Response Planning, NetRegs. • GPP 22 (2018) Dealing with Spills, NetRegs. • EU Construction and Demolition Waste Management Protocol - BIBM. • EPA Best practice guidelines for the preparation of resource & waste management plans for construction & demolition projects. • IEMA's latest Impact Assessment Guidance, A New Perspective on Land and Soil in Environmental Impact Assessment' (Feb 2022).		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			Prevention of the release of suspended solids/nutrients, dissolved substances, concrete and hydrocarbons into the drainage network and site run-off as a result of clearance of vegetation and other associated earthworks Nature Based Solutions (NBS) will be implemented on site where possible. These measures aim to mimic natural hydrological processes and restore ecological functions. The use of Sustainable Drainage Systems (SuDS) will be central to water management at the Site and will eliminate the risk of sedimentation to watercourses during both construction and operational phases. SuDS follows a treatment train approach with design principles that include: Minimise → Intercept → Treat → Disperse → Dilute. This system improves water quality, slows down flow rates, and encourages sediment settlement. Extending or maximising this approach has the potential to deliver net beneficial effects, such as a reduction in overall runoff rates at the Site, improved water quality in receiving watercourses, and a decrease in downstream flood risk. Surface water management measures will be implemented early in the project timeline, including the installation of silt fencing and delineation of riparian buffer zones prior to any internal road construction. Additional key elements, described in detail in the Surface Water Management Plan (**Appendix 2.1**), include:		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Open constructed drains to collect and treat development-related runoff. • Collection drains for upslope "clean" water to ensure it is dispersed away from disturbed construction areas. • Filtration check dams along roads running perpendicular to contours to reduce flow velocity and trap sediment. • Settlement ponds, lagoons, proprietary systems like Siltbusters, and buffered outfalls to encourage sedimentation before discharge at greenfield runoff rates. A combination of source, in-line, and end-of-line controls will be used during all construction activities. These include interceptor drains, check dams, silt fences, sumps, settlement ponds, level spreaders, vegetation filters, and proprietary systems such as Siltbusters. These measures are designed to capture and treat sediment-laden runoff and control flow velocities, reducing the risk of downstream impacts. Clean water diversion drains will also be installed upslope of construction areas to separate uncontaminated water from the treatment system. Pre-commencement drainage works will include blocking of dry drains downgradient of construction areas, installation of silt traps and check dams, and implementation of a double silt fence system where work occurs within the 50m buffer zone of watercourses.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			Pumped water from excavations will pass through silt bags before discharge to ensure sediment removal. All drainage features will be regularly inspected and maintained throughout the construction period. To prevent sediment transport from spoil storage, temporary stockpiles will be covered or stabilised, and weather forecasts will be used to schedule works, with large-scale soil disturbance avoided during heavy rainfall events. The site team will monitor real-time rainfall data using Met Éireann resources and adjust activities accordingly. There will be no direct site runoff to watercourses during construction. All outflows will be directed through sediment control features like check dams and stilling ponds and finally dispersed via diffuse overland flow through buffered outfalls. To minimise treatment load, clean water drains will divert uncontaminated runoff away from the construction area. This proactive measure reduces the volume of potentially silt-laden water and the risk of suspended solids or dissolved substances entering nearby watercourses.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			Contaminated water from construction activities such as excavations, drilling, and temporary stockpiling will be isolated, contained, and appropriately treated prior to any discharge. Earthworks will be suspended in the event of an orange warning for rainfall. Prior to earthworks being suspended the following further control measures will be completed: • All open spoil excavations will be secured and sealed. • Temporary or emergency drainage will be created to prevent back-up of surface runoff. • Working during heavy rainfall and for up to 24 hours after heavy events will not be allowed to ensure drainage systems are not overloaded. **Prevention of pollution from debris caused by vehicles during the crossing of watercourses within the Site on the site access track.** To minimise pollution risks at watercourse crossings, strict movement protocols for machinery will be enforced. There will be no tracking of machinery directly across watercourses. Instead, all plant will remain on designated access routes within the defined working corridor. This working corridor will be clearly delineated using posts and high-visibility tape to prevent unintentional encroachment into sensitive habitats. The delineation ensures that contractors' plant remains		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			within permitted areas and does not disturb adjacent watercourses or ecological features. Where working within the 50m buffer is unavoidable, such as at watercourse crossings or upgrades to existing roads, additional controls such as silt fences and sediment barriers will be installed. These will serve to capture sediment and reduce the risk of pollution entering nearby waterbodies. These measures will ensure that sediment and vehicular debris are retained and treated on-site, thereby protecting downstream aquatic habitats from turbidity spikes and sedimentation. **Prevention of pollution to Natura 2000 sites that are hydrologically connected downstream from the site** The Site drains into watercourses that are hydrologically connected to designated Natura 2000 sites downstream. To prevent any adverse effects on these protected habitats and species, a suite of mitigation measures will be implemented, including Nature Based Solutions and a SuDS approach, ensuring no sediment or pollutants reach these sensitive receptors. All surface water runoff will be directed through multiple treatment stages, including check dams, settlement ponds, and buffered outfalls, ensuring only clean, treated water is discharged. No direct		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			discharge to watercourses will occur at any phase of the development. If required, a Siltbuster or similar proprietary system will be used to enhance water treatment, particularly during high-risk activities like excavation and dewatering. This system, when managed correctly, reduces suspended solids and has an overall positive effect on water quality. Additionally, early consultation with the OPW will ensure that scheduled drainage maintenance works do not coincide with construction activities, avoiding the potential for cumulative impacts on downstream water quality and, by extension, aquatic ecology within Natura 2000 sites. **Potential for accidental spillage of hydrocarbons and other pollutants including concrete laitance.** Accidental spillage of hydrocarbons, concrete, or other pollutants presents a known risk during construction. To mitigate this, robust dewatering and containment protocols will be in place. Dewatering flow rates will be tightly regulated using inline gate valves or similar infrastructure to prevent sudden surges that could overload drainage and attenuation systems. Pumped water will be directed through an on-site treatment train or discharged to		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			vegetated surfaces via silt bags, always outside designated buffer zones. Continuous monitoring and adaptive management of dewatering operations will be carried out to ensure environmental performance under varying site conditions. Contaminated water resulting from activities like drilling, excavation, and temporary stockpiling will be isolated, treated, and only discharged when safe and compliant. These preventative measures, along with routine inspections and emergency spill response plans, will ensure no unintentional release of pollutants into surface waters. **Prevention of loss of natural watercourses due to 2 no. new watercourse crossings and the placement of bridges and culverts.** Two new watercourse crossings are proposed within the Site. These crossings will utilise clear-span bridges and culverts, with mitigation measures to avoid release of pollutants to downstream waters as detailed in **Chapter 10, Section 10.6.2.1**. There will be no tracking of machinery through any watercourse. Construction plant will operate exclusively within designated routes and the established working corridor.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			Where buffer zone encroachments are unavoidable for crossing works, appropriate sediment control measures such as silt fencing and settlement features will be installed to prevent mobilisation of sediment and protect aquatic habitats. The design avoids in-stream works, thereby preserving channel morphology, flow continuity, and ecological connectivity. As a result, permanent loss or fragmentation of natural watercourses is not anticipated. **Management of Runoff from Spoil Storage Areas to prevent contamination of watercourses.** Spoil will be temporarily stored in the temporary spoil storage area (berm) shown on **Figure 1.2**. Where any spoil cannot be used for reinstatement and landscaping works it will be permanently stored in the permanent spoil storage area (berm) located at the back of the substation**.** This is further detailed in the **Spoil Management Plan** in **Appendix 2.1: Construction Environmental Management Plan** and fully assessed in **Chapter 9: Soils and Geology.** These designated spoil storage areas are located outside of the fluvial flood zones and above the 1 in 1,000-year flood level (refer to **Figure 10.4**). These spoil storage areas are also located outside of the 50m hydrological buffer zones. During the initial placement of subsoil, silt fences and biodegradable matting will be used to control surface water runoff from the spoil storage areas.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			Where applicable the vegetative topsoil layer of the spoil storage areas will be rolled back to facilitate placement of excavated spoil, following which the vegetative topsoil later will be reinstated. Where reinstatement is not possible, the spoil storage areas will be sealed with a digger bucket and seeded as soon as possible to reduce sediment entrainment in runoff. Drainage from the spoil storage areas will ultimately be routed to oversized swales and a number of stilling ponds and a 'Siltbuster' with appropriate storage and settlement designed for a 1 in 10 year return period before being discharged to the onsite watercourses. **Prevention of risk of chemical carryover from use of Siltbuster** Measures employed to prevent overdosing and potential chemical carryover: • The Siltbuster system comprises an electronic in-line dosing system which provides an accurate means of adding agents so overdosing does not 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.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Final effluent not meeting the discharge criteria is recycled and retreated, which has a secondary positive effect of reducing carryover. • Use of biodegradable chemical agents can be used at very sensitive sites (i.e. adjacent to SACs). • Sludge from the Siltbuster will be removed off site for disposal at a licenced facility. **Ecological Enhancement Proposals** The proposed Ecological Enhancement proposals at the Site includes the planting of approximately 0.669ha of woodland, 1.646km of hedgerow to compensate for the loss of existing hedgerow and the enhancement and re-vitalisation of 5.433km of existing degraded hedgerow. Further details are provided in the **BEMP** in **Appendix 6.2**. All planting works will be undertaken during dry weather. Method statements for watercourse crossings will be prepared at the construction stage and submitted to the ECoW for prior approval. All banksides in the vicinity of the new crossings will be fully reinstated with vegetation cover as quickly as possible using only native species appropriate to the existing environment. To address the identified issue of livestock-induced pollution and physical damage to on-site streams, the implementation of		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			protective fencing along stream corridors will be implemented. To ensure animal welfare, alternative drinking water sources, such as troughs supplied from piped or rainwater-fed systems, should be provided outside of fenced riparian zones. Incorporating these protections into the project would likely have a net positive effect on local water quality and habitat integrity, particularly for species of conservation concern.		
Aquatic Ecology	Chapter 7 Aquatic Ecology	7.5.2.3	The specified measures detailed below are aimed at protection of instream aquatic biota within the vicinity of any proposed works at watercourses on the Site but equally with regards to the protection of the downstream population of salmonids and other fish species. During the construction phase the appointed contractor(s) will ensure that the following mitigation is adhered to in line with IFI (2016) Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters: • A buffer zone of at least 50m will be in place for the EPA mapped watercourses , with the exception of the sections of proposed Access Tracks to be constructed across the Maigue River and the Charleville (Stream) see **Drawing No. 6839-JOD-GGE-XX-DR-C-0202** and **Drawing No. 6839-JOD-GGE-XX-DR-C-0205** attached as part of the EIAR application. • The Temporary Construction Compound and temporary spoil storage areas will be located at a minimum distance of 50m from any watercourse as shown on planning drawings (**6839-**		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			JOD-GGE-XX-DR-C-0200 - 6839-JOD-GGE-XX-DR-C-0208).. All drainage from these facilities will be directed through a settlement pond with appropriate capacity and measures to provide spill containment. Details on how such measures will be applied (objectives, design considerations, layout) will be contained in a Surface Water Management Plan (SWMP) (appended to the CEMP in **Appendix 2.1**). • All site drainage, as described in the SWMP (**Appendix 2.1 - MP3**) and shown on associated drawings (**6839-JOD-GGE-XX-DR-C-0301 – 6839-JOD-GGE-XX-DR-C-0304**), will be directed through either sediment traps, settlement ponds and/or buffered drainage outfalls to ensure that total suspended solid levels in all waters discharging to any watercourse will not exceed 25mg/l (IFI, 2016). All construction site run-off will be channelled through a stilling process to allow suspended solids to settle out and through a spill-containment facility prior to discharge. • Daily monitoring of all sediment traps and settlement ponds will be undertaken by the Environmental Manager or Ecological Clerk of Works to ensure satisfactory operation and/or maintenance requirements. A full specification for the water quality monitoring is presented in the Water Quality Management Plan (WQMP) **Appendix 2.1 - MP 2**.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• The storage of oils, hydraulic fluids, etc., will be undertaken in accordance with current best practice for oil storage (Enterprise Ireland, BPGCS005). • All machinery operating at the Site will be fully maintained and routinely checked to ensure no leakage of oils or lubricants occurs Vehicles will be refuelled off-site where possible. For vehicles that require being refuelled on-site, fuels will be stored in the temporary construction compound and bunded to at least 110% of the storage capacity of fuels to be stored. Refuelling will take place via a mobile double skinned fuel bowser. The bowser will be a double axel refuelling trailer which will be towed to the refuelling locations by a 4x4 vehicle. The 4x4 will carry a drip tray, spill kit and absorbent mats in case of any accidental spillages. Only designated competent personnel will refuel plant and machinery on the Site. • Any extensions to existing drainage culverts on the Site Access Roads will be undertaken in dry conditions and in low flow. • During the culvert installation and associated construction work, double silt fences shall be installed immediately downgradient and downstream of the construction area for the duration of the construction phase. • The pouring of concrete, sealing of joints, application of water-proofing paint or protective systems, curing agents, etc., will be completed in the dry to avoid pollution of the freshwater environment (see **Chapter 10** for further details). There will be		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			no batching or storage of cement in the vicinity of any watercourse crossing construction area. • Procedures (as detailed in **Chapter 10: Hydrology and Hydrogeology**) will be put in place to ensure the full control of raw or uncured waste concrete to ensure that watercourses will not be affected. • Should there be any incidents of pollution to watercourses, immediate steps as specified in the Emergency Response Plan in the CEMP will be undertaken to resolve the cause of the pollution and where feasible, mitigate against the effect of pollution. • Re-seeding / re-vegetation of all areas of bare ground or the placement of geo-jute (or similar) matting will take place prior to the operational phase to prevent silt-laden run-off. Seed mixes will contain only suitable native species of plant that occur in the local area. Species selection is outlined in **Section 2.4** of the **BEMP**. • Silt traps erected during the construction phase within roadside and artificial drainage will be replaced with stone check dams for the lifetime of the project. These stone check dams will only be placed within artificial drainage systems such as roadside drains and not in natural streams or drainage lines. • A full review of construction stage temporary drainage will be undertaken by the Developer (in conjunction with the Project Hydrologist/ Site Engineer and the Project Ecologist) following		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			the completion of construction, and drainage removed or appropriately blocked where this will not interfere with infrastructure.		
Flora & Fauna	Chapter 8 Ornithology	8.14.1	Whilst significant effects on barn owls are not anticipated, works will aim to avoid the use of artificial lighting of suitable habitat (i.e., rough grassland, hedgerows and tree lines). All plant and machinery will comply with specific noise legislation (for example, Construction Plant and Equipment Permissible Noise Levels Regulations, 1998) and will be turned off when not in use (**Chapter 11: Noise**).		
Flora & Fauna	Chapter 8 Ornithology	8.16.2	To minimise the • Direct loss and fragmentation of habitat used by non-target farmland bird species such as meadow pipit, skylark, starling, swallow and redwing; and • Disturbance and displacement of these non-target farmland bird species. The following measures which will serve to minimise these effects: • Retainment of areas of more important habitat as much as possible within the development design (e.g., waterbodies and hedgerows); • Minimisation of the extent of habitat loss during construction as much as possible within the development design;		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Selection of delivery routes which use existing built infrastructure wherever possible, with laying of cables underground on the public roadway; and • Presence of an ECoW on site to oversee any ornithological issues during construction.		
Soil Contamination	Chapter 9 Soils and Geology	9.5.2.1	The CEMP sets out the key environmental management measures associated with the construction, operation and decommissioning of the proposed wind farm, to ensure that during these phases of the Project, the environment is protected, and any potential impacts are minimised.		
Erosion, Degradation and Soil Sealing	Chapter 9 Soils and Geology	9.5.2.2	The Project will be constructed in a phased manner in order to reduce the potential effects of The Project on the Soils and Geology. Phased construction reduces the amount of open, exposed excavations at any one time, lowering the risk of compaction and reducing soil exposure to degradation. To further mitigate against the compaction of soil at the site, prior to the commencement of any earthworks, the work corridor will be demarcated, and machinery will stay within this corridor so that soils outside the work area are not damaged or suffer degradation. Excavations will then be conducted from access tracks as they are constructed in order to reduce the compaction of soft or otherwise sensitive ground.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			The amount of exposed ground and soil stockpiles will also be kept to a minimum and any stockpiles in place for an extended period of time will be allowed to re-vegetate naturally.		
Subsoil and bedrock removal	Chapter 9 Soils and Geology	9.5.2.3	Construction of the Project will result in the removal of soils in parts of the site to facilitate excavation for the construction of Access Tracks and hardstands for the wind turbines within a competent stratum suitable for the emplacement of foundations. Ground conditions vary across the site with mineral soils of varying depths and competence present. At the proposed turbine bases the excavation depth required is anticipated to be a maximum of 6.00m to a suitable bearing stratum. For Access Tracks and turbine hardstands this is expected to be average 0.50m and consequently less significant. In the case of the construction of the Project, all excavated overburden will either be re-used or retained on-site for reinstatement purposes during the Decommissioning phase. This will include: • Use of suitable site-won material (mineral soils consisting predominantly of sands and gravels) as general fill in the construction of access tracks, hardstands and in reinstatement around turbine foundations.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Surplus overburden will be re-used on site in the form of landscaping and for reinstatement purposes. • Residual surplus overburden will also be stored at a permanent spoil repository, located adjacent to the Substation. Refer to the **CEMP, Spoil Management Plan** for details. Temporary stockpiles (not exceeding 2m in height) of separated soil material types will be placed adjacent to the excavation areas prior to reinstatement, but outside the Floodplain of the River Maigue. These stockpiles will be shaped and sealed to prevent the ingress of water from rainfall.		
Subsoil and bedrock removal	Chapter 9 Soils and Geology	9.5.2.3.2	Good practices, such as limiting the construction zone by demarcation and the sealing of temporary stockpiles against degradation from rainfall will be employed impacts on the soil resource.		
Subsoil and bedrock removal	Chapter 9 Soils and Geology	9.5.2.4	Spoil types will be treated separately. Mineral soils and topsoils / organic soils will be separated during excavation and these two types of spoil will be disposed of generally as follows: ***A*** *Till soils will be deposited directly on top of other mineral soils. This will require the removal of peat where present to facilitate the process.* ***B*** *Topsoils / Organic Soils will be stored separately, protected from the environment to maintain their integrity and used to*		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			reinstate the minerals soil surfaces following completion of construction works. No topsoil will be disposed of as part of the Project. **1.** Mineral soil reuse will take place at various locations within the wind farm land holding where low surface gradients combine with minimal peat depth and sufficient distance from sensitive receptors. These proposed spoil deposition areas are detailed in **Chapter 2 Project Description: Drawing No. 6839-JOD-GGE-XX-DR-C-0200 – 0209** and the **Spoil Management Plan**, contained within the **Appendix 2.1 - CEMP**.. **2.** It is intended that spoil movements will be minimised by disposing of the material within or immediately adjacent to the construction footprint of the structure from whence it was excavated. No Spoil disposal will take place with the Floodplain of the River Maigue. **3.** Preparation of the Spoil Disposal sites as shown on **Figure 9.1** will involve the removal of the topsoil which will be transferred to a specific location to be stockpiled and maintained for re-use during restoration operations. **4.** Spoil will be deposited, in layers of 0.50m and will not exceed a total thickness of 2.00m, unless contained by suitably designed and constrained berms. **5.** Spoil will only be deposited on slopes of < 5 degrees to the horizontal and greater than 10m from the top of a cutting. The		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			exact location of these deposition areas has been determined in consultation with the construction phase geotechnical specialist. . **6.** Spoil Disposal sites will have a regular weekly assessment, made by the construction manager or other suitably qualified individual, to ensure that stability and good condition is maintained. **7.** Once disposal is complete the deposition areas will be re-vegetated with the existing upper vegetated layer removed at the commencement of disposal operations. Upon commencement of the decommissioning / restoration phase guidance from a suitably qualified ecologist will be sought to provide a suitable methodology and programme of maintenance for the restored areas.		
Subsoil and bedrock removal	Chapter 9 Soils and Geology	9.5.2.5	Vehicular movements will be restricted to the footprint of the Proposed Project, particularly with respect to the newly constructed Site Access Tracks. This ensures that machinery must be kept on tracks and will not move onto areas that are not permitted. Best practice as described in the IWEA and Scottish Best Practice Guidelines[1] will be applied during construction which will minimise double handling, again reducing the site traffic.		

