

Glenvernoch Wind Farm

Environmental Impact Assessment Report Volume I Chapter 15: Schedule of Mitigation

October 2024

CONTENTS

15 SCHEDULE OF MITIGATION	15-1
Introduction.....	15-1

TABLES

Table 15.1: Schedule of Mitigation

15. SCHEDULE OF MITIGATION

Introduction

- 15.1. Chapters 6-14 of the EIA Report discuss the potential likely significant effects of the Proposed Development.
- 15.2. Consideration of the significance of any adverse effects from the Proposed Development are captured within Volume I of the Environmental Impact Assessment Report (EIA Report)
- 15.3. Embedded mitigation comprising 'Design Mitigation' has been incorporated into the description of the Proposed Development and therefore have been assessed as being part of the Proposed Development. Embedded mitigation measures have been proposed to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment. Further information on embedded mitigation is provided in Chapter 3: Description of Project and Construction Methods.
- 15.4. Where significant adverse effects have been identified within the EIA Report, mitigation measures to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment have been proposed. Such measures are normally secured by planning conditions and delivered at the detailed design stage to achieve the anticipated outcome.
- 15.5. Monitoring may also be required where there are significant adverse residual effects. In some cases, for instance where there is uncertainty of whether residual effects remain, it may also be appropriate to implement monitoring.
- 15.6. The mitigation measures proposed as part of the Proposed Development are presented in Table 15.1. Where appropriate, relevant embedded mitigation measures and assumed good practice are also included for completeness.

Table 15.1: Schedule of Mitigation

Chapter	Description of Mitigation	Timing
3: Project Description	<u>Construction Environmental Management Plan</u> A Construction and Environmental Management Plan (CEMP) will be produced by the Contractor and implemented during construction of the Proposed Development, which will include measures to manage risks associated with the production of pollution and the potential risks this may pose to water, soils, air and human health. It will be prepared in consultation with appropriate stakeholders and will include the embedded mitigation measures discussed in this chapter and Chapters 6 to 14 of the original EIA Report, and additional mitigation measures identified through the EIA. The CEMP will incorporate a series of management plans which will include but not be limited to the following: • Water Management Plan • Site Waste Management Plan • Traffic Management Plan • Noise Management Plan • Final Soils and Peat Management Plan (based on the outline contained within Volume III Technical Appendix 12.2: Outline Soils and Peat Management Plan) • Breeding Bird Protection Plan • Final Habitat Management Plan (based on final design, drawing upon the outline contained within Volume III Technical Appendix 9.4: Outline Biodiversity and Restoration Enhancement Plan) The CEMP will be submitted in advance of commencement of construction activities to regulators for approval.	• Pre-commencement • Construction • Operation
6. Landscape and Visual	<u>Embedded Mitigation</u> • The primary mitigation adopted in relation to the Proposed Development is embedded within the design of the Proposed Development and relates to the consideration that was given to avoiding and minimising landscape and visual effects during the evolution of the Proposed Development layout. • The EIA Scoping layout was based on 18no. turbines with blade tip heights up to 200m. The layout then progressed through a series of smaller iterations based upon ground conditions and landscape and visual considerations. Visual considerations were a key consideration with turbines removed to reduce the lateral extents of the wind farm from key viewpoints. • Based on general good practice design principles (as set out in NatureScot guidelines) and an analysis of site-specific opportunities and constraints, the wind farm layout has evolved to take into consideration a number of landscape and visual constraints whilst maintaining an optimal development, resulting in the 13-turbine layout which has been taken forward to the EIA phase. • A design rationale has been adopted to avoid inconsistent turbine spacing, turbine outliers, or excessive overlapping of turbines, to minimise visual confusion and ensure a balanced/compact array from key views in the local landscape. • In considering the layout of other structures and ancillary features of the Proposed Development, the position of the substation, construction compound, battery storage area, and borrow pits are located so as to minimise their influence on the surrounding area. • The turbines themselves will be painted an off-white colour with a low reflectivity semi-matt finish (or similar as agreed with Dumfries and Galloway Council). Such a finish is widely regarded to be the least intrusive in the landscape when seen against the sky in a host of weather conditions typically experienced within the UK. • The potential for woodland to be retained on a permanent basis where close to property curtilages is to be explored in more detail, to ensure that the maximum screening/filtering benefit of the woodland is maintained where there is potential visibility of the Proposed Development. • Mitigation of visible turbine aviation lighting has been designed into the Proposed Development by adopting a cardinal lighting design where only six of the outermost turbines are lit (T1, T2, T6, T7, T10, and T13). Visibility sensors would be installed on relevant turbines to measure the prevailing atmospheric conditions and visibility range. Should atmospheric conditions mean that visibility from the turbines within the Site is greater than 5km from the Proposed Development, CAA	• Pre-commencement • Construction • Operation

