Planning and Environmental Consultants

Environmental Impact Assessment Report

Taurbeg Wind Farm Extension of Operational Life

Chapter 18 – Schedule of Mitigation Measures

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18. SCHEDULE OF MITIGATION

18.1 Introduction

All mitigation and monitoring measures relating to the extended operational and decommissioning phases of the Proposed Lifetime Extension are set out in the relevant chapters of the EIAR. In addition, all mitigation and monitoring measures that will be implemented during the extended operational and decommissioning phases of the Proposed Lifetime Extension are outlined in Table 18-1 and Table 18-2 below. The mitigation measures can be grouped together according to their environmental field/topic under the following headings:

- Extended Operational Phase
- Decommissioning Phase

Mitigation and monitoring measures for the Proposed Offsetting Measures have also been considered, with these being outlines in Table 18-3 and Table 18-4.

By presenting the mitigation and monitoring proposals in the below format, it is intended to provide an easy to audit list that can be reviewed and reported on during the extended operational and decommissioning phases of the Proposed Lifetime Extension and the Proposed Offsetting Measures. The proposal for environmental management framework to be adhered to during the extended operational phase are set out in the Operational and Environmental Management Plan (OEMP) which is included as Appendix 4-2 of this EIAR. The tabular format in which the below information is presented can be further expanded upon during the operation and decommissioning phases to provide a reporting template for site compliance audits.

