APPENDIX 17.1

MITIGATION MEASURES

Introduction

All mitigation and monitoring measures relating to the pre-commencement, 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 17.1a** below. The mitigation measures have been grouped together according to their environmental field/topic and are presented under the following headings:

- Land Use
- Tourism
- Flora and Fauna
- Peat Management
- Site Drainage
- Telecoms and other service interference
- Health and Safety
- Shadow Flicker
- Noise
- Waste
- Cultural Heritage
- Traffic
- Decommissioning

The mitigation proposals in the below format provides an easy to audit list that can be reviewed and reported on during the future phases of the Project. The proposal for site inspections and environmental audits are set out in the Construction and Environmental Management Plan (CEMP) which is included as **Appendix 2.1** of this EIAR. The tabular format in which the below information is presented, can be further expanded upon during the course of future project phases to provide a reporting template for site compliance audits.

All monitoring measures which will be implemented during the pre-commencement, construction, operational and decommissioning phases of the Project are outlined in **Table 17.1b**. All monitoring measures were set out in the relevant chapters of this EIAR. The monitoring proposals are presented in terms of the monitoring requirement, frequency of monitoring and the mechanism for

reporting results where applicable. By presenting the monitoring proposals in the below format, it is intended to provide a monitoring schedule that can be reviewed and tracked during all phases of the Project to ensure all required monitoring is completed as required.

It is intended that the CEMP will be updated where required prior to the commencement of construction to include all mitigations and monitoring measures, conditions and or alterations to the EIAR and application documents should they emerge during the course of the planning process and would be submitted to the Planning Authority for written approval.

Table 17.1a: Summary of Mitigation Measures

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
Pre-Commencement Phase						
MM1	Tourism	Chapter 4: Population and Human Health	4.5.6 Tourism	Prior to the commencement of works, a schedule of works will be prepared to avoid clashing with tourist events. The transportation of abnormal loads will be programmed to avoid peak hours on the road network, thus reducing delays and disruption, and avoid peak tourist periods or events where practicable, for example during the Bunnyconnellan Agricultural Show.		
MM2	Flora and Fauna	Chapter 5: Terrestrial Ecology	5.5.5.1.3 Retention of Trees	Any trees and treelines along approach roads and planned site access tracks will be retained unless felling is unavoidable. Retained trees should be protected from root damage by an exclusion zone of at least 7 metres or equivalent to canopy height. Such protected trees will be fenced off by adequate temporary fencing prior to other works commencing.		
MM3	Flora and Fauna	Chapter 6: Aquatic Ecology	6.5.1 Embedded Mitigation	The design principle of maintaining set-backs of 65m for turbines and associated infrastructure from watercourses and utilising existing access tracks within the site will be implemented.		
MM4	Flora and Fauna	Chapter 6: Aquatic Ecology	6.5.2.2 Mitigation by Design	Surveys by the ECoW will be carried out along with review of all construction methodologies prior to construction to ensure compliance with all specified mitigation in terms of design and avoidance of impacts on downstream ecology.		
MM5	Flora and Fauna	Chapter 6: Aquatic Ecology	6.5.2.2 Mitigation by Design	Sustainable Drainage Systems will be implemented prior to the construction works.		
MM6	Flora and Fauna	Chapter 6: Aquatic Ecology	6.5.2.3 Mitigation by Reduction	Method statements for the watercourse crossing culverts will be prepared and submitted to inland Fisheries Ireland for prior approval.		
MM7	Flora and Fauna	Chapter 6: Aquatic Ecology	6.7 Monitoring	In order to verify the efficacy of pollution prevention and mitigation works during construction, Water Quality Monitoring will be undertaken prior to, during and post completion of construction works in accordance with the parameters and schedules as set out in the Water Quality Management Plan.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Monitoring will be undertaken in all watercourses within the catchment of the construction area. Monitoring will be overseen by an independent Environmental Consultant and undertaken by the Environmental Manager or by the Ecological Clerk of Works (appropriately qualified and experienced on the required monitoring methods and the use, calibration and maintenance of all monitoring equipment used). The specific monitoring requirements including frequency and parameters, are detailed in the **Chapter 9: Hydrogeology and Hydrology** and in the Water Quality Management Plan.		
MM8	Flora and Fauna	Chapter 6: Aquatic Ecology	6.1 Introduction	In the event that planning is granted for the proposed development, the CEMP will be updated prior to the commencement of construction to address the requirements of any planning conditions including any additional mitigation measures which are conditioned and will be submitted to the planning authority for written approval.		
MM9	Flora and Fauna	Chapter 7: Ornithology	7.6 Monitoring	Confirmatory breeding bird surveys focused on red grouse, merlin and snipe, will take place in the spring/summer prior to construction to establish the breeding status and distribution within the Wind Farm site to a distance of approximately 500 m from any works area. From the results of monitoring, the likely need for restrictive zones to avoid or minimise the potential for adverse effects on breeding activities will be determined		
MM10	Flora and Fauna	Chapter 8: Soils & Geology	8.5.1.2.3 Hydrogen Plant	Isolate areas of land adjacent to the Development footprint by means of subsoil berms. The actual area will depend on land holding rights, proximity to receptors, and results of detailed materials balance assessment i.e., the area required will be dictated by the volume of material available with the intention of limiting the area in order to achieve original ground level with the deposited peat material. The dimensions and angle of repose for the berms will be		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				specified by a suitably qualified geotechnical engineer during the detailed design phase. Areas identified as suitable for soil berms will be isolated with silt screens prior to any construction / excavation works.		
MM11	Flora and Fauna	Chapter 8: Soils & Geology	8.5.2.5.2 Mitigation by Good Practices	Excavation of peat in areas where there is >1.0m in peat depth will follow appropriate engineering controls such as the drainage of the peat along the proposed Site tracks in advance of excavation activity (1 month in advance where possible) so as to reduce pore water content and thus instability of the peat substrate prior to excavation. Such drains will be positioned at an oblique angle to slope contours to ensure ground stability. Drains will not be positioned parallel to slope contours. This drainage will be attenuated prior to outfall (**Chapter 9: Hydrology and Hydrogeology**). It is noted that peat depth at the site is generally shallow, and management of saturated peat will be required at relatively few locations.		
MM12	Peat Management	Chapter 8: Soils & Geology	8.5.2.8 Ground Stability	The contractor's * methodology statement and risk assessment will be in line with the Construction Environmental Management Plan and will be reviewed and approved by a suitably qualified geotechnical engineer/engineering geologist prior to Sites operations. (*Contractor here refers to the chosen or contracted construction company at the commencement stage of the proposed development).		
MM13	Site Drainage	Chapter 8: Soils & Geology	8.5.2.8 Ground Stability	In areas of saturated peatlands on the Wind Farm, prior to excavation, drains will be established to effectively drain grounds prior to earthworks. Such drains will be positioned at an oblique angle to slope contours to ensure ground stability. Drains on areas of the Site with minimal risk of bog failure as identified by Site investigations will be positioned at a more acute angle to the slope contour in order to reduce the velocity of surface water drainage. It is noted that deeper (>2.0 m) peat at the site is		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				generally confined to isolated pockets and the need for 'heavy duty' measures such as sheet piling is very low.		
MM14	Site Drainage	Chapter 8: Soils & Geology	8.5.1.2 Nature Based Solutions	Areas identified as suitable for soil berms will be isolated with silt screens prior to any construction / excavation works.		
MM15	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.13 Culverts & Instream Works	Contracted operators will draft method statements and risk assessments in line with mitigation outlined in this report and in consultation with relevant guidance **Section 9.2.2,** prior to commencing works (as part of the watercourse crossing consent application), Relevant guidance referenced here includes: • Inland Fisheries Ireland (IFI) (2016) Guidelines on Protection of Fisheries During Construction Works In and Adjacent to Waters. • Scottish Environmental Protection Agency (SEPA) (2009) Engineering in the Water Environment Good Practice Guide – Temporary Construction Methods • National Roads Authority (2008) Guidelines for the Crossing of Watercourses During the Construction of National Roads Schemes.		
MM16	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.14 Diversion of Drainage	Any newly installed drain will be fully formed prior to the diversion of existing drainage.		
MM17	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.16 Groundwater Extraction Proposed Mitigation Measures	All details in relation to monitoring will be included in the Surface Water Management Plan (SWMP). Consultation with relevant stakeholders will be sought prior to the SWMP being reviewed and approved by the planning authority.		
MM18	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.18 Emergency Response	Prior to commencement of construction, the Environmental Clerk of Works will prepare a register of corrective action and emergency response sub-contractors that can be called upon in the event of an environmental incident, and/or to give training on escalating incident where useful, including e.g., specialist hydrocarbon spill response, specialist hydrological and/or water quality response.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
MM19	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.3.4 Operational Phase Water & Wastewater Systems – Hydrogen Plant Site	A Detailed Discharge & Assimilative Capacity (DACA) and Detailed Water & Wastewater Management Plan will be developed post consent for the Proposed Development incorporating the mitigation and control measures identified, during the detailed design and consenting stage, and prior to construction / operational phase a more detailed assessment of surface water discharge and baseline chemistry will be carried out and more detailed wastewater management plan will be developed.		
MM20	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.3.4 Operational Phase Water & Wastewater Systems – Hydrogen Plant Site	Continuous monitoring through the life of the project will be used to review and update methodologies wherever appropriate on an ongoing basis, that is; the detailed water and wastewater management plan which will be developed prior to the construction phase of the proposed development will be live document and procedures will be amended where relevant based on ongoing continuous and/or routine monitoring.		
MM21	Air Quality	Chapter 10: Air and Climate	10.2.8.1 Construction Phase Mitigation	Wind Farm Site and Hydrogen Plant Site access roads will be upgraded and built prior to the commencement of construction activities. These roads will be finished with graded aggregate which compacts, preventing dust.		
MM22	Human Health	Chapter 13: Materials Assets	13.6 Electricity Networks – Grid Connection, Interconnector and Grid Network	• The Grid Connection will be constructed to the requirements and specifications (CDS-GFS-00-001-R1) of EirGrid and in line with the grid connection offer. • 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		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				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.		
MM23	Aviation	Chapter 13: Materials Assets	13.7 Air Navigation	An aeronautical lighting scheme for the Development will be agreed with the IAA		
MM24	Cultural Heritage	Chapter 14: Cultural Heritage		Buffers zones will be marked out prior to the commencement of construction works.		
MM25	Traffic	Chapter 15: Traffic and Transport	15.6 Mitigation Measures	Prior to construction and once the Contractors have confirmed their suppliers, the TMP will be updated in consultation with Sligo County Council and Mayo County Council and An Garda Síochána as necessary. HGV trips will be scheduled to avoid times when drop offs and pick-ups generally take place at schools, particularly at Stokane on the L2604. All drivers will be made aware of the location and presence of schools and other sensitive receptors at an induction session prior to construction activities taking place and will be made aware of the speed limits of the various roads on the route which are contained in the TMP. This is to ensure compliance with speed limits and school drop off and pick-up zones.		
MM26	Traffic	Chapter 15: Traffic and Transport	15.6 Mitigation Measures	A confirmatory condition survey of the L1102, L5136 and L2604 roads will be carried out prior to commencement of construction and another post-construction. The Developer will lodge a bond with Sligo County Council and Mayo County Council prior to commencement of construction in the amount to be agreed with the Council for the possible repair/upkeep of the roads.		
MM27	Traffic	Chapter 15: Traffic and	15.6 Mitigation Measures	A survey of the turbine component haul route will be undertaken prior to commencement to identify if any new overhead lines or		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
		Transport		broadband lines will need to be lifted along the route to allow abnormal loads such as tower sections and nacelles to be delivered.		
MM28	Major Accidents and Natural Disasters	Chapter 16: Major Accidents and Natural Disasters	16.4.2.2 Hydrogen Plant Site Mitigation	A Major Accident Prevention Policy has been prepared and will be refined prior to commencement of operations.		
MM29	Major Accidents and Natural Disasters	Chapter 16: Major Accidents and Natural Disasters	16.3.2 Technological Hazards	A comprehensive health and safety assessment is required for all major construction projects in Ireland. This would generally be carried out prior to construction by the selected contractor in accordance with legislation.		
MM30	Major Accidents and Natural Disasters	Chapter 16: Major Accidents and Natural Disasters	16.3.2 Technological Hazards	Emergency situations to be planned for within the ERP will be identified through a series of workshops to be conducted by the Developer. These workshops will be held prior to the commencement of construction works at the Project and will be reviewed annually as part of a wider internal audit process.		
MM31	Major Accidents and Natural Disasters	Chapter 16: Major Accidents and Natural Disasters	16.3.3 Technological Hazards	Prior to the commencement of the construction phase of the Proposed Development, a detailed Traffic Management Plan will be prepared by the Contractor for agreement with the relevant local authorities and An Garda Síochána.		
Construction Phase						
MM32	Human Health	Chapter 4: Population and Human Health	4.5.6 Tourism	Construction activities would be limited to normal working hours to minimise noise and other impacts during recreational and leisure periods.		
MM33	Human Health	Chapter 4: Population and Human Health	4.5.8 Human Health	To ensure effective implementation of mitigation measures, an Environmental Clerk of Works (EnvCoW) will be assigned to carry out monitoring during the construction and operational phases of the Proposed Development. The EnvCoW will have the authority to temporarily stop works in a particular area of the site to ensure corrective measures are implemented and adverse environmental impacts are minimised if not avoided. Monitoring of pollution prevention and mitigation undertaken by		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				the EnvCoW assigned by the Developer will include: • Monitoring site pollution prevention plan. • Water quality monitoring. • Advising on required pollution prevention measures and monitoring their effectiveness. • Liaison with local authorities in relation to pollution instances if applicable. • Considering the EnvCoW will be responsible for monitoring a broad range of environmental factors, technical monitoring and advice will be sought such as from specialist consultants as the need arises e.g. installation and website for telemetry. To mitigate against any spills, emergency spill kits with oil boom and absorbent materials will be kept on-site; in construction compounds, vehicles transporting fuel and smaller spill control kits will be kept in all construction machinery. All construction personnel will be notified of the location of spill kits as part of the site induction and will be trained on the site procedures for dealing with spills.		
MM34	Air Quality	Chapter 4: Population and Human Health	4.5.8 Human Health	• Approach roads and construction areas will be cleaned on a regular basis to prevent mud built-up and from migrating around the site and off-site; • Wheel wash facilities will be provided near the site compounds to prevent mud/dirt being transferred from the site to the public road network; • A mechanised road sweeper will be used along access roads if required; • 'Damping down' will be used if dust becomes an issue on any part of the site; • Vehicles delivering materials to the site will be covered appropriately when transporting materials that could result in dust, e.g. crushed rock or sand;		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• Ready-mix concrete will be delivered to site and it is envisaged that no batching of concrete will take place on site; • Speed restrictions on access roads at the Wind Farm Site and Hydrogen Plant Site will be implemented to reduce the likelihood to dust becoming airborne; • Public roads along the construction haul route will be inspected regularly and if dirt / mud is identified that could result in dust generation then the road will be cleaned as necessary; • Stockpiling of materials will be carried out in such a way as to minimise their exposure to wind where possible and damping down will be carried out where needed; and • A complaints procedure will be implemented on site where complaints will be reported to the site manager, logged and appropriate action taken.		
MM35	Noise	Chapter 4: Population and Human Health	4.5.8 Human Health	• Sensitive location of equipment, taking account of local topography and natural screening. • Working methods: construction noise will be controlled by prescribing that standard construction work shall be restricted to the specified working hours as outlined in **Chapter 2: Project Description**. Any construction work carried out outside of these hours shall be restricted to activities that will not generate noise of a level that may cause a nuisance. The phasing of works has also been designed with regard to avoidance of noise impacts. • Plant will be selected taking account of the characteristics of noise emissions from each item. All plant and machinery used on the site shall comply with relevant E.U. and Irish legislation in relation to noise emissions. The timing of on- and off-site movements of plant near occupied properties will be controlled.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• Operation of plant: all construction operations shall comply with guidelines set out in British Standard documents '*BS 5338: Code of Practice for Noise Control on Construction and Demolition Sites'* and '*BS5228-1:2009+A1:2014: Code of Practice for Noise and Vibration Control on Construction and Open Sites'*. The correct fitting and proper maintenance of silencers and/or enclosures, the avoidance of excessive and unnecessary revving of vehicle engines, and the parking of equipment in locations that avoid possible impacts on noise sensitive locations will be employed. • Training and supervision of operatives in proper techniques to reduce site noise, and self-monitoring of noise levels, if appropriate. A warranty will be sought from the selected turbine and Hydrogen Plant equipment manufacturers to confirm that an assessment of noise would result in noise levels at all receptors being less than or equal to the noise limits set out in **Chapter 10: Noise**. The warranty will include the provision that there will be no clear tonal components audible at any receptor.		
MM36	Accidents & Disasters	Chapter 4: Population and Human Health	4.5.8 Human Health	A competent, adequately resourced site supervisor will be appointed for the works. All relevant information relating to health and safety will be passed on to the site supervisor. The site supervisor will notify the relevant safety authorities and prepare the pre-tender health and safety plan and see that a construction phase health and safety plan is adequately developed. The site supervisor will collate information from the designers and principal contractor to produce a health and safety file for the Development. The site health and safety file will be completed as soon as is possible after the construction of the Proposed Development. It		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				will contain all relevant health and safety information relating to the Proposed Development in relation to the day to day running and maintenance operations and eventual decommissioning. It is the owner's duty to hold and make available any information contained in the file to anyone who would need such information. To maintain safety and avoid health impacts on construction workers and the general public, best practice site safety and environmental management will be maintained. The Proposed Development will be designed, constructed, operated and decommissioned in accordance with the following: • Safety, Health and Welfare at Work (Construction) Regulations 2013 Safety • Health and Welfare at Work Act 2005 Safety • Health and Welfare at Work (General Applications) Regulations 2007		
MM37	Accidents and Disasters	Chapter 4: Population and Human Health	4.5.8 Human Health	All construction staff will be adequately trained in health and safety and will be informed and aware of potential hazards. All hazards will be identified, and risks assessed. Where elimination of the risk is not feasible, appropriate mitigation and/or control measures will be followed. The contractor will be obliged under the construction contract and current health and safety legislation to adequately provide for all hazards and risks associated with the construction phase of the Development. Safe Pass registration cards are required for all construction, delivery and security staff. Construction operatives will hold a valid Construction Skills Certificate Scheme card where required. The Developer is required to ensure a competent contractor is appointed to carry out the construction works. The Contractor will be responsible for the implementation of procedures outlined in the Safety and Health Management Plan.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Once mitigation measures and health and safety measures are followed, the potential for impact on human health on the construction site during construction and decommissioning is expected to be not significant and temporary to short-term. Public safety will be addressed by restricting access to the public in the vicinity of the Proposed Development works during the construction and decommissioning stage. This measure aims to avoid potential injury to members of the public as a result of construction activities. Appropriate warning signage will be posted at the construction site entrance, directing all visitors to the site manager. Appropriate signage will be provided on public roads approaching site entrances and along haul routes. In relation to the turbine delivery route, extra safety measures will be employed when large loads are being transported, for instance, Garda escort will be requested for turbine delivery and a comprehensive turbine delivery plan will be utilised to avoid potential impact to human safety for road users and pedestrians. For the installation of the grid connection cable in the public road, a traffic management plan has been developed (**Appendix 2.1**) in discussion with locals who will be directly impacted by the works, and in agreement with the Local Authority. Public consultation will be conducted along the grid cable route to inform local residents ahead of construction and decommissioning works.		
MM38	Flora & Fauna	Chapter 5: Terrestrial Ecology	5.5 Mitigation Measures	A 65 m stream buffer zone will be implemented at the Site which will largely result in the avoidance of sensitive hydrological features. Direct discharges to surface waters of dewatered loads will not be permitted under any circumstances. This in turn will avoid or reduce the potential for adverse impacts on downstream designated sites.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
MM39	Flora & Fauna	Chapter 5: Terrestrial Ecology	5.5 Mitigation Measures	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.		
MM40	Flora & Fauna	Chapter 5: Terrestrial Ecology	5.5.2 Habitats	***Restricted access to bog*** At the commencement of works, for each of the turbine locations the required work footprint on the bog will be identified and the area will be marked by a rope fence (using wooden poles) and with appropriate signage. No construction activities will be allowed outside of the agreed work area for the duration of the construction period. The ECoW will inspect the site regularly whilst works are on-going. Excavated peat and subsoil will be removed to the approved deposition area(s), with no storage of peat or any other materials on the adjoining bog areas. The rope fences will remain in place until the works are fully complete. The above is of especial importance at the sites of turbines T3 and T9, which impact areas of high bog, as well as at T1, T10 and T13 which adjoin or are very close to areas of high bog. ***Protection of high bog*** The work areas at turbines T3 and T9 will impact areas of high bog. To minimise disturbance from plant machinery, bog mats will be used over the surface where tracking is likely to take place. The use of bog mats is a proven (yet simple) technique that is highly efficient in reducing the impact on the bog surface.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Re-vegetation of bare surfaces at work areas An ecological objective is to minimise the area of exposed peat surface and to encourage rapid re-vegetation of disturbed bog surfaces. This will be achieved by the removal of the vegetated bog surface within the work footprint, the storage of this material, and subsequent re-use around the turbine and hardstand margins. First, suitable areas within the site will be identified where the removed material can be stored for the duration of the works or until needed – it is noted that such areas will not be on other vegetated bog surfaces but rather areas of bare or sparsely vegetated peat. Also, it is important that the selected storage areas will not be prone to disturbance for the duration of the required storage period. Two approaches will then be used to 'save' the surface vegetated material. Where practical, the surface will be cut-out as sods or 'turves' to a depth of approximately 20-30 cm using a dumper/digger with a bucket. Care will be taken to keep the turves as intact as possible and the vegetated side upwards (though this is not always possible). The turves will be loaded to a trailer and transported to the pre-identified storage area. The turves will be off-loaded from the trailer and placed side by side and vegetation side upwards. They will be placed in single layers, *i.e*. not piled on top of each other. Alternatively, where the cutting out of turves will not be practical due to shallow peat or an undulating surface from past turbary, the surface vegetated areas will be scrapped off and removed to storage areas where piles will be formed until ready to re-use when works are complete. Such material will contain root and rhizome material, as well as a seed bank.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Should storage of the above materials be for prolonged periods (months), the stored turves and peat piles will need to be watered during dry spells. When ready for placement at the finished turbine/hardstand, the turves or peat piles will be lifted with a dumper and bucket and taken to the destination. Here they will be off-loaded and placed side by side on the disturbed bog surface with vegetation side up. The turves will be bedded in with the bucket of a dumper so that they form a continuous layer without gaps between them. This approach will provide almost immediate cover of the bare surfaces. Alternatively, the surface peat material from the stored peat piles will be spread over the bare surfaces. All of the above processes will be monitored by the ECoW.		
MM41	Flora & Fauna	Chapter 5: Terrestrial Ecology	5.5.2 Habitats	It is noted that when filling the deposition areas to the allowed depth, the uppermost 50 cm (at the least) should be pure peat and not include subsoil. The saved material will then be spread across the surface using a wide track machine for access. Where used, turves will be bedded in using the bucket of the dumper.		
MM42	Flora & Fauna	Chapter 5: Terrestrial Ecology	5.5.4 Common frog and common lizard	The common frog is widespread on the Wind Farm Site occurring throughout the cutover bog. 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. During the walk-over survey for presence of the common frog, any common lizards observed will be removed from the work area and placed on bog elsewhere within the site.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
MM43	Flora & Fauna	Chapter 5: Terrestrial Ecology	5.5.5 Bats	Bats typically use woodland edge habitats for commuting and feeding purposes. Areas of conifer plantation surrounding the immediate vicinity of the proposed turbines should be felled in order to discourage bat species from flying close to turbines. Various publications provide guidelines on buffer zones surrounding turbines to reduce the favourability of the site for bat activity. Eurobats 'Guidelines for consideration of bats in wind farm projects' (Rodrigues *et al*. 2015) recommend buffer zones of 200 m from turbine base to high potential features whilst Natural England Bats (England 2014) recommend 50 m buffers from blade tip to tree. NIEA (2021) recommends a minimum buffer of 100 m between the turbines at the edge of commercial forestry where wind farms are proposed to be key-holed. The following formula will be used to calculate the required felling buffer for turbines for each turbine (taking into account the height of surrounding woodland/plantations at each turbine location): $b = \sqrt{\{(50 + bl)^2 - (hh - fh)^2\}}$ where: b = the distance on the ground between the edge of the canopy and the turbine (m) bl = blade length (m) hh = hub height (m) fh = feature height (m) $b = \sqrt{\{(50+ 77.5)^2 - (110.5 - 25)^2\}}$ b = 94.6m The proposed wind turbines have the following dimensions: • Hub Height ranging from 110.5 to 102.5 m • Rotor diameter ranging from 155 to 149 m • Tip Height ranging from 185 to 179 m		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				All turbines are located a minimum of 140 m from conifer plantation edge. At this distance a buffer of 85 m from blade tip to forestry edge is achieved at all locations, adequately surpassing the typical 50 m buffer. The only other shrub plants found within this buffer zone surrounding the proposed turbine locations are small stands of gorse or willow. These will be removed prior to the powering up of the turbines.		
MM44	Flora & Fauna	Chapter 5: Terrestrial Ecology	5.5.5 Bats	In general, artificial light creates a barrier to bats so lighting should be avoided where possible. Construction operations within the Wind Farm Site and Hydrogen Plant Site will take place during the hours of daylight where possible to minimise disturbances to faunal species at night. Some works along the Grid Connection cable route and Wind Farm Site may occur at night but the Environmental Manager/ECoW shall limit night-time works to sections of the route / 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.		
MM45	Flora & Fauna	Chapter 5: Terrestrial Ecology	5.5.5 Bats	Any trees and treelines along approach roads and planned site access tracks will be retained unless felling is unavoidable. Retained trees should be protected from root damage by an exclusion zone of at least 7 metres or equivalent to canopy height. Such protected trees will be fenced off by adequate temporary fencing prior to other works commencing.		
MM46	Flora & Fauna	Chapter 6:Aquatic Ecology	6.5.2 Construction Phase Mitigation	Mitigation by Avoidance The greatest risk of negative impacts on the aquatic environment will occur during the construction phase of the development. Key to minimising this risk has been the siting of all turbine locations and other key infrastructure at a minimum set-back from		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				watercourses (50m). In designing the layout of the site careful consideration has also been given to utilising the existing access track network and minimising the numbers of watercourse crossings required. The layout has also avoided any interference with existing hydrology on the site and maintains surface water flow networks through the use of cross drains on access roads. The grid connection route avoids the need for any open cut crossings of watercourses along its length, though will require directional drilling under two watercourses (the Fiddaun River and the Glenree River) due to there being insufficient cover and depth in the existing bridges to cross within the bridge decks.		
MM47	Flora & Fauna	Chapter 6:Aquatic Ecology	6.5.2 Construction Phase Mitigation	Mitigation by Design A comprehensive suite of drainage measures has been developed to protect all receiving waters from potential impacts during the construction of the development in the catchment of the proposed Wind farm site, the Hydrogen Plant site and along the proposed grid connection route. These measures are outlined in **Chapter 2: Project Description** and detailed in full in **Chapter 9: Hydrology and Hydrogeology**, and have been transposed into the CEMP for the proposed project. The measures are aimed at avoiding or mitigating any negative effect on aquatic ecology during the construction and operation of the proposed development, including preventing sediments or other pollutants from entering watercourses through the containment and treatment of all surface water run-off from areas of works. An Ecological Clerk of Works (ECoW) will be appointed to ensure compliance during the construction stage with all mitigation measures, planning conditions and legislative requirements related to aquatic ecology. The ECoW will be		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				consulted with regard to all watercourse crossing works. Surveys by the ECoW will be carried out along with review of all construction methodologies prior to construction to ensure compliance with all specified mitigation in terms of design and avoidance of impacts on downstream ecology. The mitigation measures have been incorporated into a Construction and Environmental Management Plant (CEMP) for the development which includes Construction Method Statements for key works. The CEMP includes a Surface Water Management Plan (SWMP), a Water Quality Monitoring Plan and Watercourse Crossing Plan (WQMP) and a Waste Management Plan (WMP). The CEMP, SWMP, WQMP and WMP will require mandatory adherence by all parties involved in the construction of the wind farm site (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: • CIRIA (2001). *Control of water pollution from construction sites - Guidance for consultants and contractors (C532).* Construction Industry Research and Information Association, London. • CIRIA (2019). *Culvert, screen and outfall manual (C786).* Construction Industry Research and Information Association, London. • DHPLG (2019). *Draft Revised Wind Energy Development Guidelines*. Department of Housing, Planning and Local Government. December 2019 • Enterprise Ireland (unknown). *Best Practice Guide (BPGCS005) Oil storage guidelines*.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• IFI (2016). *Guidelines on Protection of Fisheries during Construction Works in and adjacent to waters.* Inland Fisheries Ireland, Dublin. • IWEA (2012). *Best Practice Guidelines for the Irish Wind Energy Industry*. Guidance prepared by Fehily Timoney & Company for the Irish Wind Energy Association. • Kilfeather, P.K. (2007). *Maintenance and protection of the Inland Fisheries resource during road construction and improvement works*. Southern Regional Fisheries Board. • Murphy, D.F. (2004). *Requirements for the Protection of Fisheries Habitat during Construction and Development Works at River Sites.* Eastern Regional Fisheries Board. • NRA (2008). *Guidelines for the Crossing of Watercourses during the Construction of National Road Schemes*. National Roads Authority. • SNH (2019). *Good Practice during Wind Farm Construction (4th edition).* Scottish Natural Heritage. The Surface Water Management Plan (SWMP) details the existing baseline environment of the site, describes how the surface water management will operate during construction to minimise modification and disruption to the existing site hydrology, outlines the proposed maintenance regime and the proposed drainage management post-construction. The SWMP is a live document and where there is a requirement for variation to the proposed management of surface water during construction, the SWMP will be updated to reflect any such changes. The SWMP will be updated by the Environmental Manager (EM) and, where it is relevant to ecology, with input from the Ecological Clerk of Works (ECoW) before any changes are made to the proposed management of surface water during construction of the Firlough Wind Farm and Hydrogen Plant.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				The use of Sustainable Drainage Systems (SuDS) on site will eliminate risk to watercourses from sedimentation during the construction and operational phases of the proposed development. SuDS adopts the following design principles to drainage: *Minimise → Intercept → Treat → Disperse → Dilute* All surface water management measures will be put in place concurrently during the development of the road network. The measures entail the following key elements which are described in detail within the Surface Water Management Plan: • Open Constructed drains for development run-off collection and treatment; • Collection Drains for upslope "clean" water collection and dispersion; • Filtration Check Dams to reduce velocities along sections of road which run perpendicular to contours; • Settlement Ponds, Settlement Lagoons and Buffered Outfalls to control and store development runoff to encourage settlement prior to discharge at Greenfield runoff rates. There will be no direct site run-off to watercourses during the construction phase with all outflows from drainage via settlement ponds from which treated surface water is released by diffuse overland flow at appropriate locations. To reduce the amount of silt laden water to be treated, clean water drains will be created upstream of the works area to divert water away from construction areas, thereby lessening the volume of water to be treated onsite.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				De-watering of excavations where required, will be through filtered 'silt socks' / dewatering bags or a '*Siltbuster'* or similar system, prior to discharge. Excavations will be kept to the absolute minimum for the specific task and undertaken on a 'just in time' basis to minimise the extent of silty water generated and requiring treatment prior to discharge. The three watercourse crossings within the Wind farm Site requiring culvert extensions or upgrades along the access track network will have culvert dimensions matched to existing channel bed width. The installation of these culverts will be carried out in a single operation during dry conditions between July and September (as required by IFI for in-stream works). The outline method statements prepared for the extension of the culverts and associated works is detailed in Section 4 of the WQMP. An additional 10 no. drainage ditch crossings within the Wind farm Site will require culvert extensions or upgrades. All roadside drains within the temporary works area will be culverted and check dams made from stone or sandbags covered with terram will be inserted upstream and downstream of these culverts to intercept any solids generated during the insertion or which wash out during the works. Where the ground slopes from the working area toward a watercourse, or if there is evidence of solids washing off the works area toward nearby watercourses or drains, a silt fence with straw bales, will be interposed between the works area and the watercourse. The drainage outfall from the Hydrogen Plant site to the Dooyeaghny River will be via a 300mm pipe in a concrete headwall. The structure will be pre-cast to avoid a risk of concrete laitance during installation. The risk of sediment		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				release to the stream will be mitigated for by confining the construction to a single operation during dry conditions between July and September (as required by IFI for in-stream works). Bare ground around the installed outfall will be covered with hessian pinned to the ground to prevent silt-laden run-off until the re-establishment of vegetation. On the Grid Connection route, the directional drilling under the Fiddaun River and the Glenree River (due to there being insufficient cover and depth in the existing bridges to cross within the bridge deck) will be undertaken with the following methodology: 1. A works area of circa .40m2 will be fenced on both sides of the stream crossing, 2. The drilling rig and fluid handling units will be located on one side of the bridge and will be stored on double bunded 0.5mm PVC bunds which will contain any fluid spills and storm water run-off. 3. Entry and exit pits (1m x 1m x 2m) will be excavated using an excavator, the excavated material will be temporarily stored within the works area and used for reinstatement or disposed of to a licensed facility. 4. A 1m x 1m x 2m steel box will be placed in each pit. This box will contain any drilling fluid returns from the borehole. 5. The drill bit will be set up by a surveyor, and the driller will push the drill string into the ground and will steer the bore path under the watercourse. 6. A surveyor will monitor drilling works to ensure that the modelled stresses and collapse pressures are not exceeded. 7. The drilled cuttings will be flushed back by drilling fluid to the steel box in the entry pit. 8. Once the first pilot hole has been completed a hole-opener		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				or back reamer will be fitted in the exit pit and will pull a drill pipe back through the bore to the entry side. 9. Once all bore holes have been completed, a towing assembly will be set up on the drill and this will pull the ducting into the bore. 10. The steel boxes will be removed, with the drilling fluid disposed of to a licensed facility. 11. The duct will be cleaned and proven, and their installed location surveyed. 12. The entry and exit pits will be reinstated to the specification of ESB Networks and Mayo County Council. 13. A transition chamber will be installed on either side of the bridge following the horizontal directional drilling asper ESB requirements. Despite the low potential risk, the CEMP contains a contingency plan to deal with the scenario of a peat movement occurring on the site which will include measures to control silt in such a scenario, and measures to be put in place at the initial stages of construction to off-set this risk. Specific measures are detailed in **Chapter 9 Hydrogeology and Hydrology** to be implemented in the unlikely eventuality a peat failure or some other form of failure or over-loading of the drainage and attenuation design.		
MM48	Flora & Fauna	Chapter 6:Aquatic Ecology	6.5.2 Construction Phase Mitigation	Mitigation by Reduction 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 populations of Freshwater pearl mussel and salmonids in the various catchments. These measures are a summary of the principal requirements with full detail being presented in **Chapter 9 Hydrogeology and Hydrology**, which are transposed into the Construction Environmental Management Plan.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				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: • No works will take place within the 50m buffer zone of watercourses except for the culvert extensions and road upgrade works. • Site compounds and all storage areas will be located at a minimum distance of 65m from any watercourse. All drainage from these facilities will be directed through a settlement pond with appropriate capacity and measures to provide spill containment. • All site drainage 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 shall 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 WQMP and will include at a minimum: ○ Groundwater samples taken from 4 no. locations at the proposed Wind Farm Development site. ○ Daily visual observation in areas of high construction activity or during high rainfall periods to identify any evidence of siltation, oil or other pollutants. Visual inspections will include details of the colour of the water at the time of inspection.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				○ Weekly visual inspections and monthly field hydrochemistry monitoring. ○ One round of post construction monitoring, to be agreed with Mayo and Sligo County Councils. Post construction will be defined as when the reinstatement phase is completed. ○ Monthly analysis of water parameters will be carried out. Construction-stage analytical determinants (including limits of detection and frequency of analysis) will be specified and agreed with the Local Authority and third parties for each sample location. The agreed suite of sample determinants will include the following: ➢ pH ➢ Temperature ➢ Total Suspended Solids ➢ Dissolved Organic Carbon ➢ Conductivity ➢ Dissolved Oxygen ➢ Total Oxidized Nitrogen ➢ Ammoniacal Nitrogen ➢ Ammonia ➢ Potassium ➢ Phosphate ➢ Biological Oxygen Demand ➢ Chemical Oxygen Demand ➢ Total Petroleum Hydrocarbons ○ In the event that a pollution incident arises which threatens to enter or has entered a watercourse from the construction works, additional sampling and analysis of surface water samples will be undertaken to determine the level of impact to the surface water receptor and remedial requirements, where necessary.		