[1] Irish Wind Energy Association (IWEA) (2012) Best Practice Guidelines for the Irish Wind Energy Industry, Fehilly Timoney & Company, Cork

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			All works will be managed and conducted in accordance with the Construction Environmental Management Plan (**Sections 3.3.3** of the CEMP in **Appendix 2.1** of **Volume IV**), which will be updated by the civil engineering contractor and agreed prior to any Site works commencing.		
Earthworks	Chapter 9 Soils and Geology	9.5.2.6	The Contractor will programme the works such that earthworks are not scheduled during severe weather conditions. Details of the proposed methodology and mitigation measures are summarised below and are also outlined in the CEMP.		
Geotechnical Stability and Excavation Management .	Chapter 9 Soils and Geology	9.5.2.6.1	Analysis of the historic conditions following soil movement indicates that the following main factors generally trigger slope failures: **1.** Excessive quantities of spoil loaded onto sensitive topsoil, organic soils or sensitive soils covered sloping ground. (In such cases the gradient of the slope should be no more than 5 degrees to the horizontal). Topsoils and organic soils should always be removed prior to depositing spoil and retained for re-use as landscaping a material. **2.** The angle of repose of the cut face of excavations is all too often found to be too high, sometimes 70 – 80 degrees to the horizontal. Battering back the sides of an excavation to approx. 60 degrees in clay soils and 30 degrees in granular or organic soils helps to reduce the potential for slippage, which will significantly reduce the potential for soil movement.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			3. The height of any temporary stockpile or deposition area will not exceed 2m, unless suitably constrained. **4.** Surface water flows will compromise most granular or cohesive soils at any slope angle and care should be taken to stop the development of such flows during construction. An emergency plan is to be prepared and will be enacted should soil movement occur.		
Geotechnical Stability and Excavation Management .	Chapter 9 Soils and Geology	9.5.2.6.2	Application of the following procedures will have the effect of reducing the Hazard with respect to Ground Stability: **1.** Excavated spoil will not be deposited on the down slope or up slope edges of the adjacent topsoil. This spoil will instead be deposited on the two flanks either side of the excavation (where gradient is least) and spread in such a way as to limit the surcharge pressure on sensitive topsoils. **2.** The hardstanding areas surrounding the turbine bases will be designed in a manner such that crane loadings can be transferred directly onto the competent strata underlying any sensitive mineral soils. In order to facilitate these works it will be necessary to undertake limited excavations. To ensure effective sidewall support during these operations the contractor will adopt an approved engineering solution (such as a suitable bracing system or other method) to maintain sidewall stability at all times.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			3. Movement can often occur during or following severe rainstorm events, particularly when following a prolonged dry spell. Extra vigilance will be maintained at such times, during construction. **4.** All slopes are to be regularly checked, during the construction and operational phases, for development of tension cracks, which are indicative of slope movement. **5.** Method statements will be followed at all times. Where modification is required, this will be agreed by the supervising engineer. **6.** Slopes will not be undercut or excavations left unsupported for periods in excess of 24 hours. Excavations are to be backfilled as soon as practicable. Excavation and filling operations shall be coordinated to minimise the time an excavation remains opened. **7.** Pore water pressure within excavations should be kept low at all times by draining deliberate or intentional sumps at regular intervals. This is to prevent ponding of water within excavations which can in turn increase hydraulic heads locally and potentially lead to instability. **8.** The potential for Soil Movement will be monitored regularly during the construction and operational phases by means of regular site visits and assessments, by a suitably qualified and experienced professional. **9.** Only experienced and competent contractors will be appointed to conduct the construction works.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			10. Low ground bearing pressure machinery shall be used for transport of construction materials in sensitive areas, where ground conditions dictate its requirement. **11.** Construction at less sensitive areas will be completed first to allow suitable construction practices to be established before works commence in the more difficult areas. **12.** Sufficient time should be allowed to conduct the works in a safe and timely manner.		
Soil Contamination	Chapter 9 Soils and Geology	9.5.2.7	The probability for the unlikely event of contamination resulting via these mechanisms will be minimised through the application of good practice and adherence to the CEMP, which contains specific guidance in respect to Refuelling Procedures, and Spoil Management (**Appendix 2.1**). Likewise, the importation of materials from off-site will be closely monitored to ensure that no contamination is brought onto the site from external sources. Importation of materials such as aggregates and other forms of construction materials, will be subject to "wheel washing", documented, certified, sampled and evaluated as per the requirements of the CEMP and Waste Management Plan (**Appendix 2.1**). Similarly, but to a lesser degree, there is potential for adverse impact from wastewater percolation unless wastewater is constrained. The only source of wastewater production will be the		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			welfare facilities at the substation. The foul effluent will be retained within a "closed" system with all effluent being held within a bunded storage tank with a high-level alarm, drained on a regular basis and disposed of off-site at a suitable licensed facility. This will effectively break any potential pollution linkage to the wider environment. The CEMP (**Sections 3.3.5** and **3.4.4** of the CEMP in **Appendix 2.1** of **Volume IV**) will be developed to include the checking of assets (plant, vehicles, fuel bowsers) on a regular basis during the construction phase of the Project.		
Storage of Fuels and Chemicals	Chapter 9 Soils and Geology	9.5.2.7.1	In order to guard against the risk of soil contamination the following specific mitigation measures will be applied:- As per Best Practice Guidance (BPGCS005)[2], all fuels, oils and chemicals on site will have a secondary containment system of 110% capacity and will be located more than 20m from any watercourse (i.e. outside of the watercourse buffer). A bunded diesel bowser will be located inside a fenced off area within the Temporary Construction Compound. Other chemicals will be stored within a storage container with an accompanying Control of Substances Hazardous to Health ("COSHH") Datasheet in accordance with health and safety regulations. If generators are		

[2] Best Practice Guide BPGCS005 - Oil Storage Guidelines. Available at: http://www.envirocentre.ie/includes/documents/OilStorageBPG.pdf;