18.2 EIAR Mitigation Measures – Proposed Lifetime Extension

Table 18-1 Schedule of Mitigation- Proposed Lifetime Extension

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		Operational Phase		
MM1	EIAR Chapter 5	Regarding Health and Safety during the extended operational phase: › Mitigation measures that are currently in place will continue during the extended operation of the wind farm to ensure that the risks posed to staff, landowners and the general public will remain negligible throughout the extended operational life of the wind farm. › Access to the Taurbeg Wind Farm is controlled through a locked gate. › Access to the turbines is through a door at the base of the structure, which will be locked at all times outside of maintenance visits. › Signs are erected at suitable locations across the site as required for the ease and safety of operating the various components of the wind farm. These signs include: › Buried cable route markers at regular intervals and change of cable route direction; › Directions to relevant turbines at junctions; › "No access to Unauthorised Personnel" at appropriate locations; › Speed limits signs at site entrance and junctions; › "Warning these Premises are alarmed" at appropriate locations; › "Danger Overhead HV" at appropriate locations; › "Warning – Keep clear of structures during electrical storms, high winds or ice conditions" at site entrance; › "No unauthorised vehicles beyond this point" at specific site entrances; and		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		› Other operational signage required as per site-specific hazards. › All site visitors must complete a site-specific health and safety induction prior to entering the site › Visitors must log onto the site on entry and log the site on exit by contacting a 24-hourly monitored control room › Minimum site Personal Protective Equipment (PPE) is necessary in order to enter the site, including a hard hat, safety boots and hi-visibility clothing During the operation of the wind farm regular maintenance of the turbines is carried out by the turbine manufacturer or appointed service company. A project or task specific Health and Safety Plan has been developed for these works in accordance with the site's health and safety requirements.		
MM2	EIAR Chapter 5, Chapter 12, Chapter 13	Regarding Residential Amenity during the operational phase: › All mitigation as outlined under noise and vibration and visual amenity in the EIAR, will be implemented in order to reduce insofar as possible impacts on residential amenity at properties located in the vicinity of the Existing Taurbeg Wind Farm.		
MM3	EIAR Chapter 6, Chapter 9, Appendix 6-2	Regarding Biodiversity Mitigation Measures during the extended operational phase, the following mitigation measures are proposed: **Mitigation for Sensitive Aquatic Species** › Natural vegetation filters are used regularly across the Site where the local drainage and topography allow attenuation of surface water runoff; › Interceptor drains are installed up-gradient of infrastructure to collect clean surface runoff in order to minimise the amount of runoff reaching		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		areas where suspended sediment could become entrained. It is now directed to areas where it can be re-distributed onto natural vegetation; › Swales/roadside drains are used to collect runoff from access roads and turbines hardstanding areas of the site, likely to have entrained suspended sediment, and channel it onto natural vegetation filters; › The existing drainage system at the site provides flood attenuation and has not resulted in any increased in the downstream flood risk; › Temporary check dams and silt fencing arrangements will be placed along sections of access roads where maintenance works are being undertaken. Check dams will be constructed from a 4/40mm non-friable crushed rock. › Road-going vehicles will be refuelled off site wherever possible; › On-site refuelling will be carried out at designated refuelling areas at various locations throughout the site. Machinery will be refuelled directly by a fuel truck that will come to site as required; › Only designated trained and competent operatives will be authorised to refuel plant on site. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations; › Fuel volumes stored on site will be minimised. Any fuel storage areas will be bunded appropriately for the fuel storage volume; › The plant used will be regularly inspected for leaks and fitness for purpose; › An emergency plan for the extended operational phase to deal with accidental spillages will be developed. Spill kits will be available to deal with accidental spillage in and outside the refuelling area; › A programme for the regular inspection of plant and equipment for leaks and fitness for purpose will be developed at the outset of the lifetime extension; and, › Adherence to Operational and Environmental Management Plan (refer to Appendix 4-2 of the EIAR).		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
MM4	EIAR Chapter 7, Appendix 7-7	While no significant impacts were identified for any other bird species, the Proposed Lifetime Extension has the potential to displace hen harrier from the Site, in the absence of offsetting measures there is the potential for an ongoing significant (indirect) habitat loss effect. Accordingly, Proposed Offsetting Measures are proposed. The Proposed Offsetting lands are located in Knockatee and Coom, Co. Kerry, approximately 12km east from the Taurbeg Wind Farm site. Offsetting measures include permanent removal of c. 105.5 ha of commercial forestry and restoration of c.17.7 ha of farmland to good quality hen harrier habitat. Farmland restoration measures which will be implemented are the following: › Planting and restoring of hedgerow › Rotational grazing scheme › Linear wildlife crop sowing › Cease on fertiliser application › Predator Fencing Further detail on the Proposed Offsetting Measures can be found in Appendix 7-7.		
MM5	EIAR Chapter 8	Regarding Land, Soils and Geology during the operational phase, the following mitigation measures are proposed: Oil used in transformers (at each turbine and at the substation) and any storage of oils or hydrocarbons within the control building compound could potentially leak during the operational phase and impact on soils and subsoils. During maintenance and service visits, some waste (lubricating and cooling oils, packaging from spare parts or equipment, unused paint, etc.) will arise. This will be recorded and removed from the Wind Farm Site and reused, recycled or disposed of in accordance with the relevant legislation in an authorised facility. Turbine transformers are located within the basement of each turbine (i.e. within the turbine hardstands), with dedicated concrete foundations. Oils for the purposes of cooling the turbine transformers are stored in bunded tanks within the turbine		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		foundations, within a bund able to contain at least 110% of the volume stored. Any leaks would be contained within the turbine transformer units, and hydrocarbons would not be able to permeate to ground. Each transformer is also housed within bunds to prevent any unintended leaks or spillages. In addition: › All plant and machinery to be serviced before being mobilised to site; › Road-going vehicles will be refuelled off site wherever possible; › On-site refuelling will be carried out at designated refuelling areas at various locations throughout the site. Machinery will be refuelled directly by a fuel truck that will come to site as required Irrespective of the buffer distance and location of refuelling, interceptor drip trays will be available in accordance with standard good practice. Interceptor drip trays will be positioned under any stationary mobile plant to prevent oil contamination of the ground surface or water; › Only designated trained and competent operatives will be authorised to refuel plant onsite. Mobile measures such as drip trays and fuel absorbent mats will be used during all refuelling operations. › Fuel pipes on plant outlets at fuel tanks etc. will be regularly checked and maintained to ensure that no drips or leaks to ground occur;		
MM6	EIAR Chapter 9	Mitigation Measures currently employed on the existing Taurbeg Wind Farm will be maintained during the Proposed Lifetime Extension. No additional drainage and runoff mitigation is proposed above what is already present during the extended operational phase. The below drainage mitigation measures are currently in operation at the Site; › Natural vegetation filters are used regularly across the Site where the local drainage and topography allow attenuation of surface water runoff; › Interceptor drains are installed up-gradient of infrastructure to collect clean surface runoff in order to minimise the amount of runoff reaching		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		areas where suspended sediment could become entrained. It is now directed to areas where it can be re-distributed onto natural vegetation; › Swales/roadside drains are used to collect runoff from access roads and turbines hardstanding areas of the site, likely to have entrained suspended sediment, and channel it onto natural vegetation filters; › The existing drainage system at the site provides flood attenuation and has not resulted in any increased in the downstream flood risk.		
MM7	EIAR Chapters 10, 11	Whilst no significant effects on air quality and climate are predicted with the Proposed Lifetime Extension, the following best practice mitigation measures have been proposed during the extended operational phase of the Project, with regards to Air and Climate: › Any vehicles or plant brought onsite during the operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any emissions that arise; › When stationary, delivery and on-site vehicles will be required to turn off engines. › Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements		