	policy permits lights to operate in a lower intensity mode, being a minimum of 10% of their capable illumination. Therefore, the 2000cd steady state lights would operate at 200cd. If visibility is however restricted to 5km or less, the lights would operate at 2,000cd. The inherent directional intensity of 2,000cd lights can be used to reduce vertical downwards lighting impacts at elevations less than -1° degree vertical angle from the horizontal plane from the aviation light. By ensuring the lights installed comply with the ICAO recommendations, it is possible to attenuate the vertical downwards light to a level that reduces the visual impact from receptors at ground levels below the lights. Implementing the ICAO recommendations, at -1 degrees the aviation lights should only be 1,125cd and at -10 degrees should only be 75cd, when visibility is greater than 5km.	
7: Cultural Heritage	<u>Programme of Archaeological Fieldwork</u> - A programme of fieldwalking will take place on the area of the proposed turbines, crane pads and access tracks to identify any archaeological assets which may be present within the areas and may be impacted by the proposed scheme. - Should archaeological remains be identified, consultation will be undertaken with Dumfries and Galloway Council's Archaeologist, to assess whether archaeological investigation would yield results which could provide information to the archaeological record. - If archaeological investigation was warranted, the scope of such works would be agreed with Dumfries and Galloway Council prior to commencement. - Where there is the known site of the former agricultural features, these areas will be subject to walkover with a follow up programme of archaeological recording (e.g. watching brief) if and where appropriate. - Should micro-siting be required, as far is possible, it will be ensured that turbines will be sited so as to avoid any known archaeological features.	- Pre-commencement - Construction
8: Ornithology	<u>Protecting Breeding Birds</u> In order to minimise the risk of harming or disturbing breeding birds, vegetation clearance works will not be undertaken during the breeding season (1st March to 31st August inclusive) unless a checking survey by an appropriately qualified ornithologist has shown active nests to be absent immediately prior to the start of works. Such prohibited works would also include stripping of areas of low/ground vegetation, soil stripping works and off-track vehicle movements to ensure ground nesting species such as Lapwing, Skylark and Meadow Pipit are not adversely affected. <u>Habitat Management Plan</u> Enhancement measures for biodiversity and peat restoration are set out in Volume III Technical Appendix 9.4 of the EIA Report. The core management objectives of the plan that seek to improve habitats for birds are: - To plant low density native broadleaf trees to provide improved scattered scrub/woodland mosaic habitat for a variety of species including black grouse. - To install leaky dams/ large woody debris along the Craigie Burn. contributing to natural flood management and providing localised wetland habitats for Breeding Waders. - To undertake targeted rush-cutting in identified management parcels to create varied patches and grassland/rush mosaic to improve nesting habitat for Breeding Waders. - To create wader scrapes to provide feeding sites for the chicks and adults of farmland waders. - To undertake predator control of foxes and carrion crows in order to improve egg and chick survival for on-site Breeding Waders. <u>Monitoring</u> Breeding wader surveys will be undertaken in years 1-5, 10, 15, 20, 25 and 30 during the operational life of the wind farm following standard survey guidance (NatureScot, 2017). The main objective being to assess the status of curlew population on the Site and to establish the success of habitat management measures. Surveys will follow a moorland bird survey based on an adapted Brown & Shepherd (1993) method with four survey visits at least seven days apart. These should cover the whole breeding season between mid-April and early July and be undertaken between 8:30 hours and 18:00 hours. They should be carried out in a wind of Beaufort force 4 or less, and in dry weather. Study Area coverage would be to within a 500m buffer of the Site boundary.	- Construction - Operation

