APPENDIX 4-2

Operational and Environmental Management Plan

Planning and Environmental Consultants

Operation and Environmental Management Plan

Taurbeg Wind Farm Extension of Operational Life

DOCUMENT DETAILS

Client:	**Taurbeg Limited**
Project Title:	**Taurbeg Wind Farm Extension of Operational Life**
Project Number:	**231030**
Document Title:	**Operation and Environmental Management Plan**
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Planning and Environmental Consultants

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1. INTRODUCTION

This Operation and Environmental Management Plan (OEMP) has been prepared by MKO on behalf of Taurbeg Limited (the Applicant) who intend to apply to Cork County Council for planning permission to extend the operational period of the existing Taurbeg Wind Farm as permitted by Cork County Council (Pl. Reg. Ref: N/2002/3608) for an additional 10 years to 2036 after the expiry of the current planning permissions in 2026 (the "Proposed Lifetime Extension").

This report provides the environmental management framework to be adhered to during the extended operational phase of the existing Taurbeg Wind Farm and it incorporates the mitigating and monitoring principles, as set out in the Environmental Impact Assessment Report (EIAR), that minimises the potential for any environmental impacts to occur.

This document has been prepared to accompany the EIAR prepared as part of the planning application for the Proposed Lifetime Extension.

1.1 Scope of the Operation and Environmental Management Plan

This report is presented as a guidance document for the operation of the Proposed Lifetime Extension and is intended to replace the environmental management plan currently in place up to expiry of the existing permission in 2026. The OEMP is intended to provide a more concise document targeted specifically at the continued operation of the existing Taurbeg Wind Farm

Where the 'Proposed Lifetime Extension' is referred to, this relates to the continued 10-year operation of the existing Taurbeg Wind Farm from 2026. This includes all elements within the existing Taurbeg Wind Farm Site as shown in Figure 2-1. The OEMP clearly outlines the mitigation measures and monitoring proposals that are required to be adhered to in order to operate the site in an appropriate manner.

The report is divided into six sections, as outlined below:

- **Section 1** provides a brief introduction as to the scope of the report.
- **Section 2** outlines the site location and Proposed Lifetime Extension details, detailing the targets and objectives of this plan along with providing an overview of methodologies for works that will be carried out during the Proposed Lifetime Extension.
- **Section 3** sets out details of the environmental controls to be implemented onsite including the mechanisms for implementation.
- **Section 4** consists of a summary table of all mitigation proposals to be adhered to during the Proposed Lifetime Extension.
- **Section 5** consists of a summary table of all monitoring proposals to be adhered to during the Proposed Lifetime Extension.
- **Section 6** outlines the proposals for reviewing compliance with the provisions of this report.

2. SITE LOCATION AND PROJECT DETAILS

2.1 Site Location and Description

The existing Taurbeg Wind Farm is located 3.5km south of Rockchapel and 10.5km northwest of Newmarket, Co. Cork, in the townlands of Taurbeg, Glasheenanargid and Taurmore. The existing wind farm is based within private forestry and agricultural lands. The approximate grid reference location for the centre of the wind farm is 122541, 111778.

The existing Taurbeg Wind Farm consists of 11 no. Bonus (Now Siemens) SWT -2.3-82 VS turbines, each with a rated output of 2.3 Megawatts, and an overall tip height of 108.2m. The existing wind farm, which was commissioned in March 2006, has a total rated capacity of 25.3 megawatts (MW). The wind farm is connected to the National Grid via the existing onsite 38kV substation.

No construction activities or alterations to the existing wind farm are proposed beyond routine maintenance of the turbines and electrical infrastructure during the Proposed Lifetime Extension.

2.2 Description of the Proposed Lifetime Extension

Planning permission is being sought for the Proposed Lifetime Extension of Taurbeg Wind Farm as permitted by Cork County Council under planning regulation ref N/2002/3608, for a further period of 10 years from the date of expiry (2026) per Condition no. 7 of the original planning consent issued, with decommissioning of the wind farm at the end of the proposed extension period.