Ref. No.	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). • 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. • All machinery operating on water course crossings will be steam-cleaned at the site compound in advance of works and routinely checked to ensure no leakage of oils or lubricants occurs. All fuelling of machinery will be undertaken at a discrete "fuel station" designated for the purpose of safe fuel storage and fuel transfer to vehicles. • Instream works will be undertaken during the period 1st July to 30th September as required by IFI Guidance (2016) to avoid accidental damage or siltation of spawning beds in downstream reaches. • Method statements for the watercourse crossing culverts will be prepared and submitted to inland Fisheries Ireland for prior approval. • Culvert extension or upgrade works will be undertaken in dry conditions and in low flow conditions. • In the event that stream dewatering is required for the construction of culvert extensions, electrofishing will be undertaken during the instream working window from July to September by suitably qualified and licenced personnel with any fish translocated downstream. • During the culvert installation and associated construction work, double silt fences will be emplaced immediately down-gradient and downstream of the construction area for the duration of the construction phase. • Any extensions to existing culverts or new culverts will be set		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				at an embedded depth of 0.5m. • Where bank strengthening or scour protection is required, this will utilise sensitively placed rock armour with appropriate landscaping to tie the feature into the existing river bank profile. Gabion baskets and Reno mattresses will not be used. • All bank sides and streambeds will be fully reinstated to avoid ongoing erosion. This will entail appropriately sloped banks to provide stability, and establishing vegetative cover as quickly as possible using only native species appropriate to the existing environment. • There will be no batching or storage of cement allowed in the vicinity of the crossing construction area. • Procedures (as detailed in Chapter 9) will be put in place to ensure the full control of raw or uncured waste concrete to ensure that watercourses will not be impacted. • Should there be any incidents of pollution to watercourses, immediate steps as specified in the Emergency Response Plan (CEMP-Management Plan 1) will be undertaken to resolve the cause of the pollution and where feasible, mitigate against the impact of pollution.		
MM49	Flora and Fauna	Chapter 7: Ornithology	7.5.1 Construction Phase	***Measures for loss of habitat*** While habitat loss cannot be mitigated, the loss of bog will be offset through a Biodiversity Enhancement and Management Plan (BEMP). The BEMP is described in **Chapter 6 Biodiversity** and is presented in full in **Appendix 6.4**. Briefly, the BEMP will preserve and enhance an area of 10.6 ha of blanket bog which has been partly cut. This will ensure that the bog is not planted with forestry (as have some adjoining areas) or cut further during the lifetime of the project.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Bird species associated with peatland habitats, including red grouse, merlin, snipe and meadow pipit will benefit. The regrowth of ling heather in the eroded blanket bog habitat would be of particular benefit to the local red grouse population. This Plan will compensate for the loss of bog habitat for birds.		
MM50	Flora and Fauna	Chapter 7: Ornithology	7.5.1 Construction Phase	***Measures to minimise potential disturbance to sensitive bird species*** The present assessment has identified the potential for significant disturbance effects on three breeding species of conservation importance as a result of the construction works (see **Section 7.4.2.2**). These species are red grouse, merlin and snipe. Best available evidence has been reviewed and it is suggested that these species could be disturbed by works, including tree felling, at the following distances: Red grouse 500 m Merlin 500 m Snipe 400 m Should any of these species be recorded breeding within the given distances of the works area through confirmatory surveys before and/or during construction, a buffer zone (using above distances) shall be established around the expected location of the nest (location identified as far as is possible without causing disturbance to the bird) and all works will be restricted within the zone until it can be demonstrated by an ornithologist that the species has completed the breeding cycle in the identified area. Any restricted area that is required to be set up will be marked clearly using hazard tape fencing and all site staff will be alerted through toolbox talks.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				The above mitigation, as needed, will apply from March to August (inclusive) and will ensure that the works will not have an adverse disturbance effect on the identified species of conservation importance recorded during the baseline surveys or in pre-construction surveys.		
MM51	Flora and Fauna	Chapter 7: Ornithology	7.5.1 Construction Phase	***Measures to minimise potential disturbance to nesting passerine species*** A range of passerine bird species breed within the Wind Farm Site, including the Red-listed meadow pipit and the Amber-listed skylark and willow warbler. In compliance with Section 40 of the Wildlife Acts 1976 as amended, all vegetation required to be cleared to facilitate the works will be done outside of the restricted period from 1st March to 30th August. Should it be necessary to remove vegetation during the breeding season, for instance where bramble and ephemeral plant species have become established on ground cleared earlier, this will be surveyed by an ornithologist up to 10 days before any clearance. Should an active nest be located, the area will be restricted from works by a distance where it is considered that the works would not cause disturbance or abandonment of the nest. Such distances, which will vary according to species and local topography, will be determined by the ornithologist. The restriction will be maintained until it is established that any young birds present have fledged. Should an instance arise where the placement of a restriction would have significant implications for the time frame of the Project, and where no alternative mitigation is available, the ornithologist will prepare a report (to include species, stage of breeding etc.) on the implications of removal of the nest in the context of the Wildlife Acts and consultation will be undertaken with the NPWS.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				With the above mitigation implemented, the effect of disturbance to nesting passerine species can be avoided or the reduced to Not Significant.		
MM52	Peat Management	Chapter 8 Soil and Geology	8.5.2 Construction Phase	*Erosion and Degradation* Erosion and degradation of exposed soils will occur at a minimal, primarily during construction. Considering the variability of metrological conditions and the potential for significant events to occur at any stage of the year, the construction phase will be limited to favourable meteorological conditions to avoid erosion and runoff from the site. In order to mitigate for particular earth works tasks and suitable meteorological conditions, construction activities will not occur during periods of sustained significant rainfall events, or directly after such events (allowing time for work areas to drain excessive surface water loading and discharge rates reduce). To avoid potentially loading of runoff with solids and other contaminants into the surface water network. Entrainment of solids in storm or construction water runoff are assessed under **Chapter 9: Hydrology & Hydrogeology.**		
MM53	Peat Management	Chapter 8 Soil and Geology	8.5.2.2 Soil Sealing	Soil sealing will be mitigated by the use of a geotextile membrane on top of in situ peat material will likely lead to a degree of subsidence with time. This will reduce the changes the geotechnical and hydrogeological attributes, for example; increased runoff. The use of impermeable material is an inevitable direct effect to some extent of most types of construction particularly in greenfield sites. However this will be mitigated by reducing the area of sealed soil to a minimal.		
MM54	Peat Management	Chapter 8 Soil and Geology	8.5.2.3 Land Take – Wind Farm	The Development footprint (wind farm) will require c. 32.37 ha in total, considering the area of the existing infrastructure (7.26 ha) the Development will require an additional c. 25 ha of land take to facilitate the construction of hardstands, widening Site tracks,		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				and cut and fill associated with same. This implies that, relative to the area of the Site, the magnitude of the impact of land take equates to approximately 3.73% (Small), that is; this is considered a likely, direct, negative, localised, permanent effect of the Development. Considering the effect conforms to baseline the significance is classified as moderate at a localised scale (conforms to existing or emerging baseline trends), and the weighted significance is Slight.		
MM55	Peat Management	Chapter 8 Soil and Geology	8.5.2.4 Land Take – Hydrogen Plant	The Site footprint is c. 7.59 ha, however the site area is c. 6.5ha which will involve the infrastructure for the Hydrogen plant such as Contractor Compound and Welfare Facilities, storage facilities for chemicals, underground water tanks, battery storage, substation etc. Relative to the area of the Site, the magnitude of the impact of land take equates to approximately 85% (Large), that is considered a likely, direct, negative, localised permanent effect of the Development. That is; land being used as agricultural pastures currently will be replaced by the Hydrogen Plant. The extent of land take will correlate with the footprint of the proposed Hydrogen Plant with the exception of existing drainage and the increased excavation foot print required for safe excavation practices.		
MM56	Peat Management	Chapter 8 Soil and Geology	8.5.2.5 Subsoil and Bedrock Removal or Disturbance	**Mitigation by Avoidance** The removal of peat and mineral subsoil / bedrock is an unavoidable impact of the Projects but every effort will be made to ensure that the amount of earth materials excavated is kept to a minimum in order to limit the impact on the geotechnical and hydrological balance of the Sites. This has been done initially through a process of "mitigation by avoidance" whereby the proposed hydrogen plant and infrastructure layout, and proposed turbines was dictated to a large degree by the existing		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				infrastructure, peat depth and the topography, locating turbines in areas where the existing infrastructure is utilised, peat is shallow, and the topography is favourable. Similarly, engineered cut and fill extents which have been designed will minimise the volumes of subsoils to be removed either directly by excavation (turbine foundations) (underground water tanks) or as a function of cut and fill requirements (hardstands) (swale to south of hydrogen plant to an extent). Although the removal of peat is unavoidable, it will be minimised through the use of floating tracks at some locations, namely the portion of new access track central to the site (orientated north south directly west of T10, **Figure 8.1a**) Riparian zones and / or 25m surface water buffer zones will be maintained, in line with relevant forestry guidance. This includes minimising impacts during design and construction of surface water crossings, and maintaining the 25m riparian zone in afforested areas including commercial forestry, in line with relevant guidance. Mitigation measures have been set out in the **Appendix 2.1 CEMP** where this is not possible. **Mitigation by Good Practices** **Wind Farm** Excavation of peat in areas where there is >1.0m in peat depth will follow appropriate engineering controls such as the drainage of the peat along the proposed Site tracks in advance of excavation activity (1 month in advance where possible) so as to reduce pore water content and thus instability of the peat substrate prior to excavation. Such drains will be positioned at an oblique angle to slope contours to ensure ground stability. Drains will not be positioned parallel to slope contours. This		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				drainage will be attenuated prior to outfall (**Chapter 9: Hydrology and Hydrogeology**). It is noted that peat depth at the site is generally shallow and management of saturated peat will be required at relatively few locations. In those parts of the Site where excavation may intercept areas of peat that are >1.0m depth, a geotechnical engineer/engineering geologist will be onsite to supervise and manage the excavation works and confirm the necessity for supporting newly excavated peat exposures or redirect initial construction phase drainage to maintain ground stability. For side walls in all excavations a safe angle of repose will be established. This will ensure the potential for side wall collapse will be minimised. For peat, the safe angle of repose is approximately 15°, which equates to a c. 10m horizontal distance if excavating to 2.5m depth, however given the quality of the peat, and the potential residual water content after pre excavation drainage works, or increased water content following heavy rainfall events, there remains a risk of localised stability issues arising in areas of deeper peat. Therefore, for excavation in areas of deeper peat (>2.0m) and for any areas adjacent to peat areas with increased sensitivity (e.g. wet peat areas or adjacent SAC areas identified in Chapter Biodiversity) excavation supports will be used and this will be incorporated into the CEMP for the Development, for example; temporary sheet piling, or similar. This will minimise the effect of excavation to the minimum required. Areas of the site where deeper (>2.0 m) peat was detected during site surveys are presented in **Figure 8.7a.** Similarly, the safe angle of repose for subsoils at the Site (GRAVELS), or any other material (e.g. crushed rock) arising at the site must also be considered and similar consideration and mitigation applied respectively.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Adopting good practices, planning ahead and real time monitoring in more sensitive (>1m peat depth, **Figure 8.7a**) areas will ensure that any excavations associated with the Development will have minimal impact, that is; the risk of the activity of excavation having an increasing or variable impact will be reduced. Similarly, application of the above mitigation measures will reduce the risk of stability issues arising at a localised scale. **Hydrogen Plant** Where necessary, dewater excavations. Store soil locally for backfilling and re-use **Chapter 2 Section 2.6.15**. The interface mast foundations will be backfilled one leg at a time with the material already excavated at the location. The backfill will be placed and compacted in layers. All dimensions will be checked following the backfilling process. Excavations for the proposed Hydrogen Plant as outlined in **Section 8.4.3.2** includes underwater storage tanks and foundation structures as well as trenches for single circuit sections of UGC; HDPE power and communications ducts to be installed. Dirty water that forms due to excavations will be fully and appropriately attenuated, through silt bags, before being appropriately discharged to swale vegetation areas or surface water drainage feature. A Geotechnical Engineer will complete daily monitoring of excavations during the construction phase. If high levels of seepage inflow occur, excavation work will immediately be stopped and a geotechnical assessment undertaken. Drainage at the proposed Hydrogen Plant location is limited to		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				approximately 3 no. field drains, an area of cutover, boggy peat adjacent to the south of the Hydrogen Plant Site boundary and the Dooyeaghny_or_Cloonloughan_010 River which runs 70 m at the closest point along the south of the Site. Drainage measures will be provided to attenuate runoff on both Sites, guard against soil erosion, soil compaction, and safeguard local water quality. Details of the drainage system are shown on drawing **no 410135-3000-G1000** and outlined in detail in the Surface Water Management Plan, part of the **CEMP (Appendix 2.1)**. Full details are provided in **Chapter 9: Hydrology and Hydrogeology.** **Mitigation by Reduction** Apart from the measures taken in the design phase of the Developments (avoiding the need for and reducing volumes of subsoils to be removed) there are no other reductive mitigation measures in terms of subsoil and bedrock removal, that is; the layout of these Developments minimise the impact of subsoil and bedrock removal in so far as practical, without compromising or reducing the Developments themselves. **Mitigation by Reuse** Subsoil and bedrock which are excavated as part of the initial decommissioning and construction phases of the Developments and will be reused onsite where possible. Bedrock material arising at the Sites will be reused as fill material where applicable, and access tracks. Excess bedrock will be reused as backfill in areas previously excavated, or as backfill in cut and fill operations. Using the local geology as fill will ensure that impacts to hydrochemistry are minimised.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Geotechnical testing on imported material from neighbouring quarry, will be carried out prior to its reuse onsite for both developments, particularly for reuse as a running or load bearing surface and will only be reused for those purposes if the suitability of same is conforms to relevant standards. Useful guidance in this regard include; • Good Practice during Wind Farm Construction (SNH, 2015) • Notes for Guidance on the Specification for Road Works Series NG 600 – Earthworks (TII, 2013) • Constructed tracks in the Scottish Uplands (SNH, 2015) On the Wind Farm Site, peat material excavated will be reused as backfill in areas previously excavated as much as possible, and/or for reinstatement works elsewhere on the Sites. To facilitate this the acrotelm (living layer) and the catotelm (lower layer) will be treated as two separate materials. Catotelm peat will be used to backfill, for example; around turbine foundation pads once established. Acrotelm peat will be used as a dressing on top of deposited catotelm peat in order to promote and re-establish flora and ensure the acrotelm layer becomes relatively cohesive in terms of localised peat stability (vegetated), **Appendix 9.6 Conceptual Graphics.** Temporary storage areas identified on the Wind Farm are outlined in **Figure 8.8a,** and have avoided associated constraints (presented in **Figure 8.8b),** for example avoiding buffer zones of sensitive receptors, i.e. T4 and T13. Both, all soil and subsoil types or horizons identified during actual construction phases will be treated as separate materials and arisings separated accordingly. This includes, for example; Acrotelm peat, catotelm peat, subsoils (/TILL), weathered rock.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				The management, movement, and temporary stockpiling of material on both the Wind Farm and Hydrogen Plant sites will be detailed in the CEMP, this will include identification of suitable temporary set down areas which will be located within the development footprint and will consider and avoid geo-constraints identified in this report (**Figure 9.12a-b**). Temporary set down / stockpile areas will be considered similarly to active excavation areas in terms of applying precautionary measures and good practices, and mitigation measures, including those relating to control of runoff and entrainment of suspended solids (**Chapter 9 – Hydrology & Hydrogeology**). **Mitigation by Remediation** The mitigation measures listed above, namely backfilling with peat in layers, are in effect remediation measures, whereby the impact of required excavation works are remediated and limited to the extent of the actual proposed infrastructure. Excess subsoils and bedrock will be used for remediation and reinstatement purposes elsewhere on the Sites, including areas already impacted by peat cutting and agricultural activities, eroded or degraded areas, for example, reinstating original ground level in areas of cut peat and/or damming drains in peat areas **(Figure 8.8a and 8.8b).** Mitigation measures outlined here will ensure the impacts arising from excavation activities are minimised to the footprint of the Developments, and improve some other degraded areas of the Sites, thus minimising (Hydrogen Plant) or offsetting (Wind Farm) the adverse impacts of the Developments. It is recommended that the ongoing destructive agricultural and peat cutting practices within the Developments footprint ceases for the lifespan of the project, for example; the cutting of peat		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				and soils and the installation of drainage features at the site. With reference to **Chapter 9: Hydrology & Hydrogeology**, drainage features adjacent to the Development footprint will be designed and / or modified to include appropriate attenuation features and buffered outfalls etc.		
MM57	Peat and Soil Management	Chapter 8: Soils and Geology	8.5.2.6 Storage of Stockpiles	**Mitigation by Avoidance and Good Practice** As discussed in previous sections, excavation of materials on both Sites is unavoidable however the impacts of same can be minimised if managed appropriately. Similarly, given that excavations are unavoidable, so too are temporary stockpiles, however if managed appropriately the impact of same can be minimised. Stockpiles will be restricted to less than 2 m in height and located outside of the surface water buffer zones. All stockpiling locations will be subject to approval by the Site Manager and Project Ecological Clerk of Works (ECoW). No permanent stockpiles will remain on either of the Sites. All excavated materials from the Sites or introduced materials for construction will be either used or removed from the Sites. All stockpiles will be covered with geotextiles layering to protect against water erosion and runoff in rainy weather, and/or cessation of works in certain areas such as working on a high gradient during wet and windy weather. **Wind Farm** No temporary stockpiles will be positioned or placed on peat. All temporary stockpiles will be positioned on established and existing hardstand areas. No temporary stockpile placed on established hardstands within 150m surface water buffer zones or 15m from artificial drainage, or in areas of deeper peat, will be in excess of 1m in height. This is due to potential localised stability issues in relation to the peat in the vicinity of the stockpile, discussed in the following sections of this Chapter.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				As discussed in **EIAR Chapter 9 - Hydrology and Hydrogeology**, stockpiling of material will invariably lead to the entrainment of solids in surface water runoff. Mitigation measures to address same are detailed in **Chapter 9**, however it is recommended that the CEMP incorporates a Materials Management Plan which facilitates the near immediate reuse of material in so far as practical, thus reducing the potential for temporary stockpiles in general. For example; the material arising from the first excavation is deposited in areas identified as having potential for restoration or requiring fill, the material arising from the second excavation is used as fill and reinstatement material in the first excavation location, etc **Mitigation by Reduction** The volume of material to be managed including temporary stockpiling is directly proportional to the volumes of material required to be excavated on the Sites, however if managed appropriately the volume of material to be managed at any particular time can be dramatically reduced. A Materials Management Plan, forming part of the CEMP, will be established for the Sites to identify volumes and types of materials arising, temporary stockpiling locations, routes for reuse and remediation, requirements in terms of logistics and considerations in terms of timing and planning of movements of material. The Materials Management Plan will ensure that the material arising from any excavation will have a predetermined plan and route for re-use / remediation, or disposal if all potential for reuse / remediation have been exhausted.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
MM58	Peat and Soil Management	Chapter 8: Soils and Geology	8.5.2.7 Vehicular Movements	**Mitigation by Avoidance and Good Practice** Vehicular movements will be restricted to the footprint of the Developments, and advancing ahead of any constructed hardstand will be minimised in so far as practical, for example; excavation ahead of established hardstands will be in line with expected phases of hardstand and track construction in terms of both delivery of and installation of material and site activity periods whereby excavations will not be opened ahead of site shut down periods. This will be done with a view to minimising soils / subsoils exposure to rain and runoff. Ancillary machinery will be kept on established hardstands and no vehicles will be permitted outside of the footprint of the Developments, and will not move onto land that is not proposed for the Developments if it can be avoided. Where vehicular movement are necessary outside of the developments footprint, ground conditions will be maintained as well as possible. This includes for example; replacing sods, smoothing over with excavator bucket etc. Where ground conditions are poor, or prolonged works, temporary access measures will be deployed, for example; floating platforms / floating access track. Adhering to the mitigation measures described here will minimise the adverse impacts posed by vehicular movements, and ultimately any impacts arising will be temporary considering the initial decommissioning and construction of the Developments will in effect reverse any impact by vehicular movement within the footprint of the Developments. Mitigation measures are specified in the Construction Environmental Management Plan (CEMP).		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
MM59	Peat and Soil Management	Chapter 8: Soils and Geology	8.5.2.8 Ground Stability	**Mitigation by Avoidance and Good Practice** Peat and slope stability investigations at both Sites (**Figure 8.6 a-b. Figure 8.7a-b**) indicate that the Site has a generally low risk probability with respect to slope failure under the footprint of the Developments. The investigation includes some key limiting factors and assumptions which should be noted: • The area assessed is in line with the footprint of the Developments. • The assessment 'worst case scenario' assumes a maximum of 1m fill, that is; stockpiles are limited to 1m height. Considering the assessment conclusions are related to the footprint of the Developments and initial decommissioning and construction activities including vehicular movements will be limited to the footprint of the Developments, areas of potentially high risk (GSI landslide susceptibility) in terms of peat and slope stability will be avoided. Temporary stockpiles will be limited to 2m height in sensitive areas, and removed for reuse/remediation purposes or disposed offsite as soon as possible. It is envisaged that all material will be reused on site, unless obviously contaminated. Therefore, the risk posed by the management of material in terms of peat and slope stability is dramatically reduced if not avoided completely. Furthermore, with a view to applying the precautionary principle, the following procedures will be adopted as best practice mitigation measures at the Sites. • All Site excavations and construction will be supervised by a geotechnical engineer/engineering geologist. • The contractor's* methodology statement and risk assessment will be in line with the Construction		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Environmental Management Plan and will be reviewed and approved by a suitably qualified geotechnical engineer/engineering geologist prior to Sites operations. (*Contractor here refers to the chosen or contracted construction company at the commencement stage of the proposed development). • Particular attention and pre-construction assessment (developer / sub-contractor site specific risk assessment and method statement (RAMS) and on site toolbox talks etc.) and mitigation planning will be given to any new infrastructure, for example; the proposed Site tracks, culverted watercourse crossing and hardstand associated with proximal geo-hazards including for example T2, T3 and T13 which are above particularly sensitive areas of the site as discussed in the attached SI report (**EIAR Chapter 8 - Appendix 8.7**), and as presented in constraints maps (**EIAR Chapter 8 – Figure 8.11**) • Any excavations that have the potential to undermine the up-slope component of a peat and / or unstable subsoil slope will be sufficiently supported by buttress, frame or rampart to resist lateral slippage. To this end, all new turbine foundation excavation locations will incorporate a safe angle of repose, however with a view to minimising the impact of the Development Excavation in peat of >1m depth will be supported by a restraining / support wall during the construction phase. • In such excavations, the groundwater level (pore water pressure) will be kept low at all times (excavation dewatering) to avoid ground stability risks (subsidence) associated with peat and careful attention will be given to the existing drainage and how structures might affect it. Draining water from the construction area will be done through		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				advanced dewatering techniques. In particular, ponding of water will not be allowed to occur in recent excavations, particularly in any areas encountered where peat is >1m. All deliberate or incidental sumps will be drained to carry water away from the sump following rainfall. Otherwise, this water will increase hydraulic heads locally (or increased bog water or groundwater levels), increase pore water pressure and can potentially lead to instability. • In areas of saturated peatlands on the Wind Farm, prior to excavation, drains will be established to effectively drain grounds prior to earthworks. Such drains will be positioned at an oblique angle to slope contours to ensure ground stability. Drains on areas of the Site with minimal risk of bog failure as identified by Site investigations will be positioned at a more acute angle to the slope contour in order to reduce the velocity of surface water drainage. It is noted that deeper (>2.0 m) peat at the site is generally confined to isolated pockets and the need for 'heavy duty' measures such as sheet piling is very low. • Due to peat's fluid-like properties, all peat excavated will be immediately removed from sloping areas. Peat will be carefully managed particularly when in temporary storage. Temporary storage areas will be isolated from the receiving environment by means of temporary infrastructure such as boundary berms comprised of subsoils sourced at the site, or similar material. There is potential for large volumes of bog water draining from new stockpiles which will also be managed. Mitigation will include removal of gross solids from runoff prior to bog water intercepting the wind farm drainage network. Temporary measures such as dewatering and pumping through silt bags will be employed to assist this process. Draining of stockpiled peat, in a controlled manner		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				is recommended with a view to reducing the weight and mobility of the material, therefore reducing risk in terms of localised stability. Similar measures will be applied to the management of subsoil arisings at the site. • Peat is required for reinstatement, therefore acrotelm peat (top living layer, c. 0.5m) will be stripped off the surface of the bog and placed carefully at the margins of the Development along the Site track and hardstand margins that are characterised by near-horizontal slopes (<6°). • Relatively high impact construction activities (e.g. excavations, movement of soils / subsoils / rock) will be limited to the spring to autumn period as this period is considered to be the optimal seasonal period in terms of likely rainfall conditions, low soil moisture deficit (SMD), and relatively stable pore water pressure conditions (not withstanding excessive human interference of pore waters). However, it should also be noted that the hypothesis of the spring to autumn period being optimum in terms of dry metrological conditions is based on 30 year average data, and in reality 30 year max rainfall events are observed to be significant throughout the year over the 30 year period (**EIAR Chapter 9 - Hydrology and Hydrogeology**). Therefore, considering the variability of metrological conditions and the potential for significant events to occur at any stage of the year, the construction phase will be limited to favourable meteorological conditions. Construction activities will not occur during periods of sustained significant rainfall events, or directly after such events (allowing time for work areas to drain excessive surface water loading and discharge rates reduce). • From examination of factual evidence to date, the majority of landslides occur after an intense period of rainfall. Stability		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				issues at a localised scale will be similarly impacted by rainfall events, particularly when dealing with exposed soils or open excavations. An emergency response system will be developed for the construction phase of the project, particularly during the early excavation phase. This, at a minimum, will involve 24-hour advance meteorological forecasting (Met Eireann download) linked to a trigger-response system. When a pre-determined rainfall trigger level is exceeded (e.g. one in a 100-year storm event or very heavy rainfall at >25mm/hr), planned responses will be undertaken. These responses will include; cessation of construction until the storm event including storm runoff has passed over. Following heavy rainfall events, and before construction works recommence, the Site will be inspected and corrective measures implemented to ensure safe working conditions, for example; dewatering of standing water in open excavations, etc. • Any impact to the hydrological and/or hydrogeological regime will be avoided as far as practical in relation to identified Geo-Hazards (**Figure 9.12a Figure 9.12b**) where the presence of steep inclines, deep till deposits and iron pan give rise to elevated ground stability, particularly where the potential for impacts to hydrogeology in those area / subsoils exists. For example; runoff from constructed hardstands will not be diverted and discharged into Geo-Hazard areas where possible. If unavoidable, due to slope direction etc., erosion control will be implemented in so far as practical, as discussed under **EIAR Chapter 9 – Hydrology & Hydrogeology.** *Mitigation by Reduction* • The temporary storage of construction materials, equipment, and earth materials will be kept to an absolute minimum		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				during the construction phase of the Developments. This will be achieved by means of appropriate planning and logistical considerations forming part of the CEMP, similar to the measures set out in relation to the management of spoil on the Site. • For example; the excavation material for the construction of access track will not progress ahead of actual track construction (as discussed under mitigation addressing vehicular movements), therefore minimising the volume of arisings to be managed. Areas for permanent deposit of material e.g. backfill adjacent to constructed infrastructure, will be identified and suitable material deposited as it becomes available. These efficiencies will be designed into the detailed CEMP. • The Hydrogen Plant Site Temporary Construction Compound will be positioned where the Hydrogen Tube Trailer parking is proposed. *Mitigation by Remediation* • There are no indications of significant issues on the Sites in terms of ground stability, however excavation and construction activities will lead to some impacts with respect to the immediate area adjacent to the development footprints and areas impacted by potential localised stability issues. In these instances, remediation of soils will include the deposit of suitable material where required. This will include replacement of soils / subsoils in line with baseline conditions. For example on the Wind Farm Site; the three principal materials excavated in order of depth will include peat / peat soil (including segregated acrotelm (top living layer) and catotelm peat) or topsoil at the surface, till, and crushed rock. Remediated areas will be managed and monitored in terms of reestablishment of vegetated cover.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				In the unlikely event that a peat or slope stability issue does arise on the Site during the construction or operational phases of the Development, given the variable potential extent of associated impacts, remediation will be assessed, prescribed and monitored by a suitably qualified geotechnical engineer/engineering geologist on a case by case basis.		
MM60	Peat and Soil Management	Chapter 8: Soil and Geology	8.5.2.8.4 Emergency Response	Mitigation measures as outlined in the previous sections will reduce the potential for stability issues arising during the initial decommissioning and construction phase of the Developments. However, there remains a low risk of stability issues arising, particularly at a localised scale. Emergency responses to potential stability incidents will be established and form part of the CEMP before construction works initiate. The following potential emergencies and respective emergency responses are addressed in brief: • Peat stability issues at a localised scale during excavation works – In the event that soil stability issues arise during construction activities, all ongoing construction activities at the particular area of the Site will cease immediately, the assigned geotechnical supervisor will inspect and characterise the issue at hand, corrective measures will be prescribed. • Significant peat or slope stability issues during construction activities – In the unlikely event that soil and slope stability issues arise during construction activities, all ongoing activities in the vicinity will cease immediately, operators will evacuate the area by foot, the assigned geotechnical supervisor will inspect and characterise the issue at hand, corrective measures will be prescribed. Considering the highly dynamic nature of peat or soil stability issues at any particular site, it is important to establish an		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				equally dynamic yet robust framework to follow in the event of an incident. Establishment of an emergency framework will follow relevant guidance to initially qualify any incident (by on site competent geotechnical engineer) and risk assess the area, and to then apply initial measures and design a complete emergency / contingency plan in line with an established structured emergency response. Relevant guidance includes: • Forestry Commission, Scotland (2006) Guidelines for the Risk Management of Peat Slips on the Construction of Low Volume / Low Cost Roads Over Peat • CIRIA (2006) Control of water pollution from linear construction projects. Site guide (C649)). The principal receptor and pathway for impacts associated with stability. Emergency response will prioritise isolating and containing any materials which is being or will be intercepted by the established drainage network or receiving surface water network. Emergency materials and equipment requirements will be identified, incorporated in the CEMP, and will be managed on site with a view to be being easily accessible and readily available. On site training and toolbox talks will ensure any response to any potential incident is escalated quickly and efficiently. The combination with mitigation measures as described under **EIAR Chapter 9 - Hydrology and Hydrogeology** whereby precautionary measures e.g. silt screen fencing etc. will be in place. Emergency response above existing or in place measures might include crudely building dams with an excavator to attenuate or direct flow until conditions stabilise, depositing subsoil or crushed rock material to dam drainage channels, and reactionary dewatering through silt bags to appropriate areas of the site i.e. vegetated area and without impacting on problem area in terms of stability.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
MM61	Peat and Soil Management	Chapter 8: Soils and Geology	8.5.2.9 Soil Contamination	Any accidental spillage of introduced materials, such as concrete, will be removed from the Sites. Soil contamination, or the potential for same, is an inherent risk associated with any development. As such, good practice during construction activities, as detailed in the CEMP, will address and minimise the potential for soil contamination to occur. The CEMP will be developed to include the scheduled checks of assets (plant, vehicles, fuel bowsers) on a regular basis during the construction phase of the Development. The purpose of this management control is to ensure that the measures in place are operating effectively, prevent accidental leakages, and identify potential breaches in the protective retention and attenuation network during earthworks operations. In addition, all such management plans will be revised as 'live' documents, so that lessons learned and improvements will be made over course of the Developments. **Mitigation by Avoidance and Good Practices** **Release of Hydrocarbons** Contaminants which pose the most significant risk to soils, namely hydrocarbons and construction materials such as cement / concrete, pose an even greater risk to surface waters and groundwaters. In the event an accidental discharge were to occur without mitigation, contaminates will likely leak or be spilled on soils initially. Protecting soils from such will in turn mitigate against the potential for contaminates reaching the hydrological network associated with the Site, however given that such features are fundamental to the potential effect of contaminants down gradient of surface water receptors, mitigation measures for contaminants are presented in detail in **Chapter 9: Hydrology and Hydrogeology.** To control and contain any potential hydrocarbon or other harmful substance		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				spillages by vehicles during construction, it is recommended where possible to refuel plant equipment off the development site, thus mitigating this potential impact by avoidance. Where fuelling offsite is impractical (e.g., bulldozers, cranes, etc.) and fuelling must occur on Site, all oil and chemical storage facilities will be bunded to 110% volume capacity of fuels stored at the site. A "fuel station" will be designated for the purpose of safe fuel storage and fuel transfer to vehicles, located at the Temporary Contractor's Compound. Furthermore, a Emergency Response Plan will be in place as part of the Construction and Environment Management Plan (**Appendix 2.1**) before consented works are carried out. As discussed, construction activities will be restricted to the footprint of the Developments, therefore the potential for contaminants reaching soils is likely limited to the footprint of the Developments or construction area. There remains the potential for contaminant migration through soils however, scope for migration is limited considering the site geology i.e., peat / loamy soil with low permeability and transmissivity rates, and similarly poorly productive bedrock aquifers with only localised connectivity. The highest permeability and transmissivity rates at the Sites are attributed to the underlying till / gravels. It is also noted that the scale of any potential contamination impact will likely be minor in scale, for example; plant machinery leak (on exposed ground), as opposed to a fuel tank rupture (in bunded structure). A fuel management plan will be prepared (and included in the CEMP) which will incorporate the following elements: • Mobile bowsers, tanks and drums will be stored in secure,		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				impermeable storage area, away from drains and open water; • Fuel containers will be stored within a secondary containment system e.g., bund for static tanks or a drip tray for mobile stores • Ancillary equipment such as hoses, pipes will be contained within the bund • Taps, nozzles or valves will be fitted with a lock system • Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage • Only designated trained operators will be authorised to refuel plant on Sites. In the event of an accidental spill during the construction, operational or decommissioning phase of the Development, contamination occurrences will be addressed immediately, this includes the cessation of works in the area of the spillage until the issue is resolved. In this regard, appropriate spill kits must be provided across the site to deal with the event of a spillage and made available at all times. Spill kits will contain a minimum of; oil absorbent granules, oil absorbent pads, oil absorbent booms, and heavy-duty refuse bags (for collection and appropriate disposal of contaminated matter). Staff will be trained in their use and details of personnel and location and type of spill kits will be listed in the CEMP (**Appendix 2.1**), which will be updated by the selected site Contractor. No materials contaminated or otherwise will be left on the Site. Suitable receptacles for hydrocarbon contaminated materials will also be at hand. Upon usage, spill kits will be promptly replaced. The mitigated effects associated with hydrocarbons is considered to be **neutral and temporary**.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Release of Wastewater Sanitation Contaminants A temporary compound area (**Figure 8.1a**) will be constructed on-site for the Wind Farm to contain temporary facilities for the construction phase including 'port-a-cabin' structures. The Temporary Construction Compound will be constructed on a base of geo-textile matting laid at ground level. This will be stabilized with the laying of hardcore material on top. During the construction phase, foul effluent will be periodically removed for offsite disposal. The Hydrogen plant will consist of permanent on-site 110 kV Hydrogen Plant Substation including 2 no. control buildings with welfare facilities, and wastewater holding tank. The two wastewater streams will initially be dealt with separately. Welfare wastewater will be run through a septic tank, and then through a welfare constructed wetland (WCW). The WCW will be positioned in the northeast corner of the site and will be approximately 80 m^2 to facilitate the required retention time of c. 12 days to adequately treat the welfare effluent loading. Wastewater/sewerage from the staff welfare facilities located in the Temporary Construction Compound (Wind Farm) and Operational Compound which is located in the trailer parking area (Hydrogen plant) 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. Chemicals are likely to be used to reduce odours. All wastewater will be emptied periodically, tankered off-site by a licensed waste collector to the local Ballina wastewater sanitation plant for treatment. There will be no onsite treatment		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				of wastewater. A wastewater or sewerage leakage is not anticipated in a properly managed Site. The mitigated effects associated with wastewater and sewerage on the Wind Farm Site is considered to be **slight**, **temporary** and **neutral**. The mitigated effects associated with wastewater and sewerage on the Hydrogen Plant Site is considered to be **slight**, **permanent** and **neutral**. **Release of Construction and Cementitious Materials** In order to mitigate the potential impact posed by the use of concrete and the associated effects on surface water in the receiving environment, the following precautions and mitigation measures are recommended as outlined in the CEMP: Precast concrete will be used wherever possible i.e., formed offsite. Elements of the Developments where the use of precast concrete is not possible includes Turbine Foundations. Where the use of precast concrete is not possible the following mitigation measures will apply: • Lean mix concrete, often used to provide protection to main foundations of infrastructure from soil biome, will be minimized, limited to the requirement of turbine foundations if necessary. Lean mix concrete can alter the pH of water if introduced, which would then require the treatment of acid before being discharged to the surrounding environment. The risk of runoff will be minimal, as concrete will be contained in an enclosed, excavated area. • The acquisition, transport and use of any cement or concrete on site will be planned fully in advance of commencing works by the Contractor's Environmental Manager and supervised at all times by the Developer appointed Environmental Clerk of Works (EnvCoW).		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• There will be no excess cementitious material on the vehicle which could be deposited on trackways or anywhere else on site. To this end, delivery trucks, tools and equipment will be cleaned at designated washout areas located within site compound and within a controlled area of the Site. Vehicles will undergo a visual inspection prior to being permitted to drive onto the proposed site or progress beyond the contractor's yard. In addition, the following drainage measures will apply: • Any shuttering installed to contain the concrete during pouring will be installed to a high standard with minimal potential for leaks. Additional measures could be taken to ensure this, for example the use of plastic sheeting or other sealing products at joints. • Concrete will be poured during periods of minimal precipitation. This will reduce the potential for surface water run off being significantly affected by freshly poured concrete. This will require limiting these works to dry meteorological conditions i.e., avoid foreseen sustained rainfall (any foreseen rainfall event longer than 4-hour duration) and/or any foreseen intense rainfall event (>3mm/hour). This also will avoid such conditions while concrete is curing, in so far as practical. • Ground crew will have a spill kit readily available, and any spillages or deposits will be cleaned/removed as soon as possible and disposed of appropriately. • Pouring of concrete into standing water within excavations will not be undertaken. Excavations will be prepared before pouring of concrete by pumping standing water out of excavations to the buffered surface water discharge systems in place.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• No surplus concrete will be stored or deposited anywhere on site. Such material will be returned to the source location or disposed of off-site appropriately. Elements of the Developments where precast concrete will be used will be identified in the CEMP, e.g., structural elements of watercourse crossings (single span / closed culverts) as well as cable joint bay structures. Supplementary mitigation measures outlined in **Chapter 9: Hydrology and Hydrogeology** to surface water receptors will also apply. The mitigated effects associated with construction waste is considered to be **slight** and **neutral**. **General Waste** All construction and operation waste materials will be correctly sorted, recycled or disposed of accordance with good site practice and in accordance with the Site Management Plans. A policy of Prevent, Reduce, Reuse and Recycle will apply. The mitigated effects associated with general waste is considered to be **slight**, **temporary** and **neutral**. **Mitigation by Reduction** The potential for contaminants will be reduced by managing the importation and mobilisation of equipment and materials associated with the Development, as follows: • Excess packaging and other materials will be discarded appropriately at the Temporary Construction Compound before advancing to the destined construction area. • Any vehicles coming onto the Site will be required to be inspected and cleaned before leaving the Temporary Construction Compound and before advancing to the		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				destined construction area. • Precast concrete will be used wherever possible i.e. formed offsite. Elements of the Development where precast concrete will be used have been identified and are indicated in the CEMP. Elements of the Development where the use of precast concrete will be used include e.g. structural elements of watercourse crossings (single span / closed culverts). Elements of the development where the use of precast concrete is not possible includes e.g. turbine foundations. Where the use of precast concrete is not possible the following mitigation measures outlined in **EIAR Chapter 9 – Hydrology and Hydrogeology** will apply. **Mitigation by Remediation** Mitigation by remediation, for example; housekeeping, maintenance etc, in terms of waste or contaminants will be an ongoing measure throughout the construction phase of the Development, that is; any and all contaminants will be removed from the Site in an appropriate manner when ever produced or observed. Ongoing remediation measures are specified in the CEMP. **Emergency Response** Mitigation measures as outlined in the previous sections will reduce the potential for soil contamination during the construction phase of the Developments. However, there remains the risk of accidental spillages and or leaks of contaminants onto soils. Emergency responses to potential contamination incidents will be established and form part of the Construction Management		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Plan before construction works initiate. Potential emergencies and respective emergency responses are assessed below: • Hydrocarbon spill or leak – Hydrocarbon contamination incidents will be dealt with immediately as they arise. Hydrocarbon spill kits will be prepared and kept in vehicles associated with the construction phase of the Development. Spill kits will also be established at proposed construction areas, for example; a spill kit will be established and mobilised as part of the turbine erection materials and equipment. Suitable receptacles for hydrocarbon contaminated materials will also be at hand. • Significant hydrocarbon spill or leak – In the event of a significant or catastrophic hydrocarbon spillage, emergency responses will be escalated accordingly. Escalation can include measures such as; installation of temporary sumps, drains or dykes to control the flow or migration of hydrocarbons; excavation and disposal of contaminated material. Any such measures will be reviewed by appropriate consultants, however considering that collector drainage (Chapter 9: Hydrology and Hydrogeology) will be established prior to construction activities, the need for drainage as an emergency response will be limited, however 'dig and dump' remediation processes will likely be required. • Cementitious material – Cement / concrete contamination incidents will be dealt with immediately as they arise. Spill kits will also be established at proposed construction areas, for example; a spill kit will be established and mobilised as part of the turbine erection materials and equipment. Suitable receptacles for cementitious materials will also be at hand. Emergency contact numbers for the Local Authority Environmental Section, Inland Fisheries Ireland, the		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Environmental Protection Agency and the National Parks and Wildlife Service will be displayed in a prominent position within the vicinity of works. Additionally, emergency responses, including methodologies, will be specified in the CEMP. In the event of a significant contamination or polluting incident e.g. discharge or accidental release of hydrocarbons / fuel to surface water systems, the relevant authorities, noted above and stakeholders will be informed. Refer to **Chapter 9: Hydrology & Hydrogeology** for further information.		
MM62	Peat and Soil Management	Chapter 8: Soils and Geology	8.5.2.10 Material and Waste Management	All excavated earth materials will either be re-used in an environmentally appropriate and safe manner e.g. landscaping and bog restoration OR removed from the Sites at the end of the construction phase. No permeant stockpiles will be left on the sites. Any surplus of natural materials (e.g. peat) to be used as backfill or deposited elsewhere in the Wind Farm Site will not be deposited to above existing ground level for the area in question. This ensures that peat used as backfill around newly established turbine foundations will not exceed local ground level, and any peat or natural materials deposited elsewhere, for example peat cutting areas, will not exceed original ground level. In essence, no permanent stockpiles will be established as a product of the construction phase of both Developments, or associated restoration activities. Any excess introduced natural (road building materials) or artificial (PVC piping, cement materials, electrical wiring etc.) will be taken offsite and disposed of appropriately at the end of the construction phase.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Any accidental spillage of introduced materials, such as concrete, will be removed from the Sites. The CEMP will include scheduled checks on equipment, materials storage and transfer areas, drainage structures and their attenuation ability (covered in greater detail in the Hydrology chapter of this report) on an ongoing / daily basis during the construction phase of the project. The purpose of this management control is to ensure that the measures in place are operating effectively, prevent accidental leakages, and identify potential breaches in the protective retention and attenuation network during earthworks operations. In addition, all such management plans will be revised as 'live' documents, so that lessons learned and improvements will be made over course of the Developments. It is noted that the developments intend to reuse all surplus excavated material at the sites, however in the event of waste arising at the sites, management of waste from the construction phase of the Developments will require classification, appropriate transfer, and appropriate disposal. Surplus excavated material from the Hydrogen Plant Site will be disposed of to a licensed facility. Waste streams will vary and will include the following potential categories: • Inert Soils & Stones (EWC Code: 17 05 04) – greenfield subsoils and bedrock is likely to be Inert. This could include surplus coarse / hardcore aggregate contaminated with soils remaining at the end of the construction phase of the development. • Hazardous Soils & Stones (EWC Code: 17 05 03*) or oily waste (spill kit consumables) – Soils or any materials with significant hydrocarbon contamination will likely be		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				hazardous due to Total Petroleum Hydrocarbon concentrations. Soils impacted by significantly by cementitious material contamination will likely be hazardous due to elevated pH concentrations. Given the potential range of waste streams, and considering waste streams must not be mixed or blended onsite, the management of such potential waste streams is important so as to not contaminate otherwise clean or Inert materials, therefore designated areas for temporary storage of such wastes will be provided. Materials and waste management practices will be specified and detailed in the CEMP/CWMP.		
MM63	Peat and Soil Management	Chapter 8: Soils and Geology	8.5.2.11 Clear Fell of Forestry – Wind Farm	No new impacts or remediation measures are associated with forestry activities. However, good practices working in specific environments such as forested areas will be adhered to including: • working outside of surface water or other buffer zones, • risk assessing on a case by case basis in terms of drainage intercepting run off, ecological sensitivities, etc. • All drains crossed during extraction, if necessary, will be cleared of any debris to ensure no drainage issues will occur for the remining trees, which can be a major attributor to windblow. • Felling and extraction of timber will be undertaken in dry weather conditions. The maximum use possible has been made of existing forest tracks and firelines, thereby minimising the areas of forestry that will be lost in the construction of access tracks.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
MM64	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.2 Earthworks Proposed Mitigation Measures	**General / Wind Farm Site Hydrogen Plant Site** Mitigation measures to reduce the potential for adverse impacts arising from earth works and management of spoil the following: • Management of excavated material, that is: a materials management plan will be established and form part of the Construction & Environmental Management Plan (CEMP) with a view to establishing material balance during the proposed construction phase, thus minimising the potential for, or the length of time excavated materials are exposed and vulnerable to entrainment by surface water runoff. • No permanent, or semi-permanent stockpile will remain on either Site during the Construction or Operational phase of the Proposed Development. • Suitable locations for temporary stockpiles at the Wind Farm will be identified on a case-by-case basis. The suitability of any particular location will consider characteristics of the proposed site including; topography, drainage networks in the vicinity and proximity to same, other relevant characteristics which are likely to facilitate, increase, or compound the potential for entrainment by surface water runoff. • Earthworks will be limited to seasonally dry periods and will not occur during sustained or intense rainfall events. Similar to measures outlined in relation to ground stability during excavation works (**EIAR Chapter 8 – Soils and Geology**), an emergency response system will be developed for the construction phase of the project, particularly during the early excavation phase. This, involves 24-hour advance meteorological forecasting (Met Eireann download) linked to a trigger-response system. When a pre-determined rainfall trigger levels is exceeded (e.g. sustained rainfall (any foreseen rainfall event longer than 4 hour duration) and/or		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				any yellow or greater rainfall warning (>25mm/hour) issued by Met Eireann), planned responses will be undertaken. These responses will include, inter alia; cessation of construction until the storm event including storm runoff has passed over. All construction works will cease during storm events such as yellow warning (Met Eireann) rainfall events. Following heavy rainfall events, and before construction works recommence, the Wind Farm Site and/or Hydrogen Plant Site (as appropriate) will be inspected and corrective measures implemented to ensure safe working conditions, for example, dewatering of standing water in open excavations, etc. • Exposed soils/peat (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. weekends). • All drainage infrastructure (as per drainage design), required for the management of surface water runoff or draining peat ahead of excavation works will be established before excavation works commence. Similarly, mitigation measures related to surface water quality will be implemented before excavation works commence (Section 9.5.2.5). • Conceptual and information graphics presented in **EIAR Chapter 9 – Appendix 9.7 – Tiles 9-11** as well as **Tile 14,** present indicative layout and specification for both passive treatment trains (clean water interceptor drains), active management treatment trains (management and treatment of construction water) design considerations for watercourse crossings (**Tiles 1-3**), and SuDS elements such as: checked dams (**Tiles 4-8)**, swales (**Tile 12**), stilling ponds (**Tile 13**) and buffered outfalls (**Tile 15-16**). Also included in **Appendix**		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				9.7 are emergency response (recycling or diversion of poor quality runoff the Active Management portion of the treatment train (**Tiles 9-11 and Tile 14**) and intervention considerations. • Three Peat deposition areas will be created as part of the proposed development on the Wind Farm Site and are described and mitigated for in **Chapter 8: Soils and Geology, Section 8.3.2**.		
MM65	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.2 Earthworks Proposed Mitigation Measures – Grid Connection Route and Interconnector Route	The Grid Connection Route and Interconnector Route will require excavation of cable trenches in existing roadways. With reference to general excavation practices discussed above, excavation of cable trenches in close proximity to surface water features will require special consideration in terms of managing movements, spoil arising from excavations, and entrainment of solids and contaminants in surface water runoff. Mitigation measures to reduce the potential for adverse impacts arising from earth works and management of spoil on the Grid Connection Route and Interconnector Route include the following: • In sensitive areas excavation of material will be conducted in a controlled manner whereby any temporary deposit of the material in buffer zones can be minimised. For example, vacuum excavation techniques or similar will be used for excavations within Surface Water Buffer zones and other sensitive areas (constraints) (**Figures 9.12a and b**). Excavated soil will be removed to temporary storage areas. • Management of excavated material will adhere to the measures related to the management of temporary stockpiles outlined in **EIAR Chapter 8: Soils and Geology**, a materials management plan will be established and form part of the Construction & Environmental Management Plan		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				(CEMP) with a view to establishing material balance during the proposed construction phase, thus minimising the potential for, or the length of time excavated materials are exposed and vulnerable to entrainment by surface water runoff. No permanent, or semi-permanent stockpile will remain during the construction or operational phase of the Project. • All spoil from trenches in public roadways along the Grid Connection Route and Interconnector Route will be removed from the proposed development as it is excavated and transported to a licenced facility. This is due to the presence of bituminous material and potential hydrocarbon contaminants which will not have the opportunity to be entrained in runoff from stockpiling, but rather removed (i.e., mitigation by avoidance). • Suitable locations for temporary stockpiles will be identified on a case-by-case basis. The suitability of any particular location will consider characteristics of the proposed site including; slope incline and topography, drainage networks in the vicinity and proximity to same, other relevant characteristics which are likely to facilitate, increase, or compound the potential for entrainment by surface water runoff. Temporary stockpile locations will be situated outside of Surface Water Buffer Zones. Temporary Spoil stockpiles shall have side slopes battered back to a safe angle of repose, e.g. 1:1. Silt fencing (**Appendix 9.7 – Tile 18**), is to be erected around the base of the temporary mound. Soil will be reinstated on completion of drilling and jointing operations. Temporary storage areas will require bunding and management of runoff likely contaminated with suspended solids. Management of construction waters is discussed in following sections.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• Earthworks will be limited to metrologically dry periods, and will not occur during sustained or intense rainfall events. Similar to measures outlined in relation ground stability during excavation works (**EIAR Chapter 8: Soils and Geology**), and as discussed in this chapter, an emergency response system will be developed for the construction phase of the project, particularly during the early excavation phase. This, at a minimum, will involve 24 hour advance meteorological forecasting (Met Eireann download) linked to a trigger-response system. When a pre-determined rainfall trigger level is exceeded (e.g. 1 in 100 year storm event or very heavy rainfall at >25mm/hr), planned responses will be undertaken. These responses will include, inter alia; cessation of construction until the storm event including storm runoff surge has passed over. Following heavy rainfall events, and before construction works recommence, the Site will be inspected and corrective measures implemented to ensure safe working conditions, for example; dewatering of standing water in open excavations, etc.		
MM66	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.3 Release and Transport of Suspended Solids Proposed Mitigation Measures	Conceptual and information graphics associated with mitigating runoff quality are presented in **Appendix 9.7 – Tiles 9-11.** In order to mitigate the impact posed by release of suspended solids to the surface water environment, the following mitigation measures will be implemented. The drainage, attenuation and other surface water runoff management systems will be installed concurrent with the main construction activities at each Site to control increased runoff and associated suspended solids loads in runoff during intensive construction activities e.g. excavation of foundations. Vehicular movements will be restricted to the footprint of the Proposed Development and advancing ahead of any constructed hardstand will be minimised in so far as		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				practical. For example, on the Wind Farm Site, excavation ahead of established hardstands will be in line with expected phases of Turbine Hardstand and site access road construction in terms of both delivery of and installation of material and site activity periods whereby excavations will not be opened ahead of site shut down periods. This will be done with a view to minimising soils / subsoils exposure to rain and runoff. Drainage infrastructure will be installed during meteorologically dry ground conditions **(Section 9.5.2.2**). Diffuse surface water arising as a product of excavation activities will be managed as follows: • Waters arising from dewatering practices during excavation works are highly likely to be significantly loaded with suspended solids. As such, constructed stilling ponds or buffered outfalls (**Appendix 9.7 – Tiles 13, 15 and 16**), may be insufficient in controlling the release of suspended solids to the surface water network, or have the potential to clog due to significant volumes of settled or attenuated solids. Therefore, any water pumped from excavations, or any waters clearly heavily laden with suspended solids will be contained and managed and pumped through the preestablished Active Management treatment train (**EIAR Chapter 9 – Appendix 9.7 – Tile no. 10, 11 and 14).** Waters (likely loaded with suspended solids) intercepted by the established drainage network will be managed as follows: • In line Stilling Ponds will buffer the run-off discharging from the drainage system during, by retaining water, thus reducing the hydraulic loading to watercourses. Stilling ponds are designed to reduce flow velocity to 0.3m/s at which velocity silt settlement generally occurs. Note: this method of		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				mitigation may not be feasible at some locations on the Wind Farm Site due to the complex topography. If establishing stilling ponds is not feasible at any particular location (i.e. associated with managing runoff downstream of turbine locations in particular) the collector drain associated with the area will be constructed wider and marginally deeper in these areas i.e. establish a swale **Appendix 9.7 – Tile 12,** thus facilitating the enhanced retention of runoff in the respective construction area. Stilling ponds established will be permanent (life of project at minimum). Flow control devices such as weirs and baffles will facilitate achieving better attenuation, particularly when considering fluctuating runoff rates. • In line Check Dams will be constructed across drains at both Sites **EIAR Chapter 9 – Appendix 9.7 – Tiles 4 - 8**. Check dams will reduce the velocity of run-off in turn promoting settlement of solids upstream of the dam. Check dams will also reduce the potential for erosion of drains. Rock filter bunds may be used for check dams however, wood or straw/hay bales (**Appendix 9.7 – Tile 17**), can also be used if properly anchored. It is recommended that multiple check dams are installed, particularly in areas immediately downgradient of construction areas. Check dams will only be constructed in drainage infrastructure and not in significant surface water features i.e. streams or rivers. Check dams (comprised of rock) established will be permanent. The following will be implemented in the design of check dams and their deployment (CIRA, 2004): ○ Permanent rock filter bunds (coarse aggregate) will be used for check dams however, temporary wood or straw/hay bales can also be used if properly anchored and if the need arises. Permanent rock filter bunds are		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				preferred as this will ensure that rapid surface water runoff is mitigated against for the life of the Proposed Development. ○ Check dams will be installed at c. 20m intervals within the length of drainage channels. This is dependent on the slope angle and height of check dams constructed, refer to **Appendix 9.7 – Tile 4**. ○ Check dams will include a small orifice / pipe at the base to allow the flow of water during low flow conditions i.e. maintain hydrological regime during low flow conditions. Note: the use of coarse aggregate will facilitate some infiltration. (**Appendix 9.7 - Tile no. 4 - 8).** ○ Erosion protection will be established on the downstream side of the check dam i.e. cobbles or boulder (100-150 mm diameter) extending at least 1.2m. ○ Check dams will be constructed as part of the drain i.e. reduce the potential for bypassing between the drain wall and check dam. • Surface water runoff at the Wind Farm Site will be discharged to land via buffered drainage outfalls, **Appendix 9.7 – Tiles 15 -16**. Buffered drainage outfalls will contain hard core material of similar or identical geology to the bedrock at the site to entrap suspended sediment. In addition, these outfalls promote sediment percolation through vegetation in the buffer zone, reducing sediment loading to acceptable levels any adjacent watercourses and avoiding direct discharge to the watercourse. A relatively high number of discharge points / buffered outfalls will be established, thus decreasing the loading on any particular outfall. Discharging at regular intervals mimics the natural hydrology		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				by encouraging percolation and by decreasing individual hydraulic loadings from discharge points. • Buffered drainage outfalls will be located outside of 50m surface water buffer zones. wherever possible and any outfalls required within buffer zones will be part of and include stilling ponds and emergency intervention sumps for diversion of poor quality runoff to Active Management area of the treatment train (**Appendix 9.7**), Similarly, outfalls will not be positioned in areas with extensive existing erosion and exposed soils. Buffered outfalls will be fanned and be comprised of coarse aggregate (cobbles / boulders). These structures will be akin to rip raps (coastal erosion defences/ outfall erosion defences)**.** Silt fences (discussed above) will be established downstream of buffered outfalls with a view to ensuring the effectiveness of the attenuation train, particularly during elevated flow events. Buffered outfalls established will be permanent. • Very fine solids, or colloidal particles, are very slow to settle out of waters and the finest of particles require near still water and relatively long periods of time to settle, therefore, such particles are unlikely to settle despite the aforementioned measures. To address this, as required flocculant will be used to promote the settlement of finer solids prior to redistributing to the treatment train and discharging to surface water networks. Flocculant 'gel blocks' are available and can be placed in drainage channels upstream of stilling ponds. Gel blocks are passive systems, self-dosing and self-limiting, however they still require management as per the manufacturer's instructions. Flocculants are made from ionic polymers. Cation polymers (positive charge) are effective flocculants, however their positive charge make them toxic to aquatic organisms.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Anionic polymers (negative charge) are also effective flocculants, and are not toxic i.e. environmentally friendly [1]. Therefore, if flocculants are deployed the material used must be made from anionic polymer. Gel blocks will be a temporary measure during the construction phase **Appendix 9.7 – Tile no. 10, 11 and 14**. • Straw bales (similar to stone check dams) and silt fences (discussed under diffuse runoff) **Appendix 9.7 – Tile 18** can also be used within drainage channels for the purposes of attenuating runoff and entrained suspended solids, however these measures should be considered temporary and will be used mainly in managing potential acute contamination incidents (e.g. additional features to control runoff during excavation works) or to facilitate temporary works (e.g. corrective actions, discussed in later sections). Note; the installation of straw bales or silt fences will require checking on a daily basis by the Contractor's Environmental Manager and supervised by the Environmental Clerk of Works (EnvCoW) to ensure the bypassing does not occur. Coarse stone / boulders could be used in conjunction with these measures to address such issues. • Attenuation lagoons or swales are in principal akin to stilling ponds but larger in scale and potentially permanently hold water (a pond). This SuDS concept will collect all runoff at the site before being discharged outside of the Wind Farm or Hydrogen Site boundary, that is; the outfall of attenuation lagoons will likely be in relatively close proximity to mapped surface water features, but will be numbered sufficiently to ultimately aim to collect all runoff from the Proposed Development. ○ In terms of the Wind Farm Site, this implies detailed		