	Black grouse lek surveys will be undertaken to monitor the effect of management prescriptions on local black grouse populations. Monitoring will be undertaken in Years 1-5 following wind farm operation, then subsequently every five years subject to review. Monitoring in each year will comprise black grouse lek site surveys. Survey scope and methods will be agreed with RSPB and DGC prior to commencement.	
9: Ecology	Protected Species In order to minimise the risk of protected species being adversely affected, from the implementation of the proposals, the following mitigation measures will be implemented during the construction period of the development: - As all wild birds, their nests and eggs are protected by law under Part 1 of the Wildlife and Countryside Act 1981 (as amended), then no vegetation clearance works, soil stripping works, fence construction or off-track vehicle movements would be undertaken during the bird breeding season (March to August inclusive), unless a checking survey by a suitably qualified ornithologist has shown active nests to be absent immediately prior to the start of works; - Construction works will not be undertaken at night, to minimise the risk of disturbing nocturnal species such as bats; - No high-powered lighting will be installed either during the construction or operational phases of the development; - Any trenches or pits created will be covered overnight, or one side of these features will lie at a 45o angle to allow any animals which may fall in safe access out. Such features will be checked prior to the recommencement of works on site each morning, to ensure protected and notable species are not adversely affected by the proposals; - No fires will be lit as part of the proposals; - Any chemicals required will be locked away in appropriately secure containers when not in use.	- Construction - Operation
	Measures Specific to Bats To minimise the identified potential negative effects to bat populations, from the proposed wind farm, a number of best practice mitigation measures will be adhered to, during both the construction and operation of the wind farm. These have included/will include: - The adjustment of turbine locations to avoid key habitat features – already undertaken; - Habitat Management; - Monitoring; and - Where appropriate, feathering of turbine blades.	- Pre-commencement - Construction - Operation
	Embedded Mitigation Current guidelines (NatureScot 2021) recommend that wind turbine blade tips should be more than 50m away from features likely to be used by foraging and commuting bats, such as trees, watercourses and waterbodies. During the design of the turbine and infrastructure layout for Glenvernoch, suitable buffer distances were included to maintain separation of turbines and bat habitat. Current guidance states that there is evidence that bat casualties at wind farms are reduced by pitching the blades out of the wind ('feathering') to reduce rotation speeds below 2rpm while idling, and in some cases increasing the cut-in speed during high-risk periods (for instance warm evenings in summer with low wind speeds). It has been found that the reduction in speed resulting from feathering, compared with normal idling, may reduce bat fatality rates by up to 50%. As this option does not result in any loss of output, it will be undertaken at Glenvernoch wherever it is practically possible (NatureScot 2021).	- Pre-commencement - Operation
	Habitat Management Plan To maintain a low collision risk, the Habitat Management Plan for the Site will maintain the habitats within 50m of the turbine blade swept radius in a state which offers poor foraging for bats. As the habitat on, or adjacent to, the Site changes, the habitat management methods will be reviewed to ensure that habitats within a 50m buffer of all turbine blade swept radius are unsuitable for use by bat species.	- Pre-commencement - Construction - Operation
	Monitoring To assess and revise the success of the above mitigation on Site, monitoring of turbine locations for bat corpses caused through collision with, or barotrauma from, turbines, will be completed through the first two years of the operational phase of the development. In the unlikely event that bat mortality is recorded at turbine locations, management activities will be introduced to further reduce the interaction between bats and turbines at the Site. Such management could include an increase in the buffer distance between the turbines and woodland edges, or other features.	Operation
	Measures Specific to Fisheries The following Fisheries Mitigation Strategy will be followed during the construction and operation of the Glenvernoch Wind Farm:	- Pre-commencement - Construction