MM8	EIAR Chapter 12	An assessment of the operational wind turbine noise levels has been undertaken in accordance with best practice guidelines and procedures. The findings of the assessment have confirmed that no significant cumulative impacts or effects are predicted from the operational noise turbine levels associated with the Proposed Lifetime Extension. Therefore, no specific mitigation measures are required.		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		If the Proposed Project is granted permission to continue operating, a commissioning noise survey can be carried out. In the unlikely event of any exceedances of the conditioned turbine noise limits being identified as a result of the Proposed Lifetime Extension, these exceedances will be mitigated through curtailment of turbine(s) in the relevant wind speed and wind directions. The curtailment strategy will be developed for the installed turbines to achieve the relevant noise criteria at all Sensitive Receptors. **Amplitude Modulation** In the event that a complaint which indicates potential excessive amplitude modulation (AM) associated with the Proposed Lifetime Extension, the operator will employ a qualified acoustic consultant to assess the level of AM in accordance with the methods outlined in the Institute of Acoustics IOA Noise Working Group (Wind Turbine Noise) *Amplitude Modulation Working Group Final Report: A Method for Rating Amplitude Modulation in Wind Turbine Noise* (9 August 2016) or subsequent revisions. The measurement method outlined in the IOA AMWG document, known as the 'Reference Method', will provide a robust and reliable indicator of AM and yield important information on the frequency and duration of occurrence, which can be used to evaluate different operational conditions including method to mitigate any excessive AM. These mitigation measures, if required, will consist of the implementation of operational controls for the relevant turbine type, which will include turbine curtailment under specific operational conditions. In the absence of widely accepted and robust planning conditions to control amplitude modulation (AM) from wind turbines, the commitments outlined in this EIAR are considered best practice. The proposed approach will ensure that any negative impacts arising from AM associated with the operation of the proposed development will be effectively addressed by the operator.		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
MM9	EIAR Chapter 13	No significant effects have been predicted for the proposed extended operational phase in relation to Landscape and Visual Impacts, therefore no additional mitigation measures have been proposed.		
MM10	EIAR Chapter 14	No significant operational phase activities are proposed which would require further assessment. The continuation of the operational phase of the Project will not result in any further effects on setting to the Cultural Heritage resource. No significant effects have been predicted for the proposed extended operational phase in relation to Cultural Heritage, therefore no mitigation measures have been proposed.		
MM11	EIAR Chapter 15	In relation to Material Assets, the following mitigation measures have been proposed for the extended operational phase of the Project: **Road Safety** › Junction delineated with edge of carriageway markings and STOP junction markings and STOP signs in accordance with Figure 7.35 of the Traffic Signs Manual, as shown in Figure 15-1. › The trimming back of shrubs on the northside of the L5005 in order to provide forward visibility for traffic turning right into the Taurbeg Wind Farm site, as shown in Figure 15-2, and also to maintain the available visibility splays on the southern side of the L5005, also shown in Figure 15-2 is recommended. › The introduction of junction warning signs W002L of the Traffic Signs Manual on the westbound approach to the Taurbeg Wind Farm access junction on the L5005, and W002R on the eastbound approach, in order to increase the conspicuity of the access junction. These signs should be located on the left side of the L5005 and approximately 100m in advance of the junction.		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		Telecommunications Whilst no telecoms operators have highlighted issues regarding the Proposed Lifetime Extension, a dedicated Community Liaison Officer employed by the Applicant will be available for contact to householders in the area should any interference be caused by the Proposed Lifetime Extension. **Aviation** The Applicant will coordinate with the IAA should a grant of permission be issued, to ensure that the development remains in compliance with all IAA requirements including lighting requirements. Any further details will be agreed with the Department of Defence, Air Corps and the IAA. The coordinates and elevations for the existing turbines has been supplied to the IAA, as is standard practice for all wind farm developments.		
Decommissioning Phase				
MM12	EIAR Chapter 4	In the event that the Proposed Lifetime Extension is decommissioned after the 10 years extension of life, an updated Decommissioning Plan will be prepared for agreement with the local authority. This will be a comprehensive plan updated in line with decommissioning methodologies that may exist at the time. The Final Decommissioning Plan will therefore be agreed with the Local Authority at least three months prior to decommissioning the Proposed Lifetime Extension.		
MM13	EIAR Chapter 5	Residential Amenity and Health and Safety will be protected during the decommissioning Phase via the following mitigation measures:		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		› Establishing channels of communication between the Applicant or contractor, Local Authorities and local residents; › The hours of decommissioning works (and associated traffic movements) will, insofar as possible, be limited to avoid unsociable hours. Activities shall generally be restricted to between 07:00hrs and 19:00hrs Monday to Friday and between 07:00hrs and 13:00hrs on Saturdays, with no activities on Sundays or public holidays unless in the event of an emergency. However, to ensure that optimal use is made of good weather period or at critical periods within the programme (e.g., crane use) or to accommodate removal of large turbine component along public routes it could be necessary on occasion to work outside of these hours. Any such out of hours working will be notified in advance to the Local Authority and local residents.		
MM14	EIAR Chapter 6, Decommissioning Plan	Regarding Biodiversity at the site, the decommissioning phase will involve the following best practice mitigation measures: › All measures to mitigate the risks of contamination of watercourses as outlined in Chapter 9, will be fully implemented. › The areas within 50m of the hard-stand and turbine foundations will be subject to a pre-works terrestrial ecology walkover to highlight any constraints that may be present (e.g. breeding or resting places of protected species, presence of Invasive Plant Species). › If any significant constraints are identified appropriate controls will be developed and integrated into the live decommissioning plan ahead of the commencement of the work. › If any Third Schedule Invasive species are present in or adjacent to the works footprint, an Invasive Species Management Plan (ISMP) will be developed, and all recommendations implemented in accordance with the contemporary best practice measures.		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		› Speed limits will be enforced on internal roads. › All edible wastes will be stored in covered segregated containers and disposed of at licensed facilities. › No refuelling or other hydrocarbon related usage will be undertaken within 50m of any watercourse in relation to maintenance vehicles, plant or machinery. › Any import of soil or fill necessary in the decommissioning process shall be from approved sources and appropriately tested or inspected to minimise the risk of import of invasive species. Only soil appropriate to the site (pH, soil type) will be used. The re-seeding or natural revegetation of reinstated areas will proceed on the advice of a suitably qualified ecologist. Any seed mix used will be on the approval of the ecologist.		