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			used on site, these shall be bunded (the bund shall be capable of containing 110% of the fuel tank's capacity). The bund shall be kept empty of water. Where chemicals are required on site, they must be placed in an appropriate bund to prevent ground contamination. All chemicals must be stored in a correctly marked container clearly identifying the contents. Where labels are worn off, they must have a new label placed on them or the contents transferred to a correctly marked container. All safety data sheets for all chemicals will be filed on site as part of a requirement under the provisions of the Construction Environmental Management Plan (CEMP). Spill kits will be available at all work areas within machinery and at the site office. Contingency plans will be in place for dealing with a spillage should a spillage occur.		
Refuelling	Chapter 9 Soils and Geology	9.5.2.7.2	During construction, fuel and oil deliveries will take place within the designated refuelling area within the Temporary Construction Compound only. The Contractor will supervise site deliveries to ensure that the correct amount of material is delivered to the correct tank and the level is checked prior to refilling to avoid spillage. Where refuelling of vehicles on site is necessary, the following guidelines will be strictly adhered to:		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Mobile plant will be filled in a designated area, on an impermeable surface well away from any drains • A spill kit will be stored (and clearly marked) near refuelling areas. • A bunded tank / bowser will be used with capacity of the bund to be 110% of the fuel storage capacity. • Vehicles will never be left unattended during refuelling and drip trays should be located under all static plant vehicles. • Hoses and valves will be checked regularly for signs of wear, and will be turned off and securely locked when not in use. • Vehicles will not be left running unnecessarily and low emission fuels will be used where possible. • Diesel pumps and similar equipment will be checked regularly and any accumulated oil removed for appropriate disposal.		
Existing Contamination and Imported Materials	Chapter 9 Soils and Geology	9.5.2.7.3	The following practices will be followed in relation to the excavation and reinstatement of turbines, hardstands, site tracks, substation, cable trenches, borrow pit excavation, topsoil stripping and any other earthworks, whenever foreign or fill materials are encountered: • Any suspected fill or material foreign to the Site will be stored separately and separated into individual component types, such as concrete, aggregate and bituminous materials.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Prior to disposal each stockpile of material will be classified with the relevant EU Waste Code by a relevant competent individual. • To determine the relevant contamination classification for each stockpile (**Inert**, **Contaminated Non-Hazardous** or **Hazardous**) Waste Acceptance Classification testing will be undertaken in line with EPA guidance. The frequency for these tests will be 1 suite of tests for each 100m^3 of material. • The results of all testing and waste disposal certificates will be retained on Site, by the Site Supervisor.		
Concrete	Chapter 9 Soils and Geology	9.5.2.7.4	There will be no concrete batching on the Site. Rather, it will be transported to the Site as it is required. A dedicated, bunded area will be created to cater for concrete wash-out and this will be within the onsite Temporary Construction Compound. This will be for the wash-out of the chutes only after the pour. Concrete trucks will then exit the Site via Site Entrance 2 and return to the supply plant to wash out the mixer itself. Refer to **Chapter 2 section 2.6.3.** The main concrete pours at the turbine locations will be planned in advance and proposed mitigation measures will be as follows: • Avoiding large concrete pours, for turbine foundations, on days when temperatures are not optimal as per (BS 8110) (EN1992-1-2) or when heavy or prolonged rainfall is forecast i.e., during a period in which a Met Éireann Status Red weather event will/has occurred.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Providing that all concrete pour areas are dewatered prior to pouring concrete and while the concrete is curing. • Making covers available so that areas can be covered if heavy rain arrives during the curing process which will prevent runoff of concrete which has a high pH. The chutes wash out on-site will require a small volume of water. This water will be directed to the concrete washout area which will be a temporary lined impermeable containment area or a siltbuster type washout unit or similar. The unit catches solid concrete and filters and contains the washout liquid for pH adjustment and solid separation. The residual liquids and sediments will be disposed of at an appropriately licenced facility. Temporary lined impermeable containment areas are usually constructed using straw bales and lined with an impermeable geotextile membrane. Refer to CEMP for details. An alternative construction method would be to dig a hole in the ground and place an impermeable geotextile membrane in the hole so that no wastewater can penetrate the cover and seep into the soil and groundwater.		
Wastewater and Sanitation	Chapter 9 Soils and Geology	9.5.2.7.5	Wastewater from the staff welfare facilities in the control building will be collected in a sealed storage tank, fitted with a high-level alarm. This is a device installed in a fuel storage tank that is capable		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			of sounding an alarm, during a filling operation, when the liquid level nears the top of the tank. All wastewaters will be tankered off-site by a licensed waste collector to a suitable plant in the vicinity of the Project. There will be no onsite treatment or disposal of wastewater.		
General Waste	Chapter 9 Soils and Geology	9.5.2.7.6	All materials used on Site and wastes generated on Site will be reduced by good Site practice and attention to the CEMP (**Sections 3.3.7** and **3.4.4** of the **CEMP** in **Appendix 2.1** of **Volume IV**). A policy of reduce, re-use and recycle will apply. All waste will be segregated and re-used where possible or removed from Site for recycling. Any waste which is not recyclable or compostable will be properly disposed to landfill. Whenever possible, excavated spoil materials will be re-used close to the area of excavation. The careful design which has been achieved will result in minimal excess soil and rock. Excess spoil material will be separated in terms of soil type (topsoil or mineral soils) and stored within a series of seven long-term spoil deposition areas, as identified on **Figure 9.1.** The locations for these spoil deposition areas have been carefully considered in terms of ground slope and soil characteristics as well as proximity		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			to sensitive receptors and the flood zone. In this way any potential negative effects have been minimised.		
Pollution Prevention	Chapter 9 Soils and Geology	9.5.2.7.7	Suitable protection for watercourses potentially affected by the works will be installed prior to relevant works proceeding. These measures will be in-line with EPA Pollution Prevention Guidelines. Protection measures will include: • Plant and equipment will be stored on dedicated hard standing within the construction compound. This will minimise the risk of pollution caused by leakages occurring out of hours. Drip trays will be used where appropriate. • All plant and equipment will use biodegradable hydraulic oil. • Spill kits will be readily available to all personnel. The spill kits will be of an appropriate size and type for the materials held on site. • Diesel fuel will be stored in a bunded diesel bowser which will be located within a fenced off area in the construction compound. • Refuelling and maintenance of vehicles and plant will take place in designated areas of hardstanding. • All other chemicals will be stored at the site compound within an appropriate storage facility along with an accompanying MDS Datasheet.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Wastewater from the temporary staff toilets and washing facilities will be discharged to sealed containment systems and disposed via licensed contractors. • Early seeding of lands near watercourses will be undertaken to reduce the potential for sediment runoff. All staff on site will be made aware of the pollution prevention measures being implemented throughout the construction, operational and decommissioning phases using appropriate toolbox talks and the site induction.		
Emergency Response	Chapter 9 Soils and Geology	9.5.2.7.8	The emergency response plan, as detailed in the CEMP, has been developed in order to deal with any emergency accidents or spills. In particular an emergency spill kit with oil boom and absorbers will be kept on Site in the event of an accidental spill. All Site operatives will be trained in its use. In addition, all vehicles will also contain emergency spill kits.		
Pre-emptive Site Drainage Management	Chapter 10 Hydrology and Hydrogeology	10.6.2.1	Where possible all of the key development areas (turbines, hardstands, construction compounds etc.) have been located significantly away from the delineated 50m watercourse buffer zones. Where works are proposed within the buffer zone *i.e.* at watercourse crossings additional mitigation measures are proposed. The only infrastructure elements located within the 50m watercourse buffers are the river crossings over the River Maigue and the Charleville Stream.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			Presented below are temporary and long-term drainage control measures that will be utilised during the construction phase. As stated above there is an existing drainage network at the Site which comprises of agricultural drains and surface water streams. The measures outlined below will be used in conjunction with the existing drainage network to ensure the protection of all rivers and downstream watercourses. <u>Source controls:</u> • Interceptor drains, vee-drains, diversion drains, erosion and velocity control measures such as the use of sand bags, oyster bags filled with gravel, filter fabrics and other similar/equivalent or appropriate systems. • Small working areas, covering temporary stockpiles, weathering off of side-cast spoil, cessation of works in certain areas or other similar/equivalent or appropriate measures. <u>In-Line controls:</u> • Interceptor drains, vee-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.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			<u>Treatment systems:</u> • Temporary sumps and attenuation ponds, temporary storage lagoons, sediment traps, and settlement ponds, and proprietary settlement systems such as "Siltbuster" (mitigation measures in relation to the use of Siltbuster are prescribed in **Section 10.6.2.9** and/or other similar/equivalent or appropriate systems. It should be noted that the existing network of manmade agricultural drains present in some areas will be integrated and enhanced as required and used within the Project drainage system. The integration of the existing drainage network and the proposed wind farm network is relatively simple. The key elements are the upgrading and improvements to 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: • Apart from interceptor drains, which will convey clean runoff water to the downstream drainage system, there will be no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the proposed wind farm drainage into the existing site drainage network. This will reduce the potential for any increased risk of downstream flooding or sediment transport/erosion.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Temporary silt traps will be placed in the existing drains downstream of construction works, and these will be diverted into proposed interceptor drains, or culverted under/across the works area. • During the operational phase, runoff from individual turbine hardstanding areas will not be discharged directly into the existing drainage network but discharged locally at each turbine location through field drains, main drains, and existing settlement ponds. • Buffered outfalls which will be numerous over the Site will promote percolation of drainage waters across the bog surface and close to the point at which the additional runoff is generated, rather than direct discharge to the existing drains of the Site. • Velocity and silt control measures such as check dams, sandbags, oyster bags, straw bales, flow limiters, weirs, baffles, silt fences will be used during the upgrade construction works. • Existing culverts will be lengthened where necessary to facilitate access road widening. **Pre-Commencement Temporary Drainage Works:** Prior to the commencement of road upgrades (or new road/hardstand or turbine base installs) the following key temporary drainage measures will be installed:		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• All existing dry drains that intercept the proposed works area will be temporarily blocked down-gradient of the works using check dams/silt traps. • Clean water diversion drains will be installed upgradient of the works areas. • Check dams/silt fence arrangements (silt traps) will be placed in all existing drains that have surface water flows and also along existing roadside drains. • A double silt fence perimeter will be placed down-slope of works areas that are located inside the watercourse 50m buffer zone. **Silt Fences**: Silt fences will be emplaced within drains down-gradient of all construction areas. Silt fences are effective at removing heavy settleable solids. This will act to prevent entry to the existing drainage network of sand and gravel-sized sediment, released from the excavation of mineral sub-soils of glacial and glacio-fluvial origin and entrained in surface water runoff. Inspection and maintenance of these structures during the construction phase will be completed and is critical to their functioning to stated purpose. They will remain in place throughout the entire construction phase. **Silt Bags**: Silt bags will be used where small to medium volumes of water need to be pumped from excavations (e.g. the proposed underpass locations). As water is pumped through the bag, most of		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			the sediment is retained by the geotextile fabric allowing filtered water to pass through. **Settlement Ponds:** The Project footprint will be divided into drainage catchments (based on topography, outfall locations, catchment size) and stormwater runoff rates based on the 10-year return period rainfall event will be calculated for each catchment. These flows will then be used to design settlement ponds for each drainage catchment. The settlement ponds will either be designed for 4.1hr or 24hr retention times used to settle out medium silt (0.01mm) and fine silt (0.004mm) respectively (EPA, 2006). Settlement ponds along Access Tracks and at Turbine Hardstands will have 4.1hr 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.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			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 Wind Farm 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 stand alone but are intended as part of a treatment train of water quality improvement/control systems (i.e. source controls >check dams > silt traps > settlement ponds > level spreaders > silt fences> vegetation filters). **Water Treatment Train**: If the discharge water from construction areas fails to be of a high quality, 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 to all of the construction phase. **Pre-emptive Site Drainage Management**: The works programme for the construction stage of the Proposed Development will also take account of weather forecasts and predicted rainfall in particular. Large excavations and movements of subsoil or soil		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			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/weekly basis, as required, to allow site staff to direct proposed and planned construction activities: • General Forecasts: Available on a national, regional and county level from the Met Éireann website (www.met.ie). 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 Éireann website (www.met.ie). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive. • Consultancy Service: Met Éireann provide a 24-hour telephone consultancy service. The forecaster will provide an interpretation of weather data and give the best available forecast for the area of interest. Earthworks will be suspended in the event of an orange warning for rainfall. Prior to earthworks being suspended the following further control measures will be completed: • All open spoil excavations will be secured and sealed. • Temporary or emergency drainage will be created to prevent back-up of surface runoff. • Working during heavy rainfall and for up to 24 hours after heavy events will not be allowed to ensure drainage systems are not overloaded. **Management of Runoff from Spoil Storage Areas**: It is proposed that excavated spoil will be temporarily stored in the 6 no. proposed spoil storage areas and permanently stored in 1 no. spoil storage berm adjacent to the Substation. These designated spoil storage areas are all located outside of the fluvial flood zones and above the 1 in 1,000 year flood level (refer to **Figure 10.4**). These spoil storage areas are also located outside of the 50m hydrological		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			buffer zones. During the initial placement of subsoil, silt fences, straw bales and biodegradable matting will be used to control surface water runoff from the spoil storage areas. Where applicable the vegetative topsoil layer of the spoil storage areas will be rolled back to facilitate placement of excavated spoil, following which the vegetative topsoil later will be reinstated. Where reinstatement is not possible, the spoil storage areas will be sealed with a digger bucket and seeded as soon as possible to reduce sediment entrainment in runoff. Drainage from the spoil storage areas will ultimately be routed to oversized swales and a number of stilling ponds and a 'Siltbuster' with appropriate storage and settlement designed for a 1 in 10 year return period before being discharged to the onsite watercourses. **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.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			Proposed Drainage and Water Quality Monitoring: Monitoring is detailed in **Section 10.6.5** below. **Allowance for Climate Change**: Climate Change rainfall projections are typically for a mid-century (2050) timeline. The projected effects of climate change on rainfall are therefore modelled towards the end of the life cycle of the Proposed Development, as the turbines have a life span of approximately 35 years. It is likely that the long-term effects of climate change on rainfall patterns will not be observed during the lifetime of the proposed wind farm. As outlined in the above sections we have designed settlement ponds for a 1 in 10-year return flow. This approach is conservative given that the project will likely be built over a much shorter period (38-40 weeks), and therefore this in-built redundancy in the drainage design more than accounts for any potential short-term climate change rainfall effects. **Additional Measures for Works within Buffer Zone**: In addition to the above mitigation measures, where works are proposed within the delineated 50m hydrological buffer zone the following additional mitigation measures will be implemented: • Double row silt fences will be emplaced immediately down-gradient of the construction areas.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			Measures along the Grid Connection: The GCR will require excavation of cable trenches in greenfield areas. These works are transient in nature with very limited excavation at any one time. Spoil removed from the trench will be reinstated. Any excess spoil will be transported to a licenced facility. A silt fencing filtration system will be installed on all existing drainage channels for the duration of the cable construction to prevent contamination of any watercourse.		
Siltbuster	Chapter 10 Hydrology and Hydrogeology	10.6.2.2	Management of surface water and groundwater seepages and subsequent treatment prior to discharge into the drainage network will be undertaken as follows: • Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations will be put in place. • If required, pumping of excavation inflows will prevent build-up of water in the excavation. • The interceptor drainage will be discharged to the Site constructed drainage system or onto natural vegetated surfaces and not directly to surface waters. • The pumped water volumes will be discharged via volume and sediment attenuation ponds adjacent to excavation areas, or via specialist treatment systems such as a Siltbuster unit.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• There will be no direct discharge to surface watercourses, and therefore no risk of hydraulic loading or contamination will occur. • Daily monitoring of excavations by a suitably qualified person will occur during the construction phase. If high levels of seepage inflow occur, excavation work will immediately be stopped and a geotechnical assessment undertaken. • A mobile 'Siltbuster' or similar equivalent specialist treatment system will be available onsite 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.		