The Proposed Lifetime Extension comprises:

i. 11 no. existing wind turbines with a tip height of 108.2 metres and all associated foundations and hardstanding areas;
ii. 1 no. existing onsite 38kV electrical substation including a control building, associated electrical plant and equipment, welfare facilities and a wastewater holding tank;
iii. 1 no. existing meteorological mast with a height of 67m;
iv. All existing underground electrical and communications cabling connecting the existing wind turbines to the existing onsite 38kV Substation;
v. An existing gated site entrance and existing internal access tracks;
vi. Existing site drainage;
vii. Existing ancillary infrastructure, associated site fencing and signage.

All elements of the wind farm are pre-existing and no modifications are proposed to the existing Taurbeg Wind Farm as part of this planning application.

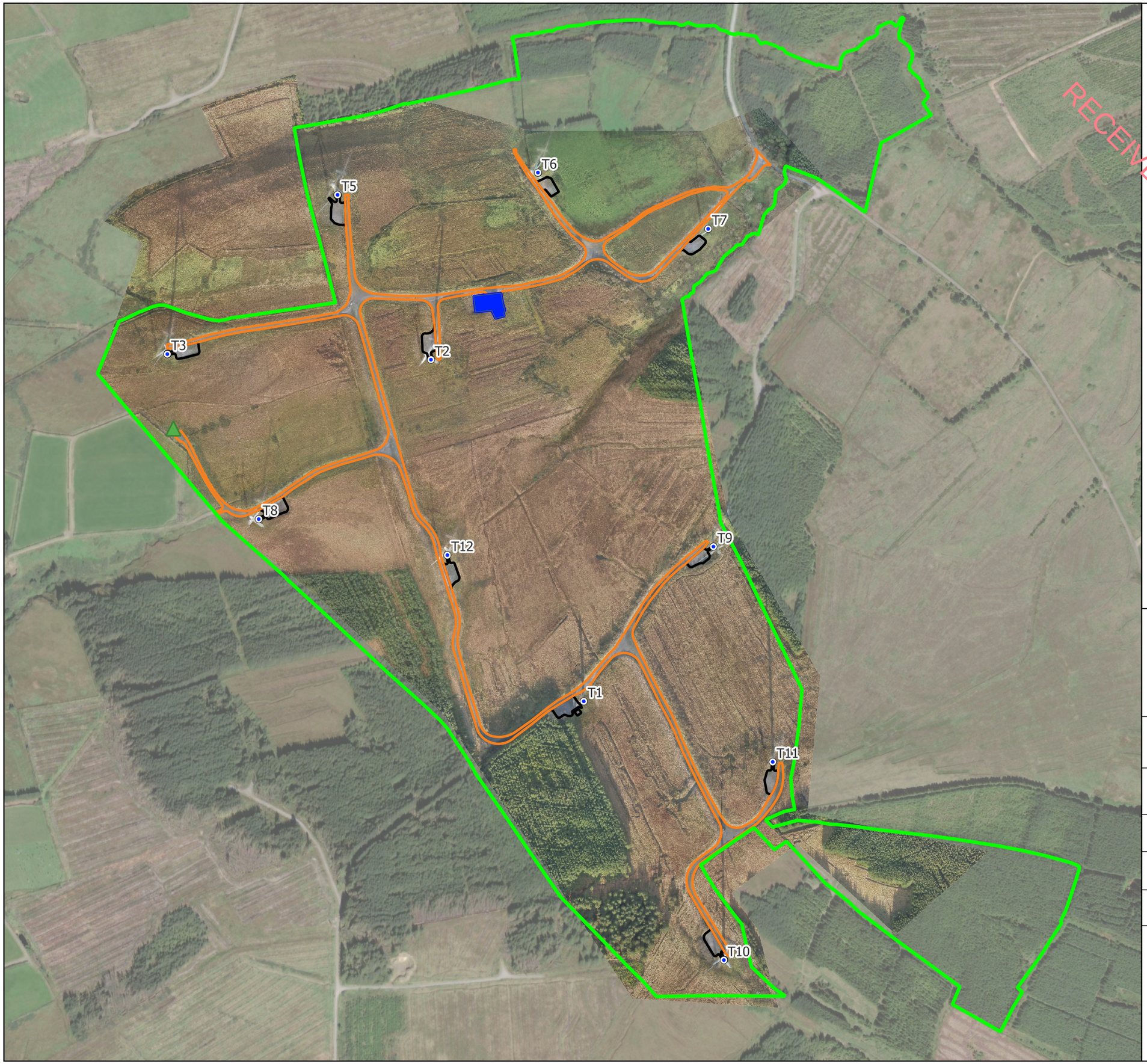
The planning history of the existing Taurbeg Wind Farm is further detailed in the accompanying EIAR Chapter 2: Background to the Proposed Project.