MM15	Chapter 7, Decommissioning Plan	Regarding Ornithology and Avian Populations, the decommissioning plan will include industry best practice measures to mitigate the impact of works on a bird, which may include the following: › All machinery will work from the existing access road corridor. › Any required vegetation removal will be conducted in line with the provisions of the Wildlife Acts 1976-2021. › Decommissioning works will begin outside the bird nesting season as defined by the Wildlife Act 1976 as amended (1st of March to the 31st of August). Any requirement for works to run into the subsequent breeding season will be subject to pre-works bird surveys to confirm the absence of breeding birds of conservation concern. If such breeding activity is identified during the works, the nest sites will be located, and no works shall be undertaken within an agreed buffer in line with industry best practise.		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		› Noise limits, noise control measures, hours of operation (i.e. dusk and dawn is high faunal activity time) and selection of plant items will be considered in relation to disturbance of birds. All plant and equipment for use will comply with the European Communities (Noise Emission By Equipment For Use Outdoors) Regulations, 2001, as amended (SI 632/2001). Plant machinery will also be turned off when not in use. › Silt fences will be installed as an additional water protection measure around existing watercourses. › An Environmental Clerk of Works and Project Ecologist will be appointed. Duties will include: › Organise the undertaking of a pre-works walkover bird survey to ensure that significant effects on birds will be avoided. › Inform and educate on-site personnel of the ornithological and ecological sensitivities within the Site. › Oversee management of ornithological issues during the works period and advise on ornithological issues as they arise. › Provide guidance to contractors to ensure legal compliance with respect to protected species onsite. › Liaise with officers of consenting authorities and other relevant bodies with regular updates in relation to decommissioning progress. Areas of marsh & fen are unaffected by traffic or storage of plant and materials. **Mitigation Measures to protect Red Grouse** › Any decommissioning works envisioned to take place during the period April – July will be preceded by a pre-commencement survey to investigate the presence of breeding red grouse. The survey will follow the methodology outlined in Section 7.2.4.2.7 of Chapter 7 (i.e. a tape-lure survey during period December - March to identify territorial males);		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		› Should territorial males be recorded during survey, then these works will be restricted to outside the main breeding season for red grouse, i.e. April – July **Mitigation Measures to protect Nightjar** › Any works within 500m of the identified area of contiguous breeding habitat during the period May to August will be preceded by a pre-commencement survey to investigate whether any potential breeding nightjar are present within 500m of the proposed works. The survey will follow the methodology outlined in Section 7.2.4.2.6 (i.e. dusk surveys during period late May to July to identify churring males); › Should churring males be recorded during the survey, then the works within 500m of the suitable breeding habitat will be restricted to outside the main breeding season for nightjar, i.e. May - August		
MM16	Chapter 8, Decommissioning Plan	Upon decommissioning of the existing Taurbeg Wind Farm, the wind turbines will be disassembled. All above-ground turbine components will be separated and removed off-site. It is proposed to leave turbine foundations in place underground and to cover them with soil and reseed as appropriate. Leaving the turbine foundations in-situ is considered a more environmentally prudent option as excavation works can be avoided. It is proposed that site roadways will be left in situ, as appropriate and where required, to facilitate on-going access and any commercial forestry uses. It is proposed to leave underground cables in place where they are below a level likely to be impacted by typical agricultural works. During decommissioning, all plant and machinery will keep to existing infrastructure (e.g. tracks and hardstanding) and will not encroach upon adjacent habitats unless this is essential in order to progress the decommissioning works.		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		Reinstatement (i.e. backfilling of the turbine foundations) will be carried out using site-won materials without compromising or damaging established/existing habitats. Hardstand areas will be covered with peatland vegetation/scraw or poorly humified peat to encourage vegetation growth and reduce run-off and sedimentation.		
MM17	Chapter 9	The disassembly and removal of the turbines will not have an impact on the hydrological/hydrogeological environment at the wind farm site, however, mitigation measures to avoid contamination by accidental fuel leakage and compaction of soil by on-site plant will be implemented as per the operational phase mitigation measures. These include: › Vehicles used during the Proposed Lifetime Extension will be refuelled off site before entering the site; › Spill kits will be available in all site vehicles to deal with an accidental spillage and breakdowns; › An emergency plan for the extended operational phase to deal with accidental spillages and breakdowns will be contained in the Operational and Environmental Management Plan; › All transformers and substation areas are bunded to 110% of the volume of oil used in each transformer/substation; and, › An emergency plan for the extended operational phase to deal with accidental spillages will be contained in the Operational and Environmental Management Plan; › Natural vegetation filters are used regularly across the Site where the local drainage and topography allow attenuation of surface water runoff; › Interceptor drains are installed up-gradient of infrastructure to collect clean surface runoff in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It is now directed to areas where it can be re-distributed onto natural vegetation;		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		› Swales/roadside drains are used to collect runoff from access roads and turbines hardstanding areas of the site, likely to have entrained suspended sediment, and channel it onto natural vegetation filters; The existing drainage system at the site provides flood attenuation and has not resulted in any increased in the downstream flood risk.		
MM18	EIAR Chapter 10, 11, Decommissioning Plan	Regarding dust: › Any site roads with the potential to give rise to dust will be regularly watered, as appropriate, during dry and/or windy conditions; › The designated public roads outside the site and along the main transport routes to the site will be regularly inspected by the Site Manager for cleanliness, and cleaned as necessary; › Material handling systems and material storage areas will be designed and laid out to minimise exposure to wind; › Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods; › The transport of soils or other material, which has significant potential to generate dust, will be undertaken in tarpaulin-covered vehicles where necessary; › All site related traffic will have speed restrictions on un-surfaced roads to 15 kph; › Daily inspection of the site to examine dust measures and their effectiveness, and, › When necessary, sections of the haul route will be swept using a truck mounted vacuum sweeper. › All vehicles and plant will be maintained in good operational order while onsite, thereby minimising any emissions that arise. The Site Supervisor/Construction Manager produce and follow a site inspection		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		and machinery checklist which will be followed and updated if/when required. › When stationary, delivery and on-site vehicles will be required to turn off engines. › Turbines and other infrastructure will be transported from the Site on specified routes only unless otherwise agreed with the Planning Authority (see Section 15.1 Chapter 15 for details) › The Decommissioning Plan (Appendix 4-3) includes a Waste Management Plan (WMP) which outlines the best practice procedures that will occur during the decommissioning phase relating to waste material. The WMP will outline the methods of waste prevention and minimisation by recycling, recovery and reuse at each stage of the decommissioning of the Proposed Lifetime Extension. ○ Section 3.10 of the Decommissioning Plan (Appendix 4-3) for this EIAR refers to the methodology that will be utilised to manage onsite waste. This waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor, ○ The MRF facility will be local to the Site where possible to reduce the amount of emissions associated with vehicle movements. ○ Disposal of waste will be seen as a last resort.		
MM19	EIAR Chapter 12	The contract documents will specify that the Contractor undertaking the decommissioning works will be obliged to adopt best practice noise abatement measures contained in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise and BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Vibration.		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		The following best practice mitigation measures from these documents will be implemented as required for the duration of the decommissioning phase: › Limiting the hours during which site activities likely to create high levels of noise or vibration are permitted; › Establishing channels of communication between the contractor/developer, Local Authority and residents; › Monitoring typical levels of noise and vibration during critical periods and at sensitive locations; › Selection of plant with low inherent potential for generation of noise and/ or vibration where practical; › Placing of noise generating / vibratory plant as far away from sensitive properties as practical within the site constraints, and; › The hours of decomissioning activity will be limited to avoid unsociable hours where possible. Works operations shall generally be restricted to between 7:00hrs and 19:00hrs Monday to Friday and Saturday between 7:00hrs and 13:00hrs.		
MM20	EIAR Chapter 14	Regarding Cultural Heritage during the decommissioning phase, there will be minimal works required and it is proposed that site roads be left in-site. No potential direct impacts to the archaeological, architectural or cultural heritage resources were identified and therefore no mitigation is required to be proposed.		
MM21	EIAR Chapter 15	Prior to decommissioning, an updated Decommissioning Plan, including material recycling/disposal and a Traffic Management Plan, will be developed to minimise impacts to local traffic. The updated decommissioning plan will be prepared in consultation with the local authority, and the final documentation will be agreed with the local authority in advance of decommissioning.		

