atmos CONSULTING

61253

Environmental Impact Assessment Report

Cummeennabuddoge Wind Farm

Chapter 19: Schedule of Mitigation

Cummeennabuddoge Wind (DAC)

September 2024

Contents

Tables

Glossary of Terms

Term	Definition
The Applicant	Cummeennabuddoge Wind Designated Activity Company (DAC)
The Agent	Atmos Consulting Limited
Environmental Advisors and Planning Consultants	Atmos Consulting Limited
Environmental Impact Assessment	A means of carrying out, in a systematic way, an assessment of the likely significant environmental effects from a development
Environmental Impact Assessment Regulations	Schedule 6 of the Planning and Development Regulations 2001(as amended)
Environmental Impact Assessment Report	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations
The Proposed Development	Cummeennabuddoge Wind Farm
The Proposed Development Site	The land enclosed by the red line shown on Figure 1-1a
The Planning Act	Directive 2011/92/EU (as amended by Directive 2014/52/EU, the EIA Directive).

List of Abbreviations

Abbreviation	Description
CEMP	Construction Environmental Management Plan
CTMP	Construction Traffic Management Plan
DoHLGH	Department of Housing, Planning and Local Government
ECow	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
GPP	Guidance on Pollution Prevention
HGV	Heavy Goods Vehicles
HMP	Habitat Management Plan
EMP	Environmental Management Plans
EPA	Environmental Protection Agency
EQS	Environmental Quality Standards
IAS	Invasive Alien Species
ISS	invasive species survey
IFI	Inland Fisheries Ireland
IWEA	Irish Wind Energy Association
KCC	Kerry County Council
NIS	Natura Impact Assessment
PPE	Personal Protective Equipment
PMP	Peat Management Plan
PC	Principal Contractor
PPP	Pollution Prevention Plan
PSA	Peat Stability Assessment
RTC	Road Traffic Collisions
SAC	Special Area of Conservation

Abbreviation	Description
SWMP	Surface Water Management Plan
SuDS	Sustainable Urban Drainage System
SQE	Suitably Qualified Ecologist
TMP	Traffic Management Plan
WTG	Wind Turbine Generators
WMP	Waste Management Plan

19 Schedule of Mitigation

19.1 Introduction

This Chapter of the EIA Report provides a summary of the mitigation measures specified to avoid or reduce the significant adverse effects determined through the conduct of the assessments presented in Chapters 5 to 18 of this EIA Report.

Directive 2014/52/EU of the European Parliament and of The Council states that an EIAR should include:

> *"A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases."*

These measures are termed 'mitigation measures' and are defined in Chapter 2: Approach and Methodology of this EIAR.

These measures can include:

- Changes to the Proposed Development design;
- Physical measures applied on site; and
- Measures to control particular aspects of the construction or operation of the Proposed Development.

19.2 Schedule of Mitigation

A Schedule of Mitigation is presented in Table 19-1 below.

Table 19-1: Schedule of Mitigation

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
Chapter 5 Population and Human Health	5.6	Pre-construction	No mitigation measures have been considered for the Proposed Development as there are no significant adverse effects anticipated.
Chapter 6 Landscape and Visual Impact Assessment	6.6	Pre-construction	The final layout has been developed to incorporate the following landscape and visual amenity considerations: Siting of the Proposed Development away from higher upland landscapes that form the skyline to reduce visual prominence of the proposed turbines, and minimise their potential to result in skyline effects and backgrounding; Location of the Proposed Development at a sufficient distance from any settlements and sequential routes; Use of a design that presents the Proposed Development at a scale appropriate to the 'host' landscape LCA 27: Clydagh River, The Paps and Derrynassaggart Mountains and the existing pattern of wind energy development; Retention and suitable set back from key landscape features on the Site, to acknowledge the existing landscape composition and key characteristics of the surrounding area; Compatibility of design to reflect the programme of proposed coniferous forestry planting and the existing blocks, maximising opportunities to mitigate visual amenity effects from residential properties and sequential routes; Siting turbines at a sufficient distance from the closest residential properties to avoid potential for visual dominance, thereby reducing potential effects on residential visual amenity; The use of existing tracks where possible, particularly at entranceways (to be upgraded for the delivery of wind turbine components), to minimise the requirement for new tracks within the Site; and The use of locally-sourced materials, recessive material finishes and colours to ensure the various proposed features relate to the key characteristics of the landscape and the local vernacular. The design has also included specific measures to minimise potential landscape and visual amenity effects associated with the following features of the Proposed Development. Tracks

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			The access routes have been designed to minimise potential landscape impacts by adopting: Promoting access to the Proposed Development Site using existing entrance access tracks and any forestry tracks that are within the Proposed Development Site as much as possible; Upgrading and extension to existing tracks to minimise the length and number of new tracks; and Construction of the tracks at the commencement of the construction phase to minimise land take and maximise opportunities for rapid restoration of vegetation cover. Turbines Key factors incorporated into the layout, design and siting of the turbines in relation to landscape and visual effects involved: Removal of one of the turbines during design iteration 2. The turbine was removed from the design due to landscape and visual considerations, as this turbine will have been viewed as an outlier and unconnected to the main body of the Proposed Development from key viewpoints (see Chapter 3 – Design Evolution and Consideration of Alternatives); Interrogation of cumulative landscape in combination with the topography of the receiving landscape identified larger turbines to be more appropriate to align with the local context. Minimising the contrast of the turbines against the sky and background landscape by selecting a pale grey colour and semi-matt finishes; and Ensuring that the Proposed Development is presented as a cohesive whole appropriate to the scale of the 'host' landscape and the existing pattern of wind energy development. Other works and Activities In minimising the potentially adverse effects on landscape and visual resources the design of the Proposed Development also included: Designing out the requirement for removal of stands of forestry for construction and operation of the Site as much as possible; Developing a layout to minimise excavation of borrow pits to provide aggregate for