[1] USEPA (2013) Stormwater Best Management Practice – Polymer Flocculation (Available at: http://www.siltstop.com/pictures/US_EPA_Polymer_Flocculant_Handout__3-14.pdf)

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				assessment of Proposed Development *micro catchments* **Figure 9.11a**, with a view to collecting all runoff at the lowest point of each micro catchment (Micro catchments in line with Wind Farm Site areas used in water balance assessments in the Flood Risk Assessment, however the drainage design accompanying the SWMP will require more detailed assessment of topography and Proposed Development drainage flow patterns which will identify suitable locations and quantities of lagoons). ○ The scale of lagoons or swales will be dependent on available space and respective Site constraints, however the larger the lagoon the greater the potential for attenuation whereby flow rates are minimised, solids settle out of solution, and organics can be diluted. Presuming the upstream treatment features are considered and installed adequately those features will remove gross solids from runoff/discharge, the role of the attenuation lagoon or swale will be to ensure finer solids are given opportunity to settled out of suspension. Flow control devices will likely be required, particularly at restricted locations in terms of space available for constructed lagoons. The above measures, buffer zones, constructed drainage, check dams, two-stage stilling ponds design for attenuation, buffered outfalls are referred to as The Treatment Train, whereby the runoff will continuously be treated from source (construction area) to receptor (site exit, outfall of attenuation lagoon). Where necessary (>25 mg/L suspended solids) the treatment train will be augmented through the use of anionic polymer gel blocks. These measures reduce the suspended sediment and associated nutrient loading to surface water courses and		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				mitigates potential impacts to water quality and on plant and animal ecologies downstream of the Site. The precautionary and mitigation measures listed here will ensure the risk of significant loading of suspended solids in the receiving surface water bodies is low. Therefore, the risk to sensitive receptors is low. It is considered possible to lower the potential impact to surface waters to neutral. However, in the unlikely event of a significant discharge of suspended solids to surface waters it should also be noted that the assimilative capacity of the receiving surface water network will also act as a natural hydrological buffer in terms of suspended solids loading, therefore reducing the potential impact on sensitive receptors further downgradient. This however, is not considered a prescribed mitigation measure, but is a 'last line of defence'. Any loading of suspended solids in downstream surface waters is considered an adverse effect of the Proposed Development and a failure to implement adequate mitigation, regardless of the natural assimilative potential downstream. A detailed design of required drainage, collector drainage, stilling ponds and other listed mitigation infrastructure has not been developed as part of this EIAR, however suitable and particularly sensitive areas are identified and presented in **Figure 9.12a and Figure 9.12b**. A detailed design of surface water mitigation infrastructure will accompany the Construction Environmental Management Plan (CEMP) in the form a Surface Water Management Plan (SWMP). The SWMP will indicate in detail the locations of treatment train features, and the specification required at each location.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required

MM67	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.4 Clear Fell of Afforested Areas Mitigation Measures	No new impacts or remediation measures are associated with forestry activities. However, good practices working in specific environments such as forested areas will be adhered to including working outside of surface water or other buffer zones, and risk assessing on a case-by-case basis in terms of drainage intercepting run off, ecological sensitivities, etc.
				