18.3 EIAR Mitigation Measures – Proposed Offsetting Measures

Table 18-2 Schedule of Mitigation - Proposed Offsetting Measures

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		Proposed Offsetting Measures		
MM1	Chapter 5	A Health and Safety Plan and method statement will be produced by the contractor for the proposed deforestation works at the Proposed Offsetting Lands prior to the commencement of the works. The following mitigation measures will be implemented at the site: › A site induction will take place prior to any deforestation works commencing. All contractors involved in deforestation operations will be required to attend; › An emergency procedure and evacuation plan has been devised for the site; › Internal roadways will be maintained and open during working times to facilitate emergency vehicles or egress in the event of an accident. All site work vehicles will park at lay byes and will not obstruct traffic on the bog roads. Traffic signs and speed limits will be obeyed at all times; › All site personnel must wear high visibility clothing and appropriate footwear on site; › 'Clean as you go' policy will be implemented on site. All waste materials will be removed off site by contractor on daily/regular basis; › Each site will have an adequate first aid kit, located within each worker's vehicle; › All accidents and dangerous occurrences will be reported to the contractor and applicant immediately;		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		› All fuel/chemicals and machine service points will be a minimum of 50 meters away from water courses, drains or culverts that may lead to water courses. All chemicals will be removed from the site at the end of the day; › There will be no lone working on the site. Workers will be present on the site in a minimum of pairs. Forest manager is to be contacted prior to access and upon exit of the site › Site safety signage (Forestry Operations in Progress, No Public Entry and Exit & Entry points) will be erected and maintained on worksite; › All plant, machinery and equipment will be in good working order and operators must be in possession of the relevant CSCS ticket; › Fire extinguishers, first aid kits and pollution control kits will be available in each machine at all times; › All accident and near misses will be reported to contractor and applicant. The works manager will complete the incident report form and record the incident in the incident reporting log. There are no additional mitigation measures relative to drainage proposed for the Proposed Offsetting Lands. The following mitigation measures are already in place at the site and will continue to be left in place during the proposed deforestation works: › Natural vegetation filters are used regularly across the Site where the local drainage and topography allow attenuation of surface water runoff; › Where possible, interceptor drains are installed up-gradient of infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It is now directed to areas where it can be re-distributed onto natural vegetation; and,		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		› Swales/roadside drains are used to collect runoff from access roads and turbines hardstanding areas of the site, likely to have entrained suspended sediment, and channel it onto natural vegetation filters. These mitigation measures have been effective in removing any silt generated during routine maintenance works. In addition to the above, temporary check dams and silt fencing arrangements will be placed along sections of access roads where maintenance works are being undertaken. Check dams will be constructed from a 4/40mm non-friable crushed rock. The works will be obliged to adopt best practice noise abatement measures contained in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites.		
MM2	EIAR Chapter 6, Chapter 9	**Aquatic Biodiversity** Forestry operations will conform to current best practice Forest Service regulations, policies and strategic guidance documents as well as Coillte and DAFM guidance documents, including the specific guidelines listed in Section 9.5.2.1 of this EIAR. The following buffer zones will be implemented: › No disturbance to ground will occur within 5m of a relevant watercourse or within 10-20m for aquatic zones. › In areas of higher sensitivity or where silt movement is more likely this zone will increase to 20m; › In these sensitive areas, there will be no machines crossing any natural watercourse; › Refuelling and maintenance of machines will occur at least 50m from watercourses. It is proposed that refuelling will only be completed at the		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		existing entrance to Area 2. This location is distant from any watercourses; › Use natural buffer zones to filter water from mound drains; › Short, stepped mound drains to be used in moderately sloped areas; and, › No drainage on very steep slopes, within delineated aquatic or buffer zones. The setback distance from sensitive hydrological features means that adequate room is maintained for the proposed mitigation measures (discussed below) to be properly installed and operate effectively. The buffer/setback zone will: › Avoid physical damage (river/stream banks and river/stream beds) to watercourses and the associated release of sediment; › Avoid peat/soil disturbance and compaction within close proximity to surface watercourses; › Avoid the entry of suspended sediment from works into watercourses; and, › Avoid the entry of suspended sediment from the drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone. In addition to the application of buffer/setback zones, the following supplementary mitigation measures will be employed during deforestation works: <u>Mitigation by Design:</u> Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods which are set out as follows:		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		› The felling coupes are carefully planned to ensure no unnecessary water crossings will be required. › Machine combinations will be chosen which are most suitable for ground conditions at the time of deforestation, and which will minimise soils disturbance. The harvester and the forwarder are designed specifically for the forest environment and are low ground pressure machines; › All machinery will be operated by suitably qualified personnel; › Checking and maintenance of forest roads and culverts will be on-going through any deforestation operations. No tracking of vehicle through watercourses will occur, as vehicles will use road infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during deforestation works; › These machines will traverse the site along specified off-road routes (referred to as brash mats); › The location of brash mats will be chosen to avoid wet and potentially sensitive areas; › Brash mats will be placed to support the vehicles on soft ground, reducing peat and mineral soil disturbance and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal will take place when they become heavily used and worn. Provision should be made for brash mats along all off-road routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall; › Silt fences will be installed at the outfalls of existing drains downstream of deforestation areas. No direct discharge of such drains to watercourses will occur. Sediment traps and silt fences will be installed in advance of any deforestation works and will provide surface water settlement for runoff from work areas and will prevent sediment from entering		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		downstream watercourses. Accumulated sediment will be carefully disposed of at pre-selected peat disposal areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground; › In areas particularly sensitive to erosion it will be necessary to install double or triple sediment traps and increase buffer zone width. These measures will be reviewed on site during the Proposed Offsetting Measures; › Double silt fencing will also be put down slope of deforestation areas which are located in close proximity to streams and/or relevant watercourses; › Drains and silt traps will be maintained throughout all deforestation works, ensuring that they are clear of sediment build-up and are not severely eroded; › Timber will be stacked in dry areas, and outside watercourse buffer zones. Straw bales and check dams to be emplaced on the down gradient side of timber storage/processing sites; › Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water runoff; › Refuelling will occur at a designated refuelling area at the existing entrance to Area 2. This refuelling area is remote from all watercourses. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; and, › Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors. › Deforestation works will only be carried out during periods of low rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses.		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		Otter While no otter signs were identified within the Proposed Offsetting Lands, it is noted that otter is a mobile species and could potentially utilise the Proposed Offsetting Lands sporadically. As such, the following mitigation measures to protect otter during the deforestation works. › During deforestation and extraction (in areas where this applies), a minimum 10 m exclusion zone will be applied along the edge of any 'aquatic zone' (rivers/ streams) on or adjoining the Proposed Offsetting Lands. Machine traffic and timber stacking will not be permitted within this zone. Trees within the reach of the harvester arm will be permanently felled by harvester and stacked outside the exclusion zone. Trees outside machine reach will be felled manually. Felled trees will be winched out of the exclusion zone where appropriate and safe to do so, or removed by extended harvester arm, for subsequent processing outside the exclusion zone avoiding mobilisation of soils. All other requirements relating to water exclusion zones, as set out in Section 6.1 of the Standards for Felling & Reforestation (DAFM, 2019) and Section 9.5.2 of Chapter 9 of this report will be adhered to. › Regarding any existing 'relevant watercourses' (drainage ditches), there will be no cleaning of any section of such watercourses within 50 m of an aquatic zone. › There will be no woody scrub/ shrub removal as part of the Proposed Offsetting Measures.		
MM4	EIAR Chapter 8, Appendix 8-1	A series of safety buffer zones (SBZ) and Felled Material Restriction (FMR) areas are proposed as mitigation for the deforestation works.		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		Safety Buffer zones are areas identified during the initial phases of the PSRA and are highlighted as possessing a potential instability risk. The development of the safety buffer zones is a semi-automated approach that combines the developed polygon areas of the FoS results, areas of risk identified during the site walkovers, and potential risk areas identified from the examination of peat depths and site topography. It is noted that the results from all FoS analyses (drained/undrained, with and without surcharge) are used, highlighting areas indicative as having a FoS < 1in the undrained scenario. Five Safety Buffer zones have been identified within the Proposed Offsetting Lands. It is considered that the low factor of safety calculated in these areas is caused by localised factors, and do not represent a global stability risk. Each safety buffer zone is located at the edge of the forestry, close to machine excavated firebreaks or small streams, with the locally higher slopes generating the low factor of safety score. It is considered that these areas do not present a significant peat landslide risk, provided the below mitigations are adhered to. These areas are to be marked out on site with warning tape, and the following mitigation measures adhered to: › No large plant is to enter the Safety Buffer zones. › No logs, windrows, stone or other materials will be temporarily or permanently placed in the areas within the FMR areas. Although the peat stability results and safety buffers have been considered in the siting of the Proposed Offsetting Measures, there are some locations where forestry work is required within a safety buffer zone. The stability assessment results at these locations suggest FoS values <1 in the surcharged scenario only and have FoS results >1.0 in the analysis without the surcharge. This suggests that the areas are of a low instability risk in their natural state but are unsuitable for the storage of felled logs or other materials.		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		Felled Material Restriction (FMR) areas are identified at 18 locations within the Proposed Offsetting Lands. Certain mitigations must be adhered to within the FMR areas in future stages of the Proposed Offsetting Measures: › No logs, windrows, stone or other materials will be temporarily or permanently placed in the areas within the FMR areas, › Any trees permanently felled in the area will be immediately removed and placed/ stored in an appropriate storage location, › Plant used within these areas will be low ground bearing and only the necessary plant will be used here. No excessive quantity or size of plant will be stored in these areas, › During, and for seven days following significant rainfall events, all works in the FMR areas will be halted, to prevent disturbance of potentially saturated peat. **Works Management** The general requirements for the management of peat and the mitigation of peat instability at the Proposed Offsetting Measures are as follows: › Appointment of experienced and competent contractors; › The forestry works on site should be supervised by experienced and qualified personnel; › Allocate sufficient time for the project to proceed safely with all peat stability mitigation measures included in the programme; › Set up, maintain and report findings from monitoring systems, including sightline monitoring;		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		› Maintain vigilance and awareness through Tool-Box-Talks (TBTs) on peat stability; › Prevent undercutting of slopes and unsupported excavations; › Prevent placement of loads/overburden on marginal ground; › Manage and maintain a robust drainage system. This will be the responsibility of the appointed contractor; › Storage of felled material including windrows be carried out in the permitted areas only; › All works will be halted during significant rainfall events, and for a minimum of one day afterwards; and › A method statement and risk assessment (RAMS) which considers the potential causes and mitigations of peat instabilities and landslide is required and must be regularly communicated to all site staff. An observational approach by all site staff to the ground conditions and the risks should be promoted and any changes in the ground or site conditions should be reported and the risk dynamically assessed. **Drainage Measures** Installation of targeted drainage measures would aim to isolate areas of susceptible peat from upslope water supply, re-routing surface (flushes/gullies) and subsurface (pipes) drainage around critical areas. Surface water drainage plans should be implemented to account for modified flows created by Proposed Offsetting Measures works, which in turn may affect peat stability, pollution and wildlife interests. Drainage measures need to be carefully planned to minimise any negative impacts. Furthermore, all proposed deforestation works will be in accordance with the best practice Forest Service regulations, policies and strategic guidance documents as well as Coillte and Forest Service guidance documents to ensure that deforestation results in minimal potential negative effects on the local peat, soil and subsoil environment.		