The site layout showing the existing infrastructure of the existing Taurbeg Wind Farm is shown in Figure 2-1.

As construction has been completed, elements of the project that were developed as a temporary facilitator have either been removed, restored to their original condition or will have naturally revegetated. All access roads and hardstanding areas form part of a site roadway network which will be required by the ongoing agricultural activities at the site, and therefore will be left in situ for future use. It is intended that decommissioning will remove the existing turbines and reinstate areas where infrastructure is removed. The following elements are included:

- Wind turbines dismantling and removal off-site;
- Electrical cabling and on-site Substation remaining in-situ;
- Turbine foundation backfilling (underground reinforced concrete remaining in-situ).

A Decommissioning Plan has been prepared for the Proposed Lifetime Extension and is presented as Appendix 4-3 of this Environmental Impact Assessment Report (EIAR).



Map Legend

- Taurbeg EIAR Site Boundary
- Existing Turbines
- Existing Site Roads
- Turbine Foundation and Hardstand
- Existing Onsite Substation
- Existing Met Mast

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Drawing Title

Existing Taurbeg Wind Farm Layout

Project Title

Taurbeg Wind Farm Extension of Operational Life

Drawn By	Checked By
MC	EMC
Project No.	**Drawing No.**
231030	Figure 2-1
Scale	**Date**
1:6,000	2025-01-27

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2.3 Targets and Objectives

The existing Taurbeg Wind Farm will continue to be operated to an approved standard and codes of practice. This OEMP considers environmental issues, and this is enhanced by the works proposals during operation, as set out in the EIAR.

The key site targets are as follows;

- Ensure works and activities are completed in accordance with mitigation and best practice approach presented in the planning documentation prepared for the wind farm;
- Ensure operational phase works and activities have minimal impact/disturbance to local landowners and the local community;
- Ensure operation and works have minimal impact on the natural environment;
- Adopt a sustainable approach to site operation; and,
- Provide adequate environmental training and awareness for all project personnel.

The key site objectives are as follows;

- Using recycled materials if possible;
- Ensure sustainable sources for materials supply where possible;
- Avoidance of any pollution incident or near miss as a result of working around or close to existing watercourses and having emergency measures in place;
- Avoidance of vandalism;
- Keeping all watercourses free from obstruction and debris;
- Correct implementation of the sustainable drainage system (SuDS) drainage design principles;
- Keep impact of operation to a minimum on the local environment, watercourses, and wildlife;
- Correct fuel storage and refuelling procedures to be followed;
- Good waste management and house-keeping to be implemented;
- Air and noise pollution prevention to be implemented;
- Monitoring of the works and any adverse effects that it may have on the environment. Working methods will be altered where it is found there is the potential to have an adverse effect on the environment;

2.4 Wind Farm Operation Overview

An appointed Operators Controller will install a Site Manager to manage the day-to-day operation of the existing wind farm and substation. The Site Manager will be responsible for ensuring compliance with this OEMP and any revisions made to this document throughout the operation. An overview of the anticipated operational phase activities is provided below.

