15. SCHEDULE OF MITIGATION AND MONITORING MEASURES

15.1 Introduction

All mitigation measures relating to the pre-commencement, construction, and operational phases of the Subject Development are set out in the relevant chapters of this rEIAR submitted as part of this substitute consent application. The mitigation and monitoring measures in the tables below are those listed in the rEIAR and relevant sections of the CEMP (Appendix 3-2).

All mitigation measures which were implemented during the pre-commencement and construction phase to date and are set out in Table 15-1 along with the limited mitigation measures that will be employed during the operational and decommissioning phases. The mitigation measures have been grouped together according to their environmental field/topic and are presented under the following headings:

- Description
- Population and Human Health
- Biodiversity – including Ornithology
- Land, Soils and Geology
- Hydrology and Hydrogeology
- Air and Climate
- Noise and Vibration
- Cultural Heritage
- Landscape and Visual
- Material Assets including Utilities and Traffic
- Vulnerability to natural Disasters

The mitigation measures 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 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 were implemented during the pre-commencement and construction phase to date and which will be implemented in the operational and decommissioning phases and are set out in Table 15-2.

15.2 rEIAR Mitigation Measures

Table 15-1 Schedule of Mitigation

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
rEIAR Chapter 3 Description					
Pre-Commencement Phase					
MM1	Environmental Management	rEIAR Chapter 3	› A Construction and Environmental Management Plan (CEMP) was prepared for the Permitted Development and is included in Appendix 3-2 of this rEIAR. The CEMP includes details of drainage, peat and overburden management and waste management. In accordance with best practice the peat and overburden management measures and drainage measures were regularly reviewed and updated on the advice of the project geotechnical engineer and project hydrologist.		
MM2	Construction Phase Monitoring and Oversight	rEIAR Chapter 3	› The implementation of the mitigation measures was overseen by the EcOW with the support of the supervising hydrogeologists, environmental scientists, ecologists or geotechnical engineers, depending on who is best placed to advise on specifical elements of the implementation.		
MM3	Site Drainage	rEIAR Chapter 3	› Prior to the onset of construction works for the Meenbog Windfarm, the drainage management systems were inserted in accordance with the EIAR and CEMP. These drainage systems were inserted around work areas and were integrated with the pre-existing forestry site drainage network		
MM4	Waste Management	rEIAR Chapter 3	› Prior to the commencement of the development, a Construction Waste Manager was appointed by the Contractor. › The Construction Waste Manager was in charge of the implementation of the objectives of the plan, ensuring that all hired waste contractors had the necessary permits/licenses and authorisations and that the waste management hierarchy was adhered to. › The Construction Waste Manager had the authority to ensure everyone working on the site adhered to the management plan.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
Construction Phase					
MM5	Refuelling	rEIAR Chapter 3	› Wherever possible, vehicles were refuelled off-site, particularly for regular road-going vehicles. › On-site refuelling of machinery was carried out at designated refuelling areas at various locations throughout the Site. › Heavy plant and machinery were refuelled on-site by a fuel truck that came to the Site as required on a scheduled and organised basis. Other refuelling was carried out using mobile double skinned fuel bowser. › All refuelling was carried out outside designated watercourse buffer zones. Only designated trained and competent operatives were authorised to refuel plant on-site. › Mobile measures such as drip trays and fuel absorbent mats were used during refuelling operations as required. All plant and machinery were equipped with fuel absorbent material and pads to deal with any event of accidental spillage.		
MM6	Dust Suppression	rEIAR Chapter 3	› In periods of extended dry weather, dust suppression was used along haul roads to ensure dust did not cause a nuisance. Water was taken from stilling ponds in the Site's drainage system and was pumped into a bowser or water spreader to dampen down haul roads and temporary construction compounds to prevent the generation of dust. › Silty or oily water was not used for dust suppression		
MM7	Vehicle Washing	rEIAR Chapter 3	› Wheels or vehicle underbodies are often washed before leaving sites to prevent the build-up of mud on public (and site) roads. Due to the length of surfaced site roads, vehicle or wheel washing facilities were not required as part of the construction phase of the Meenbog Windfarm. › Site roads were formed before road-going trucks begin to make regular or frequent deliveries to the site (e.g. with steel or concrete). The site roads were well finished with compacted hardcore, and so the public road-going vehicles were not travelling over soft or muddy ground where they might pick up mud or dirt. › A road sweeper was available in the event that a section of the public roads was dirtied by trucks associated with the Subject Development.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required

MM8	Site Drainage	rEIAR Chapter 3	› The wind farm development drainage system was designed to mitigate effects on surface watercourses by runoff control and drainage management:
			  › Firstly, 'clean water is kept clean' by avoiding disturbance to natural drainage features, minimising any works in or around artificial drainage features, and diverting clean surface water flow around excavations, construction areas and temporary storage areas.
			  › Secondly, drainage waters from works areas that might carry silt or sediment, and nutrients, are collected and routed towards settlement ponds (or stilling ponds) prior to controlled diffuse release over vegetated surfaces.
			  › There was no direct discharge from the work areas or from infrastructure footprint to surface waters.
			  › All runoff from works areas (i.e. dirty water) was attenuated and treated to a high quality prior to being released.
			› During the construction of the Meenbog Windfarm the drainage management system was extended to encompass the Subject Development. Interceptor drains and stilling ponds were constructed around borrow pits in keeping with the drainage system for the Permitted development to ensure surface water quality was protected in accordance with the CEMP.		