	- Where possible the crossing points will be located in areas of lower value for fisheries such as existing crossing points, areas where livestock cross the watercourse or other modified features, to minimise impacts; - The diameters of any culverts or pipes used should be as large as feasible in order to maintain flow and depth of water as much as possible, and to allow light into the channel. Where possible bridging rather than culverting should be used; - Culverts should be over deepened into the channel to ensure that flow persists at depth through the channel and to allow natural substrate to be deposited within the channel over time; and - All works on site should take place to a Construction Environmental Management Plan (CEMP) in order to minimise the risk of causing harm or damage to fisheries and their environment.	
10: Noise	<u>General Measures</u> To manage the potential effects of construction noise, the following good practice measures will be implemented: - Those activities that may give rise to audible noise at the surrounding properties and heavy goods vehicle (HGV) deliveries to the Site (except for abnormal loads, see below) will be limited to the hours 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 on Saturdays. Those activities that are unlikely to give rise to noise audible at noise-sensitive receptors, such as staff training may continue outside of the stated hours. - All construction activities will adhere to good practice as set out in BS 5228. - All equipment will be maintained in good working order and any associated noise attenuation such as engine casing and exhaust silencers shall remain fitted at all times. - Where flexibility exists, construction activities will be separated from residential neighbours by the maximum possible distances. - Construction plant capable of generating significant noise and vibration levels will be operated in a manner to restrict the duration of the higher magnitude levels. These measures may be included within a Construction Environmental Management Plan (CEMP) and implemented by the site contractor. Traffic movements will be managed by a Construction Traffic Management Plan (CTMP) as part of the CEMP. Turbine deliveries would only take place outside these times with the prior consent of the local authorities and the Police.	Construction
	<u>Borrow Pits</u> In the event that stone is required to be extracted from borrow pits by blasting, the following process would be employed to ensure that the effects of blasting noise and vibration on nearby properties are adequately controlled: - Compliance with planning conditions specifying limits to vibration resulting from blasting, restrictions on times of blasting, and a requirement for vibration monitoring; - Trial blasting, using progressively larger charge loads, to establish maximum acceptable charge; and - Provision of information on blasting to neighbouring residents.	Construction
	<u>Monitoring</u> The selection of the final turbine to be installed at the site will be made on the basis of enabling the relevant ETSU-R-97 noise limits to be achieved at the surrounding assessment properties. If consent is granted for the Proposed Development, conditions attached to the consent will include the requirement that, in the event of a noise complaint, noise levels resulting from the operation of the wind turbines on the Site are measured to demonstrate compliance with these noise limits. Such monitoring will be done in full accordance with ETSU-R-97 and include penalties for characteristics of the noise (if present). Furthermore, a standard planning condition can be applied to secure noise from the substation and BESS that do not exceed a rated noise level of 30 dB LAr at the nearest residential properties.	- Pre-commencement - Operation
11: Traffic and Transport	<u>Construction Traffic Management Plan</u> A Construction Traffic Management Plan (CTMP) would identify measures to reduce the number of construction vehicles as well as considering reducing or avoiding the impact of vehicles through construction programming / routing and identification of an individual with responsibilities for managing traffic and transport impacts and effects. The CTMP would also identify measures to reduce and manage construction staff travel by private car, particularly single occupancy trips. The CTMP would be developed during the detailed design phase of the Proposed Development. Potential measures could include (but are not limited to): - Immediately upon commencement, all deliveries, operatives and visitors to the Site would report to the security gate. This would be communicated to all early works contractors at their pre-start meeting. - The main contractor would develop a logistics plan highlighting the access point for the project, loading bay, pedestrian / vehicular segregation, welfare, storage, security and material handling that would be enforced following full site establishment.	- Pre-commencement - Construction

	• Approved haul routes would be identified to the Site and protocols put in place to ensure that HGVs adhere to these routes. • All contractors would be provided with a site induction pack containing information on delivery routes and any restrictions on routes. • Temporary construction site signage would be erected along the identified construction traffic routes to warn people of construction activities and associated construction vehicles. • A construction traffic speed limit (for example, 20mph) would be imposed through the sensitive area of Tarbert. • The construction material 'lay down' areas would allow for a staggered delivery schedule throughout the day, avoiding peak and unsociable hours (i.e. before 06:00 and after 22:00). • An integral part of the progress meetings held with all trade contractors is the delivery schedule pro-forma. All contractors would be required to give details of proposed timing of material deliveries to the Site. At this stage, they would be given a specific area for delivery. • The CTMP and the control measures therein would be included within all trade contractor tender enquiries to ensure early understanding and acceptance / compliance with the rules that would be enforced on this project. • Under no circumstances would HGVs be allowed to lay-up in surrounding roads. All personnel in the team would be in contact with each other and with Site management, who in turn would have mobile and telephone contact with the subcontractors. • Roads would be maintained in a clean and safe condition. • A wheel washing facility would be installed on-site during the construction period in order to reduce mud and debris being deposited onto the local road network.	
12: Hydrology, Geology and Hydrogeology	<u>Embedded Mitigation</u> • A watercourse buffer of 50m between wind turbines and watercourses has been applied. During detailed design and construction, turbines will be surveyed and micrositied within 100m to optimise distances from the waterbodies, taking into account topography and other local characteristics. • As part of the Proposed Development layout, the number of new watercourse crossings has been minimised. Where access necessitates watercourse crossings, construction features have been limited within 50m buffers of the watercourses as far as possible. • All turbines have been located outside areas of deep peat (<1m). • As part of the Applicant's commitment to promote opportunities for beneficial effects, the EIA is accompanied by Technical Appendix 9.4 Biodiversity and Restoration Enhancement Plan (BREP) that includes measures associated with biodiversity net gain. As well as measures to restore degraded peatland through upland drain blocking (among other measures), the prescriptions include the integration of natural flood management (NFM) measures across the Site, that would be appraised and integrated post-consent. NFM proposals would seek to improve the hydrological regime by attenuating peak flows, potentially providing a benefit to downstream flood risk. • During the detailed design and construction phases, turbines and hardstandings could be micrositied to avoid deeper peat. Sections of track would be surveyed and micrositied, within 100m, to optimise the distances from the waterbodies and peat, taking into account local topography and local characteristics.	• Pre-commencement
	<u>Good Practice Mitigation</u> A Construction Environmental Management Plan would detail how the successful Principal Contractor would manage the works in accordance with all commitments and mitigation detailed in the EIA, statutory consents and authorisations, and industry best practise and guidance such as CIRIA, Pollution Prevention Guidance (PPG) and Guidance for Pollution Prevention (GPP). It is expected that the following will be included within the CEMP and would ensure the works are undertaken in accordance with good practice guidance: • During construction there would be heavy plant and machinery required and as a result it is appropriate to adopt best working practices and measures to protect the water environment, including those set out in Pollution Prevention Guidance (PPG1); • In accordance with PPG2 any above ground on-site fuel and chemical storage would be bunded; • Emergency spill response kits would be maintained during the construction works (GPP21); • A vehicle management system would be put in place wherever possible to reduce the potential conflicts between vehicles and thereby reduce the risk of collision (GPP21);	• Pre-commencement • Construction