2.4.1 Turbine Maintenance

The Proposed Lifetime Extension will continue to be the subject to a routine maintenance programme involving monthly checks and intermittent changing of consumables, including oil changes throughout the extended operational life. This will be undertaken by the maintenance contractor and site personnel who will manage and operate the wind farm from the onsite control building. The turbine maintenance will not require significant plant or equipment, with all works localised in nature with operatives using vans to access the site and transport their equipment.

The maintenance contractor for Taurbeg Wind Farm will be responsible for ensuring each turbine is well maintained. Each turbine is subject to a yearly maintenance schedule which includes, yearly master

maintenance and visual blade inspections. In addition, there will be a requirement for unscheduled maintenance, which could vary between resetting alarms to major component changes.

The onsite substation and site tracks will also require periodic maintenance. The existing Taurbeg 38kV Substation will continue to be operational 24 hours per day, 7 days a week throughout the year. Substations can be operated remotely and manually. Supervisory operational and monitoring activities will be carried out remotely using a SCADA system, with the aid of computers connected via a telephone modem link.

2.4.2 Shadow Flicker Monitoring

An assessment of the potential effects associated with shadow flicker was undertaken using the WindPRO computer software to model the predicted daily and annual shadow flicker levels (the results and associated mitigation measures of which are presented in Chapter 5 of the EIAR). As part of this assessment, it was determined that exceedances of the 2006 DoEHLG guidelines ('Wind Energy Development Guidelines for Planning Authorities', Department of the Environment, Heritage and Local Government, 2006) daily and annual thresholds for shadow flicker would not be experienced by any Sensitive Receptors, with no shadow flicker being predicted. Furthermore, no Sensitive Receptors fall within both the existing Taurbeg Wind Farm study area and neighbouring wind farm study areas. Therefore, there is no potential for cumulative shadow flicker impacts on any Sensitive Receptors.

2.4.3 Turbine Noise Modelling

An operational noise assessment was undertaken for the Proposed Lifetime Extension to compare predictions from the existing Taurbeg Wind Farm against existing consented noise limits to demonstrate compliance with noise conditions of attached to the previous grant of permission for the wind farm (Cork County Council Ref N/2002/3608). Further details can be found in Chapter 12 of the EIAR.

The assessment was undertaken to determine whether the Proposed Lifetime Extension could operate within the existing consented noise limits. To inform this assessment existing noise levels have been measured at a set of locations, representative of the nearest noise sensitive locations (NSLs) in the vicinity of the wind farm to assess the potential impacts associated with the operation of the existing Taurbeg Wind Farm, and it was concluded that the wind turbine noise emissions on all noise receptors were below the consented noise limits.

It should be further noted that there have been no operational noise complaints from the existing Taurbeg Wind Farm and compliance monitoring undertaken at the wind farm previously have demonstrated that the wind farm was operating within its noise conditions. The future operation of the existing Taurbeg Wind Farm will adhere to any noise compliance requirements that may be conditioned subject to the outcome of the planning application.

In the event of a complaint regarding noise during the Proposed Lifetime Extension, including a complaint that indicates potential amplitude modulation (AM), the operator will employ a qualified acoustic consultant for assessment. If required, the acoustic consultant will 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. If considered necessary by that investigation, measures to mitigate will be implemented, consisting of the implementation of operational controls for the relevant turbine type, which will include turbine curtailment under specific operational conditions.

3. ENVIRONMENTAL MANAGEMENT

The following sections give an overview of the drainage design, dust and noise control measures, a waste management plan for the Proposed Lifetime Extension and implementation of the environmental management procedures.

3.1 Site Drainage

During the extended operational phase, various combinations/adaptations of the runoff control and drainage management measures will be employed at the site, depending on the local conditions and topography. These best practice measures include:

- Natural vegetation filters are used regularly across the site where the local drainage and topography allowed 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 level 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.
- Swales/roadside drains are used to collect runoff from access roads and turbine hardstanding areas of the site, likely to have entrained suspended sediment, and channel it onto natural vegetation filters.