Release of Hydrocarbons	Chapter 10 Hydrology and Hydrogeology	10.6.2.3	• During construction, where possible, all refuelling on site will be within the temporary compound within the dedicated re-fuelling area. • All plant will be inspected and certified to ensure they are leak free and in good working order prior to use onsite. • Site vehicles will be refuelled offsite where possible. • Only essential refuelling will be completed outside of the dedicated re-fuelling area but not within 50m of any watercourses. Onsite re-fuelling of plant and machinery will be carried out using a mobile double skinned fuel bowser:		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			○ The fuel bowser, a double-axel custom-built refuelling trailer will be re-filled off site, and will be towed around the site by a 4x4 jeep to where machinery is located; ○ The 4x4 jeep will also carry fuel absorbent material and pads in the event of any accidental spillages. ○ The fuel bowser will be parked on a level area in the construction compound when not in use and 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 be used during all refuelling operations. ○ A non-permeable High-Density Polyethylene (HDPE) membrane will be provided beneath connection points to catch any residual oil during filling and disconnection. These membrane will be inspected and if there is any sign of oil contamination will be removed from the site by a specialist waste contractor. • Onsite refuelling will be carried out by trained personnel only; • A permit to fuel system will be put in place; • Taps, nozzles or valves associated with refuelling equipment will be fitted with a lock system; • All fuel storage areas will be bunded appropriately for the duration of the construction phase. Fuels will be stored in the Temporary Construction Compound and bunded to at least 110% of the storage capacity of fuels to be stored. All bunded		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area; • Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage; • The electrical control building (at the substation) will be bunded appropriately to 110% of the volume of oils that will be stored, and to prevent leakage of any associated chemicals to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor; • The plant used during construction will be regularly inspected for leaks and fitness for purpose; and, • An emergency plan for the construction phase to deal with accidental spillages is included within the Construction and Environmental Management. Spill kits will be available to deal with any accidental spillage in and outside the re-fuelling area.		
Release of Cement Based Products	Chapter 10 Hydrology and Hydrogeology	10.6.2.4	• No batching of wet-cement products will occur onsite. Ready-mixed supply of wet concrete products and emplacement of pre-cast elements will take place. • Where possible pre-cast elements for culverts and concrete works will be used. • Vehicles will undergo a visual inspection prior to being permitted to drive into the wind farm Site to ensure that there is		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			no excess cementitious material which could be deposited on site. • Where concrete is delivered onsite, only the chute will 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. A dedicated bunded area will be created to cater for concrete wash-out and this will be located in the Temporary Construction Compound. • The contractor will use weather forecasting to plan dry days for pouring concrete. • The contractor will ensure pour site is free of standing water and plastic covers will be ready in case of a sudden rainfall event. • No surplus concrete will be stored or deposited anywhere on Site. • Raw or uncured waste concrete will be disposed of by removal from the Site and returned to the source location or disposed of appropriately at a suitably licensed facility. • Where shuttering is required to be installed in order contain the concrete during pouring, it will be installed to a high standard with minimal potential for leaks. Additional measures will be taken to ensure minimal potential of leaking, these measures are the use of plastic sheeting and the use sealing products at joints.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
Waste Disposal	Chapter 10 Hydrology and Hydrogeology	10.6.2.5	• During the construction phase, the Project will include an enclosed wastewater management system at the temporary compound capable of handling the demand during the construction phase with 90 construction workers on site at peak. • A self-contained port-a-loo with an enclosed wastewater holding tank will be used at the on-site temporary construction compound area, maintained by the providing contractor, and removed from the 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 by a licensed contractor to be discharged at a suitable offsite treatment location. • Wastewater/sewerage from the staff welfare facilities located in the temporary construction compound will be collected and held in a sealed storage holding tank, fitted with a high-level alarm. The high-level alarm is a device installed in the storage tank that is capable of sounding an alarm during a filling operation when the liquid level nears the top of the tank. • All wastewater will be emptied periodically, tankered off-site by a licensed waste collector and disposed of at a suitable wastewater treatment plant that has sufficient capacity. There will be no onsite treatment of wastewater. • No water or wastewater will be sourced on the Site, nor discharged to the site.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
Morphological Changes to Surface Watercourses	Chapter 10 Hydrology and Hydrogeology	10.6.2.6	Mitigation measures for the upgrade of the existing crossings and the new proposed crossing are detailed below: • The 2 no. new watercourse crossings will be via clear span bridge crossings and the existing banks will remain undisturbed as much as possible. • No instream excavation works are proposed and therefore there will be no direct effect on the stream at the proposed crossing location. • Any guidance / mitigation measures proposed by the OPW or the Inland Fisheries Ireland will be incorporated into the design of the proposed crossings. • As a further precaution near stream construction work will only be carried out during the period permitted by Inland Fisheries Ireland (2016) in the guidance document: "Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters" (IFI, 2016), that is, May to September inclusive. This time period coincides with the period of lowest expected rainfall, and therefore minimum runoff rates and the risk of entrainment of suspended sediment in runoff. • During the near stream construction work double row silt fences will be emplaced immediately down-gradient of the construction area. There will be no batching or storage of cement allowed on-site. • All new road river/stream crossings will require a Section 50 application (Arterial Drainage Act, 1945). The river/stream		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			crossings will be designed in accordance with OPW guidelines/requirements on applying for a Section 50 consent.		
Water Treatment Train	Chapter 10 Hydrology and Hydrogeology	10.6.2.7	No significant groundwater dewatering will be required due to the relatively shallow nature of the excavations. Direct rainfall and surface water runoff will be the main inflows that will require water volume and water quality management. For the avoidance of doubt, we would define dewatering as a requirement to permanently drawdown the local groundwater table by means of over pumping, e.g. as would be required for the operation of a bedrock quarry in a valley floor.		
Siltbuster	Chapter 10 Hydrology and Hydrogeology	10.6.2.9	Measures employed to prevent overdosing and potential chemical carryover: • The Siltbuster system comprises an electronic in-line dosing system which provides an accurate means of adding agents so overdosing does not 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.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Final effluent not meeting the discharge criteria is recycled and retreated, which has a secondary positive effect of reducing carryover. • Use of biodegradable chemical agents can be used at very sensitive sites (i.e. adjacent to SACs). • Sludge from the siltbuster will be removed off site for disposal at a licenced facility.		
Pre-emptive Site Drainage Management (associated with Piled Foundations)	Chapter 10 Hydrology and Hydrogeology	10.6.2.10	The proposed mitigation measures designed for the protection of downstream surface water quality and groundwater quality will be implemented at all construction work areas. • Mitigation measures for sediment control are detailed in **Section 10.6.2.1**, **10.6.2.2** and **10.6.2.6**. • Mitigation measures for the control of hydrocarbons during construction works are detailed in **Section 10.6.2.3**. • Mitigation measures for the control of cement-based products during construction works are detailed in **Section 10.6.2.4**. Proposed mitigation measures relative to piling works will comprise: • Strict QA/QC procedures for piling works will be followed; • Piles will be kept vertical during piling works; • Good workmanship will be employed during all piling works; and,		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Where required use bentonite seal to prevent upward/downward movement of surface water/groundwater. For bored piles, as the temporary steel casing is removed, a steel reinforcement cage is added to the pile column and then concrete is added to the toe of the pile using a tremie pipe. Vermiculite is used to create a plug between the concrete and the displaced water, therefore the concrete seals the entire pile column and pushes the vermiculite plug to the surface as concrete is added. The temporary steel casing is removed carefully as the concreting works are being completed. This concreting process is similar to that used when grouting a water supply production well (IGI (2007), and EPA (2013)).		
Flooding	Chapter 10 Hydrology and Hydrogeology	10.6.2.12	• Excavation works and infill are minimised in flood zones; • Turbines within the flood zones will be constructed using piled foundations which will reduce ground disturbance within the flood zone and will also reduce spoil volumes and earthworks within the flood zones; • During the construction phase, turbine hardstands (T4, T5, T6, T7 and T8) located within the modelled flood zones will be constructed as close to ground level as possible, depending on the grade from the nearest river crossing; • Construction compounds and soil/subsoil storage areas are located outside of mapped flood zones;		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• The proposed substation is located on land above the 0.01% AEP flood elevation, i.e. the Substation is located in flood zone C; • As per Section 50 requirements, the main river crossings will be located at a height which includes a 300mm freeboard above the 1 in 100-year flood event plus climate change. Additional culverts will be constructed on the access roads on approach to the river crossings to minimise flow disruption during flood events; • All access roads within the floodplain during the construction phase will be constructed as close to existing ground level as possible, depending on the grade from the nearest river crossing. Turbine cabling and access track infrastructure can be submerged temporarily without any impact on their function; and, • Site roads located within mapped flood zones are designed to have shallow flood depths and be accessible by emergency response vehicles should that be required. All site trackways will be demarked by reflective marker poles. No turbine maintenance will occur during flood events, so the requirement for emergency vehicle access will be limited to fire or turbine failure. Despite the low likelihood of a fluvial flood event occurring during the construction of the wind farm, weather/rainfall events of those		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			magnitudes likely to generate significant rainfall which would in turn cause fluvial flooding would be forecastable. An emergency response system has been development for the construction phase of the project to respond to high rainfall events which may result in fluvial flooding. A potential fluvial flooding event at the Site would likely be identified ~5-7 days in advance, with more accurate forecasts of severity within 24-48 hours of occurrence. Weather warnings will be issued from Met Eireann at least 60 hours before an event, but there will be indications from a week out that a likely significant event might occur. Preparation for a significant event will need to begin from the initial indications of the pending flood event. This will allow time for preparation and the implementation of additional emergency mitigation measures outlined below if there were to be a pending risk of an extreme flooding event. A forecast red weather warning (combining high river levels and heavy rainfall) is the defined trigger for the Managed Retreat described below. The first point of mitigation is ongoing monitoring of weather forecasts, weather warnings, wind direction, and rainfall depths. The project Environmental Manager or the site ECoW will be responsible for monitoring weather forecasts during the construction phase.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			When a pre-determined rainfall trigger levels is exceeded (e.g., sustained rainfall (any foreseen rainfall event longer than 4-hour duration) and/or any yellow or greater rainfall warning (>25mm/hour) issued by Met Eireann), planned responses will be undertaken. • Cessation of all construction works until the storm event, including the storm runoff has passed. All construction works will cease during storm events such as yellow warning rainfall events. Following heavy rainfall events, and before construction works recommence, the Site will be inspected and corrective measures implemented to ensure safe working conditions e.g. dewatering of standing water in open excavations, etc. • Exposed soils (exposed temporary stockpiles) will be covered with plastic sheeting during all relatively heavy rainfall events and during periods where works have temporarily ceased before completion at a particular area (e.g., overnight and weekends). With regards to the fluvial flood zones at the Site, a **Managed Retreat** from the fluvial flood zones will be implemented in the event of a high intensity rainfall event and/or red weather warning related to rainfall. This will include the following:		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Any areas where soil/subsoil is exposed at the surface will be compacted firmly with a digger bucket of a suitably sized excavator. • Open trenches will be backfilled and compacted. • All oils, fuels and waste material will be removed from the flood zones. • Existing sediment control measures will be removed, as these may be washed away and deposited elsewhere by the floodwaters. • Site access tracks will be scraped and any excess soft material will be removed from the flood zones. • All plant, machinery and equipment will be removed from the flood zones.		
Public Water Supplies	Chapter 10 Hydrology and Hydrogeology	10.6.2.13	Mitigation measures implemented for the protection of groundwater and surface water quality at the Site will ensure that there is no potential for effects on the Bruree PWS or the Adare PWS. • Mitigation measures for sediment control are detailed in **Section 10.6.2.1** and **Section 10.6.2.2**. • Mitigation measures for the control of hydrocarbons during construction works are detailed in **Section 10.6.2.3**. • Mitigation measures for the control of cement-based products during construction works are detailed in **Section 10.6.2.4**.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Mitigation measures for the protection of surface water quality in the event of a fluvial flood event during the construction phase are prescribed in **Section 10.5.2.12**. Implementation of these mitigation measures will ensure the protection of surface water quality in receiving waters.		
Hydrologically Connected Designated Sites	Chapter 10 Hydrology and Hydrogeology	10.6.2.14	Mitigation measures implemented for the protection of surface water quality at the Site will ensure that there is no potential for effects on the Lower River Shannon SAC. • Mitigation measures for sediment control are detailed in **Section 10.6.2.1** and **Section 10.6.2.2**. • Mitigation measures for the control of hydrocarbons during construction works are detailed in **Section 10.6.2.3**. • Mitigation measures for the control of cement-based products during construction works are detailed in **Section 10.6.2.4**. • Mitigation measures for the protection of surface water quality in the event of a fluvial flood event during the construction phase are prescribed in Section 10.5.2.12. Implementation of these mitigation measures will ensure the protection of surface water quality in receiving waters.		
WFD Status	Chapter 10 Hydrology and Hydrogeology	10.6.2.15	Mitigation measures relating to the protection of surface water drainage regimes and surface water quality within the Site have been detailed in **Section 10.5.2.1** (suspended solids), **Section**		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			10.5.2.3 (hydrocarbons), **Section 10.5.2.4** (cement-based products), **Section 10.5.2.5** (wastewater) and **Section 10.5.2.6** (morphological changes to watercourses). These mitigation measures will also be implemented during the construction of the Grid Connection. Similarly, mitigation measures for the protection of groundwater quantity and quality have been detailed in **Section 10.5.2.7** (groundwater levels), **Section 10.5.2.3** (hydrocarbons), **Section 10.5.2.4** (cement-based products), **Section 10.5.2.5** (wastewater).		
Timing of Site Construction Works	Chapter 10 Hydrology and Hydrogeology	10.6.2.16	All planting works will be undertaken during dry weather. All mitigation measures with respect to suspended solids entrainment in surface waters and hydrocarbons detailed in Section 10.6.2.1 and Section 10.6.2.3 (Chapter 10 Hydrology and Hydrogeology) will be implemented during the ecological enhancement works.		
Kerry Pipeline Crossing	Chapter 10 Hydrology and Hydrogeology	10.6.2.17	The works crossing the pipeline have a small footprint, and will be of short duration which limits the potential for significant effects. All works will also be completed during dry weather and in accordance with a specific works method statement. The prescribed mitigation measures, as per the method statement, are as follows:		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Prior to the commencement of any works in the vicinity of the pipeline, the pipeline centreline will be staked out by the Contractor. • Checks will also be completed by the Contractor for the presence of any other underground services using cable avoidance tools. • The depth of the pipeline will be established by the Contractor by hand excavation of a trial hole. • The use of an excavator with a toothless bucket and hand excavations. • All excavation works to be completed under the supervision of the Resident Engineer and Kerry Group Personnel will be invited to attend. • Upon completion of the pipeline crossing, it will be delineated with suitable and robust markers to ensure that all site traffic is routed to cross at the designated slabbed point. • All construction workers will be briefed regarding the designated crossing points and no other crossing points will be permitted.		
Noise	Chapter 11 Noise and Vibration	11.8.1	No significant construction noise effects have been identified. Therefore, no specific mitigation measures are required. However, general guidance for controlling construction noise through the use of good practice given in BS 5228 will be followed. Construction and Decommissioning of the Project shall be limited to working times		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			given in BS 5228 and any controls incorporated in any planning permission.		