MM9	Roadside berms	rEIAR Chapter 3	› Small, low-level roadside berms were used to contain sediment within the road corridor and prevent run-off into the wind farm drainage system at uncontrolled locations. The construction of these berms ensured that runoff was allowed to access the drainage system only via settlement ponds. The purpose of these measures was to protect water quality.		
MM10	Stilling ponds	rEIAR Chapter 3	› Stilling ponds were used to attenuate runoff from works areas during the construction phase and will remain in place to handle runoff from roads and hardstanding areas during the operational phase of the wind farm. The purpose of the stilling ponds is to intercept runoff potentially laden with sediment and to reduce the amount of sediment leaving the disturbed area by reducing runoff velocity. Reducing runoff velocity will allow larger particles to settle out in the stilling ponds,		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			before the run-off water is redistributed as diffuse sheet flow downgradient of any works areas.		
MM11	Waste Management	rEIAR Chapter 3	› It was the duty of the Waste Manager on the Site to ensure that all contractors hired to remove waste from the Site have valid Waste Collection Permits. › It was then necessary to ensure that the waste is delivered to a licensed or permitted waste facility. › The hired waste contractors and subsequent receiving facilities must adhere to the conditions set out in their respective permits/licenses and authorisations.		
MM12	Construction Timing	rEIAR Chapter 3	› Construction was timed to commence outside the bird breeding season (1st of March to 31st of August) to avoid any potentially significant effects on nesting birds. › Having commenced outside the breeding bird season, construction activities were then ongoing by the time the next bird breeding season came around and continued throughout subsequent bird breeding seasons.		
MM13	Construction Timing	rEIAR Chapter 3	› Construction activities relating to the Subject Development were carried out during normal daytime working hours (i.e., 0700 – 1900hrs Monday to Saturday).		
rEIAR Chapter 4 Population and Human Health					
Construction Phase					
MM14	Health and Safety	rEIAR Chapter 4	› The Subject Development was constructed in accordance with all relevant Health and Safety Legislation, including: › Safety, Health and Welfare at Work Act 2005 (No. 10 of 2005); › Safety, Health and Welfare at Work (General Application) (Amendment) Regulations 2016 (S.I. No. 36 of 2016); › Guidelines on the Procurement, Design and Management Requirements of the Safety, Health and Welfare at Work (Construction) Regulations 2006 › Safety, Health and Welfare at Work (Work at Height) Regulations 2006 (S.I. No. 318 of 2006).		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			› These regulations and guidelines were followed on Site and no reportable accidents occurred during the construction phase of the Subject Development.		
MM15	Air Quality: Dust, NO2, PM10 and PM25 and Co2 Emissions	rEIAR Chapter 4	The following mitigation measures were implemented during the construction of the Subject Development. › Aggregate material for the construction of roads and turbine bases was sourced onsite; therefore there was no need to transport this material to the site. › A road sweeper was available in the event that a section of the public roads was dirtied by trucks associated with the Subject Development. › All plant and materials vehicles were stored in the dedicated compound area. › Areas of excavation were kept to a minimum, and stockpiling was minimised by coordinating excavation, spreading and compaction. › Construction traffic was restricted to defined routes and a speed limit was implemented. › In periods of extended dry weather, dust suppression was implemented where necessary along haul roads and around the borrow pit areas to ensure dust did not cause a nuisance. › Where necessary, water was taken from the site's drainage system, and was pumped into a bowser or water spreader to dampen down haul roads and the temporary site compound to prevent the generation of dust. › Silty or oily water was not used for dust suppression, because this would have transferred the pollutants to the haul roads and generate polluted runoff or more dust. › Water bowser movements were carefully monitored, as the application of too much water may have led to increased runoff.		
MM16	Water Quality	rEIAR Chapter 4	› A bespoke drainage design which included interceptor drains, check dams, swales and ponds, was implemented at the Site.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
MM17	Noise and Vibration	rEIAR Chapter 4	Best practice measures for noise control as set out in the CEMP (Appendix 3-2) were adhered to on Site during the construction phase of the Subject Development. › Sensitive location of equipment, taking account of local topography and natural screening. › Working methods: construction noise was controlled by prescribing that standard construction work was restricted to the specified working hours. Any construction work carried out outside of these hours was restricted to activities that did not generate noise of a level that may cause a nuisance. The phasing of works was also been designed with regard to avoidance of noise impacts. › Plant was selected taking account of the characteristics of noise emissions from each item. All plant and machinery used on the site complied 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 was controlled. › Operation of plant: all construction operations complied 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 was employed. › Training and supervision of operatives in proper techniques to reduce site noise, and self-monitoring of noise levels, where appropriate.		
Chapter 5 Biodiversity and Ornithology					
Pre-Construction Phase					