With regards to the existing wind farm infrastructure, on-site roadways are constructed of permeable crushed stone and are cambered to direct runoff to roadside drains which run along the sides of the roads. This ensures that drainage channels have not formed on the roads, have not eroded the roadways and caused excessive sedimentation downstream. The roadside drains contain check-dams at regular intervals which reduce runoff rates. The roadside drains discharge to several outfall points which are designed in such a way that the natural hydrology of the area remained undisturbed.

During the extended operational phase, occasionally construction vehicles or plant may be necessary for maintenance of access roads and hardstand areas. Small amounts of clean granular material may be imported to maintain the surfaces of access tracks and hardstands during operation. During these routine maintenance works, application of temporary drainage control measures (i.e. silt fencing) and standard protection measures with regard oils/fuel usage will be sufficient to prevent any significant hydrological/hydrogeological effects in the nearby River Feale and lower River Shannon SAC. These measures will primarily be required at the northern turbine cluster. Mitigation measures which are already operational on the existing Taurbeg Wind Farm site, will be maintained during the Proposed Lifetime Extension.

The Environmental Impact Statement prepared as part of the original planning application (Pl. Reg. Ref: N/2002/3608) indicated that the construction phase of the existing Taurbeg Wind Farm, after following the proposed mitigation measures for the management of hydrology, geology and soils at the site, had no significant or adverse impacts to ground or surface waters.

3.2 Refuelling, Fuel and Hazardous Materials Storage

Any plant and equipment used during the extended operational phase will require refuelling. Appropriate management of fuels will be required to ensure that incidents relating to refuelling are

avoided. The following mitigation measures are proposed to avoid release of hydrocarbons at the wind farm site:

- Road-going vehicles will be refuelled off site wherever possible;
- 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;
- 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,

3.2.1 Spill Control Measures

Every effort will be made to prevent an environmental incident during the Proposed Lifetime Extension. Oil/fuel spillages are one of the main environmental risks that will exist on the wind farm site which will require an emergency response procedure. The importance of a swift and effective response in the event of such an incident occurring cannot be over emphasised. The following steps provide the procedure to be followed in the event of such an incident:

- Stop the source of the spill and raise the alarm to alert people working in the vicinity of any potential dangers.
- If applicable, eliminate any sources of ignition in the immediate vicinity of the incident.
- Contain the spill using the spill control materials, track mats or other material as required. Do not spread or flush away the spill.
- Spill kits will be available in all site vehicles to deal with an accidental spillage and breakdowns;
- If possible, cover or bund off any vulnerable areas where appropriate such as drains, watercourses or sensitive habitats.
- If possible, clean up as much as possible using the spill control materials.
- Contain any used spill control material and dispose of used materials appropriately using a fully licensed waste contractor with the appropriate permits so that further contamination is limited.
- Notify the Site Manager immediately giving information on the location, type and extent of the spill so that they can take appropriate action.
- The Site Manager will inspect the wind farm site and ensure the necessary measures are in place to contain and clean up the spill and where necessary appoint a specialist contractor to undertake the clean-up and prevent further spillage from occurring.
- The Site Manager will notify the appropriate regulatory body such as Cork County Council, and the Environmental Protection Agency (EPA), if deemed necessary.

The importance of a swift and effective response in the event of such an incident occurring cannot be over emphasised. environmental incidents are not limited to just fuel spillages. Therefore, any environmental incident must be investigated in accordance with the following steps.

- The Site Manager must be immediately notified.
- If necessary, the Site Manager will inform the appropriate regulatory authority. The appropriate regulatory authority will depend on the nature of the incident.
- The details of the incident will be recorded on an Environmental Incident Form which will provide information such as the cause, extent, actions and remedial measures used following the incident. The form will also include any recommendations made to avoid reoccurrence of the incident.
- If the incident has impacted on a sensitive receptor such as an archaeological feature the Site Manager will liaise with the Project Archaeologist.
- A record of all environmental incidents will be kept on file by the Site Manager and the Main Contractor. These records will be made available to the relevant authorities such as Cork County Council, EPA if required.