Earthworks	Chapter 13 Air and Climate	13.2.8.1	Dust Good practice construction procedures will be followed by the appointed contractor to prevent dirt and dust being transported onto the local road network and all mitigation measures outlined in the CEMP (**Appendix 2.1**) will be implemented on site. Good practice site control measures will comprise the following: • Site access tracks will be upgraded and built in the initial construction phases. These tracks will be finished with graded aggregate which compacts, preventing dust. • Approach roads and construction areas will be cleaned on a regular basis to prevent build-up of mud and prevent it from migrating around the Site and onto the public road network. • Wheel wash facilities will be provided near the Site entrance to prevent mud/dirt being transferred from the site to the public road network (Drawing No. **6839-JOD-GGE-XX-DR-C-0803**). The Wheel wash will be located outside the 50m watercourse buffer zone. • Public roads along the construction haul routes will be inspected and cleaned daily. In the unlikely event that dirt/mud is identified on public roads, the roads will be cleaned. The wheel wash facility will be investigated and the problem fixed to prevent this from happening again.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• During periods of dry and windy weather, there is potential for dust to become friable and cause nuisance to nearby residences and users of the local road network. This requires wetting material and ensuring water is supplied at the correct levels for the duration of the work activity. The weather will be monitored so that the need for damping down activities can be predicted. Water bowsers will be available to spray work areas (Turbine Hardstand areas and Grid Connection route) and construction haul route roads to suppress dust migration from the Site. See **Appendix 2.1 CEMP Sections 5.4** and **5.5**. • Vehicles delivering materials to the Site will be covered appropriately when transporting materials that could result in dust, e.g., crushed rock or sand. • Exhaust emissions from vehicles operating within the Site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the Contractor by ensuring that emissions from vehicles are minimised through regular servicing of machinery. • All machinery when not in use will be turned off and stored in a secure, bunded location (e.g. construction compound). • Ready-mix concrete will be delivered to the Site; no batching of concrete will be permitted on Site. Only washing out of chutes will take place on Site and this will be undertaken at a designated concrete washout facility at the contractor's Temporary Construction Compound see **Appendix 2.1 CEMP**		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			Section 5.4, 5.5 and **5.6**. The concrete washout facility is a lined containment system designed to prevent run-off into soil, surface water or groundwater. The concrete wash water will be disposed of at a licensed facility. • Speed restrictions of 15km/h on Site access tracks will be implemented to reduce the likelihood of dust becoming airborne. Consideration will be given to how Site speed limits are policed by the Contractor and referred to in the toolbox talks. • Good practice will be applied and care will be taken with stockpiled materials to minimise their exposure to wind; stockpiles will be covered with geotextiles layering and damping down will be carried out when weather conditions require it. • Earthworks and exposed areas/soil stockpiles will be re-vegetated to stabilise surfaces as soon as practicable. • An independent, qualified Geotechnical Engineer will be contracted for the detailed design stage of the project and geotechnical services and will be retained throughout the construction phase, including monitoring and supervision of construction activities on a regular basis. The methodology statement will be signed off by a suitably qualified Geotechnical Engineer. • A complaints procedure will be implemented on Site where complaints will be reported, logged and appropriate action taken.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			The appointed contractor responsible for the detailed design of the project will provide details to the planning authority for agreement in writing prior to the commencement of development of environmental safety methodology including best practice procedures to manage construction activities. The methodology statement will be signed off by a suitably qualified geotechnical engineer/engineering geologist. An independent, qualified geotechnical engineer/engineering geologist will be contracted for the detailed design stage of the project and geotechnical services will be retained throughout the construction phase, including monitoring and supervision of construction activities on a regular basis.		
Climate	Chapter 13 Air and Climate	13.3.7.1	• All machinery when not in use will be turned off. • Exhaust emissions from vehicles operating within the Site, including trucks, excavators, diesel generators or other plant equipment, will be controlled by the Contractor by ensuring that emissions from vehicles are minimised through regular servicing of machinery. • Use of local quarries, materials suppliers and waste facilities will be used, as outlined in **Chapter 17: Traffic and Transport**, minimising travel distances • A robust Traffic Management Plan (**Appendix 17.2**) has been developed, utilising the most direct routes where possible. This Plan will be updated to reflect project needs.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
Archaeology	Chapter 15 Archaeology and Cultural Heritage	15.5.1	The locations of turbines and associated infrastructure within the boundary of the Site will be subject to a pre-construction geophysical survey, carried out by a suitably qualified consultancy, followed by a programme of archaeological test trenching which will be informed by the results of the geophysical survey. These site investigations will be carried out under licence by the National Monuments Service (NMS) of the Department of Housing, Local Government and Heritage. The potential exists that areas of uneven and overgrown ground conditions within the boundary of the Site may not be suitable for pre-construction site investigations and a suitably qualified archaeologist will be employed to monitor ground works during the construction phase in any such locations. In the event that any sub-surface archaeological features are identified during these site investigations they will be recorded and then securely cordoned off while the NMS are consulted to determine further appropriate mitigation measures, which may include preservation in situ (by avoidance) or preservation by record (archaeological excavation) as well as monitoring of construction phase ground works within their environs. In the event that any archaeological sites are identified during monitoring of the construction phase, ground works will halt at that location and the archaeological remains will be cordoned off while their surfaces are manually cleaned and		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			recorded. The NMS will then be notified of the discovery and consulted to determine further appropriate mitigation measures, which may include preservation in situ by avoidance or preservation by record through systematic, licensed archaeological excavation. Any identified archaeological features which will be preserved by avoidance will be securely cordoned off for the duration of the construction phase and clearly signed as a 'No Entry' areas. Protective cordons extending for 20m from the outer edges of all known and potential archaeological sites within the boundary of the Site will also be securely delimited off with fencing and clearly signed as 'No Entry Areas' for the duration of the construction phase. No ground reduction works or other ancillary development works including, but not limited to, drainage/services, spoil storage, traffic/parking, compounds, or landscaping/planting, will occur within the archaeological exclusion areas and their locations will be identified during site inductions during the construction phase. The Project will result in no predicted direct effects on any architectural or other cultural heritage constraints on Site or on the TDR and, therefore, no mitigation measures for these elements of the cultural heritage resource are required.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
Archaeology	Chapter 15 Archaeology and Cultural Heritage	15.5.3	No residual construction phase indirect effects are predicted following the implementation of the mitigation measures described in Section 15.5.1 of EIAR Chapter 15.		
Traffic and Transport	Chapter 17 Traffic and Transport	17.4.1	• The appointed Contractor shall inform local residents, businesses and emergency services of proposed works on the public road network in advance of any works taking place on Site. Access shall be maintained to properties at all times during the course of the works. The Contractor will appoint a project coordinator who will be the main point of contact for matters relating to traffic which will affect the general public, local businesses and emergency services. An out of hours contact number shall also be provided. • Prior to delivery of abnormal loads i.e. turbine components, the Applicant or their representatives, will consult with An Garda Síochána, TII, PPP operators and all relevant Local Authorities to obtain all necessary abnormal load permits and discuss the requirement for a Garda escort. The Applicant will also outline the intended timescale for deliveries and efforts can be made to avoid peak times such as school drop off times, church services, peak traffic times where it is considered this may lead to unnecessary disruption, and abnormal loads may travel at night and outside the normal construction times as may be required by An Garda Síochána. Local residents at sensitive		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			locations along the affected route will be notified of the timescale for abnormal load deliveries. • Prior to delivery of abnormal loads, the Applicant or their representatives, will consult with TII, PPP operators and all Local Authorities through which the abnormal loads will pass and agree the specification for any enabling works to be carried out on the Turbine Delivery Route. • Prior to the delivery of turbine components, a survey of the Turbine Delivery Route will be undertaken to identify if any overhead lines or height restrictions at toll booths will need to be lifted along the route to allow abnormal loads such as tower sections and nacelles to be delivered. • Prior to the delivery of turbine components, a trial run shall be carried out between Foynes Port / Port of Galway and the Project entrance using an abnormal load vehicle with a retractable load gauge to determine that abnormal load vehicles can transverse the route without undue delay and disruption to public road users. • During the construction and Decommissioning phases, road works signs in accordance with the requirements of Chapter 8 of the Traffic Signs Manual will be erected at all the Project entrance and at all locations on the Grid Connection route and Turbine Delivery Route which are being modified to facilitate turbine delivery. Details of signage are given in the Traffic Management Plan in **Appendix 17.2**.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Wheel cleaning equipment will be used at all site entrance with the public road to prevent any mud and/or stones being transferred from Site to the public road network. All drivers will be required to see that their vehicle is free from dirt and stones prior to departure from the Site. • To reduce dust emissions, vehicle containers/loads will be covered during both entrance and egress to the Site where required. • All dust generating activities will be minimised where practical during windy conditions, and drivers will adopt driving practices to minimise the creation of dust. Where conditions exist for dust to become friable, techniques such as damping down of the potentially affected areas may be employed. • Access to the construction site will be controlled by on Site personnel and all visitors will be asked to sign in and out of the Site by security/Site personnel on entering and exiting the site. • All Site visitors will undergo a Site induction covering Health and Safety issues at the Contractor's temporary compound and will be required to wear appropriate Personal Protective Equipment (PPE) while onsite. • A condition survey of the road network in the vicinity of the site entrances will be carried out and agreed with Limerick City and County Council prior to any works being carried out on site. • All works on the public road network will be carried out using an approved road opening licence and traffic management plan.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• All wind farm vehicles shall have roof mounted flashing beacons when working on the public road network or will use their hazard lights within the Site. • A speed limit of 25 km/h shall apply to all vehicles within the Site.		
Operational Phase					
Health & Safety	Chapter 5 Population and Human Health	5.5.7.2	For operation and maintenance staff working at the proposed wind farm, appropriate site safety measures will be utilised during the operational phase by all permitted employees. All personnel undertaking works in or around the turbines will be fully trained and will use appropriate Personal Protective Equipment (PPE) to prevent injury. Equipment within high voltage substations presents a potential hazard to health and safety. The proposed Electrical Substation will be enclosed by palisade fencing and equipped with intruder and fire alarms in line with ESBN and EirGrid standards. All on-site electrical connections are carried by underground cable and will be marked out above ground where they extend beyond the site access track or Turbine Hardstand surface extents. Lightning conductors will be installed on each turbine as all structures standing tall in the sky require this protection. Turbines specifically require this to prevent power surges to electrical components.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			Turbines will be fitted with ice detection systems which will stop the turbine from rotating if ice is forming on a turbine blade and this helps to prevent ice throw. Rigorous statutory and engineering safety checks imposed on the turbines during design, construction, commissioning and operation will ensure the risk posed to humans is negligible. 24-hour remote monitoring and fault notifications are included as standard in the Turbine Operations and Maintenance Contracts. A Supervisory Control and Data Acquisition ("SCADA") system will monitor the Development's performance. If a fault occurs, then a message is automatically sent to the operations personnel preventing emergency situations. In addition to scheduled maintenance, the maintenance contracts will allow for call out of local engineers to resolve any issues as soon as they are picked up on the remote monitoring system. Access to the turbines inner structure will be locked at all times and only accessed by licenced employees for maintenance. In line with the Health Service Executive's Emergency Planning recommendations, any incident which may occur at the Site which requires emergency services, incident information will be provided in the 'ETHANE' format:		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Exact location • Type of incident • Hazards Access and egress • Number of casualties (if any) and condition • Emergency services present and required The design of the Project has considered the susceptibility to natural disasters. The proposed Site drainage (detailed in **Appendix 2.1**) will mitigate against any potential flooding risk due to run off with the use of Sustainable Drainage Systems (SuDS). Construction drainage will be left in-situ for the lifespan of the Project through to decommissioning. The Contractor's fire prevention/management plans will be reviewed and updated on a regular basis. A nominated competent person shall carry out checks and routine maintenance work to ensure the reliability and safe operation of firefighting equipment and installed systems such as fire alarms and emergency lighting. A record of the work carried out on such equipment and systems will be kept on Site at all times. Detection systems and turbine control software will be installed on all turbines to (i.e. permit remote shutdown as necessary) prevent shadow flicker on nearby receptors.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			The wind farm system shall include a system over-ride switch that can be operated at any time, to facilitate manual shutdown in case of an emergency.		
NIS	Natura Impact Statement (NIS)	3.4.2	• As part of the wind farm drainage design, it is proposed that runoff from the infrastructure will be collected locally in new proposed silt traps, settlement ponds and vegetated buffer areas prior to release into the existing site drainage network. The new proposed drainage measures will then create significant additional attenuation to what is already present. The operational phase drainage system will be installed and constructed in conjunction with the existing site drainage network and will include the following: • 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 into downstream field drains. • Collector drains will be used to gather runoff from access roads and turbine hardstanding areas of the Site likely to have entrained suspended sediment, and channel it to new local settlement ponds for sediment settling. • On sections of access road transverse drains ('grips') will be constructed where appropriate in the surface layer of the road to divert any runoff off the road into swales/roadside drains.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Check dams will be used along sections of access road drains to intercept silts at source. Check dams will be constructed from a 4/40mm non-friable crushed rock. Check dams will be monitored to ensure no blockages/bypass and ongoing effective operation. • Settlement ponds, emplaced downstream of access road sections and at turbine locations, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to existing drains. • Settlement ponds will be designed in consideration of the greenfield runoff rate. • All surface water runoff from the development will have to pass through the proposed settlement ponds prior to release into the existing site drainage network. The following specific measures will be implemented during the operational phase to ensure the ongoing protection of watercourses and water quality at the Site and in downstream reaches leading towards the identified European sites (Lower River Shannon SAC & River Shannon and River Fergus Estuaries SPA), which have hydrological connectivity with the proposed Project Site: • The Site compound / office will house all potential pollutants within a secure bunded COSSH store for the operational phase of the Project. • All on-site wastewater treatment facilities will function in full compliance with current water quality requirements (Building		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			Regulations 2010 as amended S.R. 66:2015) to prevent nutrient loading entering aquatic environments. It is proposed to install a sealed underground holding tank for effluent from the Substation compound. The tank shall be routinely emptied by a licensed contractor.		
Bat monitoring	Chapter 6 Biodiversity	6.10.2.1	If, following the initial 3 years of post-construction surveys, bat activity increases above the baseline and/or remains consistently high and carcass searches indicate fatalities are occurring (refer below), increased speeds will continue. This will subsequently be monitored in Years 5, 7, 10, 15, 20, 25 and 30, with further review after each monitoring period. Alternatively, if it is found that the results of bat activity surveys and fatality searches confirm that the level of bat activity at turbine locations is low, the cessation in the requirement for these cut-in speeds / curtailment measures, or a reduction on the timing restrictions for these measures can be implemented. Acoustic monitoring will be supplemented with thermal imaging cameras to provide more detailed information on bat activity in the vicinity of turbines. An assessment of static data gathered during operational surveillance will be completed using Ecobat type analysis as recommended by SNH (2021) as a minimum, or other equivalent guidance as dictated by up-to date standards and practices.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
Aquatic Ecology	Chapter 7 Aquatic Ecology	7.5.3	The following measures will be implemented during the operational phase to ensure the ongoing protection of watercourses and water quality at the Site and in downstream reaches in regards to the potential operational phase effects (Downstream flood risk, runoff resulting in contamination of surface waters and wastewater contamination): • The Site compound / office will house all potential pollutants within a secure bunded COSSH store for the operational phase of the project. • All onsite wastewater treatment facilities will function in full compliance with current water quality requirements (Building Regulations 2010 as amended S.R. 66:2015) to prevent nutrient loading entering aquatic environments. It is proposed to install a sealed underground holding tank for effluent (wastewater) from the Substation compound. The tank shall be routinely emptied by a licensed contractor.		