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
MM18	Mitigation by Avoidance	rEIAR Appendix 5-1	The Subject development avoided ecologically sensitive areas and is located primarily within coniferous forestry and follows existing tracks where possible. The Subject Development was designed to avoid any direct impacts on European or Nationally Designated Sites. The Subject Development was specifically designed to minimise the potential for impacts on watercourses in any form as these provide a direct pathway for effect to downstream European Sites and other sensitive aquatic receptors. The locations of the elements of the Subject Development were selected to minimise effects on habitats that correspond to those that are listed on Annex I of the EU Habitats Directive outside of the European and Nationally Designated Sites. When working in close proximity to any watercourses, the methods that were followed prevented any disturbance to the bankside habitats or the potential for any silt laden run off or other pollutants to enter any watercourse. The design of all infrastructure in areas close to watercourses provided for the continued passage of wildlife along the river corridors and thus avoided habitat fragmentation		
MM19	Mitigation through best practice	rEIAR Appendix 5-1	Some of the key features of the environmental management strategy are provided below: › A Construction and Environmental Management Plan (CEMP) was been prepared and is included as Appendix 3-2 of the rEIAR. The CEMP was in implemented prior to the start of the construction phase and was a working document. › Machinery and materials were either parked/stored in the specified compound areas. Wherever possible, vehicles were refuelled off-site in designated areas. This was the case for regular, road-going vehicles.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			› Refuelling operations were carried out only by designated trained and competent operatives. › Mobile anti-pollution measures such as drip trays and fuel absorbent mats were used during all refuelling operations. › Materials excavated (e.g. peat, soil, gravel, or rock) during construction of new roadways or the upgrading works on existing roadways were reused within the site. › Re-use of these materials within the site occurred under conditions where there was no possibility of the material becoming mobile in the environment and entering either surface or ground waters. › An Environmental Clerk of Works visited the site regularly (supplemented by a Project Ecologist, Project Hydrologist, and Project Geotechnical engineer as necessary) and reported to the site Construction Manager.		
Construction Phase					
MM20	Desk Study	rEIAR Appendix 5-1	In accordance with NRA Guidance, pre-construction mammal surveys were undertaken to identify evidence of protected mammals (e.g. in particular Otter holts and Badger setts) within the works areas associated with the Meenbog Wind Farm. The survey was undertaken to ensure that such protected species have not taken up residence within or close to the Meenbog Wind Farm. If breeding or resting places were recorded in the pre-construction surveys a site-specific mitigation plan was prepared and agreed with the NPWS prior to the commencement of works.		
MM21	Removal of Vegetation	rEIAR Appendix 5-1	In accordance with Section 40 of the Wildlife Acts 1976-2021woody vegetation removal was conducted outside the bird breeding season which runs from the 1st of March to the 31st of August inclusive. It should be noted that the provisions of Section 40 do not relate solely to birds, but a range of biodiversity that contributes to food chains and wider ecosystems.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
MM22	Bats	rEIAR Appendix 5-1	During the construction phase, noise limits, noise control measures, hours of operation and selection of plant items were considered in relation to disturbance of bats. In addition, plant machinery was turned off when not in use and all plant and equipment for use complied with the Construction Plant and Equipment Permissible Noise Levels Regulations (SI 359/1996). Lighting was avoided wherever possible. Where lighting was required, directional lighting was used to prevent overspill on to forestry edges. This was achieved through the use of lighting accessories, such as hoods, cowls, louvers and shields, to direct the light to the intended area only.		
MM23	Mitigation to protect Water Quality	rEIAR Appendix 5-1	The following measures have been implemented to prevent the transportation of silt laden water or pollutants from entering the wider environments including downstream watercourses. › A bespoke drainage design which included interceptor drains, check dams, swales and ponds, was implemented at the Site. › When working in any area where there is the potential for run off of pollutants/silt to an adjacent watercourse, a silt fence was constructed in order to prevent the pathway for any such run off. › There was no release of suspended solids to any watercourse as a direct or indirect result of the Subject Development. › During periods of heavy precipitation and run-off, works were halted or working surfaces/pads were provided to minimise soil disturbance.		
MM24	Mitigation to Prevent the Spread of Invasive Species	rEIAR Appendix 5-1	The following measures addressed the potential effects associated with the construction phase of the project:		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			› An Invasive Species Management Plan is presented in Section 4.9 of the CEMP. This was further developed following a preconstruction invasive species survey of the Site. › All plant and equipment employed on the construction site (e.g. excavator, footwear, etc.) was thoroughly cleaned down using a power washer unit prior to arrival on site to prevent the spread of invasive plant species. › All washing was undertaken in areas with no potential to result in the spread of invasive species. This process is detailed in the contractor's method statement.		
Chapter 6 Land, Soils and Geology					
Construction Phase					
MM25	Peat, Subsoil and Bedrock Excavation	rEIAR Chapter 6	The mitigation measures implemented during the construction works, as detailed in the CEMP, were as follows: › All infrastructure was placed in areas with shallower peat where possible; › The existing forestry road network was used to reduce peat excavation and borrow pit volumes where possible; › The peat and subsoil removed during the construction phase was localised to the wind farm infrastructure location where practicable; › The excavated peat was either used for landscaping, side-casting or was placed in the borrow pits and engineered peat cells; › Side-cast rock aggregate was used to form the base of new roads; › Sensitive habitats and designated sites were avoided; › A minimal volume of peat, subsoil and rock was excavated and removed to allow for infrastructure works to take place in comparison to the total volume of these materials present on the site due to optimisation of the wind farm design;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			› Construction of settlement ponds to be volume neutral, and all excess material used locally to form pond bunds and surrounding landscaping; and, › The peat placed in peat cells was allowed to revegetate.		
MM26	Contamination of Soil and Bedrock by Leakages and Spillages	rEIAR Chapter 6	› Wherever possible, vehicles were refuelled off-site, particularly for regular road-going vehicles. › On-site refuelling of machinery was carried out at designated refuelling areas at various locations throughout the Site. › Heavy plant and machinery were refuelled on-site by a fuel truck that came to the Site as required on a scheduled and organised basis. Other refuelling was carried out using mobile double skinned fuel bowser. › All refuelling was carried out outside designated watercourse buffer zones. Only designated trained and competent operatives were authorised to refuel plant on-site. › Mobile measures such as drip trays and fuel absorbent mats were used during refuelling operations as required. All plant and machinery were equipped with fuel absorbent material and pads to deal with any event of accidental spillage.		
MM27	Erosion of Exposed Subsoils and Peat During Construction	rEIAR Chapter 6	Standard mitigation measures for the prevention of the subsoil erosion were implemented during the construction works. These were similar to those detailed in the CEMP which were implemented for consented elements. The implemented mitigation measures were as follows: › The project ECow carried out inspections and monitoring of all development on site ; › Erosion control measures were implemented before any site clearance works commenced; › The area of exposed ground was minimised by maintaining pre-existing vegetation that would otherwise have been subject to erosion; › All peat clearance works were delayed before construction began to ensure that stripping did not occur months in advance of construction activities; › Silt fences were installed around stockpiles to limit the movement of entrained sediment in surface water runoff;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			› In areas where work was necessary within the 50m watercourse buffer drains and watercourses were protected by silt trapping apparatus such as silt fences; › No work was permitted near watercourses during or after prolonged rainfall or an intense rainfall event; › Appropriate silt control measures were installed such as silt-traps, check dams and settlement ponds; › During felling and forestry works, brash mats were used to support vehicles on soft ground, reducing peat and mineral soils erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mats were renewed when they became heavily used and worn. Brash mats were used along all off-road routes to protect soil from compacting and rutting; › All controls were regularly inspected and maintained and vegetation had re-established; and, › All works were completed in accordance with the above mitigation measures which were detailed in the CEMP.		
MM28	Excavation and Reinstatement of Borrow Pits	rEIAR Chapter 6	The mitigation measures implemented during the excavation and reinstatement of the borrow pits as outlined in the CEMP are as follows: › Prior to excavation, the areas to be used to the BPs were marked out at the corners using ranging rods or timber posts. Drainage and associated settlements were installed around the perimeter; › The initial excavation involved the removal of peat and overburden deposits. These materials were used to form a berm on the downhill side of the BP; › Interceptor drainage ditches were excavated on the upgradient sides of the BP; › The bedrock material was extracted from the BP and stockpiled or used as required; › Excavation works were undertaken and supervised by an experienced contractor and suitably qualified personnel; › The borrow pits were developed with stable ground inclinations;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			› The stability of the rock faces were inspected by the Project Geotechnical Engineer upon excavation to ensure stability; › As the BP excavations progressed deeper, any ingress of water was removed via pumping to settlement ponds; › When extraction ceased, the uphill face of the rock was stepped and deposits of soil placed which assisted the revegetation of the rock face; › Upon the removal of the required volumes of material (for the construction of the infrastructure elements at the wind farm) from the BPs it is proposed to reinstate the pits using excavated peat and spoil; › The borrow pits are designed and constructed in a way which will allow the excavated peat and spoil to be placed safely, with areas within the borrow pits designated for the storage of excavated peat; › Rock buttresses were constructed within the borrow pits to help retain placed peat and spoil. The founding stratum for each buttress was inspected and approved by the Project Geotechnical Engineer; and, › Infilling of peat and spoil commenced at the back of the borrow pit and progress towards the pit entrance.		