The Site Manager will be responsible for any corrective actions required as a result of the incident e.g. an investigative report, formulation of alternative works methodologies or environmental sampling, and will advise the Operators Controller as appropriate.

3.3 Noise Control

The operation of plant and machinery, including site vehicles, is a source of potential impact that will require mitigation at all locations within the Site. Proposed measures to control noise include:

- Limiting the hours during which site activities likely to create noticeable levels of noise or vibration are permitted;
- Establishing channels of communication between the Applicant or contractor, Local Authorities and residents;
- Selection of plant with low inherent potential for generation of noise and/or vibration;
- No plant or machinery will be permitted to cause a public nuisance due to noise;
- The best means practicable, including proper maintenance of plant, will be employed to minimise the noise produced by on site operations.
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and maintained in good working order for the duration of works;
- Compressors models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all ancillary pneumatic tools shall be fitted with suitable silencers;
- Machinery that is used intermittently will be shut down or throttled back to a minimum during periods when not in use; and
- The hours of maintenance 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) it could be necessary on occasion to work outside of these hours. Any such out of hours working will be notified in advance to local residents and the Local Authority.

Given the reduced scale of plant and equipment that will be used during the extended operational phase in comparison to the construction phase, it is not anticipated that impacts associated with noise from plant and equipment will be experienced during operation when considering no significant impact was experienced during construction. However, the appropriate mitigation has been provided above for implementation as required.

The findings of the noise monitoring campaigns confirm that operational phase noise levels will be within best practice noise criteria with no likely significant cumulative impacts or effects predicted. Therefore, no specific mitigation measures are required. However, 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.

3.4 Traffic Management

The ongoing turbine and general site maintenance will be completed by suitably qualified personnel. Typically, maintenance traffic will consist of four-wheel drive vehicles or vans. It is estimated that 1-2 monthly visits will be made to the wind farm site for authorised persons and vehicles to undertake minor routine maintenance and inspection, if and when required. The small volumes of traffic and intermittent nature of the works will not require any specific traffic management.

3.5 Environmental Management Implementation

3.5.1 Roles and Responsibilities

The Site Manager will be the project focal point relating to operation-related environmental issues.

In general, the Site Manager will maintain responsibility for monitoring site operations and Contractors/Sub-contractors from an environmental perspective. The Site Manager will act as the regulatory interface on environmental matters. The Site Manager will be responsible for reporting to and liaising with Cork County Council and other statutory bodies as required.

The Operation Controller will be responsible for employing the services of suitably qualified professionals as required throughout the extended operational phase.

3.5.2 Environmental Induction

The Environmental Induction will be integrated into the general site induction on a case-by-case basis for each member of staff employed onsite depending on their assigned roles and responsibilities onsite. Where necessary, the Environmental Induction will as a minimum include:

- A copy of the OEMP and discussion of the key environmental risks and constraints;
- A discussion of the applicable Works Method Statement;
- The roles and responsibilities of staff, including contractors, in relation to environmental management; and,
- An outline of the Environmental Incident Management Procedure.

3.5.3 Toolbox Talks

Toolbox talks will be held by the Site Manager at the commencement of each day, or at the commencement of new activities where required. The aims of the toolbox talks are to identify the specific work activities that are scheduled for that day or phase of work. In addition, the necessary work method statements and sub plans would be identified and discussed prior to the commencement of the day's activities.

Site meetings would be held on a regular basis involving all site personnel. The objectives of site meetings are to discuss the coming weeks activities and identify the relevant work method statements and sub plans that will be relevant to that week's activities. Additionally, any non-compliance identified during the previous week would also be discussed with the aim to reduce the potential of the same non-compliance reoccurring.

4. MITIGATION PROPOSALS

All mitigation measures relating to the Proposed Lifetime Extension were set out in the various sections of the Environmental Impact Assessment Report (EIAR) which accompanies this planning application, as well as in Chapter 18.