Flora and Fauna	Chapter 8 Ornithology	8.14.2	Best practice measures described in relation to construction methods will also be adopted during operational maintenance. Specifically, operational maintenance will minimise the level of removal of suitable habitat (e.g., grassland, hedgerows and scrub) and use existing access routes where possible. Best practice methods will be adopted to minimise the potential for disturbance (e.g., to minimise generation of additional noise, light and vibration). In particular, effects on active bird nests will be avoided by undertaking any required vegetation maintenance in accordance		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			with methods described below (i.e., by timing works outside the peak bird breeding season, and undertaking nesting bird checks prior to clearance of any suitable nesting habitat where avoidance is not possible). Furthermore, the installation of warning lights on turbines can help to increase their visibility, thereby reducing the risk of bird collision. A number of the turbines will be fitted with aviation warning lights in accordance with the requirements of the Irish Aviation Authority in advance of Project operation		
Timing of Works	Chapter 8 Ornithology	8.14.3	To minimise the potential for impacts on nesting birds, removal or alteration of suitable nesting habitat (e.g., grassland, hedgerow, scrub and trees) will, wherever possible, be undertaken outside of the peak breeding season (i.e., outside of the period March to August inclusive). Similarly, works with the potential to cause significant disturbance to breeding birds (e.g., through the generation of noise, dust, vibration and/or light spill, or through hydrological changes and increased human activity) will also be undertaken outside of the peak breeding season where possible. It should be recognised that whilst undertaking works in late-September to February inclusive minimises the likelihood of effects on breeding birds, certain species may still nest during this period (e.g. snipe and lapwing).		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			If suitable nesting habitat needs to be removed or altered during the peak breeding season, works to the habitat will be preceded by a nesting bird check, during which a suitably experienced ornithologist would check the affected habitat for any active nests. This check will be undertaken within 48 hours prior to the commencement of the works. If an active nest is encountered, an exclusion zone will be established within which works will be suspended until the nest is no longer active (to be confirmed by a suitably experienced ornithologist through ongoing monitoring of the nest). The size of the exclusion zone would be dependent on the species affected, the likely level of disturbance caused by the works relative to baseline disturbance levels on site, and the extent to which the nest site is screened from disturbance (e.g., by adjacent dense vegetation). Exclusion zones may range from 5m to several hundred metres.		
Ecological Clerk of Works	Chapter 8 Ornithology	8.14.4	An Ecological Clerk of Works (ECoW) will be appointed to address issues relating to birds and other sensitive habitats and species. Their responsibilities will include, but not be limited to: • Undertake a pre-construction walkover survey to ensure that significant effects on breeding and non-breeding birds will be avoided; • Undertake nesting bird checks on any vegetation that needs to be removed within the breeding season;		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• Inform and educate site personnel of sensitive ornithological features within the Project site and how effects on these features could occur; • Oversee management of ornithological issues during the construction and decommissioning period and advise on ornithological issues as they arise; • Provide guidance to contractors to ensure legal compliance with respect to protected bird species on site; and • Liaise with officers from consenting authorities and other relevant bodies and contractors with regular updates in relation to construction and/or decommissioning progress.		
Ornithology Monitoring	Chapter 8 Ornithology	8.16.3.1	During the operational phase, an avian fatality monitoring programme will be implemented within the operational wind farm. This will aim to confirm the accuracy of the collision risk modelling predictions that were made within this assessment. Carcasses of birds likely to be associated with collision with turbines will be searched for using specially trained cadaver dogs and their handlers. Monitoring will involve monthly (January-December) searches of carcasses within the first three years of operation and subsequently in years 5,7,10,15,20,25, and 30, to ensure non-breeding and breeding species of birds are accounted for. All feather spots and bird carcasses will be photographed and logged in an annual fatality search report, which will be submitted to relevant stakeholders and the planning authority for consultation.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			The results obtained from monitoring will be analysed to determine whether EIAR predictions were accurate and whether any additional mitigation measures may be required.		
Release of Hydrocarbons	Chapter 9 Soils and Geology	9.2.11.12	The main potential residual impact during the operation phase would be the risk to groundwater from contamination from spills. Storage tanks, used to store fuel for the various items of machinery, will be self-contained and double-walled. Refuelling of maintenance vehicles will be carried out from these tanks or from delivery vehicles at designated refuelling areas. Specific mitigation measures relating to the management of hydrocarbons are as follows: • Fuels, lubricants and hydraulic fluids for equipment used on the site will be carefully handled to avoid spillage. • Any spillage of fuels, lubricants or hydraulic oils will be immediately contained, and the contaminated soil removed from the site and properly disposed of. • Waste oils and hydraulic fluids will be collected in leak-proof containers and removed from the site for recycling and • Appropriate spill control equipment, such as oil soakage pads, will be kept within the refuelling areas and in each item of plant to deal with any accidental spillage. All wastes from the Substation, Substation Compound, turbines and ancillary facilities will be removed by the appropriate contractor. The operational team will carry out maintenance works (to Access		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			Tracks, Substation, Substation Compound, turbines and other ancillary facilities) and will put in place control measures to mitigate the risk of hydrocarbon or oil spills during the operational phase of the windfarm. Any vehicles utilised during the operational phase will be maintained on a weekly basis and checked daily to ensure any damage or leakages are corrected. Spoil waste stored in the spoil deposition areas will continue to be monitored for stability on a regular basis during the operational phase. This monitoring will check for early indications of movement such as the development of cracks, minor slippage and / or localised subsidence. Where identified, remediatory actions will be taken to repair any failure and restore the integrity of the deposition area. These potential effects are limited by the size of the fuel tank of vehicles used on the Site. Additional potential effects will occur in the event that a turbine needs replacement. The effects associated with this will be similar to those involved for vehicles movements during construction but much reduced.		
Additional Measures along the TDR	Chapter 9 Soils and Geology	9.2.12.2	The temporary works areas needed for the construction period such as temporary widening and temporary track required for the TDR, site compound and blade laydown areas, will be reinstated using		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			the excavated material removed and stockpiled on site, as soon as construction activities have been completed. At the time of decommissioning of The Project, some of the effects associated with reinstatement of the site (excavation of access tracks) will be avoided by leaving these in place where possible. It is proposed to leave the access tracks in-situ at the decommissioning stage. IWEA state that "it may be best" to leave site tracks in-situ depending on the size and geography of the development. It is considered that leaving the access tracks in-situ will cause less environmental damage than removing and recycling them, so these elements of the construction will be retained. Turbine hardstands and other ancillary infrastructure will be removed and covered with overburden and topsoil material to allow for re-vegetation of the Site. Areas of excess soil and rock will be reused in order to match the surrounding land as near as possible. Drainage and slopes will be restored as close to the original ground as possible.		
Water Treatment Train	Chapter 10 Hydrology and Hydrogeology	10.6.3.1	The Project design has been optimised to use the existing infrastructure (roads and hardstands) where practicable.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			Where practicable the existing Access Tracks will be upgraded as part of the Project. These works in these areas will not alter the existing runoff and recharge rates. This design prevents the unnecessary creating of additional hardstand areas which would increase surface water runoff from the Site. All turbines located within the flood zones will have a reduced hardstand area in comparison with a typical wind turbine hardstand (refer to Drawings **6839-JOD-GGE-XX-DR-C-0213** to **6839-JOD-GGE-XX-DR-C-0215**). This bespoke design will therefore have a positive effect on runoff rates in comparison to a typical wind farm design due to less areas of the site being covered in impermeable surfaces. As part of the proposed wind farm drainage design, it is proposed that runoff from the proposed infrastructure will be collected locally in new proposed silt traps, settlement ponds and vegetated buffer areas prior to release into the existing site drainage network. The new proposed drainage measures will then create significant additional attenuation to what is already present. The operational phase drainage system will be installed and constructed in conjunction with the existing site drainage network and will include the following: • Interceptor drains will be installed up-gradient of all proposed infrastructure to collect clean surface runoff, in order to		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			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 into downstream field drains. • Collector drains will be used to gather runoff from access roads and turbine hardstanding areas of the Site likely to have entrained suspended sediment, and channel it to new local settlement ponds for sediment settling. • On sections of access road transverse drains ('grips') will be constructed where appropriate in the surface layer of the road to divert any runoff off the road into swales/roadside drains. • Check dams will be used along sections of access road drains to intercept silts at source. Check dams will be constructed from a 4/40mm non-friable crushed rock. Check dams will be monitored to ensure no blockages/bypass and ongoing effective operation. • Settlement ponds, emplaced downstream of access road sections and at turbine locations, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to existing drains. • Settlement ponds will be designed in consideration of the greenfield runoff rate.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			• All surface water runoff from the development will have to pass through the proposed settlement ponds prior to release into the existing site drainage network.		
Contamination of Surface Waters	Chapter 10 Hydrology and Hydrogeology	10.6.3.2	Mitigation measures for sediment control are the same as those outlined for the construction phase in **Section 10.6.2.1** and **Section 10.6.2.2**. Mitigation measures for the control of hydrocarbons during maintenance works are similar to those outlined in **Section 10.6.2.3**.		
Flooding	Chapter 10 Hydrology and Hydrogeology	10.6.3.3	In advance of scheduled site visits review of weather and river water levels will be completed and works will be postponed, and thereafter rescheduled to avoid high risk periods and weather warning events. A key element of the site layout design has been to design for flood events and flood resilience during the operational phase. For example:: • As per Section 50 requirements, the main river crossings will be located at a height which includes a 300mm freeboard above the 1 in 100-year flood event plus climate change. Additional culverts will be constructed on the access roads on approach to the river crossings to minimise flow disruption during flood events; • During the operational phase, the roads will be set to the 1 in 20-year flood level. In the event of a flood event, the maximum		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			flooded depth along access roads will be between 200 and 400mm. Access tracks will be marked with snow poles to allow for emergency vehicular access. The proposed access point for emergency access is from the southern end of the Site which is unlikely to be affected during flood events. • The turbine plinths within the flood zone will be located at a height which includes a 150mm freeboard above the 1 in 1,000-year flood event plus climate change. • During the operational phase, turbine hardstand areas will be reduced, with the reduced hardstand area being built up to the 1 in 20-year flood level. The reinstatement of these hardstand areas post construction will reduce the hardstand area in the flood zone and will reduce the downstream flood risk. • In the unlikely event that a key component of a turbine fails during the operational phase, the hardstand will need to be built back again, and will be built up to the 1 in 20-year flood level. Once works are complete, the hardstand will be reinstated once again. • Culverts constructed beneath the site access track within the flood zones will allow flood waters to pass through should a flooding event occur, maintaining hydrological flowpaths in a flood event. • The associated drainage will be attenuated for greenfield run-off, the proposed Development will not increase the risk of flooding elsewhere in the catchment.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
Noise	Chapter 11 Noise and Vibration	11.8.4.2	Turbines T2 and T3 shall be operated in Sound Optimised Mode SO0 during certain conditions. Sound Optimised Mode SO0 has a lower maximum Sound Power Level at hub height of 104dB, compared to the maximum Sound Power Level of 104.9 dB when the proposed turbines are operating in Mode PO6000. This curtailment strategy shall ensure compliance with the 43dB night-time limit and shall be implemented during the following conditions: the night-time period, from wind speeds of 8-12m/s and for wind blowing towards the East (from 315 degrees to 45 degrees as per **Figure 11.6**).		
Air Navigation	Chapter 14 Shadow Flicker	14.2.9.3	Shadow flicker control systems, consisting of light sensors and specialised software, will be installed on each of the wind turbines. The control system will calculate, in real-time: • Whether shadow flicker has the potential to effect nearby sensitive receptors, based on pre-programmed co-ordinates for the sensitive receptors and turbines; • Wind speed (can affect how fast the turbine will turn and how quickly the flicker will occur); • Wind direction; and • The intensity of the sunlight. When the control system detects that the sunlight is strong enough to cast a shadow, and the shadow falls on a sensitive receptor or		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			sensitive receptors, then the turbine will automatically shut down; and will restart when the potential for shadow flicker ceases at the effected sensitive receptors. Such systems are common in many wind farm developments and the technology has been well established. In the event that complaints of shadow flicker are received by the Developer / site operator or by Limerick City and County Council, the Developer will conduct an investigation and the complaints frequency, duration and time of complaints will be considered and specialist modelling software will be used to confirm the occurrence(s). Should the complaint persist, a shadow flicker survey involving the collection of light data will also be carried out at the sensitive receptor in which the complaint was made. Further refinement of the blade shadow control system will be conducted to mitigate negative shadow flicker occurrence.		
Decommissioning Phase					
NIS	Natura Impact Statement (NIS)	3.4.3	The implementation of all mitigation measures relevant to the protection of ground and surface waters within the wind farm Site as detailed for the construction phase will be adopted in full (as relevant) during the Decommissioning phase to ensure all such effects are avoided.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			When the final Decommissioning Plan is prepared prior to Decommissioning and presented as a standalone document, all drainage management measures, which will include maintenance of the operational drainage measures, will be included in that document, as required. Restoration of the Site following Decommissioning of infrastructure will require the prior establishment of the new baseline conditions at the Site which will have developed over the intervening 35 -years life of the project. These studies will inform any modification or additional sensitivities that may need to be factored in restoration and Site-specific measures.		
Aquatic Ecology	Chapter 7 Aquatic Ecology	7.5.4	Decommissioning phase effects for the Project are likely to be broadly similar to construction phase effects, in terms of potential surface water quality effects from ground disturbance, refuelling and the storage of potentially hazardous materials onsite. A Site-specific **Decommissioning Management Plan (DMP)** (**Appendix 2.1 CEMP – MP6)** has been developed and will be amended prior to the commencement of any Decommissioning activities. The implementation of all mitigation measures detailed for the construction phase will be adopted in full during the Decommissioning phase to ensure all such significant effects are avoided.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			When the final Decommissioning Plan is prepared prior to decommissioning and presented as a standalone document for consideration by the relevant authority at that time, all drainage management measures, which will include maintenance of the operational drainage measures, will be included in that document, as required. However, it should be noted that by the time Decommissioning is undertaken after the planned 35-year lifespan of the Project, the areas within the Site will have revegetated resulting in a resumption of the natural drainage management that will have existed prior to any construction. It is not anticipated that the decommissioning phase will interrupt this restored drainage regime in any way with the works proposed. As a minimum measure, areas where freshly placed soil material as part of Turbine Foundation reinstatement work will be surrounded by silt fencing if deemed necessary until the area has naturally revegetated. Restoration of the Site following Decommissioning of infrastructure will require the prior establishment of the new baseline conditions at the Site which will have developed over the intervening 35-year life of the Project. These studies will inform any modification or additional sensitivities that may need to be factored in restoration and site-specific measures.		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
Aquatic Ecology	Chapter 7 Aquatic Ecology	7.6	The approach to the Project design, the use of SuDS drainage and the suite of comprehensive measures to avoid, reduce or remedy all potential significant effects on water quality will ensure that the receiving water bodies in the catchment of the Project do not suffer any deterioration in water quality, either during construction, operation, or Decommissioning.		
Flora and Fauna	Chapter 8 Ornithology	8.16.4	The assessment of effects undertaken in **Section 8.15** did not identify potential significant effects on Key Ornithological Features (KOF) during the decommissioning phase of the Project and, as such, targeted mitigation during this period, over and above the embedded mitigation outlined in **Section 8.14,** will not be required. Any habitat temporarily cleared during the decommissioning phase to accommodate the planned works would be reinstated on a like-for-like basis. Furthermore, where infrastructure is removed, then those areas will be restored to their pre-construction baseline conditions and returned for agricultural use. Following reinstatement, the Site would be monitored on a regular basis to determine the progress of re-vegetation and if necessary to look at introducing supplementary planting with native species. A reassessment of the Site would be carried out at the end of the first-year post-decommissioning to assess the Site's progression over the previous year in relation to vegetation status, drainage		