MM29	Peat Instability and Failure	rEIAR Chapter 6	The standard mitigation measures implemented at all deviation locations during the construction works with respect to peat stability, as detailed in the PSRA and included in the CEMP, were as follows: › The project geotechnical engineer carried out inspections and monitoring of all development on site ; › Experienced and competent contractors were appointed; › The Site was supervised by experienced and qualified personnel; › Sufficient time was allocated for the project; › Prevented undercutting of slopes and unsupported excavations; › Maintained a managed robust drainage system; › Prevented placement of loads/overburden on marginal ground; › Set up, maintained and reported findings from monitoring systems (as outlined in the PSRA);		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			› Ensured construction method statements were developed and agreed before works commenced and all method statements were followed by the contractor; and, › Revised and amended the Construction Risk Register as construction progresses to ensure that risks are managed and controlled for the duration of construction.		
Operational Phase					
MM30	Site Road Maintenance	rEIAR Chapter 6	› Use of aggregate from authorised quarries for use in road and hardstand maintenance.		
MM31	Site vehicle/ Plant Use	rEIAR Chapter 6	› Vehicles used during the operational phase will be refuelled off site before entering the site; › No fuels will be stored on-site during the operational phase; and › Spill kits will be available in all site vehicles to deal with an accidental spillage and breakdowns; and, › An emergency plan for the operational phase to deal with accidental spillages and breakdowns is contained in the CEMP (Appendix 3-2).		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
Chapter 7 Hydrology and Hydrogeology					
Construction Phase					
MM33	Earthworks Resulting in Suspended Solids Entrainment in Surface Waters	rEIAR Chapter 7	› The EIAR for the Permitted Development prescribed detailed mitigation measures relating to earthworks, and the release of suspended solids in surface waters, for the protection of surface water quality. › Whilst the location, alignment and size of components of the Subject Development differ from the Permitted Development plans , these infrastructure elements were constructed as per the methodology and guidelines prescribed in the EIAR for the Permitted Development and detailed in the CEMP.		
MM34	Earthworks: Mitigation by avoidance	rEIAR Chapter 7	› The key mitigation measure implemented during the construction phase was the avoidance of sensitive hydrological features where possible, by application of suitable buffer zones (i.e. 50m to main watercourses). › The majority of the Subject Development was located outside of the delineated 50m natural watercourse (river and stream) buffer zones. Only 4 no. deviations (Deviation 2, 3, 9 and 19) are located within 50m of a natural watercourse, where specific additional measures were put in place to protect water quality. › The large setback distance from sensitive hydrological features meant that adequate room was maintained for the drainage mitigation measures (discussed below) to be properly installed and operate effectively. The buffer zone: › Avoided physical damage (river/stream banks and river/stream beds) to watercourses and associated release of sediment; › Avoided excavations within close proximity to surface watercourses; › Avoided the entry of suspended sediment from earthworks into watercourses; and, › Avoided the entry of suspended sediment from the construction phase drainage system into watercourses, achieved in part by ending drain		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone.		
MM35	Earthworks: Mitigation by Design	rEIAR Chapter 7	Source controls: › Interceptor drains, erosion and velocity control measures such as use of sand bags and other similar/equivalent or appropriate systems. › Small working areas, covering stockpiles, weathering off stockpiles, cessation of works in certain areas or other similar/equivalent or appropriate measures. In-Line controls: › Interceptor drains, oversized swales, erosion and velocity control measures such as check dams, straw bales, silt bags, silt fences, sedimats, and collection sumps, temporary sumps, sediment traps, pumping systems, settlement ponds, temporary pumping chambers, or other similar/equivalent or appropriate systems. Treatment systems: › Temporary sumps and ponds, temporary storage lagoons, sediment traps, and settlement ponds. It should be noted for this site that an extensive network of forestry and roadside drains already existed, and these were integrated and enhanced as required and used within the Meenbog Windfarm drainage system. The integration of the existing forestry drainage network and the Meenbog Windfarm drainage network was relatively simple. The key elements were the upgraded and improvements to water treatment elements, such as in line controls and treatment systems, including silt traps, settlement ponds and buffered outfalls. The main elements of interaction with the pre-existing drainage were as follows: › Apart from interceptor drains, which conveyed clean runoff water to the downstream drainage systems, there was no direct discharge (without treatment for sediment reduction, and attenuation for flow management) of runoff from the wind farm drainage system into the pre-existing site drainage network. This reduced the potential for any increased risk of downstream flooding or sediment transport/erosion;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			◦ Silt traps were placed in the pre-existing drains upstream of any streams where construction works / tree felling occurred, and these were diverted into interceptor drains, or culverted under/across the works area; ◦ Runoff from individual work areas was not discharged into the pre-existing drain network but discharged locally at each work location through settlement ponds and buffered outfalls onto vegetated surfaces; ◦ Numerous buffered outfalls have been used to promote percolation of drainage waters across vegetation and close to the point at which the additional runoff is generated, rather than direct discharge to the pre-existing drains of the Site; and, ◦ Drains running parallel to the existing roads which were upgraded were targeted to the opposite side of the road. Velocity and silt control measures such as check dams, straw bales and silt fences were used during the construction works. Regular buffered outfalls were also added to drains to protect downstream surface waters. ◦ The full details of the drainage implemented at the Site are prescribed in the CEMP including details on the use of interceptor drains, swales, check dams, level spreaders, vegetation filters, settlement ponds, silt bags and silt fences.		
MM36	Earthworks: Pre-emptive Site Drainage Management:	rEIAR Chapter 7	◦ The works programme for the construction phase of the development also considered weather forecasts, and predicted rainfall in particular. Large excavations and movements of soil/subsoil or vegetation stripping were suspended or scaled back when heavy rain was forecast. The extent to which works were scaled back or suspended related directly to the amount of rainfall forecast.		
MM37	Earthworks: Management of Runoff from Peat and Subsoil Storage Areas:	rEIAR Chapter 7	◦ Excavated peat was used for landscaping throughout the Site and any excess peat was stored in the onsite borrow pits and the peat storage cells. All the borrow pits were located outside the 50m watercourse buffer zones. ◦ During the initial placement of peat and subsoil, silt fences, straw bales and biodegradable geogrids were used to control surface water runoff from the storage areas.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			› Drainage from peat storage areas was ultimately routed to an oversized swale and a number of settlement ponds with appropriate storage and settlement designed for a 1 in 100 year 6 hour return period before being discharged to the on-site drains. › Peat/subsoil storage areas were sealed with a digger bucket and vegetated as soon possible to reduce sediment entrainment in runoff. Once re-vegetated and stabilised peat/subsoil storage areas were no longer a potential source of silt laden runoff.		
MM38	Earthworks: Management of Runoff from Felling Areas:	rEIAR Chapter 7	Best practice Mitigation Measures detailed in the CEMP for the Meenbog windfarm are reproduced below: › Machine combinations were chosen which were most suitable for the ground conditions at the time of felling and to minimise soils disturbance; › Use of buffer zones for aquatic zones as per the Forest service (2000) guidance; › Roads and culverts were checked and maintained during felling operations; › No tracking of vehicles through watercourses occurred; › Where possible, existing drains were not disturbed during felling works; › Ditches which drain from the felling area towards existing surface watercourses were blocked, and temporary silt traps were constructed. No direct discharge of such ditches to watercourses occurred during felling. Drains and sediment traps were installed during ground preparation works. Collector drains were excavated at an acute angle to the contour (~0.3%-3% gradient), to minimise flow velocities. Main drains from collector drains included water drops and rock armour, as required, where there were steep gradients, and were not placed at right angles to the contour; › Sediment traps were sited outside of buffer zones and had no direct outflow into the aquatic zone. Machine access was maintained to enable the accumulated sediment to be excavated. Sediment was carefully disposed of away from all aquatic zones. Where possible, all new silt traps were constructed on even ground and not on sloping ground; › In areas, particularly sensitive to erosion, it was necessary to install double or triple sediment traps. This measure was reviewed on site during construction works;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			› All drainage channels tapered out before entering the aquatic buffer zone. This ensured that discharged water gently fanned out over the buffer zone before entering the aquatic zone, with sediment filtered out from the flow by ground vegetation within the zone. On erodible soils, silt traps were installed at the end of the drainage channels, to the outside of the buffer zone; › Drains and silt traps were maintained throughout all felling works, ensuring that they were clear of sediment build-up and are not severely eroded. Correct drain alignment, spacing and depth ensured that erosion and sediment build-up were minimised and controlled; › Brash mats were used to support vehicles on soft ground, reducing peat and mineral soils erosion and avoiding the formation of rutted areas, in which surface water ponding could occur. Brash mat renewal took place when they became heavily used and worn. Provision was made for brash mats along all off-road routes, to protect the soil from compaction and rutting. Where there was a risk of severe erosion occurring, extraction was suspended during periods of high rainfall; › Timber was stacked in dry areas, and outside a local 50m stream buffer zone. Straw bales and check dams were emplaced on the down gradient side of timber storage/processing sites; › Works were carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water run-off; › Refuelling or maintenance of machinery was not permitted within 50m of an aquatic zone. Dedicated refuelling areas were used during the felling works; and, › Branches, logs or debris were not allowed to build up in aquatic zones. All such material was removed when harvesting operations were completed, but care was taken to avoid removing natural debris deflectors.		