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		In addition, the following mitigation measures will be implemented during deforestation operations: **Mitigation of adverse Effects due to the erosion of soils and exposed subsoils/peat** › Before any works are completed silt fences will be installed to limit the movement of entrained sediment in surface water runoff; › The harvester and the forwarder are designed specifically for the forest environment and are low ground pressure machines; › All machinery will be operated by suitably qualified personnel; › These machines will traverse the site along specified off-road routes (referred to as racks or brash mats); › Brash mats will be placed on all routes off the forest road to support the vehicles on soft ground, reducing peat and mineral soil disturbance, compaction and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur; › As deforestation progresses, the harvester will collect brash produced by the deforestation and place it in front of the machine before it advances forward along the brash mat; › The condition of the brash mats will be continually monitored and fresh brash will be applied when the brash mat becomes heavily used and worn, ensuring that the mat remains effective throughout the Proposed Offsetting Measures; and, › The location of brash mats will be chosen to avoid wet and potentially sensitive areas **Soil Contamination by Leakages and Spillages** › All road-going vehicles will be refuelled off-site;		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		› On-site re-fuelling will be required for forestry and excavator machinery; › The on-site refuelling will be undertaken at a dedicated refuelling area at the existing entrance to Area 2. The refuelling will be completed using a double skinned bowser with spill kits kept on site for accidental leakages or spillages; › The bowser will be refilled by a fuel lorry; › Absorbent materials and pads will be kept on site in the event of accidental spillages; › Only designated trained operatives will be authorised to refuel plant; › Taps, nozzles or valves associated with refuelling equipment will be fitted with a lock system; › Fuels stored on-site will be minimised. All storage areas will be bunded appropriately for the duration of the Proposed Offsetting Measures. All bunded areas will be fitted with a storm drainage system and an appropriate oil interceptor. Ancillary equipment such as hoses, pipes will be contained within the bunded area; › Fuel and oil stores including tanks and drums will be regularly inspected for leaks and signs of damage; › The plant used during Proposed Offsetting Measures will be regularly inspected for leaks and fitness for purpose **Peat Stability** The following control measures will ensure the management of the risks for this site: › Felling will be completed during periods of low rainfall; › Appointment of experienced and competent contractors; › The forestry works will be supervised by experienced and qualified personnel;		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		› Allocate sufficient time for the project to proceed safely with all peat stability mitigation measures; › Set up, maintain and report findings from monitoring systems, including sightline monitoring (installation of monitoring posts is recommended where works are taking place in areas where pet depths exceed 2m. Monitoring posts should be observed at least once a day); › Maintain vigilance and awareness through Tool-Box-Talks on peat stability; › Prevent undercutting of slopes and unsupported excavations; › Prevent placement of loads/overburden on marginal ground; › Manage and maintain a robust drainage system; › Surface water drainage plans should be implemented to account for modified flows created by the works, which in turn may affect peat stability; › Store felled material including windrow in permitted areas only; › A method statement and risk assessment which considers the potential causes and mitigations of peat instabilities and landslide is required and must be regularly communicated to all site staff. An observational approach by all site staff to the ground conditions and the risks should be promoted and any changes in the ground or site conditions should be reported and the risk dynamically assessed.		
MM5	EIAR Chapter 9	Mitigation measures relating to potential effects of deforestation on water quality can be seen in MM1, MM2 and MM4 above. **Mitigation by Design:** Mitigation measures which will reduce the risk of entrainment of suspended solids and nutrient release in surface watercourses comprise best practice methods which are set out as follows:		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		› The deforestation coupes are carefully planned to ensure no unnecessary water crossings will be required. › Machine combinations will be chosen which are most suitable for ground conditions at the time of deforestation, and which will minimise soils disturbance. The harvester and the forwarder are designed specifically for the forest environment and are low ground pressure machines; › All machinery will be operated by suitably qualified personnel; › Checking and maintenance of forest roads and culverts will be on-going through any deforestation operations. No tracking of vehicle through watercourses will occur, as vehicles will use road infrastructure and existing watercourse crossing points. Where possible, existing drains will not be disturbed during deforestation works; › These machines will traverse the site along specified off-road routes (referred to as brash mats); › The location of brash mats will be chosen to avoid wet and potentially sensitive areas; › Brash mats will be placed to support the vehicles on soft ground, reducing peat and mineral soil disturbance and erosion and avoiding the formation of rutted areas, in which surface water ponding can occur. Brash mat renewal will take place when they become heavily used and worn. Provision should be made for brash mats along all off-road routes, to protect the soil from compaction and rutting. Where there is risk of severe erosion occurring, extraction will be suspended during periods of high rainfall; › Silt fences will be installed at the outfalls of existing drains downstream of deforestation areas. No direct discharge of such drains to watercourses will occur. Sediment traps and silt fences will be installed in advance of any deforestation works and will provide surface water settlement for runoff from work areas and will prevent sediment from entering		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		downstream watercourses. Accumulated sediment will be carefully disposed of at pre-selected peat disposal areas. Where possible, all new silt traps will be constructed on even ground and not on sloping ground; › In areas particularly sensitive to erosion it will be necessary to install double or triple sediment traps and increase buffer zone width. These measures will be reviewed on site during the Proposed Offsetting works; › Double silt fencing will also be put down slope of deforestation areas which are located in close proximity to streams and/or relevant watercourses; › Drains and silt traps will be maintained throughout all deforestation works, ensuring that they are clear of sediment build-up and are not severely eroded; › Timber will be stacked in dry areas, and outside watercourse buffer zones. Straw bales and check dams to be emplaced on the down gradient side of timber storage/processing sites; › Works will be carried out during periods of no, or low rainfall, in order to minimise entrainment of exposed sediment in surface water runoff; › Refuelling will occur at a designated refuelling area at the existing entrance to Area 2. This refuelling area is remote from all watercourses. Mobile bowser, drip kits, qualified personnel will be used where refuelling is required; and, › Branches, logs or debris will not be allowed to build up in aquatic zones. All such material will be removed when harvesting operations have been completed, but care will be taken to avoid removing natural debris deflectors. Deforestation will only be carried out during periods of low rainfall, and therefore minimum runoff rates. This will minimise the risk of entrainment of suspended sediment in surface water runoff, and transport via this pathway to surface watercourses.		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		Drain Inspection and Maintenance: The following items shall be carried out during inspection before deforestation and after: › Communication with forestry operatives in advance to determine whether any areas have been reported where there is unusual water logging or bogging of machines; › Inspection of all areas reported as having unusual ground conditions; › Inspection of main drainage ditches and outfalls. During inspections prior to deforestation, the main drainage ditches shall be identified. Ideally the inspection shall be carried out during rainfall; › Following deforestation, all main drains shall be inspected to ensure that they are functioning; › Extraction tracks near drains need to be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground; › Culverts on drains exiting the site will be unblocked; and, › All accumulated silt will be removed from drains and culverts, and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall. In addition to this, Forestry operations will conform to current best practice Forest Service regulations, policies and strategic guidance documents as well as Coillte and DAFM guidance documents, including the specific guidelines listed below, to ensure that deforestation and other forestry operations result in minimal potential negative effects to the receiving environment. These mitigation measures are tried and tested, best practice mitigation measures which are implemented at forestry sites across the country. The guidance documents include:		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		› Forestry Standards Manual (Forest Service, 2015) › Environmental Requirements for Afforestation (Forest Service, 2016a) › Land Types for Afforestation (Forest Service, 2016b) › Forest Protection Guidelines (Forest Service, 2002) › Forest Operations and Water Protection Guidelines (Coillte, 2013) › Forestry and Water Quality Guidelines (Forest Service, 2000b) › Forestry and the Landscape Guidelines (Forest Service, 2000c) › Forestry and Archaeology Guidelines (Forest Service, 2000d) › Forest Biodiversity Guidelines (Forest Service, 2000e) › Forests and Water, Achieving Objectives under Ireland's River Basin Management Plan 2018-2021 (DAFM, 2018) › Coillte Planting Guideline SOP › A Guide to Forest Tree Species Selection and Silviculture in Ireland (Horgan et al., 2003) › Management Guidelines for Ireland's Native Woodlands. Jointly published by the National Parks & Wildlife Service (Cross and Collins, 2017) › Native Woodland Scheme Framework (Forest Service, 2018) › Code of Best Forest Practice (Forest Service, 2000) There is a requirement in the Forest Service Code of Practice and in the FSC Certification Standard for the installation of buffer zones adjacent to aquatic zones. Minimum buffer zone widths recommended in the Forest Service (2000) guidance document "Forestry and Water Quality Guidelines" will be implemented during the deforestation activities. **The following buffer zones will be implemented:** › No disturbance to ground will occur within 5m of a relevant watercourse or within 10-20m for aquatic zones.		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		› In areas of higher sensitivity or where silt movement is more likely this zone will increase to 20m; › In these sensitive areas, there will be no machines crossing any natural watercourse; › Refuelling and maintenance of machines will occur at least 50m from watercourses. It is proposed that refuelling will only be completed at the existing entrance to Area 2. This location is distant from any watercourses; › Use natural buffer zones to filter water from mound drains; › Short, stepped mound drains to be used in moderately sloped areas; and, › No drainage on very steep slopes, within delineated aquatic or buffer zones. The setback distance from sensitive hydrological features means that adequate room is maintained for the proposed mitigation measures (discussed below) to be properly installed and operate effectively. The buffer/setback zone will: › Avoid physical damage (river/stream banks and river/stream beds) to watercourses and the associated release of sediment; › Avoid peat/soil disturbance and compaction within close proximity to surface watercourses; › Avoid the entry of suspended sediment from works into watercourses; and, › Avoid the entry of suspended sediment from the drainage system into watercourses, achieved in part by ending drain discharge outside the buffer zone and allowing percolation across the vegetation of the buffer zone.		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
MM6	EIAR Chapter 10 and 11	Mitigation measures to protect air quality and climate during the Proposed Offsetting Measures include: › Any vehicles or plant brought onsite during the extended operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any emissions that arise. › When stationary, delivery and on-site vehicles will be required to turn off engines; › Good management practice will be will occur on site. Good management practice, consists of good site design and layout, adopting appropriate working methods, choosing the right equipment and ensuring that the workforce understands the company's responsibilities and is familiar with good working practice and dust suppression techniques. › Waste material will be transferred to a licensed /permitted Materials Recovery Facility (MRF) by a fully licensed waste contractor where the waste will be sorted into individual waste streams for recycling, recovery or disposal. The MRF facility will be local to the Site to reduce the emissions associated with vehicle movements		
MM7	EIAR Chapter 12	The contract documents will specify that the Contractor undertaking the works will be obliged to adopt best practice noise abatement measures contained in British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Noise.		