				Further mitigation measures in regard to the management of forestry operations include:
				• Phased felling approach
				• Minimising erosion by use existing tracks and use of brash for off track areas.
				• Felling and extraction of timber will, as far as possible, be undertaken in dry weather conditions.
				• All Forest Service guidelines will be adhered to during all harvesting activities.
				• All relevant forestry guidance and policies include:
				  ○ Forest Protection Guidelines
				  ○ Forestry and Water Quality Guidelines
				  ○ Forest Harvesting and Environmental Guidelines
				  ○ Forestry and Freshwater Pearl Mussel Requirements - Site Assessment and Mitigation Measures
				  ○ Forest Biodiversity Guidelines
				  ○ Forestry and The Landscape Guidelines
				  ○ Forestry and Archaeology Guidelines
				• It should be noted that the clear-felling of trees in the State requires a felling licence.
				• All drains, mound drains, culverts, water crossings crossed during extraction, if necessary, will be cleared of any debris to ensure no drainage issues will occur for the remining trees, which can be a major attributor to windblow.
				• Harvesting operations will be scheduled according to the		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				nature of the soil seasonally, depending on ground conditions. Also, best practice is to suspend mechanised harvesting operations during and immediately after periods of particularly heavy rainfall. Waterways are particularly vulnerable to the effects of harvesting as silt from the movement of machinery can enter streams and rivers causing blockage of gravels which affects insect and fish life. Also, nutrients released from decaying branches, particularly from large, clear-felled sites, can cause enrichment of the waters which in turn causes pollution. To counteract these effects careful planning is required in carrying out harvesting operations. Some of the measures taken to avoid impacts include: ○ Limiting the size of the areas to be felled which reduces the amount of nutrients and silt released. ○ Minimising the crossing of drains and streams, but where necessary installing temporary structures (log bridges, pipes etc) to avoid machines entering the water. • Establishing buffer zones around waterways from which machines are excluded and riparian zones maintained. Once the above measures are implemented the risk of sediment release from clear felling practices being intercepting the surface water network will be significantly reduced.		
MM68	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.5 Release of Hydrocarbons Proposed Mitigation Measures	The following mitigation measures to reduce potential impacts from the environmental release of hydrocarbons and other harmful chemicals to the surface waters will be implemented: • Refuelling of vehicles will be carried out offsite to the greatest practical extent. This refuelling policy will mitigate the potential for impacts by avoidance. Due to the location of the Site, it is unlikely that implementation of this refuelling		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				policy will be practical in all circumstances (e.g., bulldozers, cranes, etc.). In instances where refuelling of vehicles on Site (Wind Farm, Hydrogen Plant, Interconnector, Grid Connection and/or Killybegs Turbine Delivery Route/ Galway Turbine Delivery Route) is unavoidable, a designated and controlled refuelling area will be established at each Wind Farm Site and/or Hydrogen Plant. The designated refuelling area will enable low risk refuelling and storage practices to be carried out during the works. The designated refuelling area will contain the following attributes and mitigation measures as a minimum requirement: ○ The designated refuelling area will be located a minimum distance of 50m from any surface waters or Site drainage features ○ The designated refuelling area will be bunded to 110% volume capacity of fuels stored at the Site (**Appendix 9.7 – Tile 19**) ○ The bunded area will be drained by an oil interceptor that will be controlled by a pent stock valve that will be opened to discharge storm water from the bund ○ Management and maintenance of the oil interceptor and associated drainage will be carried out by a suitably licensed contractor on a regular basis, including Decommissioning following construction. ○ Location of 2 oil booms downstream of construction of Hydrogen plant to intercept any major oil spillages ○ Any oil contaminated water will be disposed of at an appropriate Licensed wate disposal site. ○ Any minor spillage during this process will be cleaned up immediately ○ Vehicles will not be left unattended whilst refuelling ○ All machinery will be checked regularly for any leaks or		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				signs of wear and tear ○ Containers will be properly secured to prevent unauthorised access and misuse. An effective spillage procedure will be put in place with all staff properly briefed. Any waste will be collected, stored in appropriate containers and disposed of offsite in an appropriate manner. Notwithstanding the management of refuelling and fuel storage at the designated refuelling area, the potential risk of hydrocarbon spills from plant and equipment or other general chemical spills at other areas of the Project remains. As a precautionary measure, to mitigate against potential spills at other areas of the Proposed Development, the following mitigation measures will be implemented (**Appendix 9.7 – Tile 20**): • Oil absorbent booms and spill kits will be available adjacent to all surface water features associated with the Project. The controls will be positioned downstream of each construction area and at principal surface water drainage features. Oil booms deployed will have sufficient absorbency relative to the potential hazard • Spill kits will also be available at construction areas such as at turbine erection locations, the Temporary Construction Compound, Onsite Substation, spoils storage areas, Hydrogen Plant Site, and in vehicles associated with the Grid Connection and Interconnector Routes. • Spill kits will contain a minimum of oil absorbent pads, oil absorbent booms, oil absorbent granules, and heavy-duty refuse bags for collection and appropriate disposal of contaminated matter • Should an accidental spill occur during the construction or		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				operational phase of the Project, such incidents will be addressed immediately, this will include the cessation of works in the area of the spillage until the issue has been resolved. • Spill kits will be kept in each vehicle at the Site and will be readily available to all operators. • No materials, contaminated or otherwise will be left on the Site • Suitable receptacles for hydrocarbon contaminated materials will also be available at the Site • A detailed spill response plan will be prepared as part of the Site-specific CEMP. Once the above measures are implemented the risk of hydrocarbon contamination intercepting the surface water network will be significantly reduced, however there remains a level of risk, and therefore both precautionary measures and emergency response protocols will be established and specified on the CEMP.		
MM69	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.6 Release of Horizontal Directional Drilling Fluid – Interconnector Route and Grid Connection Route	Excavation and installation of cable ducts within existing bridges (alteration) will require consent from the OPW and various mitigation measures. Mitigation measures outlined in this Report have been developed to minimise the environmental impacts of the Grid Connection Route and Interconnector Route on the receptors of conservation importance that have been recorded in the area. Mitigation measures mentioned in this Report will be included in the CEMP, which will be developed by the Contractor. Detailed site investigations, method statements and risk assessments will be carried out with a view to identifying and qualifying risk associated with all watercourse crossings, and in		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				particular mapped and non-mapped karst features in close proximity to the grid route connection corridor. In relation to directional drilling, and the general risk to groundwater during grid connection route construction, risk assessment and prescription of mitigation measures will be designed in accordance with relevant guidance and reference documents, including: • Bennett, D. and Wallin, K. (2008) "Step by Step Evaluation of Hydrofracture Risks for Horizontal Directional Drilling Projects", In: International Pipelines Conference, Atlanta, GA. American Society of Civil Engineers. Available at: <https://doi.org/10.1061/40994(321)74>. • EPA (2014) "Guidance on the Authorisation of Direct Discharges to Groundwater". • Exploration & Mining Division, Minerals Ireland, Dept. of Communications, Climate Action & Environment (2019) "Exploration Drilling – Guidance on Discharge to Surface and Groundwater". • IFI (2016) "Guidelines for the Protection of Fisheries During Construction Works in and Adjacent to Waters", Inland Fisheries Ireland. • MDM (2018) "Rockabill System Specifications for Cable Installation", McMahon Design & Management Ltd. Consulting Engineers and Project Managers, Job no. 1319. • Moore Group (2016) "Appropriate Assessment of Cork Lower Harbour Main Drainage Project Estuary Crossing by Horizontal Directional Drilling", Moore Group Environmental Services on behalf of Irish Water, Ref No. 15184. • National Roads Authority (NRA) (2008) "Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes". • Transport Infrastructure Ireland (TII) (2014) "Drainage		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Design For National Road Schemes - Sustainable Drainage Options". • UnityWater (2021) "Pr9788 – Specification for Horizontal Directional Drilling", Infrastructure Technical Standards Committee, Doc No. Pr9788; Rev No. 8. Risk assessments involved identifying pathways and receptors for each potential source of contamination. This included each directional drilling location, and is particularly important in relation to groundwater source protection zones and surface water bodies protected for the purposes of drinking water. Prescription mitigation measures are driven by the identification and qualified risk associated with each particular location and are as follow: **General Overview of Works Mitigation Measures** • The timing of Grid Connection and Interconnector cable laying will be carried out during metrologically dry seasons/periods. • An Environmental Clerk of Works (EnvCoW) should be onsite in order to lessen environmental disruption and ensure site integrity is maintained. The EnvCoW will also be responsible for routine environmental monitoring and report writing. • Methodology Statements of works, prepared by the Contractor, will be submitted to the local and relevant authorities associated with the Proposed Development. • Any temporary access structures, put in place to allow machinery access to the area will be arranged in discussion with the EnvCoW and the site will be fully restored post grid route connection (GRC) works. • All chemical fluids used in the boring process are to be inert		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				to the environment (environmentally safe) and follow the relevant legislation. The Contractor is to retain a chemical register and have Safety Data Sheet (SDS) documents available onsite during the operation. The Contractor will also be responsible for a Fluid Management procedure which should include: ○ Drilling Fluid program and MSDS ○ Management of spoil including volume on site, specialised site storage ○ Management of drilling fluid displacement (expected volumes and proposed storage) • Considering the high volumes, high flow rates and high contaminant content (drilling spoil) of water arising for drilling activities, water will be managed and treated by means of a settlement tank and/or associated infrastructure (**Appendix 9.7**). If a separation (recycling) system is to be used it must be adequately sized and bunded to handle the through-put of the drilling fluid so continuous drilling and reaming operation can be maintained. A separation system must be complete with screens and hydro - cyclones to separate the solids from liquid. Drilling fluids and drill spoils will be disposed off-site at an approved licensed location, or discharged to the local surround area with approved licencing permits. **Good Practice of Plant Machinery** All equipment used during HDD will be in good working order, checked regularly and maintained when necessary. In particular, fluid return lines used in HDD process should be tested for leaks prior to use to check their reliability. Plant machinery not in use is required to have drip trays below engines as well as at refuelling points, if necessary.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				All practices involving bentonite will be monitored closely, that is: pumping pressure, drilling mud formulation i.e., drilling fluid volume and the volume of mud returns. Fuels, lubricants and hydraulic fluids for equipment use on Site will be carefully handled to avoid spillage, properly secured and provided with spill containment kits in case of incident to ensure best practice. Spill kits, hydrocarbon mats, oil booms etc., will be maintained at areas of works for emergency use and replaced when necessary. **Contingency Plan** In the event that a drilling fluid spill or 'breakout' occurs, the Contractor shall cease drilling immediately, notify the ECoW and Emergency Service Management Personnel. Emergency contact numbers for the Local Authority Environmental Section, Inland Fisheries Ireland, the Environmental Protection Agency and the National Parks and Wildlife Service will be displayed in a prominent position within the site compound. These agencies will be notified immediately in the event of a pollution incident. The Contractor is to draft and apply a Contingency Plan highlighting with the principal HDD risks. At minimum, the Contractor will identify incident response plan along with equipment and materials on standby to mitigate against the following risks associated with HDD: • Hydro-lock (loss of fluid flow) • A hydro-fracture incident (loss of fluid pressure) • Fluid spill over • Hydrocarbon/fuel spill • Drill pipe rupture • Borehole path failure		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• Major workplace safety events in remote areas The HDD operators will need to be equipped with straw bales, stakes to secure bails, oil booms, silt fences, sand bags, spill kits, shovels, pumps, and any other materials or equipment necessary to contain and clean up and properly dispose of unintentional releases.		
MM70	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.7 Construction and Cementitious Materials Proposed Mitigation Measures	In order to mitigate the potential impact posed by the use of concrete and the associated effects on surface water in the receiving environment, the following precautions and mitigation measures are recommended: • The acquisition, transport and use of any cement or concrete on site will be planned fully in advance of commencing works by the Contractor's Environmental Manager and supervised at all times by the Developer appointed Environmental Clerk of Works (EnvCoW). This entails minimising quantities on site, planning delivery routes and washout stations. • Precast concrete will be used wherever possible i.e. formed offsite. Elements of the Proposed Development where precast concrete will be used have been identified and are indicated in the CEMP. Elements of the Proposed Development where the use of precast concrete will be used include structural elements of watercourse crossings (single span / closed culverts) as well as Cable Joint Bays. Elements of the Proposed development where the use of precast concrete is not possible includes turbine foundations and joint bay pit excavations. Where the use of precast concrete is not possible the following mitigation measures will apply. ○ Lean mix concrete, often used to provide protection to main foundations of infrastructure from soil biome, can alter the pH of water if introduced, which would then require the treatment of acid before being discharged to		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				the surrounding environment. The use of lean mix concrete will be minimized, limited to the requirement of turbine foundations. The risk of runoff will be minimal, as concrete will be contained in an enclosed, excavated area. ○ Vehicles transporting such material will be relatively clean upon arrival on site, that is; vehicles will be washed/rinsed removing cementitious material leaving the source location of the material (**Appendix 9.7 – Tile 21**). There will be no excess cementitious material on the vehicle which could be deposited on trackways or anywhere else on site. To this end, vehicles will undergo a visual inspection prior to being permitted to drive onto the proposed site or progress beyond the contractor's yard. Vehicles will also be in good working order. ○ Drivers of such vehicles will be instructed to ensure that all vehicles are washed down in a controlled environment prior to the departure of the source site, such as at concrete batching plants. • Any shuttering installed to contain the concrete during pouring will be installed to a high standard with minimal potential for leaks. Additional measures will be taken to ensure this, for example the use of plastic sheeting or other sealing products at joints. • Concrete will be poured during metrological dry periods/seasons of minimal precipitation. This will reduce the potential for surface water run off being significantly affected by freshly poured concrete. This will require limiting these works to dry meteorological conditions i.e. avoid foreseen sustained rainfall (any foreseen rainfall event longer than 4 hour duration) and/or any foreseen intense rainfall event		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				(>3mm/hour, yellow on Met Eireann rain forecast maps), and do not proceed during any yellow (or worse) rainfall warning issued by Met Eireann. This also will avoid such conditions while concrete is curing, in so far as practical. • Pouring of concrete into standing water within excavations will be avoided. Excavations will be prepared before pouring of concrete by pumping standing water out of excavations to the buffered surface water discharge systems in place. • Temporary storage of cement bound sand (if required) will be on hardstand areas only where there is no direct drainage to surface waters and where the area has been bunded e.g. using sand-bags and geotextile sheeting or silt fencing to contain any solids in run-off. • No surplus concrete will be stored or deposited anywhere on site. Such material will be returned to the source location or disposed of off-site appropriately at a suitable licensed facility. Concrete washing will be contained and managed similarly. • Designated washout of concrete trucks shall be strictly confined to the batching facility and will not be located within the vicinity of watercourses or drainage channels. Only the chutes will be cleaned prior to departure from Proposed Development, and this will take place at a designated area at the Temporary Construction Site Compounds at the Wind Farm Site and Hydrogen Plant Site. The contents will be allowed to settle, and the supernatant will be removed off site by licenced generator to a licenced wastewater treatment plant. • Ground crew will have a spill kit readily available, and any spillages or deposits will be cleaned/removed as soon as possible and disposed of appropriately.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
MM71	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.8 Release of Waste Water Sanitation Contaminants Proposed Mitigation Measures	*Wind Farm Site* A temporary compound area will be constructed on-site to contain temporary facilities for the construction phase including 'port-a-cabin' structures. The temporary compound will be constructed on a base of geo-textile matting laid at ground level. This will be stabilized with the laying of hardcore material on top. During the construction phase, foul effluent will be periodically removed for offsite disposal. Wastewater/sewerage from the staff welfare facilities 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. Chemicals are likely to be used to reduce odours. All wastewaters will be emptied periodically, taken off-site by a licensed waste collector to the local wastewater sanitation plant in Ballina for treatment. There will be no onsite treatment of wastewater. A wastewater or sewerage leakage is not anticipated in a properly managed Site. *Hydrogen Plant Site* Wastewater from the Welfare facility at the Hydrogen Plant will run through a septic tank, and then through a welfare constructed wetland (WCW), positioned in the northeast corner of the Hydrogen Plant Site. The WCW will measure approximately 80 m2 to facilitate the required retention time of c. 12 days to adequately treat the welfare effluent loading. A wastewater storage tank, sized c.1500 m3 will be located to the south of the water treatment building at the Hydrogen Plant		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Site. The outfall of the WCW will be combined with hydrogen process wastewater stream in storage. The combined wastewater will be pumped to a secondary series of process constructed wetlands (PCW). The PCW will achieve a minimum of 6 days retention time. It is noted that this retention time is lower than the required retention time for loading in line with welfare facilities, however the loading from process wastewater will be significantly less than that of welfare wastewater of sewage. Any particular contaminant which is observed to be excessively high in incoming source water will be targeted with specific wastewater treatment.		
MM72	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.9 Excavation Dewatering Proposed Mitigation Measures – Passive Construction	***Water Management*** Passive management systems (**Appendix 9.7 – Tile 9**), include some of the features described in Active Management treatment trains. These include: • Spoil bunds and/or temporary berms. Spoil bunds and/or berms will be constructed using either crushed rock or clean soils and overlain or lined with an impermeable layer e.g., geotextile or plastic membrane. This is particularly important for effective surface water management associated with both Wind Farm and Hydrogen Plant infrastructure within the 50m surface water buffer zones. The drainage system will be permanent. These features are intended to control the movement of construction water / runoff with a view to: ○ Containing contaminated water (e.g., drilling / excavation spoil and runoff laden with solids). Temporary bunds will be used to manage spoil arising from drilling operations or saturated spoil arising from excavations in sensitive areas e.g., within SW buffer zones.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				○ To divert runoff i.e., divert clean/storm runoff during construction works or contaminated construction water away from sensitive receptors such as drains/surface waters directly adjacent to construction areas. • Silt screens. These will be utilised in a similar sense to berms whereby, silt screens will be installed between construction areas and sensitive receptors, including: ○ At the outfall of the treatment train where discharging to vegetated ground or within non-mapped drains (within redline boundary). ○ Along the permitter of construction areas which are directly adjacent to watercourses or within surface water buffer zones. This includes all watercourse crossings and sections of Grid Connection Route and Interconnector Route adjacent to watercourses and the swale along the southern boundary of the Hydrogen Plant Site. ○ Multiple silt fences will be used drains / treatment trains discharging to the surface water network. Silt fences will be temporary features, but will remain in place for a period following the completion of the Construction Phase. Passive systems are intended to function with minimal supervision, however in the management of construction water on Site, in many cases the diverted water will likely require active management to ensure sensitive receptors are protected. For example, diverted storm water, if clean can discharge to the receiving vegetated areas or existing drains, but any construction waters impacted by contaminants on the site must be managed, and potentially active management / treatment is required.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
MM73	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.10 Excavation Dewatering Proposed Mitigation Measures – Active Construction Water Management	In all instances where construction water, or runoff has the potential to entrain solids during excavation and other construction activities, runoff will be contained by means of temporary berms (lined geotextile of similar), bunds (lined) and sumps. This will be referred to as Dewatering. Construction water (contaminated) will be pumped to the Treatment Train (**Appendix 9.7 – Tiles 9-11**). Contaminated water arising from construction works, namely; excavations, drilling and temporary stockpiling, will be contained and treated prior to release or discharge. The schematic presented here is a conceptual model of measures implemented to manage arisings and runoff (Letter headings align with **Appendix 9.7 – Tile no. 10**). A. Arisings. Arisings from the launch / reception pit, or any other significant excavation (e.g., cable joint bays), will be directed the treatment train. B. Temporary Bund. Arising control area i.e., a temporary bund. Gross solids will be temporarily deposited here. Water arsing with the material will be allowed to drain to sump. C. Sump / Pump. Sump will discharge by gravity / pumped to stilling pond. D. Temporary Stilling Pond. This can be constructed using soils for bunding in combination with an impermeable liner. E. Outfall. The outfall from the stilling pond will be buffered (coarse aggregate) to dissipate energy and diffuse discharging water. F. Silt Screen. A silt screen will be in place down gradient of the Stilling Pond outfall. This is a precautionary measure to mitigate peak loads or surcharges in the system.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				G. Monitoring Location/s. Discharge quality will be monitored in real time using telemetry systems. H. Monitoring of discharge quality will be carried out at the outfall of the stilling pond i.e., before being actually discharged to surface vegetation or surface water (licenced). I. Sump / Pump. Discharge By-Pass. If water discharging from the stilling pond exceeds quality reference limits water will be diverted (pumped) from the stilling pond to the settlement / treatment tank. Stilling Pond By-Pass. Similar to Discharge By-Pass, if conditions dictate water can be diverted directly to Settlement / Treatment Tank. J. Settlement / Treatment Tank. A settlement tank will in line and ready to use if required i.e., water quality at stilling pond outfall fails to meet quality reference limits. The tank will be equipped with treatment systems which will be activated as the need arises, for example; very fine particles which are very slow to settle can be treated with a flocculant agent to promote settlement of particles. K. GAC Vessel/s. As a precautionary measure, GAC (Granulated Activated Carbon) vessel/s will be in line and ready to use if required. GAC vessels are used to filter out low concentrations of hydrocarbons. Significant hydrocarbon contamination is only envisaged under accidental circumstances. If a hydrocarbon spill does occur, normal operations will pause and the treatment train will be utilised to remediate captured contaminated runoff. L. GAC Vessel By-Pass. If the quality of the water is acceptable in terms of hydrocarbon contamination. M. Treated water will be discharge by gravity / pump to the stilling pond for additional clarification, monitoring and buffered discharge to vegetated area.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				N. Silt Bag. A silt bag can be used as alternative to stilling ponds. However, silt bags must only be used as primary method in lower risk areas i.e., outside of buffer zones, etc. Stilling ponds will be the primary method (D, N) is circumstances where risk is elevated, however a gate vale and silt bag can be included in the treatment train and used as an emergency discharge route in the event that the stilling pond needs remediation or maintenance. In all instances, stilling ponds (D), Silt Bags (N) and outfalls (E) will be situated outside of surface water buffer zones. At many locations, particularly at HDD locations works will be within buffer zones. In these instances, waters can be pumped to the treatment train which can be positioned upgradient along the road (Grid Connection Route and Interconnector Route) where discharge to vegetated areas / roadside drains can be managed. Discharge of non-contaminated storm runoff to vegetated land within the Redline Boundary is not a licenced activity however, particularly in relation to the Grid Connection and Interconnector this methodology is possible only under relatively low flow conditions (e.g. <2 litres per second (l/sec) typical of runoff over a relatively small site area. Due to the constricted nature of the grid connection works, in the event that the expected incoming flow rate or dewatering rate is relatively high (>2 l/sec, for example; HDD locations, culvert crossing locations) a discharge licence will be acquired and trade effluent will be discharge directly to the surface water network. The latter will include all works associated with HDD. The discharge points will be identified during the licence application process. As discussed previously, the main		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				components of the treatment will be positioned outside of the 50m surface water buffer zone where possible. The Developer will identify suitable locations for the establishment of temporary infrastructure taking into account other variable such as traffic and access management. Similarly, the preferred location of discharge points will be outside of buffer zones and into minor or non-mapped surface water / drainage features where possible. The subject drain will be inspected to ensure connection to the mapped network (not blocked). The quality of the water being discharged will be monitored. If discharge water quality is poor (e.g. >25mg/l) additional measures will be implemented, for example; pausing works as required and treating construction water by dosing with coagulant to enhance the settlement of finer solids – this can be done in a controlled manner by means of a suitably equipped settlement tank. Collected and treated construction water will be discharged by gravity / pump to a vegetated area of ground within the Wind Farm Site or Hydrogen Plant Site. Silt fences will be established at the discharge area to ensure potential residual suspended solids are attenuated and the potential for erosion is reduced. The discharge area will be outside of 50m surface water buffer areas (similar to dewatering of excavations. The quality of water discharged will be in line with licence discharge limits assigned by the county council, and will be monitored in real time (telemetry with 15 min sampling rate), as well as laboratory samples taken, analysed and reported and the frequency indicated in the licence. Daily sampling is recommended given the short duration and temporary nature of the works.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Discharging of construction water (trade effluent) directly to surface waters or groundwater is a licenced activity. (This is in accordance with Local Government (Water Pollution) Act, 1977 as amended). Active Construction Water Management will be utilised for all works within surface water buffer zones, and for all over pumping.		
MM74	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.11 Watercourse Crossings Proposed Mitigation Measures – Design Specific	The Proposed Development of the Wind Farm, Grid Connection Route and Interconnector Route will require upgrades or installations of watercourse crossings, identified in **Section 9.4.4.9**. The Hydrogen Plant does not require a watercourse crossings. These crossings require detailed planning and consideration to ensure potential impacts are assessed adequately and in turn mitigated against. In relation to the design and construction of watercourse crossings the following is a non-exhaustive list of relevant guidance documents: • NRA (2008) Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes • Inland Fisheries Ireland (IFI) (2016) Guidelines on the Protection of Fisheries During Construction Works in and Adjacent to Waters • Office of Public Works (OPW) (2013) Construction, Replacement or Alteration of Bridges and Culverts • Scottish Environment Protection Agency (SEPA) (2010) Engineering in the water environment: good practice guide – River Crossings Regulation 50 of the European Communities (Assessment and Management of Flood Risks) Regulations 2010 SI 122 of 2010 requires that: "No Person, including a body corporate, shall construct any new bridge or alter, Reconstruct, or restore any		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				existing bridge over any watercourse without the Consent of the Commissioners or otherwise than in accordance with plans previously approved of by the Commissioners." The word "watercourse" includes rivers, streams, and other natural watercourses, and also canals, drains, and other artificial watercourses. The word "bridge" includes a culvert or other like structure. The OPW is responsible for the implementation of the regulations and consent to construct any bridge will be sought from the OPW via their application process. Details on the application process and guidance / requirements of the bridge design and considerations in terms of flow can be found in the OPW guide Construction, Replacement, or Alteration of Bridges and Culverts (A Guide to Applying for Consent under Section 50 of the EU (Assessment and Management of Flood Risks) Regulations SI 122 of 2010 and Section 50 of The Arterial Drainage Act, 1945). This application and consent process will mitigate against the potential for the design of the new bridge leading to significant adverse impacts. Single span structures are structures which span the width of the channel with no associated instream support and do not affect the bed of the river or water body. This ensures that the bank and instream habitats are maintained and the river bed is not impacted. Furthermore, in stream works will be minimal if not avoided completely, thus reducing the risk of construction works leading to adverse impacts. This crossing method is considered low impact. However, it should be noted that this methodology, single span structures require significant engineering and		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				construction works, and are relatively expensive in comparison to other methods. Single span structures are of most benefit to ecological sensitivities and therefore the sensitivity and importance of the baseline ecological conditions should also be considered when considering single span structures for water course crossings. The closed culvert design implies that the watercourse crossing will possess an artificial invert (floor). This in turn implies that the watercourse crossing infrastructure itself will adversely impact on the existing bank and instream habitats, and instream works are likely to lead to adverse impacts e.g. release of suspended solids. This crossing method is considered high impact. However, it should be noted that where existing closed culverts are in place at existing watercourse crossings, pending the results of a condition survey, extending the existing closed culvert will minimise construction activities required and in turn minimise potential impacts when compared to replacing the entire watercourse crossing. Where existing crossings are upgraded or replaced, opportunity should be taken to improve any environmental impact the existing feature may have. None of the existing watercourse crossings are considered to significantly adversely impact on the hydrological regime at the Site. The proposed watercourse crossings at the Wind Farm Site are relatively near the head waters of the surface water network therefore, bridge or culvert specification and construction are envisaged to be of relatively low significance in terms of expected flow, etc. However, watercourse crossings must be designed to facilitate peak, or storm discharge rates so as to		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				avoid localised flooding and associated issues during storm events. In accordance with Engineering in the water environment: good practice guide – River Crossings (SEPA, 2010) and Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes (NRA, 2008) it is recommended that the category of watercourse crossing employed over river waterbodies in upland or transitional river segments is a **single span structure**. The type of watercourse crossing employed will be in line with good practice as defined by relevant guidance (SEPA, 2010) whereby; the course of action serves a demonstrated need, minimises the potential for ecological harm, and at a cost which is not disproportionally expensive. This approach will also consider the condition of the existing structure, where relevant by means of a competent engineer's assessment. With reference to ecology, none of the proposed watercourse crossing locations are associated with areas, or immediately proximate to surface water features with significant ecological sensitivity or importance. The principal risk to ecological sensitivities associated with proposed watercourse crossing works is the potential for adverse impacts to water quality downstream of the Wind Farm Site and Hydrogen Plant Site, namely the potential for mobilisation of solids. It is also noted that watercourse crossing methodologies employed will ensure potentially long term / permanent impacts downstream (e.g. scouring etc) or upstream (e.g. passage of fish) will be avoided. Considering all of the above, and considering baseline conditions – including ecological sensitivity and importance of		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				surface water features associated with each of the watercourse crossings, the following water course crossings and upgrades are proposed for the Proposed Development: • **New Watercourse Crossings WCC03 – Single Span Structures**. This is in line with good practice as defined by relevant guidance (SEPA, 2010) whereby; the course of action serves a demonstrated need, in relation to slope of surrounding environment, **Chapter 8 Figure 8.7b**, and minimises the potential for ecological harm. • **Existing Watercourse Crossings Ex. WCC1 and WCC2** – Upgraded Closed Culverts (If upgrading required). This is in line with good practice as defined by relevant guidance (SEPA, 2010) whereby; the course of action serves a demonstrated need (single span structure will facilitate maintaining the hydrological regime. Relatively large catchment and high discharge rates). However, the ecological sensitivity and importance at the location of the crossing/s is minimal. Furthermore, to work within a cost which is not disproportionally expensive, and therefore is recommended, a closed culvert could be utilised here, particularly if the crossing is required to be replaced following an engineer's assessment. • All other new watercourse crossings (drainage network) will be closed culvert, or the upgrading of existing culverts. • Considering the width of all waterbodies associated with crossings discussed here (<2m width) it is not envisaged that in stream supports will be required for the construction of single span structures. • Guidance documents, and in turn this EIAR are not intended to be referred to as technical design manuals. The principles described here address aspects of the water environment		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				that should be considered. In line with relevant guidance the following design considerations will be made and the design tailored accordingly on a case by case basis. • Ensure the design facilitates adequate hydraulic capacity. This ensures that the design will maintain the existing channel width – including proposed new closed culverts, and will facilitate peak discharge events (storm events) without flow being constrained and contributing to flooding or other issues. Values presented Appendix 9.2 and Appendix 9.3 indicate the potential discharge rate associated with each watercourse crossing during a 1 in 100 year storm event taking into account for climate change. For existing crossings the channel width will be maintained. • In line with the above design consideration, allowance will be made for the transport of sediment through the crossing, not just hydraulic capacity. • Ensure the design facilitates adequate freeboard. The design facilitates passage of woody debris. Freeboard to facilitate navigation and recreation is not applicable in relation to the proposed development and associated surface water features. • For single span structures (**Appendix 9.7 – Tile 3**) set abutments will be back from the river channel and banks to allow the continuation of the riparian corridor underneath the structure. This helps to minimise or prevent the need for bed and bank reinforcement, reduces the risk of creating a barrier to fish passage and allows mammal passage under the structure. The distance between the bridge abutments will be as wide as possible and will maintain the bank habitat, maximising the riparian corridor and allowing the river some space to move. Bury foundations (of abutments) deep enough to minimise or prevent the need for bed or bank		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				reinforcement or bridge weirs or aprons. This maintains the natural bed material and bed levels, protecting habitat and allowing fish passage. The foundations should be buried deep enough to allow for scour during high flows. A suitably qualified engineer or geomorphologist should be consulted to advise on an appropriate depth. • Ensure the design minimises the potential for localised bank and bed erosion. • For closed culverts the diameter or sectional area of the culvert is oversized to maintain the existing width of the channel. In addition, the invert of the culvert should be buried under the original bed level – refer to guidance for recommended depths based on culvert dimensions. Culverts will also require assessment on a case by case basis to establish the degree of slope to be maintained (will not exceed 0.5% for a culvert >24m length and will not exceed 1.0% for a culvert <24m length), maintaining average daily flow (will not exceed 1.2m/s for culverts <24m length and 0.9m/s for culverts >24m length). Where such requirements cannot be met additional measures will be required e.g. notched baffles, this is to ensure the potential ecological impact is minimised e.g. facilitate movement of fish. • For closed culverts pools should be formed at each end of the culvert to provide for transmission from shape of the pool to shape of the river. The pools will be constructed using natural rock and the purpose of such pools is to reduce the potential for erosion while also facilitating ecological factors (**Appendix 9.7 – Tile 2).** There remains the potential for the actual construction of such crossings to have significant adverse impacts on the receiving watercourse/s. Relevant guidance documents have been		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				consulted and applicable mitigation measures i.e. applicable to the consented detailed design of proposed bridges and construction methodology of same, will be adhered to with a view to mitigating and reducing any potential impact on the receiving watercourse.		