MM39	Earthworks: Management of Drainage From Works	rEIAR Chapter 7	› As detailed above only 4 no. deviations (deviations 2, 3, 9 and 19) are located within the 50m hydrological buffer zone.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
	within Hydrological Buffer Zone		› Silt fences were installed as an additional water protection measure around existing watercourses in certain locations, particularly where works occurred within the hydrological buffer zone. The silt fences were installed as single, double or triple silt fences depending on the space available and the anticipated loading. Further details in silt fences are included in the CEMP.		
MM40	Earthworks: Timing of Construction Works	rEIAR Chapter 7	› Construction of the site drainage system was only carried out during periods of low rainfall, therefore, minimising runoff rates. This reduced the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses. Construction of the drainage system during this period also ensure that attenuation features associated with the drainage system were in place and operational for all subsequent construction works.		
MM41	Effects Associated with Runoff From Peat and Subsoil Storage Areas	rEIAR Chapter 7	› Mitigation measures to prevent sediment entrainment in runoff from peat and subsoil storage areas included the following. › During the initial placement of peat and subsoil, silt fences, straw bales and biodegradable geogrids were used to control surface water runoff from the storage area; › Drainage from the peat storage areas were routed to oversized swales before being discharge to the on-site drainage network; and, › Peat/subsoil storage areas were sealed with a digger bucket and vegetated as soon as possible to reduce sediment entrainment in runoff. Once re-vegetated and stabilised, the peat and spoil storage areas were no longer a potential source of sediment laden water.		
MM42	Excavation Dewatering and Potential Effects on Surface Water Quality	rEIAR Chapter 7	› Management of groundwater seepages and subsequent treatment prior to discharge into the drainage network was completed as follows: › Appropriate interceptor drainage, to prevent upslope surface runoff from entering excavations were put in place; › If required, pumping of excavation inflows prevented build-up of water in the excavation; › The interceptor drainage discharged to the site constructed drainage system or onto natural vegetated surfaces and not directly to surface waters;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			› The pumped water volumes were discharged via volume and sediment attenuation ponds adjacent to excavation areas, along with use of more specialist treatment systems such as a Siltbags; › There was no direct discharge to surface watercourses, and therefore no risk of hydraulic loading or contamination occurred; and, › Daily monitoring of excavations by a suitably qualified person occurred during the construction phase. If high levels of seepage inflow occurred, excavation work was immediately stopped and a geotechnical assessment undertaken.		
MM43	Effects on Groundwater Levels During Excavation Works	rEIAR Chapter 7	› Relevant environmental management guidelines from the EPA quarry 2006 guidance document – "Environmental Management in the Extractive Industry" in relation to groundwater issues were implemented during the construction phase. › The mitigation measures and construction methodologies for the borrow pits were detailed in full in the CEMP.		
MM44	Release of Hydrocarbons During Construction and Storage	rEIAR Chapter 7	› All plant was inspected and certified to ensured that they were leak free and in good working order prior to use. › Wherever possible, vehicles were refuelled off-site, particularly for regular road-going vehicles. › On-site refuelling of machinery was carried out at designated refuelling areas at various locations throughout the Site. › Heavy plant and machinery were refuelled on-site by a fuel truck that came to the Site as required on a scheduled and organised basis. › Other refuelling was carried out using mobile double skinned fuel bowser. All refuelling was carried out outside designated watercourse buffer zones. › Mobile measures such as drip trays and fuel absorbent mats were used during refuelling operations as required. › All plant and machinery were equipped with fuel absorbent material and pads to deal with any event of accidental spillage. › Onsite refuelling was carried out by trained personnel only;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			› A permit to fuel system was put in place; › Fuels stored on site were minimised. › The plant used during construction was regularly inspected for leaks and fitness for purpose; and, › An emergency plan for the construction phase to deal with accidental spillages was included within the Construction and Environmental Management Plan (Appendix 4-3). Spill kits were available to deal with and accidental spillage in and outside the re-fuelling area. However no spills were recorded during the construction of the Subject Development.		
MM45	Groundwater and Surface Water Contamination from Wastewater Disposal	rEIAR Chapter 7	› Self-contained port-a-loo with an integrated waste holding tank were used for welfare facilities, maintained by the providing contractor; and, › No water was sourced on the site or discharged on the site.		
MM46	Effects on the Lough Mourne Surface Water Abstractions	rEIAR Chapter 7	› The mitigation measures implemented in relation to the entrainment of suspended solids apply here as well › The implemented mitigation measures (MM5) with respect to hydrocarbons apply here as well › The implemented mitigation measures with respect to wastewater contamination apply here as well		
MM47	Effects on Hydrologically Connected Designated Sites	rEIAR Chapter 7	› The mitigation measures implemented in relation to the entrainment of suspended solids apply here as well › The implemented mitigation(MM5) measures with respect to hydrocarbons apply here as well › The implemented mitigation measures with respect to wastewater contamination apply here as well		
MM48	Potential Effects on Surface Water and	rEIAR Chapter 7	› Mitigation measures relating to the protection of surface water quality and quantity were implemented during the construction of the Subject Development.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
	Groundwater WFD Status		◦ The mitigation measures implemented in relation to the entrainment of suspended solids apply here as well ◦ The implemented mitigation measures with respect to hydrocarbons apply here as well ◦ The implemented mitigation measures with respect to wastewater contamination apply here as well › Similarly, mitigation measures for the protection of groundwater quantity and quality have been detailed above: ◦ The mitigation measures implemented with respect to groundwater levels apply here as well ◦ The implemented mitigation measures with respect to hydrocarbons apply here as well ◦ The implemented mitigation measures with respect to wastewater contamination apply here as well		
Operational Phase					
MM49	Progressive Replacement of Natural Surface with Lower Permeability Surfaces	rEIAR Chapter 7	› Interceptor drains have been installed up-gradient of the Subject Development infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. This water will then be directed to areas where it can be re-distributed over the ground by means of a level spreader; › Swales/road side drains will be used to collect runoff from access roads and turbine hardstanding areas of the site, likely to have entrained suspended sediment, and channel it to settlement ponds for sediment settling; › On steep sections of access road transverse drains ('grips') will be constructed where appropriate in the surface layer of the road to divert any runoff off the road into swales/road side drains;		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			› Check dams will be used along sections of access road drains to intercept silts at source. Check dams will be constructed from a 4/40mm non-friable crushed rock; › Settlement ponds, emplaced downstream of road swale sections and at turbine locations, will buffer volumes of runoff discharging from the drainage system during periods of high rainfall, by retaining water until the storm hydrograph has receded, thus reducing the hydraulic loading to watercourses; and, › Settlement ponds will be designed in consideration of the greenfield runoff rate. › Natural vegetation filters will replace settlement ponds as the site matures over the operational phase and potential sources of sediment diminish.		
MM50	Runoff Resulting in Contamination of Surface Waters	rEIAR Chapter 7	› Mitigation measures for sediment control are the same as those outlined above for the construction phase. › Mitigation measures for control of hydrocarbons during maintenance works are similar to those outlined for the construction phase.		
Chapter 8 Air and Climate					
Construction Phase					
MM51	Exhaust Emissions	rEIAR Chapter 8	› All construction machinery was maintained in good operational order while on-site, minimising any emissions that were likely to arise. › Machinery that was used intermittently was shut down or throttled back to a minimum when not in use. › Construction traffic was restricted to defined routes and a speed limit was implemented.		
MM52	Dust Emissions	rEIAR Chapter 8	› Water misting or bowsers operated on-site as required to mitigate dust in dry weather conditions. › The transport of soils or other material, which had significant potential to cause dust, was undertaken in tarpaulin-covered vehicles where necessary.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			› In periods of extended dry weather, dust suppression was necessary along haul roads and around the borrow pit area to ensure dust did not cause a nuisance. Water was taken from stilling ponds in the site's drainage system and was pumped into a bowser or water spreader to dampen down haul roads and site compounds to prevent the generation of dust. Silty or oily water was not used for dust suppression, because this would transfer the pollutants to the haul roads and generate polluted runoff or more dust. Water bowser movements were carefully monitored, as the application of too much water could have led to increased runoff.		
MM53	Greenhouse Gas Emissions: Construction of Subject Development Infrastructure	rEIAR Chapter 8	› All construction machinery was maintained in good operational order while on-site, minimising any emissions that were likely to arise. › Areas of excavation were kept to a minimum, and stockpiling was minimised by coordinating excavation, spreading and compaction. › Machinery that was used intermittently was shut down or throttled back to a minimum when not in use. › Aggregate materials for the construction of the Subject Development were predominantly sourced onsite.		
MM54	Greenhouse Gas Emissions: Waste Disposal	rEIAR Chapter 8	› Waste material was transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste was sorted into individual waste streams for recycling, recovery or disposal. The MRF facility was local to the Site to reduce the amount of emissions associated with vehicle movements. ›		
Operational Phase					
MM55	Greenhouse gas Emissions	rEIAR Chapter 8	› Ensure that all maintenance and monitoring vehicles will be maintained in good operational order while onsite, and, when stationary, be required to turn off engines thereby minimising any emissions that arise.		
Chapter 9 Noise and Vibration					