	• A speed limit would be used to reduce the likelihood and significance of any collisions; • Plant nappies would be placed under stationary vehicles which could potentially leak fuel / oils; • Any water contaminated with silt or chemicals would not be discharged directly or indirectly to a watercourse without prior treatment; and • Water for temporary site welfare facilities would either be brought to site or a local surface water or groundwater abstraction would be identified. Any water abstraction would be made in accordance General Binding Rules or an authorisation would be obtained from SEPA in accordance with the Controlled Activity Regulations (CAR); and • Foul water would either be collected in a tank and collected for offsite disposal at an appropriately licensed facility or discharged to a septic tank or soakaway in accordance with the CAR.	
	<u>Pollution Prevention Plan</u> The CEMP would include a Pollution Prevention Plan (PPP) and provide details of the proposed surface water drainage management arrangements for the proposed development to avoid and minimise impacts on soils, peat, geology, groundwater, surface water and PWS. The key components of the PPP are as follows: • Surface Water Drainage Management: A sustainable drainage system (SuDS) will be designed and implemented to minimise, where possible, any change to the hydrology and groundwater conditions within the site. The SuDS will utilise a series of surface water drainage management techniques that will mitigate any adverse impact on the hydrology of the site. • Water Quality Treatment: A surface water treatment system will be implemented for the treatment of surface water run-off from the site during the construction phase prior to flows entering receiving watercourses. All temporary and permanent SuDS from the site will have a minimum three stages of treatment. A single stage of treatment is considered as any of the following; - Conveyance through a swale. - Filtration of water through filter media (e.g. check dam). - Detention in settlement ponds / behind dam in overland breakout. - Filtration / settlement across vegetated ground • Clean water (groundwater, natural overland flows, watercourses, etc.) and dirty water (from access tracks, hardstands and cut slopes) will be as far as practicably possible kept separate. Reducing the volume of water entering the surface water treatment system will significantly improve the performance of the treatment. Where appropriate, a cut off ditch will be installed to ensure that surface water run-off can be directed around areas of work and consequently reduce volumes of silt laden construction run-off. • Potential causes of pollution will be managed at their source. Areas stripped of vegetation will be kept to a minimum. Stripped vegetation will be reinstated on slopes as soon as possible after removal. Where necessary, biodegradable matting will be utilised on cut slopes to prevent washing of fines into the surface water treatment system. • Good quality stone will be used in access track and hardstand construction. Construction material will be specified in accordance with the Specification for Highway Works (SHW). SHW compliant material does not permit the use of large quantities of fine material and therefore all material imported to site will not be heavily laden with silt / fines. Regular inspections and testing of material will ensure the construction material is compliant with the SHW. • Source Control; Potential causes of pollution will be controlled at source. Flows from excavations and hardstand areas will discharge into swales. Check dams will be installed in the swales at regular intervals to provide a level of attenuation, reduce water velocity, and promote settlement of suspended solids and silt. • Buffer Zones; - Wind turbine centres are located a minimum of 50m from watercourses. A 10m buffer zone will be employed for all main watercourses in accordance with GPP5: Works or maintenance in or near water (2017). Where this is impossible at watercourse crossing locations, works will be in accordance with the relevant guidance outlined in paragraphs 12.126 to 12.129. - Washing out of concrete mixer lorries will be strictly controlled and limited to a designated wash area a minimum of 50m away from any watercourse. Where a` potential risk is identified of an accidental concrete spillage into a watercourse, cut off ditches and diversion dams will be installed to channel potential spillages and run-off water to a suitable collection area. In accordance with GPP5: Works or maintenance in or near water (2017), contaminated water shall not be pumped or allowed to flow into the water environment without treatment. Collected effluent shall be pumped out and disposed of off-site in compliance with the Waste Management Licensing (Scotland)	• Pre-commencement • Construction