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
			management, and general site appearance, to ensure the Site remains favourable to ornithology and wider biodiversity.		
Hydrocarbons	Chapter 10 Hydrology and Hydrogeology	10.6.4	Mitigation measures to avoid contamination by accidental fuel leakage and compaction of soil by on-site plant will be implemented as per the construction phase mitigation measures.		
Waste	Chapter 13 Air and Climate	13.2.8.3	The decommissioning plan (Management plan no. 6 to the CEMP, **Appendix 2.1**) is a live document and outlines the mitigation measures required during decommissioning.		

Table 18.2: Monitoring Schedule

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Phase	Audit Result	Action Required
Bats Monitoring	Chapter 6 Biodiversity	6.5.6.2.1	As such, the feathering of blades to prevent 'idling' during low wind speeds will be implemented for all nine turbines during the bat activity season (April to October) when temperatures are optimal for bat activity.			
Bats Monitoring	Chapter 6 Biodiversity	6.5.6.2.2	At two-step smart curtailment strategy is proposed that will protect bats whilst minimising the curtailment periods and will be informed by post-construction monitoring. **Step 1: Operational curtailment, Year 1** Smart curtailment will commence prior to the final close out of construction, as long as the turbine (s) are erected and turning, i.e. posing a collision risk. Year 1 monitoring will be in line with the start of the bat active season (April) and will continue until the end of October. Results from the 2022 and 2023 static survey show activity continues into October. As such, smart curtailment will continue into October. Cut-in speeds will be increased during the bat activity season (April-October inclusive) where weather conditions are optimal for bat activity (see below) from 30 minutes prior to sunset and to 30 minutes after sunrise at all turbines. Cut-in speed restrictions will be operated according to specific weather conditions:			

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Phase	Audit Result	Action Required
			<u>For turbines 1, 2, 5, 6, 7 and 9</u> When the air temperature is above a 9.5°C at nacelle height. Wind speeds below 5.5 m/s (at nacelle height). <u>For turbines 3, 4 and 8</u> When the air temperature is above a 10.0°C at nacelle height. Wind speeds below 5.0 m/s (at nacelle height). **Step 2: Operational curtailment - Year 2 onwards** Smart curtailment must be guided by a coherent and comprehensive post-construction monitoring methodology, which will clarify the bat usage of the site at turbine locations post construction. Year 1 fatality monitoring together with information from static deployment at height and at feature level on temporal usage of the site at specific turbine locations post-construction (including usage over each season and over night-time periods within specific seasons) will be utilised to provide a highly effective mitigation approach by implementing smart curtailment during the periods and environmental parameters that are known to be preferred by at-risk species.			

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Phase	Audit Result	Action Required
			A risk assessment will be produced based on the Year 1 data which will be used to inform a curtailment strategy from Year 2 onwards, where required. Static deployment data will be compared with weather stations based at nacelle height to inform cut-in speeds restrictions according to specific weather conditions. The post construction surveys (static deployment, transects, fatality monitoring) will be used to refine the Year 1 curtailment regime designed around the values for the key weather parameters and other factors that are known to influence collision risk. This will include all the following: • Wind speed in m/s (measured at nacelle height) • Time after sunset • Month of the year • Temperature (ºC) • Precipitation (mm/hr) Should it be found that the results of the bat activity surveys and fatality searches confirm that the level of bat activity at turbine locations post construction is low, the cessation in the requirement for curtailment measures, or a reduction on the timing restrictions for these measures, will be implemented. This will subsequently be monitored in Years 5, 7, 10, 15, 20, 25 and 30, with further review after each monitoring period.			

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Phase	Audit Result	Action Required
			If bat activity increases above the baseline and/or remains consistently high and fatality monitoring indicates fatalities are occurring, increased cut-in speeds will be considered Acoustic monitoring will be supplemented with thermal imaging cameras to provide more detailed information on bat activity in the vicinity of turbines. An assessment of static data gathered during operational surveillance will be completed using Ecobat type analysis as recommended by SNH (2021) as a minimum, or other equivalent guidance as dictated by up-to date standards and practices.			
Buffer zones	Chapter 6 Biodiversity	6.5.6.2.3	The vegetation-free buffer zones (refer to section **6.5.6.1.1** above) around the identified turbines will be managed and maintained during the operational life of the development. The immediate surroundings of individual turbines will be managed and maintained so that the areas have minimal potential to attract insects. This will be achieved through physical management of			
Pre-construction bat surveys	Chapter 6 Biodiversity	6.9.1	A full suite of bat activity surveys will be completed in the season before construction works commence. Future survey work will be completed according to best practice guidelines available (NatureScot 2021, Collins 2023) and will include static detector, activity and roost inspection surveys.			