MM75	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.12 Watercourse Crossings Proposed Mitigation Measures – General Construction	The following mitigation measures are suggested to ensure any potential impacts during the construction of the proposed watercourse crossing are minimised: • Proposed bridges will be designed in such a way as to minimise, in so far as practical but to the extent deemed acceptable by the competent authority, the disturbance or alteration of water flow, erosion and sedimentation patterns and rates. This will be done following and adhering to relevant available guidance as described in this report, and will be reviewed and consented by the OPW. • A detailed construction management plan, and detailed method statement and risk assessment (RAMS), will be drafted by the contracted operator at the commencement phase of the proposed development and will include details of the bridge design and construction methodology, including the environmental risk/s involved (as identified in this report) and how each can be minimised using best practice techniques, in line with the mitigation set out in this report. • Construction methodology will be designed and planned with a view to minimising the potential for contaminating the receiving watercourse, in particular the potential for the release of suspended solids into the receiving watercourse in line with the mitigation set out in this report. . • Plant machinery used in the construction of proposed bridges, or any part of the Proposed Development, will only be refuelled at an established refuelling station or suitable off site locations e.g. commercial filling stations.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• During use of heavy plant machinery there is an inherent risk of accidental leaks or spillages of fuel/hydrocarbons. This will be incorporated in the RAMS, including an emergency response plan for such incidents. An emergency spill kit will be kept onsite at all times and within 50m of ongoing construction works. The spill kit will contain oil absorbent pads and booms, and heavy-duty refuse bags (for collection and appropriate disposal of contaminated matter) at a minimum. An oil absorbent boom will be installed downstream (within 25m) of construction works, before works commence. • All construction works associated with watercourse crossings and within surface water buffer zones are considered with additional detail in terms of mitigating acute risk given the proximity to a sensitive receptor. This includes additional precautionary measures e.g. double / triple silt screens, and emergency response and intervention. For further detail refer to **Appendix 9.7.**		
MM76	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.13 Culverts & Instream Works	Infrastructure such as culverts will require instream works in all aspects of the Project. Where in stream works are required as identified in **Section 9.4.4.9**, the following will be implemented: • Contracted operators will draft method statements and risk assessments in line with mitigation outlined in this report and in consultation with relevant guidance **Section 9.2.2,** prior to commencing works (as part of the watercourse crossing consent application), Relevant guidance referenced here includes: ○ Inland Fisheries Ireland (IFI) (2016) Guidelines on Protection of Fisheries During Construction Works In and Adjacent to Waters. ○ Scottish Environmental Protection Agency (SEPA) (2009) Engineering in the Water Environment Good		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Practice Guide – Temporary Construction Methods ○ National Roads Authority (2008) Guidelines for the Crossing of Watercourses During the Construction of National Roads Schemes. • The construction area will be isolated, this means; the water feature (streams / drains) will be temporarily dammed upstream of the watercourse crossing and flow will be diverted by means of a flume / pipe by gravity, or pumped (this is referred to as over pumping, **Appendix 9.7 – Tile no. 1**) downstream of the watercourse crossing and construction area. Following the successful upstream damming, a downstream dam or barrier will also be established. The downstream barrier will ensure contaminated runoff in the isolated work area can be contained and managed, and will block surface water back flow in lower lying or flatter areas. **Appendix 9.7 – Tile no. 1,** presents a conceptual plan view of an isolated construction area within a surface water feature. Over pumping of a surface water feature is considered diversion of water runoff only and therefore considered similar to discharge of storm water runoff only to sewer (exempt from licensing), however it is imperative that controls are in place to ensure environmental impacts are minimised, particularly in relation to ecological sensitivities (for further information refer to Chapter 5 Terrestrial Ecology and Chapter 6 Aquatic Ecology), and also in relation to water quality. • In order to ensure isolation and over pumping is carried out effectively, the methodology must ensure that dams are secure / sufficiently supported, and that pumping of water can continue uninterrupted and that pumps are capable of keeping up with the discharge rate of the surface water feature. Pumping systems will require backup and fail safe		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				protocols e.g. backup pumps and generator. At significant surface water features e.g. non-mapped streams, isolation and diversion of drainage will be implemented. • Provided the construction water within the isolation area is managed effectively, over pumping of the surface water feature does not pose a significant risk to surface water quality down stream of the watercourse crossing. The passage if fish in the surface water feature is to be considered also, and will be temporarily impacted by the works if fish species are present. • Water ingress into the construction area will be managed and collected by established sumps immediately downstream of the works (upstream of the downstream barrier) (**Appendix 9.7 – Tile 1**). Runoff within the construction area will likely be heavily laden with suspended solids. Where required, dewatering (pumping out or extracting) of such waters will be discharged to an inline settlement tank, or preestablished stilling pond to remove suspended solids before being discharged, **Appendix 9.7 – Tile 14 and 13**. The quality of the water being discharged will be monitored. If discharge water quality is poor (e.g. >25mg/l) additional measures will be implemented, for example; treating construction water (Active Treatment, **Section 9.5.2.9**) by dosing with coagulant to enhance the settlement of finer solids – this can be done in a controlled manner by means of a suitably equipped settlement tank. Collected and treated construction water will be discharged by gravity / pump to a vegetated area of ground within the Site **Appendix 9.7 – Tiles 15 and 16**. Silt fences will be established at the discharge area to ensure potential residual suspended solids are attenuated and the potential for erosion is reduced, **Appendix 9.7 – Tile 18**. The discharge		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				area will be outside of 50m surface water buffer areas (similar to dewatering of excavations). For further details refer to **Appendix 9.7 – Tiles 9 - 11**. • Discharging of construction water (trade effluent) directly to surface waters is a licenced activity. No extracted or pumped or treated construction water from the isolated construction area will be discharged directly to the surface water network associated with the Site (This is in accordance with Local Government (Water Pollution) Act, 1977 as amended). It is noted that all runoff on the site will eventually discharge to the receiving surface water network, however with appropriate management the quality of runoff discharging to the surface water network will be acceptable e.g. <25 mg/l Suspended Solids. • Operation of machinery in-stream will be kept to an absolute minimum and avoided where possible. Where in stream works are required the area will be isolated by means of over pumping or drainage diversion. • Works in relation to watercourse crossings will be carried out during periods of sustained dry meteorological conditions, and will not commence if sustained wet conditions or if wet conditions are forecast. • Works in relation to watercourse crossings will be planned and carried out as efficiently as possible. This means work plans are agreed fully and all equipment and materials are prepared fully before in stream works commence. Works will be completed as quickly as possible and will not pause for the duration of the in stream works e.g. Installation of culverts (24 hour as necessary), with the exception of circumstances related to meteorological and/or health and safety conditions. • Only precast concrete will be used for in stream works.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• Precautions will be made to mitigate the potential risk of a hydrocarbon spill. Further to measures outlined in **Section 9.5.2.4**, settlement tanks (will be adequately equipped with hydrocarbon removal functionality on standby, for example; hydrocarbon absorbent booms, oil skimmers, and GAC (granulated activated carbon) filters.		
MM77	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.14 Diversion of Drainage	Diversion of artificial drainage channels will be required at locations where the proposed development layout intercepts existing artificial drainage networks for the Project (**Figure 9.6a**), for example; T9 and associated hardstand area is overlain on an existing drainage feature. Diversion of drainage will be done under similar conditions to that described above for instream works. Many of the existing constructed drainage channels are observed to be dry during sustained dry meteorological conditions which implies that over pumping or diverting of water flow may not be necessary, nonetheless the methodology described for instream works will be implemented to mitigate the risk of any flow through the construction area or for unforeseen wet meteorological events. Any newly installed drain will be fully formed prior to the diversion of existing drainage. Erosion control will be incorporated into the design (**Appendix 9.7**), this requires minimising the area of exposed soil in existing and newly established channels. This will include a combination of the use of coarse aggregate / crushed rock (non-friable / non-weak), engineered solutions and/or revegetation. A series of temporary silt fences will be installed to mitigate against the entrainment and mobilisation of solids during key		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				events during the construction process, for example; the initial use of the new diverted channel, or the infilling of the original channel made redundant. The use of silt screens as a form of mitigation during watercourse crossing works is considered a precautionary last defence measure, provided measures detailed above will be made effective. Refer to **Appendix 9.7** for further information on the recommended ordering of control measures.		
MM78	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.15 Groundwater Contamination Proposed Mitigation Measures	A combination of the underlying bedrock geology, the associated aquifer potential, low permeability soils/peat and low recharge rates has resulted in the risk posed to groundwater quality by the Project being considered as low risk. Nevertheless, mitigation measures to reduce potential risks to groundwater will be implemented as a precautionary approach. A primary risk to the underlying groundwater quality would be through the accidental release of hydrocarbons from fuels or oils during the construction phase of the Proposed Development. In order to mitigate against potential groundwater contamination by hydrocarbons, implementation of the following mitigation measures is recommended: • In the first instance, no fuel storage should occur at the Proposed development whenever feasible and refuelling of plant and equipment should occur off the Proposed Development a controlled fuelling station. • In instances where on Site refuelling is unavoidable, then the bunded on the Proposed Development designated refuelling area must be used. The designated refuelling area must be bunded to 110% volume capacity of fuels stored at the Proposed Development. **(Appendix 9.7 – Tile 19)** • The bunded area will be drained by an oil interceptor that will be controlled by a pent stock valve that will be opened to discharge storm water from the bund.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• Management and maintenance of the oil interceptor and associated drainage will be carried out by a suitably licensed contractor on a regular basis. • Any oil contaminated water will be disposed of at an appropriate oil recovery plant. • Any minor spillage during this process will be cleaned up immediately. • Vehicles will not be left unattended whilst refuelling. • For large machinery such as cranes, a drip tray will be used, and spill kits will be on hand. • A Site-specific CEMP will be enforced to ensure that equipment, materials and chemical storage areas are inspected and maintained as required on a regular basis. The following mitigation measures will be implemented in relation to non-hydrocarbon potential contamination: • All other liquid-based chemicals such as paints, thinners, primers and cleaning products etc. will be stored in locked and labelled bunded chemical storage units. • Wastewater from temporary sanitation facilities (Wind Farm Site and during construction phase) will be mitigated by use of temporary and portable sanitary facilities that are self-contained and supplied by tank trucks. These facilities will not interact with the existing hydrological environment in any way and they will be maintained, serviced and removed from site at the end of the construction phase. • As outlined in **Appendix 9.3 pDACA Section 2.9** The Hydrogen Plant will require volumes of treated water for use. The proposed facility design team (Black and Veatch) have provided indicative predictive wastewater quality data, and predicted water demand and peak production flow rates. The Hydrogen Plant will require volumes of wastewater to be		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				treated water for discharge to surface waters. Mitigation measures and recommendations is outlined further in **Appendix 9.3 pDACA.** • The controlled attenuation of suspended solids in settlement ponds and check dams etc. at the Wind Farm Site will result in inorganic nutrients (if present in elevated concentrations) such as phosphorus and nitrogen being absorbed and retained by the solids in the water column. This will allow for a reduction of peak inorganic discharges in a controlled and stable run off rate. • Bacteriological contamination arising from availability of nutrients (e.g. sanitation, livestock etc.) will be mitigated by appropriate self-contained sanitation facilities (above) and livestock grazing control on the site overall, but particularly on areas zoned for excavation and proposed development. • There is low risk of mobilising trace metals that may naturally be present. The potential impact may arise from introduced water percolation with excavated bedrock substrate. Concentrations of trace metals are usually low in the natural environment; however, water quality will be checked for metals concentration before, during and after the construction phase as part of monitoring at river monitoring locations.		
MM79	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.16 Groundwater Extraction Proposed Mitigation Measures	No significant potential effect has been identified. No boreholes will be used on the Wind Farm Site. With reference to the Minerex Environmental Limited Groundwater Supply Assessment for the Hydrogen Plant (**Appendix 9.8**), it was determined that two boreholes drilled on the Hydrogen Plant Site are able to supply the expected water demand of the Hydrogen Plant Site without depleting the aquifer or impacting the wells in the region.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				No potential effects have been identified on the Grid Connection Route, Interconnector Route, Killybegs Turbine Delivery Route and Galway Turbine Delivery Route.		
MM80	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.18 Emergency Response	Monitoring of the Proposed Development during the construction and operational phase will potentially indicate weaknesses of the drainage and attenuation design, and/or the potential for excessive loading at particular locations etc. In such instances corrective actions will be taken to mitigate against any potential adverse impacts. Depending on the severity of the issue there is the potential that immediate action will be required, for example; the introduction of straw bales to reduce flow / enhance attenuation at a particular location, erect silt fences etc., however such measures will be temporary, another example is the underground attenuation water storage tanks on the Hydrogen Plant site. Any issue observed will require assessment by a specialist consultant and alternative mitigation design (in line with measures described in this EIAR) will be implemented to ensure the efficacy of the system during both the construction and operational phases of the Proposed Development. Scenarios where corrective action may be required, and proposed corrective mitigation measures include: • Potential issue; Elevated concentrations of suspended solids in runoff during excavation activities during an unforeseen or low probability storm event, for example; a 1 in 100 year event. Proposed measure; Cover exposed stockpiles in plastic sheeting and placement of straw bales and silt fences in associated drainage channels. • Potential issue; Failure or degradation of stone check dam during a storm event with associated elevated runoff volumes. Proposed measure; Introduction of straw bales and silt fences in order to regain attenuation capacity of the drainage channel until the maintenance can be completed.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• Potential issue; Localised peat stability issue leading to deposit of peat within an active drainage channel. Proposed measure; Introduction of straw bales and silt fences directly downstream, of the area in order to attenuate gross solids isolate the area and over pump until remedial works and maintenance can be completed, divert all runoff from the area to Active Management area of the treatment train (**Appendix 9.7 – Tile 9 to 11**). • Potential issue; Management of unexpected runoff patterns leading to excessive drying or wetting in a particular area, potentially leading to enhanced erosion and / or adversely impacting on the ecological health of ecosystems such as blanket peat in the case of the Wind Farm and the neighbouring river adjacent to the Hydrogen Site. Proposed measure; This type of issue will require assessment on a case by case basis. Solutions might include; decommission, modification, introduction or relocation of buffered outfall, or diversion of runoff volumes to or away from the area. In regard to the potential for erosion and similar physical processes, any such issues will become apparent through monitoring relatively rapidly, whereas in regard to ecological sensitivities and such issues will become apparent relatively slowly. It is noted that much of the Site is impacted as part of baseline in this regard e.g. extensive existing artificial drainage networks. Prior to commencement of construction, the Environmental Clerk of Works will prepare a register of corrective action and emergency response sub-contractors that can be called upon in the event of an environmental incident, and/or to give training on escalating incident where useful, including e.g.; specialist hydrocarbon spill response, specialist hydrological and/or water quality response.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Mitigations measures as outlined in the previous sections will reduce the potential for contamination of waters during the construction phase of the proposed development, however there remains the risk of accidental spillages and or leaks of contaminants, and excessive loading of surface water mitigation infrastructure. Emergency responses to potential contamination incidents will be established and form part of the CEMP. Potential emergencies and respective emergency responses include: • Hydrocarbon spill or leak – Hydrocarbon contamination incidents will be dealt with immediately as they arise. Hydrocarbon spill kits will be prepared and kept in vehicles associated with the construction phase of the proposed development. Spill kits will also be established at proposed construction areas, for example; a spill kit will be established and mobilised as part of the turbine erection materials and equipment. Suitable receptacles for hydrocarbon contaminated materials will also be at hand. • Significant hydrocarbon spill or leak – In the event of a significant hydrocarbon spillage, emergency responses will be escalated accordingly. Escalation can include measures such as; installation of temporary sumps, drains or dykes to control the flow or migration of hydrocarbons and contaminated runoff will be contained, managed and pumped to a controlled area in line with Active Management including treatment through a suitably equipped treatment tank and Granular Activate Carbon (GAC) vessels. This process will be managed by the EnvCoW in conjunction with a preidentified consultant (EnvCoW specialist register) in regard to effective remediation, treatment and removal of hydrocarbon contaminated water and soils Excavation and appropriate disposal of contaminated soils will be required in this instance. a		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• If a significant hydrocarbon spillage does occur, the contractor on behalf of the developer will have an approved and certified clean-up consultancy available on 24-hour notice to contain and clean-up the spill. The faster the containment or clean-up starts, the greater the success rate, the lower the damage caused and the lower the cost for the clean-up. • Cementitious material – Cement / concrete contamination incidents will be dealt with immediately as they arise. Spill kits will also be established at proposed construction areas, for example; a spill kit will be established and mobilised as part of the turbine erection materials and equipment. Suitable receptacles for cementitious materials will also be at hand. • Other construction and general waste – Wastes which are dispersed by construction activities or by natural causes such as wind will be collected and dealt with immediately. In the event of a significant contamination or polluting incident the relevant authorities will be informed immediately.		
MM81	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.2.19 Managing and Reporting Environmental Incidents	Environmental incidents including accidental spillages on soils (e.g., fuel), breeches of licence limits if applicable (discharge of trade effluent), and significant environmental incidents (e.g., landslide) on the Proposed Development will be reported to the Local Authority as part of emergency responses to such incidents. Incident notification will be escalated to relevant third parties where relevant e.g., Inland Fisheries Ireland (IFI) if surface water receptors are intercepted.		
MM82	Air	Chapter 9: Air and Climate	10.2.8 Mitigation Measures and Residual Effects	The main potential impact during the construction phase of the Proposed Development will be from dust nuisance at sensitive receptors close to the Wind Farm Site and Hydrogen Plant Site. Good practice procedures will be followed by the appointed contractor to prevent dirt and dust being transported onto the		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				local road network. Good practice control measures will comprise the following: • Wind Farm Site and Hydrogen Plant Site access roads will be upgraded and built prior to the commencement of construction activities. These roads will be finished with graded aggregate which compacts, preventing dust. • Approach roads and construction areas to and on the Wind Farm Site and Hydrogen Plant Site will be cleaned on a regular basis to prevent build-up of mud and prevent it from migrating around the sites and onto the public road network. • Wheel wash facilities will be provided near the entrances to both sites to prevent mud/dirt being transferred from the site to the public road network. • Public roads along the construction haul route will be inspected and cleaned daily. In the unlikely event that dirt/mud is identified on public roads, the road will be cleaned and the wheel wash facility will be investigated and the problem fixed to prevent this from happening again. • 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. For example, weather will be monitored so that the need for damping down activities can be predicted. Water bowsers will be available to spray work areas (wind turbine area, Grid Connection Route and Interconnector Route) and haul roads to suppress dust migration. • Vehicles delivering materials 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 sites,		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				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 • Ready-mix concrete will be delivered to the sites and no batching of concrete will take place on either site. Only washing out of chutes will take place at the sites and this will be undertaken at designated concrete washout facilities. • Speed restrictions on access roads will be implemented to reduce the likelihood of dust becoming airborne. Consideration should be given to how on-site speed limits are policed by the Site Foreman and toolbox talks should include this. Lower speed limits should be set for traffic on public roads also, to minimise nuisance to the general public. • Stockpiling of materials will be carried out in such a way as to minimise their exposure to wind where possible. 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. • Methodology statements will be signed off by a suitably qualified Geotechnical Engineer. An independent, qualified Geotechnical Engineer 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. • A complaints procedure will be implemented where complaints will be reported, logged and appropriate action taken.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
MM83	Air Quality	Chapter 10: Air and Climate	10.3.7.1 Construction Phase	The main potential impact during the construction phase of the Development will be from emissions from construction vehicles. All construction vehicles and plant will be maintained in good operational order while on-site, thereby minimising any emissions that arise.		
MM84	Noise	Chapter 11: Noise and Vibration	11.15.1 Construction Noise Mitigation	No significant construction noise effects have been identified so no specific mitigation measures are required. General guidance for controlling construction noise through the use of good practice given in BS 5228 will be followed. During construction, activity shall be limited to daytime, except where delivery of large transport loads such as turbines, where it may be necessary to transport outside of daytime hours. During decommissioning noise levels are likely be no more than predicted in Table 11.11 as similar plant will be utilised. Any legislation, guidance or best practice relevant at the time of decommissioning should be complied with.		
MM85	Noise	Chapter 11: Noise and Vibration	11.28.1 Construction Noise Mitigation	No significant construction effects have been identified. General guidance for controlling construction noise through the use of good practice given in BS 5228 will be followed. During construction of the development, activity generated noise shall be limited to daytime guidance given in the NRA guidelines, except where delivery of large transport loads such as the turbines, where it may be necessary to transport outside of daytime hours. During decommissioning of the Hydrogen Plant, if applicable, noise levels are unlikely to be more than predicted in **Table 11.21** as similar plant will be utilised. Any legislation, guidance or best practice relevant at the time of decommissioning will be complied with.		
MM86	Land Use	Chapter 13: Material Assets and Other	13.4 Land Use	The following mitigation measures to minimise impacts on turbary, agricultural and forestry land use have been incorporated into the design stage:		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
		Issues		The construction and operational footprint of the Proposed Development has been kept to the minimum necessary to avoid impact on existing land uses and existing tracks at the Wind Farm Site and the Hydrogen Plant Site have been used where possible. New Wind Farm Site access roads have been sensitively designed to minimise impact on land take. Electricity cables will be installed underground in or alongside Wind Farm Site and Hydrogen Plant Site access roads to avoid and minimise negative impact. This has allowed for the prevention of unnecessary or inappropriate ground works or land use alterations to occur and will avoid unnecessary soil compaction. Prior to the Grid Connection and Interconnector installation works within public roads, it is proposed that all access points (domestic, business, farm) are considered when finalising the temporary road closures and diversions, to maintain local access as much as possible and avoid impacts on various land uses. **Chapter 15: Traffic and Transportation** will be referred to for all proposed works and deliveries along the turbine delivery route to avoid undue impact to adjacent land uses. This is also considered for the decommissioning phase for which traffic will be required along the Construction Haul Routes. The Turbine Delivery Route will no longer be needed. This is further detailed in **Chapter 2: Project Description**. The construction and decommissioning works will be planned and controlled by a Construction and Environmental Management Plan (CEMP) (**Appendix 2.1**). This provides details on day to day works and methodologies. As part of these works, the public and other stakeholders will be provided with updates on construction activities which will affect access to		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				lands. This will be communicated to members of the public through a community liaison officer employed for the duration of the construction period. Implementation of the measures outlined above will ensure that residual impacts on agriculture and turbary will be slight negative for the duration of the construction and operational lifespan of the Development. The impact on land take during construction, operation and decommissioning phases is likely to have a permanent slight, negative impact on forestry, in that it alters the character of the environment, albeit in a manner consistent with existing and emerging wind farm trends in the surrounding area. Forestry will be replanted under licence from the Forest Service of the Department of Agriculture, Food & the Marine is Ireland's. Implementation of the measures outlined above will ensure that any residual impacts will be slight negative and permanent in duration. There are no worse residual impacts predicted, with respect to land use, arising from the operational phase.		
MM87	Telecommunications	Chapter 13: Material Assets and Other Issues	13.5 Telecommunications	All electrical elements of the proposed development are designed to ensure compliance with electro-magnetic fields (EMF) standards for human safety. Mitigation measures were undertaken in the design phase through mitigation by avoidance i.e., the known routes of the telecommunication links were plotted and a buffer was applied to them, outside of which the proposed wind turbines were located. Compliance with the EMC Directive 2014/30/EU will mean that the electromagnetic emissions from devices used will not cause interference to other equipment.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Appendix 13.2: Telecommunications Impact Study states that during the construction phase, Turbine T2 will be in a position to impact an Interference Condition of 8.47 m to the 2nd Fresnel of an ESB radio link. Consultation with ESB Networks was carried out to discuss the findings of the report. A number of possible mitigation measures were discussed with ESB Networks to offset the possible impact of Turbine T2 on the ESB UHF radio link. It was agreed with ESB that a relay mast site to the south of T2 would offer the most appropriate mitigation measure. The associated costs were discussed, and it was agreed that should the relay mast site be constructed, the Developer would cover the costs. ESB provided a consultation response on October 1st 2021 with confirmation that this proposed mitigation measure was acceptable.		
MM88	Electricity Networks	Chapter 13: Material Assets and Other Issues	13.6 Electricity Networks – Grid Connection, Interconnector and Grid Network	Mitigation by design and avoidance will minimise impacts on existing electricity networks. • The Grid Connection will be constructed to the requirements and specifications (CDS-GFS-00-001-R1) of EirGrid and in line with the grid connection offer. • 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		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				around the perimeter of the live work area to visibly warn members of the public of the hazards of ongoing construction works.		
MM89	Aviation	Chapter 13: Material Assets and Other Issues	13.7 Air Navigation	Although no potential effects were identified the following mitigation measures proposed by the Irish Aviation Authority (IAA) will be implemented: • An aeronautical lighting scheme for the Development will be agreed with the IAA and will be installed. • As-constructed coordinates in WGS84 format together with ground and tip height elevations at each wind turbine location will be provided to the IAA. • The IAA will be notified of intention to commence crane operations with at least 30 days prior notification of their erection.		
MM90	Quarries	Chapter 13: Material Assets and Other Issues	13.8 Quarries	• Existing tracks have been used where possible and the layout was designed to minimise the length of new track required in order to reduce the requirement for such stone material. • Local quarries have been identified to reduce impact on transportation (Please see Chapter 15: Traffic and Transportation). • The source quarry will be chosen based on stone which is chemically simar to that occurring at the Development. This will reduce hydrogeochemical impacts. (Please see Chapter 8: Soils and Geology)		