	Regulations 2011. Residual solidified concrete within the containment area would be broken up and disposed of off-site in accordance with the pertinent regulations, prior to reinstatement of the area. - Any dewatering from excavations will be via surface silt traps, check dams, and temporary settlement ponds to reduce potential silt entering receiving watercourses. No dewatering or outflows will be permitted within the 10m buffer zones. • All surface water drainage management measures being implemented will be checked regularly and action taken to ensure functionality. Any sign of silt laden water entering a watercourse will be reported immediately to the Principal Contractor, the source of the silt identified and further remedial measures undertaken. • Flow control measures: - Attenuated flows will be discharged over existing vegetation prior to discharging into receiving watercourses, as per the existing drainage regime for the site. Rate and volume of run-off will be attenuated using settlement ponds receiving flows from newly constructed hardstand areas. - Attenuation features will also reduce flow velocities and allow settlement of fines prior to discharge. Flow rates will also be reduced through the integration of swales and check dams. - Access tracks and hardstand areas are to be constructed from unbound aggregate and are therefore not fully impermeable, thus helping to reduce run-off rates. - Cross drains, where required, will be provided with associated sumps and check dams. The cross drains will provide a means for flows to pass from a swale on the uphill side of the access track to the downhill side of the access track and would help maintain existing flow patterns. In cases where the access tracks run significantly downhill, grips will be constructed in the surface of the access tracks to divert any run-off flowing down the access track into the swale. Excavated access tracks will incorporate swales with check dams to overland breakouts over vegetation. - If used, floating access tracks will follow the principles of minimum disturbance of the vegetated layer. Stone / geotextile will be laid directly onto existing vegetation. No swales will be constructed alongside floating access track, water will run-off directly off the access track onto existing vegetation. Flow balancing pipes, in the form of perforated pipes will be provided at existing flush locations and at regular intervals along the sections of floating access track. - Existing overland flow routes and channels will be maintained and buried cable trenches would also be designed in a way to avoid modifying shallow flow patterns. • Private Water Supplies will be safeguarded through the implementation of good practice with regards to pollution prevention as well as erosion and sedimentation. Whilst adverse impacts are not anticipated, a Private Water Supply Monitoring and Method Statement (PWSM&MS) will be prepared post consent to support the CEMP. The PWSM&MS will contain emergency response and contingency arrangements associated with temporary water supplies.	
	<u>Pollution Incidents</u> The adoption of the applicable good practice measures would reduce the probability of an incident occurring and also reduce the magnitude of any incident due to a combination of good Site environmental management procedures, including minimised storage volumes, staff training, contingency equipment and emergency plans. Key measures identified to reduce potential for pollution include: • Application of a 50m buffer zone from mapped OS 1:10,000 and OS 1:50,000 scale watercourses, except where a watercourse crossing is required; • Secure oil and chemical storage in over-ground bunded areas, limited to the minimum volume required to serve immediate needs with specified delivery and refuelling areas; • Emergency spill kits retained onsite with regular briefings and training for site operatives on emergency response arrangements; • Special measures at concrete batching plants with pre-cast structures used where appropriate; • Cessation of work and development of measures to contain and/or remove pollutant should an incident be identified; and • A surface water quality monitoring programme is recommended, to commence 12 months prior to construction and continue into the early operational period. During construction, this would include an adaptive monitoring system enabling early investigation of parameters outwith expected ranges, with prompt alerts to the construction team to amend any work activities causing an adverse effect.	• Construction