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
Construction Phase					
MM56	Mitigation	rEIAR Chapter 9	› No plant used on site was permitted to cause an on-going public nuisance due to noise. › The best means practicable, including proper maintenance of plant, was employed to minimise the noise produced by on site operations. › All vehicles and mechanical plant were fitted with effective exhaust silencers and maintained in good working order for the duration of the contract. › Compressors were attenuated models fitted with properly lined and sealed acoustic covers which were kept closed whenever the machines were in use and all ancillary pneumatic tools were fitted with suitable silencers. › Machinery that was used intermittently will be shut down or throttled back to a minimum during periods when not in use. › During the course of the construction programme, supervision of the works included ensuring compliance with the limits detailed in Table 9-1 using methods outlined in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise. › The hours of construction activity were limited to avoid unsociable hours where possible. Construction operations shall generally be restricted to between 7:00hrs and 19:00hrs weekdays and between 7:00hrs and 19:00hrs on Saturdays. However, to ensure that optimal use was made of good weather period or at critical periods within the programme it was occasionally necessary to work out of these hours › Where rock breaking was employed, the following are examples of measures that were considered, where necessary, to mitigate noise emissions from these activities: › Fit suitably designed muffler or sound reduction equipment to the rock breaking tool to reduce noise without impairing machine efficiency. › Ensure all leaks in air lines are sealed. › Use a dampened bit to eliminate ringing.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			› Erect acoustic screen between compressor or generator and noise sensitive area. When possible, line of sight between top of machine and reception point needs to be obscured. › Enclose breaker or rock drill in portable or fixed acoustic enclosure with suitable ventilation. › Where blasting was employed, the following mitigation measures were employed to control the impact of vibration during blasting activities: › Trial blasts were undertaken to obtain scaled distance analysis; › Appropriate burden to avoid over or under confinement of the charge; › Accurate setting out and drilling; › Appropriate charging; › Appropriate stemming with appropriate material such as sized gravel or stone chipping; › Delay detonation to ensure small maximum instantaneous charges; › Decked charges and in-hole delays; › Blast monitoring to enable adjustment of subsequent charges; › Good blast design to maximise efficiency and reduce vibration; › Avoid using exposed detonating cord on the surface;		
Chapter 10 Cultural Heritage					
Construction Phase					
MM57	Cultural Heritage	rEIAR Chapter 10	› Archaeological monitoring of ground disturbing activities was carried out during the construction stage		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
Chapter 12 Material Assets					
Construction Phase					
MM58	Traffic Volumes	rEIAR Chapter 12	› A detailed Traffic Management Plan (TMP) was prepared and incorporated in the CEMP for the Meenbog Windfarm which is included as Appendix 3-2 of this rEIAR. While there was no traffic generated by the Subject Development, all construction traffic associated with the Site was required to abide by the TMP		
MM59	Electricity	rEIAR Chapter 12	› Any area where excavations were planned were surveyed and all existing services were identified prior to commencement of any works. › Liaison was had with the relevant sections of the Local Authority including all the relevant area engineers to ensure all services were identified. (No underground services existed in the works areas for the Subject Development) › Excavation permits were completed, and all plant operators and general operatives will be inducted and informed as to the location of any services. › The contractor complied with and standard construction codes of practice in relation to working around electricity, gas, water, sewage and telecommunications networks.		
MM60	Waste Management	rEIAR Chapter 12	› The CEMP of the Meenbog Windfarm, Appendix 3-2 of this rEIAR, included a Waste Management Plan (WMP) which outlines the best practice procedures during the construction and decommissioning phases of the project. The construction of the Subject Development followed all relevant procedures and mitigation measures set out in this CEMP. › Waste management was carried out in accordance with 'Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects' (2006) by the Department of Environment. the most up-to date document at the time of the EIAR of the Permitted Development. WMP outlines the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			of construction of the Subject Development. Disposal of waste was seen as a last resort. › All hazardous wastes were stored in bunded containers/areas before being collected by an authorised waste contractor and brought to an EPA licensed waste facility. Hazardous wastes were kept separate from non-hazardous wastes that contamination did not occur. Please see the CEMP for best practise measures to prevent the creation of waste materials. › All non-hazardous waste generated on-site by the Subject Development was contained in waste skips at a waste storage area on-site. This waste storage area was kept tidy with skips clearly labelled to indicate the allowable material to be disposed of therein. › The waste volumes generated on-site from the Subject Development were not large enough to warrant source segregation at the Site. Therefore, all waste streams generated on-site were deposited into a single waste skip. This waste material was transferred to a Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste was sorted into individual waste streams for recycling, recovery or disposal. › Site personnel were instructed at induction that under no circumstances can waste be brought to Site for disposal in the on-site waste skip. It was also made clear that the burning of waste material on-site was forbidden.		
Chapter 13 Vulnerability to Natural Disaster					
Construction Phase					
MM61	Peat Stability During Construction	rEIAR Chapter 13	› The standard mitigation measures implemented at all deviation locations during the construction works with respect to peat stability, as detailed in the PSRA and included in the CEMP, were as follows:		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
			◦ The project geotechnical engineer carried out inspections and monitoring of all development on site; ◦ Experienced and competent contractors were appointed; ◦ The Site was supervised by experienced and qualified personnel; ◦ Sufficient time was allocated for the project; ◦ Prevented undercutting of slopes and unsupported excavations; ◦ Maintained a managed robust drainage system; ◦ Prevented placement of loads/overburden on marginal ground; ◦ Set up, maintained and reported findings from monitoring systems (as outlined in the PSRA); ◦ Ensured construction method statements were developed and agreed before works commenced and all method statements were followed by the contractor; and, ◦ Revised and amended the Construction Risk Register as construction progresses to ensure that risks are managed and controlled for the duration of construction. ◦ As stated above, some deviation locations are located outside of the area assessed in the AGEC PSRA these areas were assessed by the Geotechnical Engineer prior to construction works.		