18.4 EIAR Monitoring Proposals – Proposed Lifetime Extension

Table 18-3 Schedule of Mitigation - Proposed Lifetime Extension

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
	Operational Phase				
MX1	EIAR Chapter 5 EIAR Chapter 12	Commissioning noise surveys will be undertaken to ensure compliance with any noise conditions applied to the development. It is common practice to commence surveys within six months of a wind farm being commissioned – in this instance, continuing its operation. If an exceedance of the noise criteria is identified as part of the commissioning assessment, the guidance outlined in the IOA GPG and Supplementary Guidance Note 5: Post Completion Measurements (July 2014) will be followed, and relevant corrective actions taken	Within 6 months of continued operation	As Required	Noise Consultant
MX2	Appendix 6-1 Bat Report	**Post Consent Bat Monitoring** To assess the effects of the Proposed Lifetime Extension on bat activity, at least 3 years of post-consent monitoring is proposed. It will include static detector surveys, walked survey transects and dog-led carcass searching to record any bat fatalities resulting from potential collision. The results of post-consent monitoring will be utilised to assess any potential changes in bat activity patterns and to monitor the implementation of the mitigation strategy. Results of Year 1 surveys will assess whether adaptations to the monitoring plan are required, and further mitigations such as curtailment will be considered. If a further curtailment requirement is identified, a programme can be devised around key activity periods and weather parameters, as well as a potential increase in buffers.	Years 1,2,3	Yearly	Project Ecologist

		At the end of each year, the efficacy of the mitigation and monitoring plan will be reviewed, and any identified efficiencies incorporated into the programme. This approach allows for an evidence-based review of the potential for bat fatalities at the Site, to ensure that the necessary measures, based on a new baseline post-lifetime extension, are implemented for the protection of bat species locally. The effectiveness of any mitigation/curtailment needs to be monitored in order to determine (a) whether it is working effectively (i.e. the level of bat mortality is incidental), and (b) whether the mitigation/curtailment regime can be refined such that turbine down-time can be minimised whilst ensuring that it remains effective at preventing casualties. The below subsections provide additional detail on the proposed survey effort, timing, and mitigation. **Monitoring Year 1** ***Bat activity surveys*** Surveys for the Proposed Lifetime Extension will be carried out. Static monitoring shall take place at each turbine during the bat activity season (between April and October) (NatureScot, 2021, NIEA, 2021). Full spectrum recording detectors shall be utilised for the same duration as during pre-application surveys and at the same density (NatureScot, 2021). The assessment of bat activity levels will follow the pre-application methodology, allowing uploaded activity data to be contrasted with a comparable reference range, allowing objective and robust interpretation. A specific focus will be required at turbine 9 in Spring and turbine 7 in Autumn. The static surveys at these two specific turbines will be of 20 days starting during the last week of April at T9 and in Autumn at T7 starting mid-August. Seasonal walked survey transects will also be conducted. Key weather parameters and other factors that are known to influence collision risk will be monitored and shall include:			

		› Windspeed in m/s (measured at nacelle height) › Temperature (ºC) › Precipitation (mm/hr) ***Carcass searches*** Carcass searches, to monitor and record potential bat fatalities, shall be conducted at each turbine in accordance with NIEA Guidance. This will include searcher efficiency trials and an assessment of scavenger removal rates to determine the appropriate correction factor to be applied in relation to determining an accurate estimate of collision mortality. Surveys will cover all activity seasons and the use of a trained dog detection team will be carried out to ensure maximum efficiency. **Monitoring Years 2 & 3** Monitoring surveys shall continue in Year 2 and 3, and in the event where a curtailment requirement has been identified, the success of the curtailment strategy shall be assessed in line with the baseline data collected in the preceding year(s). The performance of the curtailment programme in terms of its ability to respond to the changes in bat abundance based on temperature and wind speed shall be analysed to confirm it is neither significantly over- nor under- curtailing during different periods of bat activity. At the end of each year, the efficacy of the mitigation/curtailment programme shall be reviewed, and any identified efficiencies incorporated into the programme. The requirement for continued post-consent monitoring will also be considered. Should no bat fatalities be recorded in Year 1, curtailment (where applicable) in Year 2 and Year 3 could be reduced/re-evaluated or removed with monitoring continuing to inform this strategy.			
MX3	Chapter 7	A detailed Bird Monitoring Programme has been prepared for the extended operational phase of the existing wind farm (refer to Appendix 7-8 for further details).	Weekly	n/a	Project Ornithologist

		The programme of works will monitor parameters associated with collision, displacement/barrier effects and habituation during the extended operational phase. Surveys will be scheduled to coincide with Years 1, 2, 3, 5, and 10 of the Proposed Lifetime Extension. Monitoring measures are broadly based on guidelines issued by NatureScot (SNH, 2009). The following individual components are proposed: › Vantage point surveys from 4 no. locations. › Monthly distribution and abundance surveys: breeding walkover surveys (adapted Brown & Shepherd) and winter walkover surveys. › Targeted bird collision surveys (carcass searches) will be undertaken with trained dogs. The surveys will include detection and scavenger trials, to correct for these two biases and ensure the resulting data is robust. Full details of all monitoring protocols are provided in Appendix 7-8.			
MX4	Appendix 4.2: Operational and Environmental Management Plan	A programme for the regular inspection of plant and equipment for leaks and fitness for purpose will be developed at the outset of the lifetime extension.	Weekly	n/a	Applicant
MX5	Chapter 15	A dedicated Community Liaison Officer employed by the Applicant will be available for contact to householders in the area should any interference be caused by the Proposed Lifetime Extension	n/a	n/a	Applicant
	Decommissioning Phase				
MX6	Chapter 6, Decommissioning Plan	The Site Manager in consultation with the Ecological Clerk of Works (ECoW) will be responsible for employing the services of a suitably qualified ecologist and any other suitably qualified professionals as required throughout the decommissioning works.	As required	As required	ECoW/ Site Manager

MX7	Chapter 7	Decommissioning monitoring surveys will be undertaken prior to the commencement of works associated with decommissioning at the Site. Additionally, if works are to continue into the breeding season, surveys will be required monthly from April to July. The survey will include a thorough walkover survey to a 500m radius of the development footprint and all works areas, where access allows. If winter roosting or breeding activity of birds of high conservation concern is identified during the decommissioning phase (e.g. red grouse or nightjar), no works shall be undertaken within a species-specific disturbance buffer (e.g. Forestry Commission Scotland, 2006; Ruddock and Whitfield, 2007; Goodship and Furness, 2022) in line with industry best practice. No works shall be permitted within the buffer until it can be demonstrated that the roost/nest is no longer occupied	As required	As required	Project Ornithologist