	In addition, the substantial dilution factor when comparing Site watercourse flows with downstream flow characteristics, taking account of enlarged catchment areas and confluences, would be expected to further reduce any potential effect downstream. This would be particularly notable for the large hydrological systems of River Cree. The site will require a Construction Site Licence, this pre-construction application process will involve descriptions of pollution control methods and specific detailed design features to gain SEPA approval.	
	<u>Disturbance, Loss and Compaction of Soils and Peat</u> Modifications made during the layout design process has led to an avoidance of areas where deeper peat has been identified. Volume III Technical Appendix 12.2: Soil and Peat Management Plan (SPMP) evaluates the likely volumes of soil and peat excavated during construction and opportunities for reuse of this material. It also identifies measures for the management of peat throughout the construction process. It is recognised that the initial priority is to reduce the volume of peat excavated, followed by appropriate reuse of any peat and soil excavated, as per the principle of the 'mitigation and waste hierarchy'. The extensive dataset of peat depth data collected for the peat stability study has been used to inform this assessment. The design principles and adoption of the applicable good practice measures summarised in Volume III Technical Appendix 12.2: SPMP would reduce the soil losses, compaction of soil and dewatering effects, with the combination of planning infrastructure on very shallow soils, minimising excavation, promoting local reuse of suitable material, identifying catotelmic/amorphous peat in-situ and the majority of vehicle movements being restricted to new access tracks or clearly demarcated construction areas. This combination of measures resulting in any notable effect being very localised and temporary in nature. Site monitoring would identify any areas where soil effects are noted and enable a fast response to minimise effect. Key measures identified to minimise loss and compaction of soils and peat include: • Reducing excavation depth and footprint required for Site infrastructure by site investigation and consequential design evolution; • Limiting storage of soil and peat to a maximum height of <2m; • Appropriate re-use of excavated material for reinstatement and profiling of track verges on disturbed ground; and • Limiting movements to specific corridors avoiding sensitive receptors such as deep peat and priority peatland habitat. With peat excavation and reuse opportunities refined, based on pragmatic good practice measures, approximately 56,770 m³ of peat could be re-used as part of the sites reinstatement.	• Construction
	<u>Peat Stability</u> The inherent design principles and adoption of the applicable good practice measures summarised in the Outline CEMP would reduce the effect of peat instability. Key measures identified to minimise peat stability risk include the following, with further details provided in Volume III Technical Appendix 12.3: Peat Landslide Hazard Risk Assessment (PLHRA): • Avoidance of removal of slope support; • Avoidance of heavy loading on slopes; • Good drainage practice to ensure flows not concentrated onto slopes or into excavations; • Restricting earthmoving activities during and immediately after intense and prolonged rainfall events; and • Creating and managing of geotechnical risk register or similar management system throughout the detailed design and construction phases	• Construction
	<u>Erosion and Sedimentation</u> The adoption of the applicable good practice measures would reduce the probability of an incident occurring and also reduce the magnitude of any incident due to a combination of good site environmental management procedures, including additional precautions when operating machinery close to watercourses, soil management, staff training, contingency equipment and emergency plans. Key measures identified to reduce erosion and sedimentation include: • Vegetation clearance would be scheduled only as needed, buffer strips would be retained as vegetated features and revegetation encouraged with native species; • Silt traps would be employed and maintained in appropriate locations; • Temporary interception bunds and drainage ditches would be constructed upslope of excavations such as turbine foundations to minimise surface runoff ingress and in advance of excavation activities; • Excavation and earthworks would be suspended during and immediately following periods of heavy rainfall in order to minimise sediment generation and soil damage; and A surface water quality monitoring programme is recommended, to commence 12 months prior to construction and continue into early operational period. During construction, this	• Construction