This section of the OEMP groups together all of the mitigation measures presented in the planning documentation. The mitigation measures are presented in Table 4-1 below.

By presenting the mitigation proposals in the below format, it is intended to provide an easy to audit list that can be reviewed and reported on during the Proposed Lifetime Extension. The tabular format in which the below information is presented, can be further expanded upon during the course of operation and provides a reporting template for site compliance audits.

Table 4-1 Operational Phase Mitigation Measures

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 › 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		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		› 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	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 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;		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		› 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). **Mitigation for Bats** With regard to bats, a precautionary approach suggests the implementation of an adaptive monitoring and mitigation strategy (NatureScot 2021). Elements of this strategy include: › Automatic 'feathering' of idling blades will be implemented (through SCADA) to reduce rotation speed of blades to below 2 RPM while idling. Feathering blades has		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		been shown to be effective in reducing fatality rates of bats by up to 50% and does not result in a significant loss of energy output (NatureScot 2021). › Bat activity will be monitored for 3 years (by deployment of passive detectors) after the implementation of the 'feathering' of turbine blades. › Dog-based fatality monitoring will be carried out on a monthly basis between 15 April and 15 October each year of the LTE. Annual reports will be prepared and submitted for the attention of the local authority and NPWS. › Systematic searches will be conducted within a 125m x 125m grid centred on the turbine. › A minimum of 5 turbines will be searched at random during each visit. › Search effort will follow NatureScot 2021 and is further detailed in Chapter 6 Biodiversity. › In the event that a bat collision is recorded, curtailment will be immediately implemented at the particular turbine (15 April to 15 October annually). › Following NatureScot guidance (where 90% of all bat activity can occur on sites when temperature exceeded 11.5°C and windspeed was below 5m/s; and where bat activity was generally recorded 30 minutes after sunset and 40 minutes prior to sunrise. These conditions are largely consistent with the high seasonal activity peaks recorded at the proposed development site. Therefore, these parameters will be used at the windfarm during the LTE when designing the curtailment programme. › Searcher efficiency trials will also be conducted alongside Scavenger Removal Rates.		
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		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		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 11.5km east from the Taurbeg Wind Farm site. Offsetting measures include permanent removal of c. 105.5 ha of commercial forestry and restoration of c.17.4 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 foundations, within a bund able to contain at least 110% of the volume stored. Any leaks		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		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 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.		
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.		
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. 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.		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		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.		
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.		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
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. **Telecommunications** › Whilst no telecoms operators have highlighted issues regarding the Proposed Lifetime Extension, a dedicated Community Liaison Officer employed by the Applicant will be		

Ref No.	Reference Location	Mitigation Measures	Audit Result	Action Required
		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.		

5. MONITORING PROPOSALS

All monitoring proposals relating to the Proposed Lifetime Extension were set out in the various sections of the Environmental Impact Assessment Report (EIAR) which accompanies this planning application.

This section of the OEMP groups together all of the monitoring proposals presented in the planning documentation. The monitoring proposals are presented in Table 5-1 below.

By presenting the 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 Proposed Lifetime Extension. The tabular format in which the below information is presented, can be further expanded upon during the course of operation to provide a reporting template for site compliance audits.

Table 5-1 Schedule of Operational Phase Monitoring Proposals

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**		**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. 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		**Yearly**	**Project Ecologist**

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		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)			

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		› 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**

Ref. No.	Reference Location	Monitoring Measure	Frequency	Reporting Period	Responsibility
		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 4no. 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**

6. COMPLIANCE AND REVIEW

6.1 Site Inspections and Environmental Audits

Routine inspections of site operations will be carried out on a regular basis by the Wind Farm Manager (in recent years this has averaged at approximately 12 no. visits per year) to ensure all controls to prevent environmental impacts, relevant to the operational activities taking place at the time, are in place.