Ref. MM no.	Reference Heading	Reference Location	Mitigation Measures	Audit Result	Action Required
MM62	Contamination	rEIAR Chapter 13	In order to mitigate the risk of contamination of soil or water resources the following mitigation measures were implemented during the construction works and will also be implemented during any operational phase maintenance works associated with the Subject Development: › Minimal refuelling or maintenance of construction vehicles or plant took place on site. Off-site refuelling occurred at a controlled fuelling station; › On-site refuelling of machinery was carried out at designated refuelling areas at various locations throughout the Site. › Heavy plant and machinery were refuelled on-site by a fuel truck that came to the Site as required on a scheduled and organised basis. › Other on site re-fuelling was undertaken using a double skinned bowser with spill kits on the ready for accidental leakages or spillages; › Re-fuelling was undertaken by suitably trained personnel only; › Mobile measures such as dips trays, spills kits and fuel absorbent mats were used during all refuelling operations. › The plant used during construction was regularly inspected for leaks and fitness for purpose; and, › An emergency plan for the construction phase to deal with accidental spillages was detailed within the Construction and Environmental Management Plan (Appendix 3-2 of this EIAR). Spill kits were available to deal with and accidental spillage in and outside the re-fuelling area.		
Operational Phase					
MM63	Contamination	rEIAR Chapter 13	The best practice procedures contained in MM5 to prevent hydrocarbon spills will be employed during the operation phase.		