	would include an adaptive monitoring system enabling early investigation of parameters outwith expected ranges, with prompt alerts to the construction team to amend any work activities causing an adverse effect. In the case of pollution incident effects, good practice site environmental management measures and the dilution factor involved would be expected to reduce any potential sedimentation effect downstream.	
	<u>Modification of Surface Water Drainage Patterns</u> The adoption of the applicable good practice measures would reduce the impact of modification to surface water drainage patterns, with artificial drainage installed only where necessary and would, wherever practical, be installed in advance of ground being cleared of vegetation. All structures would be designed and constructed following good practice techniques and would be of sufficient capacity to receive storm flows with an allowance for increased flows due to climate change. Key measures identified to minimise alterations to surface water drainage patterns include: • Minimising the number of watercourse crossings through site layout and design; • Application of sustainable drainage techniques to increase peak lag time and implementation of cross-drains at appropriate intervals and frequent discharge points to reduce scour potential; • Minimising the size and duration of in-channel works; and • Appropriate design of crossing structures to ensure sufficient capacity to convey 1:200-year storm flows and enable mammal and fish passage. The area of impermeable surface created would be very small in comparison with sub-catchment areas, as only the turbine, hardstandings and control building bases would be designed as impermeable, with the unbound tracks likely to act as semi-permeable features with limited infiltration potential. As outlined in Volume III Technical Appendix 9.4 BREP, prescriptions associated with appraising and implementing natural flood management measures have the potential provide a beneficial effect associated with improving the hydrological regime of the site as well as flood risk.	• Construction • Operation
	<u>Modification of Groundwater Levels and Flows</u> The adoption of the applicable good practice measures would reduce potential for lowering effects upon groundwater systems, with the effects of dewatering likely to be very local and temporary, with groundwater expected to return to former levels quickly following cessation of construction activities. The key concerns for good groundwater management involve careful decisions involving locations of drainage and dewatering activity and ensuring such activities are undertaken sympathetically and minimised in terms of extent and time to avoid excessive influence on groundwater levels and flows. Key measures identified to minimise alterations to groundwater levels and flows include: • Drainage systems, typically consisting of french drains (using a gravel layer as water conduit, rather than pipework, running downhill to a soakaway zone designed to enable water to percolate back into soil), would be installed at hardstanding locations where applicable; • Dewatering activity would be limited to the minimum necessary duration; and • Access tracks crossing GWDTE would have appropriate drainage measures applied to maintain current groundwater conditions.	• Construction
13: Infrastructure and Human Health	<u>Health and Safety</u> • Adequate separation distances as stated in the Engineering Recommendation L44 guidance (Energy Network Association, 2012) relating to separation between wind turbines and overhead power lines will be maintained. • Construction traffic and plant will be offset from overhead powerlines in accordance with the Guide to the Safe Use of Mechanical Plant in the Vicinity of Electricity Overhead Lines (Energy Networks Association, 2007). • A Construction Health and Safety Plan (CHSP) will be produced by the appointed construction contractor in consultation with Dumfries and Galloway Council to manage and minimise risks to safety during construction. Where required, all contractors and sub-contractors will provide a copy of their Health and Safety Policy or Management System as part of the tender process prior to appointment to the Applicant. • Furthermore, a Construction Traffic Management Plan (CTMP) will be produced that will include consideration of health and safety in relation to construction traffic. • While not in use, hazardous substances and machinery will be securely stored in the construction compound to prevent use by unauthorised persons. Safety protocol and procedures will be strictly enforced including the erection of appropriate signage relating to restricted areas. • Appropriate temporary signage will be implemented on Site during the construction and decommissioning stages to ensure members of the public are aware of the areas in which construction will be occurring and the risks involved. In	• Pre-commencement • Construction

	addition, members of the public and local residents shall be informed in advance of the works. Where necessary, temporary fencing will also be erected during construction and decommissioning stages to stop members entering restricted or potentially dangerous areas.	
	<u>Measures Specific to Aviation</u> A planning condition will be attached to the consent which states that as a minimum the MOD require the development to be fitted with MOD accredited aviation safety lighting in accordance with the Air Navigation Order 2016.	• Pre-commencement • Operation
	<u>Measures Specific to Shadow Flicker</u> A shadow flicker protocol would be secured via planning condition, requiring the programming of the wind turbines to automatically shut down at times when flicker effects could occur. This would ensure that any potential effects are minimised or removed entirely.	• Pre-commencement • Operation
14: Socio-economics	<u>Construction Method Statement</u> • A Construction Method Statement (CMS) would be prepared by the construction contractors and agreed with Dumfries and Galloway Council prior to the commencement of the construction works. The CMS would include measures for the construction contractor to work proactively with contractors and suppliers to provide employment opportunities in the local area. Activities may include a 'meet-the-buyer' open day; this would provide an opportunity for local contractors and suppliers to present their business to the construction contractor. • The CMS would include public liaison including public notices that would be issued prior to the construction works informing local residents and businesses of dates and durations of the works. • In keeping with good practice for construction sites, notices would be placed in prominent locations around the Site with details of any areas with restricted access. Alternative access routes would be provided for informal walkers, horse-riders and cyclists where possible. The area and duration of such restrictions would be kept to a minimum as is required for the work to be conducted safely and efficiently	• Pre-commencement • Construction
	<u>Operational Access and Safety</u> When maintenance activities are undertaken, appropriate safety measures including adequate warning signs and exclusion areas would be required to ensure safety for informal walkers, horse-riders, cyclists and deer stalkers.	• Operation