A maintenance contractor will be responsible for ensuring each turbine is well maintained. Each turbine will be subject to a routine maintenance programme, which includes monthly inspections and intermittent changing of consumables. Each turbine is also subject to a yearly master maintenance and visual blade inspections. In addition, there will be a requirement for unscheduled maintenance, which could vary between resetting alarms to major component repairs/changes. All site roads and public roads are suitable for this access if required and no modifications are required. Typically, maintenance traffic will consist of four-wheel drive LGVs.

The onsite substation and site tracks will also require periodic maintenance. The existing Taurbeg 38kV Substation will continue to be operational 24 hours per day, 7 days a week throughout the year. Substations can be operated remotely and manually. Supervisory operational and monitoring activities will be carried out remotely using a SCADA system, with the aid of computers connected via a telephone modem link.

The following maintenance procedures will also be adhered to:

- Periodic service and maintenance works which include some vehicle movement.
- For operational and inspection purposes, substation access is required.
- Servicing of the substation equipment will be carried out in accordance with the manufacturer's specifications, which would be expected to entail the following:
    - Yearly service – three-day visit
    - 4-year master maintenance – 1 week visit

Occasional technical problems may require maintenance visits by technical staff. During the six-month and annual 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.

It is estimated that 1-2 daily visits will be made to the wind farm site for authorised persons and vehicles to undertake minor routine maintenance and inspection, if and when required. However, the level of activity required for the maintenance of the existing Taurbeg Wind Farm is likely to be minimal.

Environmental inspections will ensure that the works are undertaken in compliance with this OEMP and all other planning application documents. The Site Manager will be suitably trained to undertake environmental site inspections.

6.2 Auditing

An environmental audit will be carried out quarterly during the Proposed Lifetime Extension to ensure the operational phase mitigation measures that are still in place as required are adequate.

In contrast to monitoring and inspection activities, audits are designed to shed light on the underlying causes of non-compliance, and not merely detect the non-compliance itself. In addition, audits are the

main means by which system and performance improvement opportunities may be identified. Environmental audits will be carried out by the Site Manager on behalf of the Operation Controller. It is important that an impartial and objective approach is adopted. Environmental audits will be conducted at planned intervals to determine whether the OEMP is being properly implemented and maintained. The results of environmental audits will be provided to project management personnel.

6.3 Environmental Compliance

The following definitions shall apply in relation to the classification of Environmental Occurrences during the Proposed Lifetime Extension.

Environmental Near Miss: An occurrence which if not controlled or due to its nature could lead to an Environmental Incident.

Environmental Incident: Any occurrence which has potential, due to its scale and nature, to migrate from source and have an environmental impact beyond the site boundary.

Environmental Exceedance Event: An environmental exceedance event occurs when monitoring results indicate that limits for a particular environmental parameter (as indicated in the Environmental Monitoring Programme) has been exceeded.

An exceedance will immediately trigger an investigation into the reason for the exceedance occurring and the application of suitable mitigation where necessary.

Exceedance events can be closed out on achieving a monitoring result below the assigned limit for a particular environmental parameter.

Environmental Non-Compliance: Non-fulfilment of a requirement and includes any deviations from established procedures, programs and other arrangements related to the OEMP.

6.4 Corrective Action Procedure

A corrective action is implemented to rectify an environmental problem onsite. Corrective actions will be implemented by the Site Manager. Corrective actions may be required as a result of the following;

- Environmental Audits;
- Environmental Inspections and Reviews;
- Environmental Monitoring;
- Environmental Incidents; and,
- Environmental Complaints.

A Corrective Action Notice will be used to communicate the details of the action required to the main contractor. A Corrective Action Notice is a form that describes the cause and effect of an environmental problem onsite and the recommended corrective action that is required. The Corrective Action Notice, when completed, will include details of close out and follow up actions.

If an environmental problem occurs onsite that requires immediate attention direct communications between the Site Manager will be conducted. This in turn will be passed down to the site staff involved. A Corrective Action Notice will be completed at a later date.

6.5 Operation and Environmental Management Plan Review

This OEMP will be reviewed after every 6 months of operation and may also require updating after the planning application process to comply with any conditions should planning permission be granted.