18.5 EIAR Monitoring Proposals – Proposed Offsetting Measures

Table 18-4 Schedule of Monitoring - Proposed Offsetting Measures

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
	Proposed Offsetting Measures				
MX1	Chapter 6 Biodiversity	**Invasive species management plan** An invasive species management plan has been developed and is outlined below: › A pre-commencement survey for Rhododendron will be carried out within Areas 1, 2 and 4 of the Proposed Offsetting Lands to determine the extent and locations of Rhododendron prior to the Proposed Offsetting Measures taking place. › All Rhododendron plants will be geolocated. › A cut will be made at the base of each stem of each Rhododendron plant, after which a herbicide (glyphosate) will be applied to cut. › Plants will be left in place and revisited for repeat treatment after 6 months. › Rhododendron plants will not be interfered with during the deforestation operations in Areas 1, 2 and 4. › After 1 year all, Rhododendron plants will be revisited to assess the effectiveness of treatment. › If Rhododendron plants are dead, they will be cut at the base and left on site to decompose. › If Rhododendron plants are alive then another treatment cycle as outlined above will be undertaken.	Each year for first 10 year extension	As Required	Project Ecologist

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		› An invasive species survey of Areas 1, 2 and 4 of the Proposed Offsetting Lands will be carried out each year following the Proposed Offsetting Measures for 10 years (2026-2036). This survey will be carried out by a competent ecologist. Any new areas of Rhododendron will be geolocated and subject to treatment. › If seedling Rhododendron are identified during the yearly invasive species surveys, hand removal of emerging seedlings can be conducted in order to deal with any residual rhododendron. › After 2036, the Applicant will commission an ecologist with the relevant experience to undertake invasive species surveys at 5-year intervals with a key focus on identifying Rhododendron seedlings or plants for removal			
MX2	Chapter 7 Ornithology Appendix 7-7	The following individual monitoring components for the Proposed Offsetting Measures are: › Foraging activity surveys from 2no. strategically located vantage points overlooking the Offsetting Lands that are sufficient distance to avoid influencing the flight activity within the area of interest. › Passerine point count surveys along transect routes through the Offsetting Lands to provide a yearly index of passerine abundance	Annually	As required	Project Ecologist
MX3	Appendix 8-1 Chapter 8	The installation of movement monitoring posts is recommended for areas where works are taking place on or adjacent to identified peat depths greater than 2m. Movement monitoring posts will be installed upslope and downslope of the works areas and will be as outlined:	Daily during Offsetting Measures Works	Daily	Felling Operatives

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		› Posts will be 1m to 1.5m in length, installed at 5m intervals with no less than seven posts in each line of sight (~30m). › A string line will in attached to the first and last post with all intermediate posts in contact with one side of the string line, › A numbering system will be designs for the monitoring posts and a record will be kept of this numbering system. Movement monitoring posts will be observed at least once a day with more frequent inspections which adjacent works are ongoing. Should movements be recorded the frequency of these inspections will be increased. Record will be kept of all monitor post inspections with reference to date, time and any relative movement between posts, if any. Any movement identified in the posts will be recorded with reference to the post numbering system. The contactor will also develop a routine inspection of all areas surrounding work in peat, not just exclusively on the monitoring posts. These inspections will include an assessment of ground stability and drainage conditions. These inspections should identify any cracking or deformation on the peat surface, excessive settlement on structures, drain blockages or springs etc.			
MX4	Chapter 9 Hydrology	**Drain Inspection** The following items shall be carried out during inspection pre-felling and after: › Communication with tree felling operatives in advance to determine whether any areas have been reported where there is unusual water logging or bogging of machines; › Inspection of all areas reported as having unusual ground conditions;	Pre and Post Felling	As Required	ECoW

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		› Inspection of main drainage ditches and outfalls. During pre-felling inspections, the main drainage ditches shall be identified. Ideally the pre-felling inspection shall be carried out during rainfall; › Following the permanent tree felling all main drains shall be inspected to ensure that they are functioning; › Extraction tracks near drains need to be broken up and diversion channels created to ensure that water in the tracks spreads out over the adjoining ground; › Culverts on drains exiting the site will be unblocked; and, › All accumulated silt will be removed from drains and culverts, and silt traps, and this removed material will be deposited away from watercourses to ensure that it will not be carried back into the trap or stream during subsequent rainfall **Surface Water Quality Monitoring** In line with standard forestry practice, and in combination with the above, grab sampling will be completed at additional sampling locations downstream of deforestation areas before, during (if the operation is conducted over a protracted time) and after the deforestation activity. The 'before' sampling should be conducted within 4 weeks of the deforestation activity, preferably in medium to high water flow conditions. The "during" sampling will be undertaken once a week or after rainfall events. The 'after' sampling will comprise as many sampling events as necessary to demonstrate that water quality has returned to pre-activity status (*i.e.* where an effect has been shown). Criteria for the selection of water sampling points include the following:			

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		› Avoid man-made ditches and drains, or watercourses that do not have year round flows, i.e. avoid ephemeral ditches, drains or watercourses; › Select sampling points upstream and downstream of the forestry activities; › It is advantageous if the upstream location is outside/above the forest in order to evaluate the effect of land-uses other than forestry; › Where possible, downstream locations should be selected: one immediately below the forestry activity, the second at exit from the forest, and the third some distance from the second (this allows demonstration of no effect through dilution effect or contamination by other land-uses where impact increases at third downstream location relative to second downstream location); and, › The above sampling strategy will be undertaken for all on-site sub-catchments streams where permanent tree felling is proposed.			
MX5	Chapter 16, Appendix 8-1	Where excessive movement is observed, the following measures will be taken: › All works will be suspended in the area, › A competent Geotechnical Engineer will carry out an assessment of the peat instability including drainage. The competent Geotechnical Engineer will compile a report outlining the surveys undertaken, the potential cause of the instability, assessment of any increased risk caused by the instability, and the further measures required to manage this risk, › An increased monitoring regime will be specified including increase in number of monitoring post lines, decrease on monitoring post spacing and an increase in the frequency of monitoring post observations,	When Excessive Movement Noted	As Required	Geotechnical Engineer

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		› Should no further movement be detected, activities will be recommenced while maintaining the increased monitoring regime, › Should further excessive movement be detected, the geotechnical engineer will need to be informed and the design of further reinstatement works will be required such as excavation of the disturbed material, installation of a granular berms or similar. **Emergency Response to a Landslide Event** Due to the high factors of safety and negligible risk of peat landslides identified on site, it is not anticipated that peat failure will occur on site, However, in the event of peat failure (e.g. tension cracking, surface rippling, sliding), the following measures will be implemented by the contractor: › All members of the project team will be alerted immediately or as it is safe to do so; › All habitat enhancement works will be ceased with immediate effect, and all available resources will be used for the management and mitigation of the risks posed by the event; › Localised peat slides that do not present a risk to watercourses will be assessed by competent engineers, and will be stabilised by rock infill and granular material where necessary; › The key initial activity will be to prevent displaced materials from reaching any watercourses or sensitive environments. Given the terrain of the Proposed Offsetting Lands, the key risk is the development of a propagation landslide or slip within topographic valleys and watercourses. Where possible, catch ditches will be constructed to aid prevent further run out of the disturbed peat material. These catch ditches may slow or halt runout, although it is preferable that they are cut in non-peat material. Simple			

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		earthwork ditches can form a useful low-cost defence. Paired ditches and barrages have been observed (Tobin, 2003) to slow peat landslide runout at failure sites.			