15.3 rEIAR Monitoring Measures

Table 15-2 Schedule of Monitoring

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
Pre-Construction Phase						
MX1	Pre-construction mammal Surveys	rEIAR Appendix 5-1	In accordance with NRA Guidance, pre-construction mammal surveys were undertaken to identify evidence of protected mammals (e.g. in particular Otter holts and Badger setts) within the works areas associated with the Meenbog Wind Farm. The survey was undertaken to ensure that such protected species have not taken up residence within or close to the Meenbog Wind Farm. If breeding or resting places were recorded in the pre-construction surveys a site-specific mitigation plan was prepared and agreed with the NPWS prior to the commencement of works. It was not anticipated that any protected mammal breeding/resting places were to be encountered or require to be excluded as part of the Meenbog Wind Farm based on the findings of the extensive surveys undertaken. However, if any breeding/ resting places were encountered during the pre-construction surveys, it was subject to exclusion procedures as outlined in the TII/ NRA guidelines (2006B).			
MX2	Biological Water Quality Assessment (Q-sampling)	rEIAR Chapter 5	› Baseline biological monitoring at 5 no. locations was completed in September 2014 to assess aquatic macroinvertebrates for Q-Value determination of the baseline environment.			
MX3	Baseline Monitoring	rEIAR Chapter 7	› Additional hydrological monitoring was completed during the construction in line with the requirements set out in the EIAR and the Construction Environmental Management Plan (CEMP). This monitoring comprised of the following:			

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			› Installation of sondes to provide continuous turbidity monitoring. 3 no. sondes were installed on 9th September 2019 and 3 no. additional sondes were installed following the peat slide that occurred in November 2020; › A suitably qualified Ecological Clerk of Works (ECoW) undertook daily visual check of waterbodies during the construction phase. These checks included the maintenance of sondes, visual inspection of surface water sampling points and visual inspection of all visual check locations (12 no. locations);			
MX4	Surface Water Quality monitoring	rEIAR Chapter 7	› HES completed surface water monitoring at 4 no. locations on the Bunadaowen River in September 2017. › 3 no. sondes (MSe1. MSe3 and MSe4) were installed as a water quality early warning system on the Lowerymore, Bunadaowen and Shruhangarve watercourses on 9th September 2019, prior to the onset of construction			
MX5	Earthworks: Monitoring	rEIAR Chapter 7	› An inspection and maintenance plan for the on-site drainage system was prepared in advance of commencement of any works. Regular inspections of all installed drainage systems were undertaken, especially after heavy rainfall, to check for blockages, and ensure there was no build-up of standing water in parts of the systems where it is not intended. Inspections were also completed after tree felling. ›			
Construction Phase						
MX6	Biological Water Quality	rEIAR Chapter 5	Additional Q-Value monitoring occurred as follows:			

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
	Assessment (Q-sampling)		› MKO completed biological monitoring at 19 no. locations in November 2020; › Triturus Environmental Ltd. completed biological monitoring at 10 no. locations in October 2021; and › MKO completed biological monitoring at 10 no. locations in October 2023.			
MX7	Surface Water Quality monitoring	rEIAR Chapter 7	› 3 no. sondes (MSe1. MSe3 and MSe4) were installed as a water quality early warning system on the Lowerymore, Bunadaowen and Shruhangarve watercourses on 9th September 2019, prior to the onset of construction and continued to monitor throughout the construction phase › MSe 5, 6, and 7 were installed in various locations along the Mourne Beg River to monitor turbidity upstream of active works and downstream of the Shruhangarve Stream from December 2020 › Monthly grab sampling at 4 no. sampling locations from August 2019 to February 2023 › During the construction phase field testing and laboratory analysis of a range of parameters with relevant regulatory limits and EQSs was undertaken for each primary watercourse, and specifically following heavy rainfall events (i.e. weekly, monthly and event based).			
MX8	Earthworks: Monitoring	rEIAR Chapter 7	› Any excess build-up of silt levels at dams, the settlement pond, or any other drainage features that may decrease the effectiveness of the drainage feature, was removed. ›			
MX9	Surface Water Quality Monitoring:	rEIAR Chapter 7	› During the construction of the Meenbog Windfarm, MKO was engaged to undertake a water quality monitoring programme in line with the requirement set out in the EIAR for the Permitted			

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
			Development. This included continuous turbidity monitoring, daily visual checks of waterways and monthly hydrochemistry monitoring. › Since construction commenced in late 2019, over 230 visual check sheets were filled out until March 2021. The visual checks were completed at 12 no. locations on watercourses in the vicinity and downstream of the Site. The locations of these inspection points are shown on Figure 7 11. › Daily visual checks noted any localised increases in turbidity in onsite water courses, general site conditions, and recorded mitigation measures necessary as outlined in the CEMP or discussed with the relevant personnel such as the project hydrologist, geologist, or site manager. Copies of the available visual check sheets are included as Appendix 7 2. › Monthly grab samples were taken from August 2019 to February 2023 and sent to an accredited laboratory for analysis. A total of 4 no. sampling locations were sampled during this monitoring period. The locations of the sampling are shown on Figure 7 11. Sampling was paused in February 2023 as all key water quality parameters had been stable for almost 2 years. The original laboratory certs are attached as Appendix 7 3.			
MX10	Groundwater Seepages Monitoring:	rEIAR Chapter 7	› Daily monitoring of excavations by a suitably qualified person occurred during the construction phase.			
MX11	Construction Phase Archaeological Monitoring	rEIAR Chapter 10	› Ground works associated with the Subject Deviations were subject to archaeological monitoring in compliance with Condition No. 17 of the grant of permission (Ref. ABP-300460-17). No archaeological finds or features were uncovered by the monitoring archaeologist during the works ›			

Ref. No.	Reference Heading	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
Operational Phase						
MX12	Post Construction Monitoring	rEIAR Chapter 6	› The monitoring of ground movement in relation to peat stability will be completed during the continued construction phase and the operation phase The monitoring plan is detailed in Appendix E of FT's Peat Stability Assessment of Meenbog Wind Farm Site (2021). In order to monitor the performance of the constructed works, a series of monitoring points will be established throughout the Site. These monitoring points will also be established in the vicinity of the Subject Development to ensure that there is no change in the stability of these areas. Any deviation of the posts would indicate potential movement of the peat. The monitoring will be completed weekly or following heavy rainfall.			
MX13	Post Construction Monitoring	rEIAR Chapter 6	› The monitoring of ground movement in relation to peat stability will be completed during the continued construction phase and the operation phase The monitoring plan is detailed in Appendix E of FT's Peat Stability Assessment of Meenbog Wind Farm Site (2021). In order to monitor the performance of the constructed works, a series of monitoring points will be established throughout the Site. These monitoring points will also be established in the vicinity of the Subject Development to ensure that there is no change in the stability of these areas. Any deviation of the posts would indicate potential movement of the peat. The monitoring will be completed weekly or following heavy rainfall.			