MM91	Waste and Utilities	Chapter 13: Material Assets and Other Issues	13.9 Utilities	Mitigation measures relating to existing water services have been assessed and are detailed in **Chapter 9: Hydrology and Hydrogeology** and referred to in **Chapter 4: Population and Human Health**. Mitigation for wastes include the following: • ***Staff Facilities:*** Provision for separation of waste streams		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				will be provided so that e.g., paper, and cardboard waste and bottles may be recycled. • ***Sewage:*** It is proposed to install a rainwater harvesting system as the source of water for toilet facilities for the operational phase of the Wind Farm Site. Wastewater from the staff welfare facilities at the Wind Farm Site 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 of sounding an alarm, during a filling operation, when the liquid level nears the top of the tank. During the operational phase, wastewater from facilities at the Hydrogen Plant will be treated through a septic tank and constructed wetlands with regulated discharge rates, before being discharged to the Glenree watercourse to the south of the Hydrogen Plant. • ***Concrete:*** During the construction phase: ○ Precast concrete will be used wherever possible i.e., formed offsite. Elements of the Development where precast concrete will be used have been identified and are indicated in the CEMP. Elements of the Development where the use of precast concrete will be used include structural elements of watercourse crossings (single span / closed culverts) as well as Cable Joint Bays. Elements of the development where the use of precast concrete is not possible include turbine foundations and joint bay pit excavations. Where the use of precast concrete is not possible the following mitigation measures will apply. ○ The acquisition, transport and use of any cement or concrete on site will be planned fully in advance and supervised at all times. ○ Vehicles transporting such material will be relatively		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				clean upon arrival on site, that is; vehicles will be washed/rinsed removing cementitious material leaving the source location of the material. There will be no excess cementitious material on vehicles which could be deposited on trackways or anywhere else on site. To this end, vehicles will undergo a visual inspection prior to being permitted to drive onto the proposed site or progress beyond the contractor's yard. Vehicles will also be in good working order. ○ Any shuttering installed to contain the concrete during pouring will be installed to a high standard with minimal potential for leaks. Additional measures will be taken to ensure this, for example the use of plastic sheeting or other sealing products at joints. ○ Concrete will be poured during metrological dry periods/seasons. This will reduce the potential for surface water run off being significantly affected by freshly poured concrete. This will require limiting these works to dry meteorological conditions i.e. avoid foreseen sustained rainfall (any foreseen rainfall event longer than 4 hour duration) and/or any foreseen intense rainfall event (>3mm/hour, yellow on Met Eireann rain forecast maps), and do not proceed during any yellow (or worse) rainfall warning issued by Met Eireann. This also will avoid such conditions while concrete is curing, in so far as practical. ○ Ground crew will have a spill kit readily available, and any spillages or deposits will be cleaned/removed as soon as possible and disposed of appropriately. ○ Pouring of concrete into standing water within excavations will be avoided. Excavations will be prepared before pouring of concrete by pumping		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				standing water out of excavations to the buffered surface water discharge systems in place. ○ Temporary storage of cement bound sand (if required) will be on hardstand areas only where there is no direct drainage to surface waters and where the area has been bunded e.g., using sand-bags and geotextile sheeting or silt fencing to contain any solids in run-off. ○ No surplus concrete will be stored or deposited anywhere on site. Such material will be returned to the source location or disposed of off-site appropriately. A concrete washings area can be seen on Drawing 6225-PL-803. • ***Chemicals, Fuels and Oils:*** All storage containers of over 200 litres will have a secondary containment of 110% capacity to ensure that any leaking oil is contained and does not enter the aquatic environment. Avoid bringing chemicals to the Hydrogen Plant unless required. • ***Chemical and Waste*****;** An Inventory will be kept, this will include: ○ List of all substances stored on-site (volume and description) ○ Procedures and location details for storage of all materials listed ○ Waste disposal records, including copies of all Waste Transfer Notes detailing disposal routes and waste carriers used ○ Any tap or valve permanently fixed to the mobile unit through which oil can be discharged to the open or when delivered through a flexible pipe which is fitted permanently to the mobile unit, will be fitted with a lock and locked shut when not in use ○ Sight gauges will be fitted with a valve or tap, which will		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				be shut when not in use Sight gauge tubes, if used will be well supported and fitted with a valve ○ Mobile units must have secondary containment when in use/out on site Under the EU Directive 95/55/EC all such dangerous substances will be conveyed in a container that compiles with the ADR. As such the manufacturer of each bowser will provide certification to contractors that the following: • A leak-proof test certificate • A copy of the IBC approval certificate • An identification plate attached to the container Where mobile bowsers are used on site, guidelines will be followed so that: • Any flexible pipe, tap or valve will be fitted with a lock where it leaves the container and be locked shut when not in use; • Flexible delivery pipes will be fitted with manually operated pumps or a valve at the delivery end that closes automatically when not in use. Where possible, a nozzle designed to dispense oil is used; • The pump or valve will have a lock and be locked shut when not in use. For loads in excess of 1000 litres (220 gallons), the bowser vehicle driver will have undergone training and hold a special license. • ***Refuelling:*** During construction/decommissioning, where possible all refuelling on site will be within the temporary compound within the re-fuelling area (see Drawing No. 6225-PL-803). Only essential refuelling (e.g., cranes) will be		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				carried out, outside of this area, but not within 65 m of any watercourse. In such cases a non-permeable High-density Polyethylene (HDPE) membrane will be provided beneath connection points to catch any residual oil during filling and disconnection. This membrane will be inspected and if there is any sign of oil contamination, it will be removed from site by a specialist licensed waste contractor. All vehicles will be well maintained and free from oil or hydraulic fuel leaks. • ***Packaging:*** In accordance with the waste hierarchy, packaging will be returned to the originator ahead of re-use or recycling. Where this is not possible, waste will be separated as appropriate and safely stored on site appropriately in anticipation of recycling. • ***Metals:*** Waste metals from concrete reinforcing during construction and removal of metals during decommissioning etc. will have commercial value and will be re-used or recycled with the appropriate licensed waste contractor.		
MM92	Cultural Heritage	Chapter 14: Cultural Heritage	14.6.1 Construction Phase	Ground works within the Redline Boundary during the construction phase of the Wind Farm Site area, as well as peat restoration areas located both within and outside the Red Line Boundary, will be subject to archaeological monitoring under licence by the National Monuments Service (DHLGH). An archaeological testing programme under licence by National Monuments Service shall be adopted at the greenfield areas within the Redline Boundary for the proposed access road and Hydrogen Plant Site. This programme will be undertaken in advance of construction and will include targeted trenching of the former levelled vernacular settlement and lime-kilns within the design footprint. Should any material sub-surface remains be discovered, these shall be evaluated and recorded with written, drawn and photographic trench/section details.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Given the ZoN and proximity to barrow SMR SL022-026---, licenced archaeological monitoring shall also extend to the domestic yard area at the proposed access road to the Hydrogen Plant Site. This shall be undertaken during groundworks associated the demolition and removal of existing outbuildings to site. A strict works exclusion zone shall also be adopted to ensure no access to the barrow monument is permitted during construction stage. A full written, drawn and photographic record of the vernacular outbuildings to the domestic yard area at the proposed access road will be undertaken prior to their removal. A record of the existing dwelling and remaining outbuilding shall also be undertaken in order to complete a full archival record of the existing 19th/20th century farmyard complex. It is also noted that in the event of the construction of a replacement dwelling with shed to the south of the proposed access roundabout, as part of a separate planning process, this will likely require archaeological site investigations prior to construction in order to mitigate any potential impacts on unknown sub-surface archaeological features/remains. In the event that any sub-surface archaeological features are identified during these site investigations (testing and/or monitoring) they will be recorded and then securely cordoned off while the National Monuments Service are consulted to determine further appropriate mitigation measures, which may include preservation in situ (by avoidance) or preservation by record (archaeological excavation). A full written and photographic record of the court tomb RMP MA031-034--- located within the Wind Farm Site, to specifically include its monument setting, shall be undertaken for archival record purpose in advance of construction works. Furthermore,		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				provision of a works exclusion zone via non-ground intrusive temporary fencing shall ensure that no construction related activities or tracking of machinery shall occur within the designated buffers assigned for court tomb RMP MA031-034--- which shall also account for a previously discovered area of potential archaeological sub-surface remains (burnt spread) (see **Volume III, Figure 14.12**). Licenced archaeological monitoring noted shall also extend to identified discreet sections of the Grid Connection route at the location of a ringfort MA031-047--- and adjacent to a ringfort and children's burial ground (MA031-023--- and MA031-023001-) as well as a short offline portion at the 110kV loop-in and 2 no. end-mast towers location at Rathreedaun/Bunnyconnellan West townland boundary. Works exclusion zones shall be applicable to the discreet areas outside the Redline Boundary at the proposed Hydrogen Plant Site to ensure no inadvertent damage during construction stage to the undesignated cultural heritage features (turf stand and rock outcrop). In addition, due care and diligence will be exercised for all construction-related vehicular crossings for material haul routes at protected stone bridge RPS 428.		
MM93	Traffic	Chapter 15: Traffic and Transportation	15.6.1 Construction Phase	The potential effects of the construction of Development have been identified as being potentially high but temporary in nature. The following mitigation measures are recommended: • A Traffic Management Plan (TMP) has been developed (see Management Plan 7 attached to the CEMP). Prior to construction and once the Contractors have confirmed their suppliers, the TMP will be updated in consultation with Sligo County Council and Mayo County Council and An Garda Síochána as necessary. HGV trips will be scheduled to avoid		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				times when drop offs and pick-ups generally take place at schools, particularly at Stokane on the L2604. All drivers will be made aware of the location and presence of schools and other sensitive receptors at an induction session prior to construction activities taking place and will be made aware of the speed limits of the various roads on the route which are contained in the TMP. This is to ensure compliance with speed limits and school drop off and pick-up zones. • All significant traffic likely to be generated by the Wind Farm will be during the construction of the development and will be temporary in nature. It is envisaged that the construction period for the wind farm will span a 21-month period with the underground cable being installed over a concurrent 12-month period. The construction-phase Traffic Management Plan will mitigate these impacts. • Use special transporter vehicles with rear wheel steering in delivery of wind turbine components to ensure safe transportation and manoeuvrability on the roads. Extendable transporter vehicles will be retracted on return journeys. • Prior to delivery of abnormal loads i.e. turbine components, the Applicant or their representatives, will consult with An Garda Síochána and Sligo County Council and Mayo County Council Roads Departments to discuss the requirement for a Garda escort. • The Developer will confirm the intended timescale for deliveries and every effort will be made to avoid peak times such as school drop off times, church services, sporting events, peak traffic times where it is considered this may lead to unnecessary disruption. • Abnormal loads are likely to travel at night and outside the normal construction times as may be required by An Garda Síochána. Due to the distance between Killybegs Port and		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				the Site of c.148km, the journey is achievable within a 4-5 hour timeframe and the distance between Galway Port and the Site of c 178, the journey is achievable within a 5-6 hour timeframe. Accordingly, locations for resting will not be required. Local residents along the affected route will be notified of the timescale for abnormal load deliveries. • The Developer will lodge a bond with Sligo County Council and Mayo County Council prior to commencement of construction in the amount to be agreed with the Council for the possible repair/upkeep of the roads. During the construction period, these roads will be inspected weekly by the Developer's Resident Engineer and the Contractor will be instructed to repair any defects within the following two weeks. At the end of the construction period, any further defects will be remedied to the satisfaction of Sligo County Council and Mayo County Council. • Wheel cleaning equipment will be used at the exit to the wind farm site and hydrogen plant Site 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 construction Site. • The Site entry points will also be appropriately signed. Access to the wind farm and hydrogen plant construction Sites 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. • In addition, any dust generating activities will be minimised		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				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 will be employed. • To reduce dust emissions, vehicles transporting crushed stone will be covered during both entrance and egress to the Site. • A survey of the turbine component haul route will be undertaken prior to commencement to identify if any new overhead lines or broadband lines will need to be lifted along the route to allow abnormal loads such as tower sections and nacelles to be delivered. • During the construction phase, clear construction warning signs will be placed on the L2604, L1102, L66121, L6612 and L5136 as necessary, which will advise road users of the presence of a construction Site and of the likelihood of vehicles entering and exiting the Site or road construction areas. This will help improve road safety. • Works on public roads on the turbine delivery road and grid connection will be strictly in accordance with "Guidance for the Control and Management of Traffic at Road Works – 2nd Edition 2010" as well as "Traffic Signs Manual 2010-Chapter 8- Temporary Traffic Measures and Signs at Roadworks". • Road Closures will be obtained for grid connection and interconnector works on narrow public roads with passing bays available. A number of options are available in some areas for diverting traffic that will allow flexibility during construction. When the interconnector is under construction on the L6612, then the L1102 may be utilized to divert traffic. For the grid connection works within the L1102 and L5136, passing bays can be utilized. While traffic diversions are in		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				place, local access will be maintained at all times. All access points (domestic, business, farm) will be considered when finalising the proposed road closures and diversions. Additional measures such as local road widening, traffic shuttle systems and 'Stop-Go' systems will also be considered subject to agreement with Sligo County Council and Mayo County Council. Road closures will be scheduled in consultation with local residents and the Contractor shall endeavour to avoid times of high agricultural activity e.g. silage cutting. • The widening/straightening of haul route L2604 is proposed to be completed in advance of road closures. • The L1102 and the L66121 shall not be closed at the same time i.e. one should remain open while the other is closed. • Road Opening Licences will be obtained for the grid connection trench and chambers within public roads as well as for the widening of public roads. • All vehicles using or while in operation at the wind farm site shall either have roof mounted flashing beacons or will use their hazard lights. • A speed limit of 25km/h shall apply to all vehicles within the wind farm site. • Provide a footpath adjacent to the upgraded carriageway where works are being undertaken. This footpath should provide a safe method of permitting pedestrians to access the pre-exiting carriageway at the terminations of the works. • Ensure all visibility envelopes are kept clear of high vegetation. • Provide visibility splays set back a suitable distance from the yield line. • Replace the RUS 001 sign with RUS 006. • Provide signage opposite each entry arm.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• Provide a uniform radius from the roundabout entry to the exit. • Reinstate any speed limit signs removed by the works. • Replace the RRM017 with RRM001. • Redesign this arm or roadside treatment to enable road users to differentiate this private access from the public ones.		
MM94				*The Wind Farm Site* The application for the Proposed Development is accompanied by a CEMP (**Appendix 2.1**) which sets out details of the environmental controls to be implemented on site. The CEMP sets out the Emergency Response Procedure to be adopted in the event of an emergency including contamination, health and safety and environmental protection. The CEMP provides details on all mitigation and monitoring measures to be actioned prior to construction, during the construction, operation and decommissioning phase. The CEMP will be subject to ongoing review through regular environmental auditing and site inspections. This will confirm the efficacy and implementation of all mitigation measures and commitments identified in the application documentation. The CEMP includes an Emergency Response Plan (Management Plan 1). It provides details of procedures to be adopted in the event of an emergency relating to health & safety or environmental protection. The Emergency Response Plan includes details on the response required and the responsibilities of all personnel in the event of an emergency. Please see **Appendix 2.1** for details.		
Operational Phase						
MM95	Noise	Chapter 4: Population and	4.5.8 Human Health	To ensure the Wind Farm Site is compliant with noise limits, some of the turbines may need to be operated in noise reduced		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
		Human Health		modes of operation to protect residential amenity. The wind farm system shall include a kill switch that can be operated at any time with an overriding manual shutdown system in case of an emergency.		
MM96	Noise	Chapter 4: Population and Human Health	4.5.8 Human Health	For operation and maintenance staff working at the Proposed Development, 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 Wind Farm Substation and Hydrogen Plant Substation will be enclosed by palisade fencing and equipped with intruder and fire alarms in line with ESB 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 Access roads or hardstanding surface. Details of cables installed in the public road will be available from ESBN. 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. Turbines will be fitted with ice detection systems which will stop the turbine from rotating if ice is forming on a turbine blade. 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.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				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: • 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 Proposed Development has considered the susceptibility to natural disasters. The proposed site drainage 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 Development through to decommissioning. The Contractor's fire plans are 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.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				A Supervisory Control and Data Acquisition ("SCADA") system will monitor the Proposed Development's performance. If a fault occurs, then a message is automatically sent to the engineer preventing emergency situations. Warning signs and security infrastructure will be in place around the onsite switchgear and control building to provide for public safety. A Safety Management Programme is to be developed for the Hydrogen Plant site. This process has already commenced through a Preliminary Hazard Analysis and a Major Accident Prevention Policy. The Developer has engaged with the HSA, Mayo County Council and Sligo County Council in relation to the development of an Emergency Response Plan for the Hydrogen Plant Site. These processes will help identify and mitigate hazards onsite and reduce the risk to employees, the public and the environment during the construction and operational phase of the facility. The Hydrogen Plant Site will be remotely monitored and manned 24 hours a day. Warning signs and security infrastructure will be in place around the switchgear and control building and Hydrogen Plant Site to provide for public safety. Access to the Hydrogen Plant Site will be restricted to authorised personnel and security fencing will prevent egress by the public. Design standards specific to hydrogen production facilities (Shown in **Table 2.5 in Chapter 2; Project Description**) have been used throughout the preliminary design phase and regulations and separation distances required by industry good practice have been incorporated into the design. A Major Accident Prevention Policy has been prepared and will be refined post-consent and prior to operations. An Emergency Response Plan (recommended, not required for lower-tier		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				COMAH sites) will be produced for the plant. A risk management programme, ATEX Assessment and Safety Management Programme will be in place for the Hydrogen Plant Site. Safety equipment installed will include: • Leak/fire detection + isolation/automatic shut-off • Emergency stops • Building ventilation (passive + active) • Piping pressure/flow rate monitoring • Impact sensors at dispensers • Audible and visual alarms • Fire protection and suppression equipment The detection system in place at the Hydrogen Plant Site will be capable of detecting hydrogen gas or hydrogen fire and a Supervisory Control and Data Acquisition ("SCADA") system will monitor the facilities performance. Firefighting systems will include dedicated firefighting water tanks, alarms, water spray deluge systems, sprinkler systems, carbon dioxide suppression systems and mobile fire protection equipment in accordance with the relevant codes and standards. The location of the Hydrogen Plant Site has been specifically selected to minimise the potential to affect any receptors. The public will have no access to the Hydrogen Plant Site. The nearest public road L66121 is 600 m to the west and the nearest buildings which are not associated with the Hydrogen Plant Site are also 299 m away. All chemicals stored on-site will be subject to a COSHH (Control of Substances Hazardous to Health) assessment and compliance with the requirements of REACH, i.e., European		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Communities Regulation 1907/2006 for the Regulation, Evaluation, Authorisation and Restriction of Chemicals. Chemicals will be managed in accordance with European Chemicals Agency's Guidance for Downstream Users (2014). Final selection of bulk chemicals will be subject to an assessment of trace elements to ensure that they are within acceptable limits. Storage of large volumes of oils and other hazardous substances will have a secondary containment such as a bund to prevent hydrocarbon contamination to land/water. Waste oils and other chemicals, including oil rags/wipes will be disposed of as hazardous waste. Operational staff will receive training on the handling, containment, use, and disposal requirements for all potentially polluting products on-site. A more detailed assessment can be found in **Chapter 16: Major Accidents and Natural Disasters.**		
MM97	Flora & Fauna	Chapter 6:Aquatic Ecology	6.5.3 Operational Phase Mitigation	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: • 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 start of the operational phase to prevent silt-laden run-off. The seed mix will contain only suitable native species of plant. • 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. • 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)		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				following the completion of construction, and drainage removed or appropriately blocked where this will not interfere with infrastructure. • The Site compound / office will house all chemicals within a secure bunded COSSH store for the operational phase of the project. • All onsite wastewater treatment facilities will be in full compliance with current regulations to prevent nutrient loading entering aquatic environments.		
MM98	Flora and Fauna	Chapter 7: Ornithology	7.5.2 Operational Phase	A requirement for mitigation during the operational phase of the wind farm has not been identified. However, should post construction monitoring identify an impact, such as higher collision rates than predicted for a particular species due perhaps to a change in population distribution since the baseline surveys, mitigation will be considered following best practice available at the time.		
MM99	Peat and Soil Management	Chapter 8: Soils and Geology	Chemical Storage on Site	An Operational Phase Management Plan will be established, and implemented during the operational phase of the Developments, potential issues arising giving cause to residual impacts are likely to be infrequent, imperceptible to slight, localised and reversible. The Operational Management Plan will include monitoring similar to the construction phase but on a less frequent and / or as required. For example; the developments will be inspected on a routine basis and following storm events. Any potential issues arising will be escalated and remedial action taken in line with construction phase mitigation. *Chemical Storage on Site* The storage of Nitrogen, Potassium hydroxide for electrolysis process (lye), Sodium bisulphite for de-chlorination of mains water, Oils used by hydraulic systems, compressors and		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				transformers and diesel, Antiscalant used to prevent/reduce scaling of water treatment equipment, Glycol for coolant during the operational phase of the Hydrogen Plant poses a risk on the geological, geomorphological and geotechnical environment. Therefore specific detail design is necessary in regards to cement bunding of hazardous materials kept on the Sites, as well as routine inspections and maintenance of the areas. Limiting the volume of hydrogen stored on site mitigates any accidents. Should external factors limit the removal of hydrogen from the Hydrogen Plant Site for transportation, a shutdown system will stop production in order to stay within COMAH lower tier regulation volumes. Other chemicals associated with the wider process including the water treatment?		
MM100	Site Drainage	Chapter 9: Hydrology and Hydrogeology	9.5.3 Operational Phase	***Increase in Hydraulic Loading Proposed Mitigation Measures – Wind Farm Site*** The principles of the mitigation measures described under **Section 9.5.1** (check dams, stilling ponds, attenuation lagoons etc.) are based on the control and management of runoff discharge rates, which ensure the regulating the speed of runoff within the drainage network, buffering the discharge from the drainage network where possible, and maintaining the natural hydrological regime. As such, the measures described with a view to controlling the release of suspended solids also mitigate against the potential for rapid runoff and rapid hydrological responses to rainfall potentially leading to flooding and erosion of the drainage network or downstream of the proposed development. The same measures will be implemented with a view to mitigating against net increase surface water runoff arsing from		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				the proposed development. For example, the following conceptual model will be applied at a proposed turbine hardstand location: • Collector drains; allowing for and estimated 0.5m depth, 1.0m width, presume semi-circular, sectional area; c. 0.4m2. Presume 100m length of collector drain; up to 40m3 capacity per 100m, by 50% allowing for gradient equates to 20m3. Collector drains are not intended to store runoff, however the in line attenuation features, such as check dams and flow regulators will serve to reduce discharge rates dramatically, effectively backing up water and regulating the rate of discharge The actual attenuation capacity of the drainage network and treatment trains will be calculated during the detailed design phase of the proposed development. • Check dams at regular intervals throughout the drainage network (existing, new clean collector and new dirty collector drains) will attenuate runoff intercepted by respective drainage channels. • Dirty water collector drains (associated with construction areas) will direct runoff to established stilling ponds. Stilling ponds will reduce the velocity of runoff, further reducing the hydrological response to rainfall. • Buffered outfalls to vegetated areas will utilise the infiltration capacity of the ground prior to the rejected rainfall eventually being intercepted by the receiving surface water system. • Clean water collector drains will intercept clean runoff (upgradient of construction areas) and will direct runoff around construction areas. The runoff will be attenuated by means of check dams and intermittent buffered outfalls (**Appendix 9.7**).		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				The potential combined attenuation capacity of the proposed drainage infrastructure is designed to attenuate net increase in water runoff during extreme storm events i.e. 1 in 100 year storm event (**Appendix 9.1** and **Appendix 9.2 Site Flood Risk Assessments for Firlough Wind Farm** and **Hydrogen Plant**, respectively). The conceptual model described above indicates that the attenuation capacity is easily achievable with proper consideration, however the effectiveness of attenuation is also dependent on the inclusion of other attenuation features such as check dams, stilling ponds and intermittent buffered outfalls. ***Increase in Hydraulic Loading Proposed Mitigation Measures – Hydrogen Plant Site*** With reference to **Appendix 9.3**, Preliminary Discharge & Assimilative Capacity Assessment, the Hydrogen Plant will harvest and store all rain water intercepted on the site including from roofs and hardstand surfaces on site. The net land sealing at the site is approximately 97%. Furthermore, water storage of 15,064 m^3 has been sized to maximise storage potential, given physical constraints at the Hydrogen Plant Site, in order to capture as much rain water as possible, supplementing groundwater abstraction, to provide the raw water required for the hydrogen production process. In addition, wastewater arising at the Hydrogen Plant Site will be discharged to surface water (Glenree watercourse) via a series of constructed wetlands with a minimum retention rate of 6 days. The discharge rate will also be reduced as required depending on water chemistry or other environmental variables, namely insufficient assimilative capacity in the river during dry weather flow or prolonged drought conditions. This effectively equates to a >6 day lag to the hydrological response to rainfall at the Hydrogen Plant Site and a beneficial impact in terms of reducing potential flood risk downstream of the site.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				During extreme weather events (1 in 100 year) runoff in the order of 373.68 m^3/hour will be attenuated on site. The rainwater storage of 15,064 m^3 equates to approximately 40 hours of rain during a 1 in 100 year storm event. The management of rainwater storage on site will include limiting volumes in storage to allow excess emergency space for attenuation up to 6 hours rain during a 1 in 100 year storm event. This equates to approximately 2,238m^3 or approximately 15% of rain water storage will be left empty in expectation of future storm events. In the event storage does reach capacity, the storm system will be equipped with an overflow diverting excess water (>6 hours during a 1 in 100 year event) to waste water storage and the secondary constructed wetlands (if rainwater storage is mixed with untreated abstracted groundwater, and only if not treating / discharging wastewater) for eventual discharge to surface waters, or direct to surface waters. ***Chemical Storage On Site*** Storage of chemicals (Nitrogen, Potassium hydroxide for electrolysis process (lye), Sodium bisulphite for de-chlorination of mains water, Oils used by hydraulic systems, compressors and transformers and diesel, Antiscalant used to prevent/reduce scaling of water treatment equipment, Glycol for coolant) during the operational phase of Project will include a degree of risk depending on the chemical and volume in storage or use at any particular time, therefore specific detailed design is necessary to ensure adequate storage methods are implemented. This will include plastic bunding or cement bunding of hazardous materials to 110% volume, as well as specific requirements set out in specific Material Data Sheets routine inspections and maintenance of the areas. In addition, storm water systems will		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				include oil water interceptors to ensure mitigation against accidental releases. Chemicals will be managed in accordance with European Chemicals Agency's Guidance for Downstream Users (2014). Chemicals on the Wind Farm Site will be limited to minor quantities of hazardous materials used for maintenance purposes, or household materials e.g. bleach including in canteens and welfare facilities. Chemical Storage on the Hydrogen Plant Site is outlined in **Chapter 2 Section 2.6.6.2.** The selection of bulk chemicals will be subject to an assessment of trace elements to ensure that they are within acceptable limits. Secondary containment, for example a bund, will be used to store the large volumes of oils and other hazardous substances, to prevent hydrocarbon contamination to land/water. Operational staff will receive training on the handling, containment, use, and disposal requirements for all potentially polluting products such as chemicals and oil rags etc, on the Hydrogen Plant Site. Maintenance and monitoring in itself, during the operational phase of the Wind Farm Site and Hydrogen Site poses similar hazards and risks associated with the construction phase but to a far lesser extent, for example; the potential for fuel spills from vehicles, etc. ***Operational Phase Water & Wastewater Systems – Hydrogen Plant Site*** The operational Hydrogen Plant Site will require ongoing monitoring and active management to ensure source water and wastewater treatment systems perform adequately, and		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				discharge rates and quality are in line with discharge licence conditions. The Preliminary Discharge & Assimilative Capacity Report (pDACA, **Appendix 9.3**) indicates that assuming treatment systems are designed, managed and perform adequately, assessed parameters (e.g. BOD) discharging to the river at concentrations in line with indicative discharge licence conditions, the river assimilative capacity will be adequate with the potential exception of prolonged dry weather flow. Under dry weather flow the management and restriction of discharge will ensure downstream water quality achieves relevant Environmental Quality Standards (EQS). To achieve this the reports describes and lists measures to be taken to ensure adequate oversight and sustainable management of environmental resources and receptors, and process and treatment systems. The following will be carried out with a view to managing wastewater quality and volumes on site, and minimizing potential for discharge to have adverse impacts on receiving surface water quality: • Groundwater quality will be monitored on a routine / continuous basis with a view to establishing site specific baseline water quality ranges managing source water and process water chemistry. • Surface water quality will be monitored on a routine / continuous basis with a view to establishing site specific Q95 and baseline water quality ranges, and managing source water and process water chemistry. • Groundwater levels will be monitored continuously. • Surface water levels and discharge rate in the receiving river will be monitored continuously.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• Water sources (groundwater and harvested rainwater) will be utilized and combined at the beginning of the process to minimize contaminant loading in the process source water generally with a view to minimizing loading on downstream wastewater treatment systems. • Groundwater abstraction volumes will be monitored and recorded continuously. It is likely that the development will exceed abstraction volumes of 25m3/day. Therefore, the facility will be required to register with the EPA and follow any associated guidance or legislated responsibility. • 'Water Environment (Abstractions and Associated Impoundments) Act 2022', the Act sets out a process for the registration, assessment and licensing of both surface water and groundwater abstractions although at the time of writing the Act has yet to be commenced. ○ All abstractions, including group water schemes, that reach a minimum daily threshold of abstraction (25m3 per day) will be required to register its abstraction in a similar fashion. Those that abstract 2,000m3 or more will automatically require an abstraction licence. ○ EPA will assess abstractions and if deemed necessary due to potential environmental risk certain development will require EIA. EIAs for these abstractions will reviewed at least once every six years. ○ For groundwater, recharge times and impacts on connected surface waters are among the elements assessed. ○ There is onus on stakeholders to ensure sustainable use of water, and in light of climate change and potential for extreme meteorological conditions, to work towards water sustainability gains. • In line storage throughout the process will facilitate buffering		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				flow through and discharge rates. This includes wastewater storage with a view to buffering inflow and regulating discharge from wastewater treatment works on site. • Process water treatment will include at minimum the proposed design features i.e. Filtration, Reverse Osmosis, and Deionization. The process water treatment facility will be designed to include additional treatment features where required, for example; with the potential for increasing concentrations of contaminants being extracted from the Zone of Contribution (ZOC) over time, the engineered process source water treatment facility will be equipped when and if required to remove elevated concentrations of any particular contaminant which may overload or adversely impact on performance of downstream wastewater treatment facilities. • All engineered water and wastewater treatment systems will be designed and specified by competent, qualified and experienced engineers. • Two wastewater streams identified i.e. process wastewater and foul sewage arising from welfare facilities (toilets, canteen etc.) will be dealt with separately initially. • Wastewater will be treated and managed through passive but managed nature-based solutions, including constructed wetlands (Note; engineered treatment solutions for waste water will be included upstream in the process source water treatment facilities. • All nature based water and wastewater treatment systems (constructed wetlands) will be designed and specified by competent, qualified and experienced environmental engineers. It is recommended that this item is executed at an early stage of the detailed design. Constructed wetlands will be designed with particular characteristics and ecological		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				attributes based on the expected contaminant loading, achievable retention time, and performance / discharge quality objectives. The wetland systems will likely take some time to become established and therefore will be required at an early stage of the construction stage of the proposed development. The detailed assessment and design of constructed wetlands will follow the Department of Agriculture, Fisheries and Food guidance document (2011), Minimum Specification for Integrated Constructed Wetlands and Ancillary Works. • Without advanced assessment of the site hydrogeological properties, including soil infiltration rates and potential for natural attenuation of contaminants, it is recommended that constructed wetlands are lined and do not permit infiltration or recharge to groundwater bodies. There is merit in including assessment for the potential for use of unlined systems. If appropriate (soil infiltration rates, distance to saturated zone) and safe (no dangerous chemicals / contaminants) to do so, allowing treated wastewater to infiltrate to ground will provide beneficial impacts to groundwater in the area (assuming loading reduced to acceptable levels) in terms of both quality and recharge to and replenish groundwater levels following extraction. • Foul sewage will undergo primary treatment by septic tank. The septic tank will be emptied by tanker in line with standard practices. The outfall of the septic tank will be transferred to the foul sewage constructed wetland (FCW) for secondary treatment. The FCW will be positioned in the northeast corner of the site and will be approximately 80m2 to facilitate the optimal retention time of c. 12 days to adequately treat the welfare effluent loading. The outfall of the FCW will be combined with process wastewater in		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				storage before being transferred to the second constructed wetland configuration. • The outfall of the foul constructed wetland (FCW) will be monitored and sampled in line with sampling frequency and reporting requirements set out in the discharge licence conditions, discussed in later points. • The combined wastewater will be pumped to a secondary series of process constructed wetlands (PCW). The remaining area on the site will be utilized to maximize area of PCW and associated retention time. This includes a linear feature within the 5m easement along the southern boundary. Based on initial high level calculations, with the approximate space left available on site, and with regulation of loading and discharge rates, the PCW will achieve a minimum of 6 days retention time. This is lower than the required retention time for loading in line with foul sewage arising from welfare facilities, however the loading from process wastewater will be significantly less than that of welfare wastewater of sewage under normal circumstances*. *Potential for variable source water / groundwater quality • Wastewater storage will be adequately sized (e.g. c. 1500m3) to achieve ability to significantly reduce (e.g. 50%) discharge rates to surface water, or in emergency situations to completely halt discharging for a minimum duration of one month. Emergency situations in the context of this report includes observing prolonged drought conditions and prolonged low dry weather discharge rates in the receiving river, for example; under Scenario B described in this report, discharging under such conditions could significantly adversely impact on water quality in the receiving river. Therefore, this is an important piece to consider in the management of wastewater and effluent discharge.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• A discharge license will be applied for through the relevant local authority (Sligo Co. Co. / Mayo Co. Co.) and assuming obtained, the facility will include and adhere to all license conditions as part of the site water and wastewater management plan. A Detailed Discharge & Assimilative Capacity (DACA) and Detailed Water & Wastewater Management Plan will be developed post consent for the Proposed Development incorporating the mitigation and control measures identified, during the detailed design and consenting stage, and prior to construction / operational phase a more detailed assessment of surface water discharge and baseline chemistry will be carried out and more detailed wastewater management plan will be developed. A preliminary Detailed Discharge & Assimilative Capacity (pDACA) outlined in **Appendix 9.3** This will be done with a view to applying for a discharge licence to discharge a trade effluent to surface waters. Continuous monitoring through the life of the project will be used to review and update methodologies wherever appropriate on an ongoing basis, that is; the detailed water and wastewater management plan which will be developed prior to the construction phase of the proposed development will be live document and procedures will be amended where relevant based on ongoing continuous and/or routine monitoring.		