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Phase	Audit Result	Action Required
Pre-felling survey of trees	Chapter 6 Biodiversity	6.9.2	All trees registered as Potential Roost Features (PRF) or Further Assessment Required (FAR) will require at-height surveys to be conducted by a suitably qualified ecologist with roost disturbance and inspection camera licences should they be required to be felled. Should PRF's be found above ladder height the use of tree climbing / cherry pickers, scaffolding will be required to gain access to PRFs for detailed examination with the use of recording inspection cameras. Surveyors will carry out a detailed internal inspection using a torch, mirror and endoscope. Data such as internal dimensions particularly length of cavity would be gathered where relevant. Should the removal of the roost be required at a later stage these dimensions will be vital. Should a bat roost be found a derogation licence will be sought from the NPWS seeking permission for the translocation of the roost (if possible). Evidence of bat usage sought during the surveys will include: • Bat droppings; • Live bats; • Insect remains (under feeding perches); • Oil (from fur) and urine stains; • Scratch marks; and • Bat corpses.			
Pre-construction otter survey	Chapter 6 Biodiversity	6.9.3	If three years lapse from between the planning-stage surveys (carried out in 2023) and commencement of construction works at			

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Phase	Audit Result	Action Required
			water crossings, it will be necessary to carry out a survey for otter in areas of potential suitable habitat which may be disturbed by the works as the local distribution of otter may have changed in that period. It is noted that should the pre-construction survey indicate a requirement for protection of the relevant species (in this case otter), appropriate measures will be taken to comply with all relevant legislation and best practice guidance in force at the time.			
Pre-construction badger survey	Chapter 6 Biodiversity	6.9.4	While badger was not recorded within the site during the baseline surveys, it is present in the wider area of the site and distribution can change over time. Should three years lapse from between the planning-stage surveys (carried out in 2023-24) and commencement of construction works, it will be necessary to carry out a survey for badger in areas of potential suitable habitat which will be disturbed by the works.			
On-going monitoring during construction	Chapter 6 Biodiversity	6.9.5	An Ecological Clerk of Works (ECoW) will be employed by the Contractor for the duration of the construction phase and will ensure that all mitigation measures relating to ecology described in this report and contained within the planning permission are implemented.			
Habitats	Chapter 6 Biodiversity	6.10.1	Post-construction habitat monitoring will focus on the newly planted hedgerows and the native woodland plot. Required			

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Phase	Audit Result	Action Required
			monitoring is detailed in the Biodiversity and Enhancement Management Plan (**Appendix 6.2**). Areas of disturbed ground from the construction works will be monitored for vegetation recovery for a period up to three years (when full recovery can be expected) or longer if necessary. The purpose is to ensure that areas of bare soil are minimised so as to reduce the risk of run-off of suspended solids to local watercourses with species such as otter. Should recovery be slow in any area, further seeding may take place. For areas close to watercourses, vegetated grassland sods may be used to provide immediate coverage. Such sods would be dug out from a selected area of the site which is not in proximity to watercourses or subject to flooding.			
Bat monitoring	Chapter 6 Biodiversity	6.10.2	Monitoring will take place for at least 3 years after construction, which will provide sufficient data to detect any significant change in bat activity relative to pre-construction levels. It will assess changes in bat activity patterns and the efficacy of mitigation to inform any changes to curtailment. During years one to three of operation bat activity will be measured at each turbine location, in combination with fatality surveys. In addition, wind speed and temperature data will be continuously recorded at the nacelle height of each turbine. Modern remotely-operated wind turbines as proposed here allow			

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Phase	Audit Result	Action Required
			cut-in speeds to be controlled centrally/automatically, facilitating an operation regime designed to minimise harmful impacts to bats.			
Bat monitoring	Chapter 6 Biodiversity	6.10.2.2	The success of the implemented mitigation measures for bats on the project will be monitored for a period of three years after construction and appropriate measures taken to enhance these if and where required. Should bat fatalities be found within the first three years of surveys additional mitigation measures will be implemented in order to prevent this from reoccurring. Buffer zones surrounding the turbines will be increased from 50 m to 65 m and/or curtailment parameters will be tweaked to increase cut-off times. A recommended schedule for monitoring is given in **Table 6.14** below. <u>Bat fatality monitoring</u> Although curtailment is a mitigation proven to lower bat fatalities it is recommended that the scheme be monitored for bat fatalities for the first three years of operation (post construction surveys) and subsequently in years 5, 7, 10, 15, 20, 25 and 30 as part of the additional curtailment monitoring schedule. A comprehensive onsite fatality monitoring programme is to be undertaken following published best practice (e.g. SNH 2021 or equivalent at the time of operation) (as below). All turbines will			

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Phase	Audit Result	Action Required
			be included in the searches in Years 1, 2 and 3 and refined thereafter further to review of results. a) Carcass removal trials to establish levels of predator removal of possible fatalities. This will be done following best recommended practice and with due cognisance of published effects such as predator swamping, whereby excessive placement of carcasses increases predator presence and consequently skews results. At the time of writing, predation trials set using trail cameras following guidance set out in Smallwood (2010) provides the most accurate results. b) Turbine searches for fatalities will be undertaken with the use of conservation dogs following best practice in terms of search area (minimum radius hub height) and at intervals selected to effectively sample fatality rates as determined by carcass removal trials in (a) above. At the time of writing (2024), the typical search area surrounding the turbine bases follow Edkins (2014) *Impacts Of Wind Energy Developments On Birds And Bats: Looking Into The Problem*, who recommends the "search width should be equal to the maximum rotor tip height'', *e.g.* turbines at Garrane have a max tip height of 170 m thus the spread of searched area, as a			

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Phase	Audit Result	Action Required
			rectangle, square or circle, should be 85 m in either direction from the turbine base." c) Search intervals will follow SNH (2021). d) Recorded fatalities will be calibrated against known predator removal rates to provide an estimate of overall fatality rates. e) Monitoring reports to be submitted at the end of each survey year to Limerick County Council and NPWS at agreed intervals <u>Bat activity monitoring</u> As per NatureScot 2019 "*In order to evaluate the success of the curtailment regime, a minimum of 3 years of monitoring should take place during which time casualty searches and acoustic monitoring should take place concurrently",* monitoring will take place for at least 3 years after construction. This will provide sufficient data to detect any significant change in bat activity relative to pre-construction levels. It will assess changes in bat activity patterns and the efficacy of mitigation outlined to inform any changes to curtailment. During years one to three of operation, bat activity will be measured at each turbine location, in combination with fatality surveys. In addition, wind speed and temperature data will be			

<table>
<tr><th>Reference Heading</th><th>EIAR Chapter</th><th>Section</th><th>Mitigation Measure</th><th>Phase</th><th>Audit Result</th><th>Action Required</th></tr>
<tr><td></td><td></td><td></td><td>continuously recorded at the nacelle height of each turbine. Modern remotely-operated wind turbines as proposed here allow cut-in speeds to be controlled centrally/automatically, facilitating an operation regime designed to minimise harmful impacts to bats
Monitoring schedule for bat mitigation measures
<table>
<tr><th>Mitigation measure</th><th>Monitoring required</th><th>Description</th><th>Duration</th></tr>
<tr><td>Bat boxes, tubes</td><td>Monitor bat use</td><td>Bat boxes, rocket boxes and tubes to be placed at locations removed from wind farm as determined by project ecologist/ECoW at least 1 season before start of construction. These shall be examined by a licenced bat specialist according to</td><td>From mounting to 3 years post construction</td></tr>
</table></td><td></td><td></td><td></td></tr>
</table>

Reference Heading	EIAR Chapter	Section	Mitigation Measure				Phase	Audit Result	Action Required
					NPWS recommendations. Records should be submitted to Bat Conservation Ireland for inclusion in its bat distribution database. If the boxes / tubes are not used within the first three years of deployment re-site if necessary. Annual clearing required if well used by bats or if used by birds. Replace if damaged/lost.				
			Roost monitoring	Emergence surveys	Conduct emergence	From initial operation			

Reference Heading	EIAR Chapter	Section	Mitigation Measure				Phase	Audit Result	Action Required
					surveys of Natterer's bat roost throughout the bat active season of first 3 years of operational phase. Observed if mitigation measures are working and bats are travelling east. Use of thermal cameras are recommended for surveys to avoid disturbance. Should Natterer fatalities be found, provide further mitigation to prevent further losses.	conducting during Years 1, 2 & 3.			

Reference Heading	EIAR Chapter	Section	Mitigation Measure				Phase	Audit Result	Action Required
			Activity surveys	Static detectors	Static surveys conducted both at feature height (2-5 m) and at nacelle during spring, summer and autumn.	From initial operation conducting during Years 1, 2 & 3.			
			Mortality study	Fatality monitoring	Corpse searches beneath turbines to assess the impact of operation on bats.	From initial operation conducted during Years 1, 2, 3, 5, 7, 10, 15, 20 and 25 post construction.			
Aquatic Ecology	Chapter 7 Aquatic Ecology	7.7.1	The Site Environmental Manager (EM) will have a stop works authority. Weekly site meeting will include for scheduling of works according to weather forecast. Suitable locations (further downstream) for biological Q-Value sampling will be identified by Site EM. • During the construction phase daily inspection of silt traps, settlement ponds, buffered outfalls and drainage channels will be undertaken. Routine measurement of total suspended solids, electrical conductivity, pH, and water						

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Phase	Audit Result	Action Required
			temperature at selected water monitoring locations at the Site will be carried out. Monitoring of locations where excavations are being dewatered (likely high in solids) will be done in real time. • One baseline monitoring visit (in advance of construction), including upstream and downstream biological Q value sampling and reporting. • Once daily general visual inspections by site EM at all sample sites identified. • Weekly grab sample inspections by site EM (Sample parameters will include, suspended solids, and on-site measurement of: turbidity, pH, temperature, electrical conductivity). At two locations within the WF site in man-made drains, and at SW3 and SW4. • Monthly grab sampling by site EM at surface water monitoring locations SW3, SW4 and SW5 (refer to **Figure 10.5** in **Chapter 10**). Analysis suite will include (same as **Section 10.6.5** in **Chapter 10** including suspended solids, BOD, nitrite, nitrate, ammonia, orthophosphate and chloride). • An "ECoW / Environmental Officer with an appropriate level of experience relevant to aquatic ecology will be present to supervise all water crossings			

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Phase	Audit Result	Action Required
			• Monitoring after heavy rain /prolonged rain events will be undertaken particularly downstream of spoil storage areas and drainage swales around the site to assess the ongoing efficacy of the mitigation measures. • Daily monitoring of excavations by the Geotechnical Engineer will occur during the construction phase. If high levels of seepage inflow occur, excavation work will immediately be stopped, and a geotechnical assessment undertaken. • During the construction phase of the project, the development areas will be monitored daily for evidence of groundwater seepage, water ponding and wetting of previously dry spots, and visual monitoring of the effectiveness of the constructed drainage and attenuation system so that it does not become blocked, eroded or damaged during the construction process.			
Aquatic Ecology	Chapter 7 Aquatic Ecology	7.7.2	• During the operational phase of the project the stilling ponds and buffered outfalls will be periodically inspected during maintenance visits to the Site. • Water monitoring on nearby natural watercourses will be undertaken during and post construction to determine if any pollution has migrated off-site, and if so, measures will be implemented to rectify the impact, as agreed with relevant statutory agencies (e.g. Inland Fisheries Ireland (IFI)).			

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Phase	Audit Result	Action Required
			• Monthly inspections and grab sampling during post construction for 3 months. • Annual upstream and downstream biological Q value sampling and reporting, including one post construction event.			
Archaeology	Chapter 15 Archaeology and Cultural Heritage	15.5.7	There are a number of obligatory processes to be undertaken as part of archaeological licence applications which will allow for monitoring of the successful implementation of the archaeological mitigation measures identified in **section 15.5.1**. These include the submission of method statements detailing the proposed strategy for all site investigations for the approval of the NMS as part of licence applications. A report will be compiled on all archaeological site investigations to comply with the licensing process which will clearly present the results in written, drawn and photographic formats and copies will be submitted to the National Monuments Service, the Planning Authority and the National Museum of Ireland.			
Drain Inspection and Maintenance	Chapter 10 Hydrology and Hydrogeology	10.6.5	The monitoring programme during the course of construction works (unless otherwise specified by any required planning condition) will include: • One baseline monitoring visit (in advance of construction), including upstream and downstream biological Q value sampling and reporting.			

Reference Heading	EIAR Chapter	Section	Mitigation Measure	Phase	Audit Result	Action Required
			• Once daily general visual inspections by site EM at all sample sites identified. • Weekly grab sample inspections by site EM (Sample parameters will include, suspended solids, and on-site measurement of: turbidity, pH, temperature, electrical conductivity). At two locations within the WF site in man-made drains, and at SW3 and SW4. • Monthly grab sampling by site EM at surface water monitoring locations SW3, SW4 and SW5 (refer to **Figure 10.5**). Analysis suite will include (same as **Table 10.16** including suspended solids, BOD, nitrite, nitrate, ammonia, orthophosphate and chloride). • Monthly inspections and grab sampling during post construction for 3 months. • Annual upstream and downstream biological Q value sampling and reporting, including one post construction event. The Site Environmental Manager (EM) will have a stop works authority. Weekly site meeting will include for scheduling of works according to weather forecast. Suitable locations (further downstream) for biological Q-Value sampling will be identified by Site EM.			