MM101	Air Quality	Chapter 10: Air and Climate	10.2.8.2 Operational Phase Mitigation	As the operation of the Wind Farm will not have any direct negative impact but will have indirect positive impacts by displacing fossil fuels, mitigation measures are considered unnecessary. Though no significant negative impacts have been identified for		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				the Hydrogen Plant during operation, mitigation by design and health and safety has been a key consideration in the design of the Hydrogen Plant, and the approach has incorporated good practice principles such as inherently safer design and the hierarchy of controls. The Seveso III Directive (Directive 2012/18/EU), the main EU legislation dealing specifically with the control of onshore major accident hazards involving dangerous substances, along with the Chemical Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 which implements the SEVESO directive, apply to the Hydrogen Plant. The ATEX Directive (Directive 1999/92/EC) which sets out a system of precautions and controls to be put in place where explosive atmospheres may be present due to flammable dusts vapours or gases. The ATEX Directive is transposed into Irish Legislation by Part 8 of the Safety, Health and Welfare at Work (General Application) Regulations 2007 and these regulations also apply to the Hydrogen Plant. Design standards specific to hydrogen production facilities (NFPA 2, NFPA 55, ISO 22734, ISO 19880 and ISO 15916 as shown in **Chapter 2: Project Description Table 2.5**) have been used throughout the preliminary design phase. Regulations and separation distances required by industry good practice have been incorporated into the design. Site specific safety measures in accordance with COMAH, ATEX, Safety, Health and Welfare at Work Act and Regulations and other relevant standards and codes will be in place for the full life of operation. An outline Major Accident Prevention Policy has been prepared and is included in **Appendix 16.2.** An Emergency Response Plan (recommended, not required for lower-tier COMAH sites) will be produced for the plant. A risk management programme, ATEX		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Assessment and Safety Management System will be in place for the facility. A Quantitative Risk Assessment (QRA) has been undertaken for the Hydrogen Plant. The QRA was developed in accordance with the inputs, methodology and rulesets outlined in the Irish Health and Safety Authority (HSA) Guidance for Technical Land Use Planning Advice. The results of the analysis show that the proposed site of the Hydrogen Plant is within the tolerable risk region established within the HSA's Technical Land Use Planning Advice guidance. Safety equipment installed at the Hydrogen Plant will include: • Leak/fire detection + isolation/automatic shut-off • Emergency stops • Building ventilation (passive + active) • Piping pressure/flow rate monitoring • Impact sensors at dispensers • Audible and visual alarms • Fire protection and suppression equipment The detection system in place at the Hydrogen Plant will be capable of detecting hydrogen gas or hydrogen fire and a Supervisory Control and Data Acquisition ("SCADA") system will monitor the facilities performance. Fire fighting systems will include alarms, water spray deluge systems, sprinkler systems, carbon dioxide suppression systems and mobile fire protection equipment. Limiting the volume of hydrogen stored on site mitigates accidents. Should external factors limit the removal of hydrogen from the Hydrogen Plant Site for transportation, a shutdown system will stop production in order to stay within COMAH lower tier regulation volumes. To prevent loss of oxygen containment		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				increasing fire risks, the oxygen systems will be physically separated from the hydrogen systems and stores of any combustible materials in line with good practice design standards. All chemicals will be stored in a bunded area and will be subject to requirements of the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001 to 2021 (as amended) and compliance with the requirements of REACH, i.e., European Communities Regulation 1907/2006 for the Regulation, Evaluation, Authorisation and Restriction of Chemicals. Chemicals will be managed in accordance with European Chemicals Agency's Guidance for Downstream Users (2014). Final selection of bulk chemicals will be subject to an assessment of trace elements to ensure that they are within acceptable limits. Storage of large volumes of oils and other hazardous substances will have a secondary containment such as a bund to prevent hydrocarbon contamination to land/water. Waste oils and other chemicals, including oil rags/wipes will be disposed of as hazardous waste. Operational staff will receive training on the handling, containment, use, and disposal requirements for all potentially polluting products on the Hydrogen Plant Site.		
MM102	Noise	Chapter 11: Noise and Vibration	11.15.3 Operational Noise Mitigation	The Wind Farm has been designed to comply with the Wind Energy Development Guidelines 2006, background noise levels and recent 2022 An Bord Pleanála decision. All turbines will have STE fitted as industrial standard to reduce noise emission levels. No other mitigation is considered necessary.		
MM103	Noise	Chapter 11: Noise and	11.28.3 Operational Mitigation	The Hydrogen Plant has been designed to comply with a low background site according to the EPA's NG4 guidelines. A		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
		Vibration		number of mitigation measures are specified in **Section 11.25.4.4** to be incorporated into the design of the Hydrogen Plant Site.		
MM104	Cultural Heritage	Chapter 14: Cultural Heritage	14.6.4 Operational Phase	Following the implementation of the mitigation measures presented in **Section 14.6.1**, the operational phase of the Proposed Development will result in no predicted direct impacts on the archaeological, architectural and cultural heritage resources and, therefore, no mitigation measures are required. As detailed in **Section 14.5.5**, the Development will result in a negative long-term significant/very significant indirect impact on the setting of court tomb RMP MA031-034---. The landscape setting archival record to be undertaken prior to construction shall off-set and reduce this the indirect operational impact on monument setting. There is also a range of long-term, indirect, slight negative impacts of a visual nature on the wider setting of archaeological sites within the surrounding landscape (wedge tomb RMP MA031-005---, barrow SMR SL022-026--- and National Monuments Ref. 293 at Carrowcrom/Carrowcastle). Given the nature and form of wind farm turbines there are no mitigation measures that can ameliorate these visual impacts on the court tomb or those archaeological monuments in the wider environment, but it is noted that they will be reversed following the decommissioning phase.		
MM105	Traffic	Chapter 15: Traffic and Transportation	15.6.3 Decommissioning Phase	Effects during operation have been assessed as being imperceptible. The hydrogen plant will have a total of 26 HGV and 10 light vehicles entering and leaving the site on a daily basis. However, it is still important that any effect is minimised as for as is possible. Therefore, the following measures are recommended: • All vehicles using the wind farm site shall either have roof mounted flashing beacons or will use their hazard lights.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• A speed limit of 25km/h shall apply to all vehicles within the wind farm site. • Signage shall be maintained throughout the operational period. • Road surfaces shall be inspected on a quarterly basis and any remedial works identified will be carried out within one month of the inspection.		
MM106	Major Accidents and Disasters	Chapter 16: Major Accidents and Natural Disasters	16.4.2	*Wind Farm Site* At the Wind Farm Site a suitable separation distance from turbines and other key infrastructure to properties has been embedded in the EIA Development design. Additional mitigation to protect site personnel and the public will also be implemented in the event of damage to a turbine and subsequent likely turbine or turbine component failure. These are: • Turbines will be procured from a reliable manufacturer and will have undergone vigorous safety checks during design, construction, commissioning and operation. • Physical and visual warnings such as signs will be erected as appropriate for the protection of site personnel and the public. • Facility for remote turbine deactivation will be provided. Access to turbines for site personnel will be restricted in storm events. Where access by site personnel is required safety precautions may include remotely shutting down the turbine, yawing to place the rotor on the opposite side of the tower door and parking vehicles at a distance of at least 100 m from the tower. All personnel will be fitted with appropriate PPE. Regular maintenance and inspections will take place during the 40-year operational phase. The final turbine model chosen will		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				be in line with International Electrotechnical Commission IEC 61400-1 safety standards. Maintenance visits will take place as needed with the Scada control system monitoring turbine performance remotely. Access to the turbines will be via the door at the base of the turbines. The turbine access door will otherwise be securely locked at all times.		
MM107	Major Accidents and Natural Disasters	Chapter 16: Major Accidents and Natural Disasters	16.4.2.2 Hydrogen Plant Site Mitigation	***Hydrogen Plant Site Mitigation*** Health and Safety has been a key consideration in the design of the Hydrogen Plant Site, and the approach has incorporated good practice principles such as inherently safer design and the hierarchy of controls. The Seveso III Directive, the main EU legislation dealing specifically with the control of onshore major accident hazards involving, along with the Chemical Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 which implements the SEVESO directive, governs the inventory of substances stored at the Hydrogen Plant Site. Strict ignition controls are in place in line with COMAH and ATEX regulations. Design standards specific to hydrogen production facilities (Shown in Table 2.5 in Chapter 2; Project Description) have been used throughout the preliminary design phase and regulations and separation distances required by industry good practice have been incorporated into the design. A Major Accident Prevention Policy has been prepared and will be refined prior to commencement of operations. An Emergency Response Plan (recommended, not required for lower-tier COMAH sites) will be produced for the plant. A Risk Management Programme, ATEX Assessment and Safety Management System will be in place for the Hydrogen Plant Site. Safety equipment installed will include:		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				• Leak/fire detection + isolation/automatic shut-off • Emergency stops • Building ventilation (passive + active) • Piping pressure/flow rate monitoring • Impact sensors at dispensers • Audible and visual alarms • Fire protection and suppression equipment The detection system in place at the Hydrogen Plant Site will be capable of detecting hydrogen gas or hydrogen fire and a Supervisory Control and Data Acquisition ("SCADA") system will monitor the facilities performance. Fire fighting systems will include alarms, water spray deluge systems, sprinkler systems, carbon dioxide suppression systems and mobile fire protection equipment in accordance with the relevant codes and standards. Water for firefighting purposes will be contained within two dedicated fire water storage tanks of 636 m^3 designed for 120 minute operation in the event of a fire. These will have sprinkler and manual hose operation. This will be reviewed during further design stages. The location of the Hydrogen Plant Site has been specifically selected to minimise the potential to affect any receptors. The public would have no access to the Hydrogen Plant Site. The nearest public road L66121 is 600 m to the west and the nearest buildings which are not associated with the Hydrogen Plant Site are also 299 m away. The current facility design adheres to ISO and NFPA standards, which includes guidance on equipment separation distances. Relevant codes and standards will be applied during the design and operation phases of the project.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				To prevent loss of oxygen containment increasing fire risks, the oxygen systems would be physically separated from the hydrogen systems and stores of any combustible materials in line with good practice design standards. Strict ignition control regulations will also be adhered to. The tube trailer parking area is set back by a minimum of 11 m from equipment and buildings to provide physical separation in the event of a fire or explosion. Any damaged or defected tube trailers will be stored separately in a containment area 24 m from other tube trailers. To prevent over-pressurization events of storage tanks and tube-trailers, pressure-relief systems will also be installed. Site specific safety measures will be in place for the full life of operation. Tube trailers and the high-pressure storage tanks will be designed to suitable standards and filled with trained and competent personnel to avoid any loss of containment during filling. Limiting the volume of hydrogen stored on the Hydrogen Plant Site mitigates any accidents which could affect offsite receptors. Should external factors limit the removal of hydrogen from the Hydrogen Plant Site for transportation, a shutdown system will stop production in order to stay within COMAH lower tier regulation quantities. Chemicals stored on the hydrogen production plant include: • Oils used by hydraulic systems, compressors and transformers • Electrolyte • Coolants • Cleaning products		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				All chemicals stored on-site will be subject to a COSHH (Control of Substances Hazardous to Health) assessment and compliance with the requirements of REACH, i.e., European Communities Regulation 1907/2006 for the Regulation, Evaluation, Authorisation and Restriction of Chemicals. Chemicals will be managed in accordance with European Chemicals Agency's Guidance for Downstream Users (2014). Final selection of bulk chemicals will be subject to an assessment of trace elements to ensure that they are within acceptable limits. Storage of large volumes of oils and other hazardous substances will have a secondary containment such as a bund to prevent hydrocarbon contamination to land/water. Waste oils and other chemicals, including oil rags/wipes will be disposed of as hazardous waste. Operational staff will receive training on the handling, containment, use, and disposal requirements for all potentially polluting products on-site. The application for the Proposed Development is accompanied by a CEMP (**Appendix 2.1**) which sets out details of the environmental controls to be implemented on-site. The CEMP sets out the Emergency Response Procedure to be adopted in the event of an emergency including contamination, health and safety and environmental protection. The CEMP provides details on all mitigation and monitoring measures to be actioned prior to construction, during the construction, operation and decommissioning phase. The CEMP will be subject to ongoing review through regular environmental auditing and site inspections. This will confirm the efficacy and implementation of all mitigation measures and commitments identified in the application documentation.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				The CEMP includes an Emergency Response Plan (**Management Plan 1**). It provides details of procedures to be adopted in the event of an emergency relating to health & safety or environmental protection. The Emergency Response Plan includes details on the response required and the responsibilities of all personnel in the event of an emergency. Please see **Appendix 2.1** for details. Hydrogen on its own cannot burn or ignite, it requires an oxidant (air/oxygen) to do so, along with an ignition source, such as an electric spark. It is therefore transported in enclosed containers with high safety margins and be fitted with relief valves. Hydrogen will be moved offsite by road Carriage of Dangerous Goods (ADR) approved tube trailers pulled by HGVs. While the likelihood of a traffic incident has a rating of 3; "Unlikely" the likelihood of an incident resulting in a fire or explosion is considered to be lower due to the design and safety standards of the hydrogen tube trailers. Using specially designed tube trailers is mitigation by design, the tube trailer layout includes individual cylinders bundled together in steel racks and contained within a steel frame or cage, this offers more protection and lowers the likelihood of a large explosion or fire compared to a large single tank. The cylinders are usually made of steel or composite and designed to withstand impacts. The cylinders are constructed and tested to high safety standards, including ISO 11120 and EN1964-1. Only cylinders that have been appropriately specified and selected for hydrogen transportation shall be used. Before filling all cylinders and transport vessels/tubes will be checked that they are free from obvious damage and harmful contaminants.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Operating instructions shall be available at the filling station. Assemblies shall be bonded and earthed during filling. EU Directives which are relevant to the movement and transportation of hydrogen include: • Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods. This Directive applies to the transport of dangerous goods by road, by rail or by inland waterway within or between Member States, including the activities of loading and unloading, the transfer to or from another mode of transport and the stops necessitated by the circumstances of the transport. • Directive 2010/35/EU, the Transportable Pressure Equipment Directive (TPED) – This Directive applies to the design, manufacture, conformity assessment and periodic reassessment of transportable cylinders, tubes, cryogenic vessels and tanks for transporting gases. • International Carriage of Dangerous Goods by Road (ADR); a European Agreement concerning the international carriage of dangerous goods by roads The cylinders onboard the tube-trailers are designed to these standards and are built to be strong enough to withstand impacts. They are fitted with pressure relief devices that will release the contents in the event of a fire. This reduces the risk of explosions. They are also identified with appropriate safety signage. Vehicles will regularly be inspected for damage, leaks or equipment malfunction and maintained in good working order. Vehicle operators will be suitable qualified. High-pressure hydrogen tanks are designed not to rupture and are held to rigorous performance requirements. Cylinders undergo		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				extensive testing, this includes, cycling tests in which they are pressurized and depressurized many more times than they would be during their lifetime to make sure that they meet these performance requirements. Hydraulic stress testing to test the strength of the cylinders is performed. Low and high heat temperate tests and fire simulation tests are used to ensure the cylinder and its safety components can withstand a temperature of at least 800°C for 12 minutes without rupturing. In testing, cylinders are exposure to pressures above normal to simulate fault management, dropped from height, undergo impact tests, are shot with a rifle, burned, and exposed to chemicals such as automotive fluids and acids, salts, and other road hazards to validate that they are safe even under severe or unusual conditions. Gaseous hydrogen is currently delivered by tube trailers in the U.S and across Europe including England and Wales. A detailed Emergency Response Plan (ERP) for the operational phase of the Hydrogen Plant, to cover health and safety emergencies as well as environmental emergencies, as part of the H&S Plan will be developed. This ERP shall be activated in the event of an emergency such as an accident, fire, spillage etc. and will provide details on who is required to be notified, first aid facilities and closest hospitals. The safe design of hydrogen transportation vehicles, the standards and regulations which are required, the health and safety policies and procedures in place during the operational phase of the Hydrogen Plant and the regular inspection and maintenance of the transportation vehicles work to reduce the likelihood of a fire or explosion in the event of a traffic incident involving the hydrogen tube trailers.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Safety Management Plan (SMP) The safety management activities will generate and present the evidence to demonstrate that the risk of harm from hazards associated with the plant will be mitigated by the Proposed Development to an acceptable level once planning consent has been obtained. Hydrogen safety, like all flammable gas, relies on these key safety considerations: • Eliminate hazards or define mitigation measures • Ensure system integrity • Provide proper ventilation to prevent accumulation • Manage discharges • Detect and isolate leaks • Train personnel		
Decommissioning Phase						
MM108	Decommissioning	Chapter 6: Aquatic Ecology	6.5.4 Decommissioning Phase Mitigation	Decommissioning of the Development will be scheduled to take place after the proposed 40 year lifespan of the project. Decommissioning phase impacts for the proposed development are likely to be broadly similar to construction phase impacts, in terms of potential surface water quality impacts from ground disturbance, refuelling and the storage of potentially hazardous materials onsite. The implementation of all mitigation measures detailed for the construction phase will be adopted in full during the decommissioning phase to ensure all such impacts are avoided. 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. However, it should be		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				noted that by the time decommissioning is undertaken after the planned 30-year lifespan of the Development, 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 40 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.		
MM109	Decommissioning	Chapter 4: Soils and Geology	8.5.4 Decommissioning Phase	It is the intention that the Hydrogen Plant will continue operations indefinitely. The source of electricity for the Hydrogen Plant would change upon the decommissioning of the Wind Farm and be changed to one of the following options: • Subject to planning consents, the repowering of Firlough Wind Farm. • Reinforced electricity network with a corporate Power Purchase Agreement with a green electricity producer. • Connection to an offshore wind power generator off the west coast. No new impacts are anticipated during the decommissioning phase of the Wind Farm project (removal of turbines and similar infrastructure on the geological, geomorphological and geotechnical environment) therefore no new mitigation measures are required, however the decommissioning of major		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				infrastructure including proposed turbines poses similar hazards and risks to the environment compared to that of the construction phase. Further details can be found in **Chapter 2 Section 2.9**. Restoration of the Wind Farm Site and its substation, following decommissioning of the proposed infrastructure is in its own right a phase of the Development. Restoration activities have the potential to be disruptive and hazardous to the environment, to the point that a 'benefit analysis' will likely be required to evaluate any such activity before it is permitted (Schumann, M., and Joosten, H., 2008). Likely difficulties impeding restoration highlighted by means of 'benefit analysis' in terms of soil and geology include the following: • Removal of Turbine Foundations – Significant disturbance due to the difficulties associated with excavating, breaking concrete, cutting steel, loading and transferring foundation materials offsite, and subsequent disturbance associated with the excavation of suitable material to be used as fill to replace the turbine foundation. Vibration caused, particularly in relation to the breaking of concrete, may impact on peat and slope stability locally. Turbine foundations will likely be left in situ. • Removal of Hardstand / Substation / Site tracks – Significant disturbance due to operations associated with excavation and removal of hardstand materials. Removal of such materials will likely impact on blanket bog directly adjacent to the hardstand area in question, and change the hydrological characteristics of the area in question (**Chapter 9: Hydrology and Hydrogeology**). For this reason all		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				proposed Wind Farm site access roads, hardstanding areas and drainage will be left in situ for future use. • The material required to reinstate any areas where infrastructure is removed will need to be sourced from elsewhere on the Wind Farm Site. Considering the elapsed time (reasonable to presume >20 years) the acquisition of natural material itself will likely do more harm (to established blanket bog) than that of the benefit of removing and restoring infrastructure associated with the Development. Ultimately, any such restoration activities will need to be assessed under the scope of multiple environmental disciplines, similar to this EIAR, and the potential synergistic effects. Given that the condition of the environment will likely change over the course of the operational phase of the Development, particularly in terms of the health and degree of establishment of blanket bog and associated ecology, and ornithology, it is recommended that the potential for restoration following the decommissioning phase of the Development is evaluated closer to the time (c. 35-40 years). It should be noted that restoration activities do not currently conform to baseline conditions. Excavation of all material including concrete turbine foundations will likely not be proposed due to the high impact nature of such works e.g. breaking of reinforced concrete. Extensive vehicular movement on peat is not anticipated to any significant extent considering adequate hardstand will have been established, however the risk of fuel or other contaminant spillages, or management of waste are valid hazards during the decommissioning phase of the Development. The mitigation measures described in this EIAR chapter will be adopted and implemented by means of a Decommissioning Phase Management Plan (DPMP).		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				On the basis that a Decommissioning Phase Management Plan will be established, and implemented during the decommissioning works associated with the Development, potential issues arising giving cause to residual impacts are likely to be infrequent, imperceptible to slight, localised and reversible. Residual impacts after the decommissioning phase is complete include all impacts classified as being long-term to permanent effects of the Development, that is; there will remain a change in ground conditions at the Site with the replacement of natural materials such as peat, subsoil and bedrock by concrete, subgrade and surfacing materials. This is a localised, negative, moderate adverse significance, Significant / Moderate weighted significance, direct permanent change to the materials composition at the Site. However, the carefully managed reintroduction and/or reuse of soils and peat at the Site in place of hardstand areas, and successful habitat management, revegetating and rewilding of those areas will have beneficial impacts, or revert to baseline conditions preconstruction phase.		
MM110	Decommissioning	Chapter 9: Hydrology and Hydrogeology	9.5.4 Development Decommissioning & Restoration Phase	No new impacts are anticipated during the decommissioning phase of the Project on the hydrological and hydrogeological environment therefore no additional mitigation measures are required, however the decommissioning of major infrastructure including proposed turbines, poses similar hazards and risks to the environment compared to that of the construction phase. Mitigation measures similar to the construction phase will be implemented. In regard to Wind Farm Site, excavation of material is not anticipated, similarly vehicular movement on soil is not anticipated considering adequate hardstand will have been established, therefore the risk of release of suspended solids is		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				slight, however the risk of fuel or other contaminant spillages, or management of waste are valid hazards during the decommissioning phase of the proposed development. Deconstruction works during the decommissioning phase of the Proposed Development pose similar hazards and risks associated with the construction phase but to a far lesser extent, for example; the potential for fuel spills from vehicles is valid but there will likely be less vehicles required, for example, no excavators. The principles mitigation measures described in this EIAR chapter will be implemented by means of a Decommissioning Phase Management Plan. Restoration of the Wind Farm Site following decommissioning of infrastructure is in its own right a phase of the Proposed Development. Restoration activities have the potential to be disruptive and hazardous to the environment (similar impacts to construction), to the point that a 'benefit analysis' will likely be required to evaluate any such activity before it is permitted (Schumann, M., and Joosten, H., 2008). Baseline conditions will likely change over the life of the project, therefore repeat assessments will be carried out prior to decommissioning and restoration with a view to tailoring and implementing site specific measures which will be reviewed and agreed with the planning authority prior to the commencement of decommissioning. Examples of difficulties impeding restoration highlighted by means 'benefit analysis' in terms of hydrology and hydrogeology include the following: • Removal of Hardstand / Access Tracks – Significant disturbance due to operations associated with excavation and removal of hardstand materials. Removal of such		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				materials will leave an exposed area of ground in situ, which will lead to erosion and entrainment of suspended solids in surface water runoff traversing these exposed areas. The drainage network established for the purposes of the construction phase of the Proposed Development will likely not be sufficiently suitable to manage such contamination instances, and Active Management will be required similar to the construction phase. • Removal of Turbine Foundations – The removal of concrete foundations is a challenge in itself, however it also increases the potential for surface water contamination via concrete dust and other debris. If water accumulates within open foundation removal excavations, and concrete dust is entrained, the water arising from dewatering activities will likely have an elevated pH. Discharging such water to the receiving surface water network could potentially have significant adverse effects. The water would likely require treatment before discharging. For this reason, and the disproportionate effort required to remove buried foundations, they will likely be left in situ. • The material required to reinstate any areas where infrastructure is removed will need to be sourced from elsewhere on the site. This will lead to similar issues as described in the points above. It is the intention that the Hydrogen Plant will continue operations indefinitely. The source of electricity for the Hydrogen Plant would change upon the decommissioning of the Wind Farm and be changed to one of the following options: • Subject to planning consents, the repowering of Firlough Wind Farm. • Reinforced electricity network with a corporate Power		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Purchase Agreement with a green electricity producer. • Connection to an offshore wind power generator off the west coast. If these alternatives are not viable then the process equipment would be decommissioned; all plant, machinery and equipment will be emptied and dismantled to be sold or recycled or, where these are not possible, disposed of through a licenced waste contractor. If required, all machinery will be cleaned prior to removal and all necessary measures implemented to prevent the release of contaminants. All waste will be removed from the facility and recycled wherever possible, disposal operations will be controlled by licenced waste contractors. Ultimately, any such restoration activities will need to be assessed under the scope of multiple environmental disciplines, similar to this EIAR, and the potential synergistic effects at the end of life of the project (c. 40 years). Given that the condition of the environment will likely change over the course of the operational phase of the Proposed Development, particularly in terms of the health and degree of establishment of environmental attributes including land use, ecology and ornithology etc., it is recommended that the potential for restoration following the decommissioning phase of the Proposed Development is evaluated closer to the time.		
MM111	Decommissioning	Chapter 15: Traffic and Transport	15.6.3 Decommissioning Phase	As the turbine blades can be cut into manageable lengths on decommissioning, there is no requirements to re-use the turbine supply haul route for decommissioning. Thus, all decommissioning related traffic will use the L2604. The Developer is applying for a consent for an operational period of 40 years for the Wind Farm. Cranes of similar size to those used for construction will disassemble each wind turbine		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				using the same crane hardstands. The towers, blades and all components will then be removed from the Wind Farm Site and reused, recycled, or disposed of in a suitably licenced facility. The wind turbine transformers will also be removed from the Wind Farm Site. There is potential to reuse wind turbine components, while others can be recycled. Underground cables will be removed while the ducting will be left in-situ. The foundations and upstand sections will remain in-situ. All Wind Farm site access roads, hardstanding areas and drainage will be left in situ for future use. It is intended that all above ground components and underground cabling (ducting left in-situ) will be removed from the Wind Farm Site as part of the decommissioning of the Wind Farm. The following elements are included in the decommissioning phase: • Wind turbines dismantling and removal off the Wind Farm Site • Underground cabling removal (ducting left in-situ) • Turbine Foundation backfilling following dismantling and removal of wind turbines (any excavated material, will be re-instated / foundations that protrude above ground level will be backfilled with soil -underground reinforced concrete remaining in-situ) • Transport Route Accommodation Works Any structural materials suitable for recycling will be disposed of and sent to a licenced facility. The financial costs of decommissioning, at current material values, will be more than met by the recycling value of the wind turbine components.		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				Prior to wind turbine removal, due consideration will be given to any potential impacts arising from these operations. Potential impacts are likely to be similar to that of the construction phase, to an equal or lesser extent. Some of the potential issues could include: • Potential disturbance by the presence of cranes, HGVs, and personnel on-site • Time of year and timescale (to be outside sensitive periods). Prior to the decommissioning work, a comprehensive plan will be drawn up and submitted to the relevant planning authority for written agreement. The plan will take account of the findings of this EIAR and the contemporary best practice at that time, to manage and control the component removal and ground reinstatement. It is the intention that the Hydrogen Plant will continue operations indefinitely. The source of electricity for the Hydrogen Plant would change upon the decommissioning of the Wind Farm and be changed to one of the following options: • Subject to planning consents, the repowering of the Wind Farm. • Reinforced electricity network with a corporate Power Purchase Agreement with a green electricity producer. • Connection to an offshore wind power generator off the west coast. If these alternatives are not viable then the process equipment would be decommissioned; all plant, machinery and equipment will be emptied and dismantled to be sold or recycled or, where these are not possible, disposed of through a licenced waste contractor. If required, all machinery will be cleaned prior to		

Ref. No.	Reference Heading	EIAR Chapter	Section	Mitigation Measure	Audit Result	Action Required
				removal and all necessary measures implemented to prevent the release of contaminants. All waste will be removed from the facility and recycled wherever possible, disposal operations will be controlled by licenced waste contractors. The buildings and infrastructure would be retained and repurposed.		

Table 17.1b: Monitoring Schedule

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
Pre-Construction Phase						
MX1	Flora and Fauna	6.7 Monitoring Chapter 6: Aquatic Ecology	In order to verify the efficacy of pollution prevention and mitigation works during construction, Water Quality Monitoring will be undertaken prior to, during and post completion of construction works in accordance with the parameters and schedules as set out in the Water Quality Management Plan.			
MX2	Flora and Fauna	7.6 Monitoring Chapter 7: Ornithology	confirmatory breeding bird surveys focused on red grouse, merlin and snipe, will take place in the spring/summer prior to construction to establish the breeding status and distribution within the Wind Farm site to a distance of approximately 500 m from any works area. From the results of monitoring, the likely need for restrictive zones to avoid or minimise the potential for adverse effects on breeding activities will be determined (see **section 7.5.1.2**). All monitoring surveys will be undertaken by a suitably qualified ornithologist, with the red grouse survey following the tape lure method (under licence).			
MX3	Site Drainage	9.5.3.4 Operational Phase Water & Wastewater Systems – Hydrogen Plant Site Chapter 9: Hydrology and Hydrogeology	Continuous monitoring through the life of the project will be used to review and update methodologies wherever appropriate on an ongoing basis, that is; the detailed water and wastewater management plan which will be developed prior to the construction phase of the proposed development will be live document and procedures will be amended where relevant based on ongoing continuous and/or routine monitoring.			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
Construction Phase						
MX4			An Ecological Clerk of Works (ECoW) and Environmental Manager will be on site as required during the construction phase. As required, a consultant ecologist with expertise in peatland habitats will assist the ECoW and Environmental Manager. The consultant ecologist will be employed by the developer and will be independent of the Contractor. The ECoW will ensure that all mitigation relating to ecological impacts is being implemented throughout the construction phase of the project. Mitigation for Kerry Slug, as described in **Section 5.6.7**, will involve monitoring of potential Kerry Slug habitat prior to any works commencing. This will be carried out by an ecologist with proven expertise in the ecology of Kerry Slug and will be under licence.			
MX5	Chapter 7: Ornithology	7.6.1.1 Pre-construction phase and construction phase	As noted in **section 7.4.2.2**, confirmatory breeding bird surveys focused on red grouse, merlin and snipe, will take place in the spring/summer prior to construction to establish the breeding status and distribution within the Wind Farm site to a distance of approximately 500 m from any works area. From the results of monitoring, the likely need for restrictive zones to avoid or minimise the potential for adverse effects on breeding activities will be determined (see **section 7.5.1.2**). All monitoring surveys will be undertaken by a suitably qualified ornithologist, with the red grouse survey following the tape lure method (under licence). As more than two or three years are expected to have passed between the baseline surveys in 2019-2021 and the			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			commencement of construction, the surveys will include all target species as the distribution of some species may change in the intervening period. As noted in **section 7.5.1.3**, bird monitoring will take place as required to identify locations of nesting bird during the construction phase should vegetation need to be removed.			
MX6	Chapter 8 Soils and Geology	8.5.3.3 Maintenance and Monitoring	Maintenance and monitoring in itself, during the operational phase of the Wind Farm Site and Hydrogen Site poses similar hazards and risks associated with the construction phase but to a far lesser extent, for example; the potential for fuel spills from vehicles, etc. The mitigation measures described in this EIAR chapter will be adopted and implemented. Vehicular movements will remain constant on the Hydrogen plant in the operational phase, there will be constant transport of hydrogen from the site. It is a working assumption that as the hydrogen market develops tube trailer technology will evolve and greater volumes will be able to be transported per trailer. This assumption results in a maximum predicted number of truck movement per day 26. If this assumption was not to apply the number of movements would be of the order of 50.			
MX7	Chapter 9: Hydrology and Hydrogeology	9.5.2.17 Construction Phase Monitoring	To ensure effective implementation of mitigation measures, environmental auditing, and monitoring of environmental obligations of the Developer, an Environmental Clerk of Works (EnvCoW) will be assigned to carry out monitoring during the construction and operational phases of the Proposed Development. The role of the EnvCoW will be to actively and continuously monitor site conditions and advise on environmental issues and monitoring compliance, and will not be responsible for implementing measures, the due duty of implementing measures will be held by the Developer /			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			contracted construction operator. The EnvCoW will have the authority to temporarily stop works in a particular area of the site to ensure corrective measures are implemented and adverse environmental impacts are minimised if not avoided. Monitoring of pollution prevention and mitigation undertaken by the EnvCoW assigned by the Developer will include: • Monitoring site pollution prevention plan. • Water quality monitoring. • Advising on required pollution prevention measures (as described in this EIAR) and monitoring their effectiveness. • Liaison with local authorities in relation to pollution instances if applicable. • Considering the EnvCoW will be responsible for monitoring a broad range of environmental factors at the Site, technical monitoring and advice will be sought such as from specialist consultants as the need arises e.g. installation and website for telemetry. The following measures will be implemented for site monitoring in relation to the hydrological and hydrogeological impacts: • The baseline monitoring undertaken at the Wind Farm Site and Hydrogen Plant Site as part of this study will be repeated periodically before, during and after the construction phase of the Proposed Development to monitor any deviations from baseline water quality that occur at either the Wind Farm Site or Hydrogen Plant Site. This monitoring along with the detailed monitoring outlined below will ensure that the mitigation measures that are in place to protect water quality are working. Specifically, a construction period and post construction monitoring programme for the Site will include the following:			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			• During the construction phase; daily inspection of silt traps, buffered outfalls and drainage channels and daily measurement of total suspended solids, electrical conductivity, and pH at selected water monitoring locations on the Wind Farm Site and Hydrogen Plant Site. Monitoring of the aquifer underlaying the Hydrogen Plant will be required during the construction phase. Monitoring of same during times when excavations are being dewatered (likely high in solids) will be done in real time. In this regard, physiochemical properties will be monitored in real time by means of alarmed telemetry e.g. telemetric monitoring at baseline sampling locations and alarm thresholds established in line with water quality reference concentrations/limits which will be set using relevant instruments for example; Surface Water Quality Regulations, <25mg/l Total Suspended Solids (TSS). • Continuous Monitoring will be carried out as part of Active Management of construction water management and treatment (**Appendix 9.7**). These monitoring systems will travel with the active construction areas / remain with the Active Management infrastructure. The purpose of this is to recycle water if quality is unfavourable and adjust the dewatering and treatment train accordingly until discharge quality is observed to be acceptable. A small degree of tolerance above reference concentrations is acceptable at this location but only if the discharge from the Active Management train discharges to another Passive Management system or to a non-sensitive vegetated area. If discharging within sensitive areas or buffer zones, the quality of discharge from the Active Management train will be in line with prescribed reference limits (e.g. 25mg/l TSS) • Continuous Monitoring at downstream Baseline SW			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			Monitoring Locations (**Figure 9.6**) will be carried out using telemetry during the construction phase of the Proposed Development. Triggering of the threshold at these locations will trigger emergency response and escalation of measures including immediate full Proposed Development inspection to ascertain to the potential unknown source (baring in mind that the quality of managed runoff at the site will be known by means of live telemetry and hand held meters). Continuous monitoring at Baseline SW Monitoring Locations will continue into the operational phase until stable conditions are observed e.g. stable conditions in line with baseline conditions for 6 months. • Post construction; inspection of silt traps, buffered outfalls and drainage channels, measurement of total suspended solids, electrical conductivity, and pH at selected water monitoring locations at the Site will be carried out at a reasonable frequency (weekly initially gradually reduced based on observed stability of conditions), and will also be scheduled following extreme metrological events (**Section 9.5.2.1**). During the operational phase of the project the stilling ponds and buffered outfalls will be periodically inspected e.g. weekly during maintenance visits to the Wind Farm Site and Hydrogen Plant Site initially and gradually reduced based on observed stability of conditions. • During the construction phase of the project, the Proposed 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. This monitoring will continue at a reasonable frequency (weekly initially			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			gradually reduced based on observed stability of conditions) during the operational phase of the Proposed Development, however it is envisaged that any potential issues in this regard will be identified and rectified during the construction phase. • During the construction phase of the project, the Proposed Development areas and adjacent receiving drainage systems will be monitored daily for evidence of erosion and other adverse impacts to natural drainage channels and existing degraded areas whereby soils/peat are exposed and prone to enhanced degradation. This monitoring will continue at a reasonable frequency during the operational phase of the Proposed Development, however it is envisaged that any potential issues in this regard will be identified and rectified during the construction phase. • During both the construction and operational phases of the project watercourse crossings will be monitored frequently (daily during construction and intermittently during operational phase i.e. weekly / monthly inspections initially and reduced gradually in line with observed stability and confidence in longer term data obtained. The water course crossings will be monitored in terms of structural integrity and in terms of their impact on respective watercourses. • A detailed inspection and monitoring regime, including frequency is specified in the Construction Environmental Management Plan (CEMP). This will include the development of an environmental risk register e.g. constraints linked to the development construction schedule, routine reporting on the performance and effectiveness of drainage and attenuation infrastructure, and any actions taken to rectify or enhance the system. • Site water runoff quality at all surface water monitoring			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			locations will be monitored on a continuous basis during the construction phase of the Proposed Development. Monitoring will continue into the operational phase until such time that each of the Wind Farm Site and Hydrogen Plant Site and water quality have stabilised (stable conditions in line with baseline conditions for e.g. 8 consecutive quarterly monitoring events). This monitoring will be carried out at the downstream surface water baseline sampling location **(Figure 9.6a Figure 9.6b**) • Continuous monitoring systems will be in place, particularly in principal surface water features draining the site. For example; remote sensing, or telemetric monitoring sensors (turbidity) will be employed in this regard. • At construction areas requiring drilling (HDD) and/or significant excavations (launch pits, cable joint bays), and in the management of general excavations, arisings will be managed carefully with a view to containing and treating all drained water and runoff which will likely be laden with suspended solids. Active continuous monitoring will be required at these locations in line with the conceptual model presented in Appendix D – Tile 2. The monitoring location will be at the outfall or discharge point of the treatment train at any respective location. Continuous monitoring will include telemetry. • Continuous Monitoring Locations or Telemetric Monitoring Stations (TMS) will use probes to monitor the following parameters: ○ Electrical Conductivity ○ Turbidity (Data obtained can be equated to estimated Total Suspended Solids (TSS) through calibration) ○ pH ○ Temperature			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			○ Capacity for additional probes. • TMSs will be self-powered and will be comprised of the following components at a minimum; ○ Remote Telemetry Unit (RTU) – Modem / data hub and transmission. ○ Solar panel ○ Sensor – pH ○ Sensor – Turbidity ○ Sensor – Electrical Conductivity ○ Sensor Cleaning Device (SCD)(Turbidity probe) ○ Power Management Unit (PMU) ○ Power Bank (PB) ○ Website – presenting data trends over time. ○ Metal stand / frame and protective fencing. ○ The TMS will have capacity for additional parameters. • Telemetric continuous monitoring sampling frequency is generally set at one data point per 15 minutes, however considering the intensive nature of the proposed works, particularly drilling activities, if possible it is recommended that sampling frequency is set at 5 minutes or less with a view to escalating responses to potential discharge quality issues in good time. Data is transmitted to a project website which will display data trends over time. Access to the website can be gained and shared via a website link. • Telemetric Monitoring Systems will be used a key part of Active Management of runoff and construction water at the site, as presented in **Appendix 9.7 – Tiles 9 - 11**. • A handheld turbidity meter will be available and used to accurately measure the quality of water discharging from the site at any particular location. The meter will be maintained and calibrated frequently (per the particular unit's calibration requirements / user manual), and will also			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			be used to check and calibrate remote sensors if they are employed. Quality thresholds will be established for the purposes of escalating water quality issues as they arise. • Rainfall will be monitored (1 no. rainfall gauge required). This unit will be connected with and displayed with other site water quality telemetry data via the telemetry website. • Surface water runoff control infrastructure will be checked and maintained on a on-going basis, and stilling ponds and check dams will be maintained (de-sludge / settle solids removed) on an ongoing basis , particularly during the construction phase of the Proposed Development. It is important to minimise the agitation of solids during these works, otherwise it will likely lead to an acute significant loading of suspended solids in the drainage network. This can be achieved by temporarily reducing or blocking inkling flow and vacuum extracting settled solids or *sludge*. Where the drainage feature posses relatively significant flow rates, isolating and over pumping is the best course of action. • As part of the Construction Environmental Management Plan (CEMP) regular checking and maintenance of pollution control measures are required (in line with frequencies outlined above), with an immediate plan for repair or backup if any breaches of design occur. In the event that established infrastructure and measures are failing to reduce suspended solids to an acceptable level, construction works will cease until remediation or upgrading works are completed. • All details in relation to monitoring will be included in the Surface Water Management Plan (SWMP). Consultation with relevant stakeholders will be sought prior to the SWMP being reviewed and approved by the planning authority.			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			Monitoring of potential hydrological impact of the Proposed Development, particularly during the operational phase will be inherently linked to the ecological health of the blanket peat on the Wind Farm Site (as a functioning ecosystem) and therefore both hydrology and ecology will be considered, and monitored in tandem. For example, impacts to the hydrological regime at the Site can potentially impact on the ecological health or characterisation of the Site, and vice versa. Ecological indicators can potentially provide useful data in relation to the long-term impact of changes to the hydrological regime at the Site. However, as discussed in earlier section of this report (**Section 9.4**), changes to the management of runoff and in turn the hydrological regime at the site will lead to a positive impact overall when compared to the baseline conditions associated with the site e.g. introduction of intermittent buffered outfalls along the length of the drainage network is in contrast to baseline, this will promote a more even distribution runoff, attenuate runoff and reduce the hydrological response to rain fall, enhanced potential for recharge to ground, and in turn raising bog water levels wetting of blanket peat at the Wind Farm Site. The hydrogen Plant has been designed so that it can be in operation 24 hours a day, seven days a week and will be manned with a dedicated team providing maintenance and servicing. Site specific management systems and operating procedures will be developed in accordance with industry procedures and policies. In the event planning is granted for the Proposed Development, the CEMP provides a commitment to mitigation and monitoring, and reduces the risk of pollution whilst improving the sustainable management of resources.			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
Operational Phase						
MX8		7.6.1.2 Post-construction phase	Post-construction bird monitoring is required to establish possible effects on bird species as a result of the project. The monitoring programme will comprise the following: **Flight activity surveys** Flight activity surveys will be undertaken using the Vantage Point method (Scottish Natural Heritage 2017) during the operational phase of the wind farm. This will use the same two vantage points as used for the baseline EIAR surveys. The surveys will be undertaken monthly in Years 1, 2, 3, 5, 10 and 15 of the life-time of the project (in accordance with Scottish Natural Heritage Guidance 2009). Usage of the site by merlin, kestrel and golden plover will be of particular interest. **Distribution and abundance surveys** Distribution and abundance surveys will be undertaken to monitor short-term and long-term effects on bird populations within the site. Survey methodology will be similar to the transect methods employed for baseline on-site EIAR surveys, which will allow a comparison of data to be made for each monitoring year. For red grouse, a repeat of the pre-construction red grouse tape lure survey (under licence) will take place in Years 1, 2, 3 and 5 of operation. This will establish whether red grouse maintain a presence on site in the area of the wind farm infrastructure. Surveys will follow the standard methodology as used in the baseline EIAR survey. **Collision searches** Whilst no significant effects on birds due to collision are			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			predicted, the proposed Wind Farm development will provide an opportunity to gain baseline data on bird/turbine interaction and hence the Wind Farm Site will be monitored for bird fatalities. Carcass search was traditionally completed by human observers whose efficiency is influenced by several factors including carcass type, environmental conditions and observer competence. Numerous studies have been conducted demonstrating that dogs have a superior ability to detect bird and bat carcasses than humans, particularly with small carcasses or in dense vegetation (see for example Mathews 2013). A standard plot size will be selected at each turbine location where search will occur. At the start of each survey, data recorded will include meteorological and ground cover information. The locations of any carcasses found will be recorded by GPS and will be photographed in-situ. The state of each carcass will be recorded on a corpse record card, using the following categories (after Johnson 2003): • Intact - a carcass that is completely intact, is not badly decomposed, and shows no sign of being fed upon by a predator or scavenger • Scavenged - an entire carcass which shows signs of being fed upon by a predator or scavenger, or a portion(s) of a carcass in one location such as wings, legs, skeletal remains or pieces of skin • Feather Spot - ten or more feathers at one location indicating predation or scavenging. If only feathers are found, 10 or more total feathers or two or more primaries must be discovered to consider the observation a casualty.			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			Searcher efficiency and predation tests will be carried out at the commencement of the programme in order to calibrate the results to account for the search dog's ability to find bird corpses and to also account for scavenging of corpses by animals. The collision searches for birds can be combined with the bat carcass searches which will be carried out in the first three years of operation (post-construction surveys) and subsequently in years 5, 10, 15, 20, 25 and 30 in the spring to autumn periods. In addition, a winter survey will be carried out for birds in each survey year owing to the occurrence of wintering golden plover in the area. ***Operational Phase Monitoring – Wind Farm Site*** Monitoring at the Wind Farm Site during the Construction phase will continue into the operational phase and at a similar frequency until such time as conditions stabilize and revert to baseline or objective benchmarks in terms of improvement works. This will include monitoring associated with ecology, including in the revegetating of improvement or reinstatement areas. The frequency of monitoring will gradually reduce when conditions are observed to be stable, but will continue for the life time of the Project. This will include, but is not limited to; • Routine checks and maintenance of storm drainage systems, including permanent stilling ponds and outfalls. • Routine surface water monitoring repeated at baseline monitoring locations. • Routine checks and maintenance of welfare and chemical storage facilities.			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			Operational Phase Monitoring – Hydrogen Plant Site The following section is an overview of the conceptual graphics detailing monitoring requirements during the operational phase of the Hydrogen Plant. As discussed and mentioned throughout this report, monitoring will be required at numerous locations to facilitate and ensure adequate management of a dynamic process in terms of expected source water, wastewater, and receiving water qualities. Detailed monitoring plans will be developed for the following@ • Input and Sources ○ Groundwater levels will be monitored continuously. ○ Ambient groundwater chemistry will be monitored in boreholes. As per likely licence conditions, a minimum of quarterly monitoring of groundwater chemistry will be required. ○ Rainfall at the site will be monitored continuously. ○ Harvested Rainwater & Storm Water volumes. ○ The use of storm water as a raw material requires pre-treatment via oil water separation during storage to prevent contamination of process by hydrocarbons. This will require regular monitoring and maintenance in line with standard practices. ○ Continuous monitoring of water sources being input to the facility and process water treatment works. Establishing site specific water quality ranges will be necessary to ensure consistent and appropriate loading in wastewater. • Process Water Treatment & Output ○ It is assumed that the engineered water and wastewater treatment facilities will require a degree of continuous monitoring as standard. However, at minimum the works will monitor flows and			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			concentrations of key parameters in wastewater streams. This will be carried out on an ongoing basis to ensure that the water treatment systems are functioning adequately, and to monitor the contaminant loading in wastewater transferred to nature-based treatment systems downstream i.e. constructed wetlands. ○ Welfare and Foul Sewage ○ Septic tanks will require monitoring and maintenance in line with standard practices. ○ The outfall of the Foul Constructed Wetland (FCW) will be monitored continuously for key chemical parameters and physically sampled in line with likely licence conditions. ○ FCW outfall volumes will be monitored on a continuous basis with a view to monitoring chemistry of combined FCW outfall and Process Wastewater. • Wastewater Treatment ○ Volumes within wastewater buffer storage will be monitored continuously. ○ Quality data obtained from process water treatment and FCW outfall monitoring will be utilized to infer water quality within wastewater buffer storage, if chemistry in storage is monitored directly. This will be done on a continuous basis for key parameters. ○ The outfall / pumped volume from wastewater storage to the Process Constructed Wetland (PCW) will be monitored continuously. ○ Health and performance of all constructed wetlands will be monitored on an ongoing basis. • Discharge & River ○ Routine and continuous monitoring of surface water			

Ref. No.	Reference Heading	Reference Location	Mitigation Measure	Frequency	Reporting Period	Responsibility
			quality in line with licence conditions and advised Environmental Quality Standard (EQS) chemical parameters including but not limited to; temperature, pH, turbidity, electrical conductivity, dissolved oxygen, nitrogen, phosphorous, and other key EQS parameters. This will be done with continuous monitoring equipment for a select key parameters and those which can practically be monitored in situ in real time. Other parameters which require physical sampling e.g. Biological Oxygen Demand (BOD) will be monitored on a routine basis, with high frequency e.g. weekly to inform the proposed development of the detailed water management plan, that is; adequate data to establish representative baseline concentration trends of key parameters and to adjust assimilative capacity calculations accordingly. ○ Monitoring described above will be conducted at three monitoring locations on the river; upstream (FHP-SW-US), the discharging effluent at the discharge point (DP) or at a representative (of end of pipe) sampling location on the discharge line, and downstream (FHP-SW-DS) of proposed development. Continuous real time monitoring data obtained at these locations will be used to manage and calibrate the wastewater and discharge regime at the site. ○ Discharge rates in the river will be monitored on a continuous basis. Data obtained will be used to establish a hydrograph and associated discharge (Q) percentiles (similar to EPA HydroTool) for the river at the point of monitoring i.e. DP. Dray weather flow will also be qualified. Continuous real time monitoring data will be used to manage and calibrate the wastewater			

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			and discharge regime at the site e.g. restricting discharge during dry weather discharge rates will inadequate assimilative capacity. • Overall Environmental Impact ○ All data obtained will be compiled, reviewed, assessed and used to inform ongoing review and assessment of overall impacts to the receiving environment in terms of sustainable use and interaction e.g. ongoing monitoring of effects on groundwater quality and levels, ongoing monitoring of river water discharge rates and quality.			
Decommissioning Phase						
MX9			Similar monitoring to the that of the construction phase will be carried out throughout the decommissioning phase.			