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			new tracks and hardstandings; Careful siting of borrow pits, the temporary construction compound, laydown areas and machinery storage using local topography in order to visually screen them from the surrounding landscape as much as possible, whilst still considering other constraints such as watercourses (See Figure 1-2); Careful design of the proposed substation to ensure its scale, form and appearance complement local vernacular; Promotion of landscape remediation works immediately following the construction phase to encourage rapid revegetation of land around the locations of the temporary site office and borrow pits; Ensuring the surface of crane hardstandings, and locations where tracks have been widened, are restored, covered or managed to revegetate naturally during decommissioning, eventually marrying into the surrounding area so they are visually recessive; Limiting land take to the minimum required for safe construction and effective operation of the Proposed Development; and Ground laying turbine connecting cables within access tracks avoiding the need for overhead lines.
Chapter 6 Landscape and Visual Impact Assessment	6.6	Construction	Construction of the turbines and tracks will be carried out in accordance with an agreed Construction Environmental Management Plan (CEMP) (Appendix 4-1), which includes arrangements for implementation of various aspects of the works to mitigate any potentially local adverse impacts during construction. Specific mitigation measures necessary during construction and included within the CEMP include: Minimal alteration to valued Site features, including the removal of forestry which will typically occur cyclically through rotational felling as part of commercial forestry practices, and the erection of turbines which already form part of the baseline of the Visually Sensitive Area that covers the Proposed Development Site. Further impacts will be restricted through limited land clearance, vegetation removal and land occupation to the minimum necessary for the works in line with the defined plan; After dark, controlling construction lighting so that it does not impinge upon sensitive views, for example those from residential windows; Ensuring the Site and working compounds are maintained and kept tidy, avoiding clutter, unsightly debris / structures, mud, smoke or dust;

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			Restoration of borrow pits as soon as possible after sections of construction work are complete. Re-instatement of excavated areas of soil and surface vegetation as soon as possible after sections of work are complete; Work access will be restricted to designated tracks and other working areas to avoid the spread of vehicle track scars across other areas; Temporary warning signs and other road safety management measures will be established in an orderly and well-organised manner that achieves the necessary safety management objectives with minimal landscape intrusion; Disturbed areas and mounds of peat, topsoil or subsoil will be re-graded to blend into the surrounding landform. Turves lifted and stored prior to construction will be utilised to ensure that disturbed areas will regenerate with locally-appropriate vegetation; and Removal of all temporary construction materials from the site once work is completed.
Chapter 6 Landscape and Visual Impact Assessment	6.6	Operation	The Proposed Development will include site management procedures to enable routine maintenance of site facilities and infrastructure. Suitable signage will be implemented to provide directions, contacts and health and safety information (See Chapter 4: Description of Development)
Chapter 7 Traffic and Transport	7.7	Construction	While not strictly necessary to address the environmental effects associated with the increase in traffic within the study area, a Construction Traffic Management Plan (CTMP) is proposed as a "good practice" measure to support the Proposed Development. A Traffic Management Plan (TMP) has been prepared as part of the CEMP and is included as Technical Appendix 4-1. This CTMP document will be developed further in accordance with the conditions of any permission granted. The CTMP identifies measures to reduce the number of construction vehicles as well as considering ways to reduce or avoid the impact of vehicles through construction programming / routeing and identification of an individual with responsibilities for managing transport and access effects. The CTMP also includes measures to reduce and manage construction staff travel by private car, particularly single occupancy trips. Prior to construction and once the Contractors have confirmed their suppliers, the CTMP will be updated in consultation with Cork and Kerry County Councils and An Garda Síochána as necessary. Proposed measures include (but are not limited to): Immediately upon commencement, all deliveries, operatives and visitors to the

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			Proposed Development Site will report to the security gate and be required to sign in and out. All Site visitors will undergo a Site induction covering Health and Safety issues at the Contractor's temporary compound and will be required to wear appropriate Personal Protective Equipment (PPE) while onsite. This would be communicated to all early works contractors at their pre-start meeting; The main contractor will develop a logistics plan highlighting the access point for the project, loading bay, pedestrian / vehicular segregation, welfare, storage, security and material handling that would be enforced following full site establishment; Approved haul routes have been identified to the Proposed Development Site and protocols put in place to ensure that Heavy Goods Vehicles (HGVs) adhere to these routes; The new N22 Macroom By-Pass will be used to transport all materials to the wind farm site, so as to minimise traffic through built-up areas such as Macroom, Ballymakeery and Ballyvourney; Prior to delivery of abnormal loads i.e. turbine components, the Applicant or their representatives, will consult with An Garda Síochána and Cork and Kerry County Council Roads Departments to discuss the requirement for a Garda escort; Abnormal loads are likely to travel at night and outside the normal construction times as may be required by An Garda Síochána. Due to the relatively modest distance between Ringaskiddy Port and the Site of approximately 80km, the journey is achievable within a 2-3 hour timeframe. Accordingly, locations for resting will not be required. Local residents along the affected route will be notified of the timescale for abnormal load deliveries Works on public roads on the turbine delivery road and grid connection will be strictly in accordance with "Guidance for the Control and Management of Traffic at Road Works – 2nd Edition 2010" as well as "Traffic Signs Manual 2010-Chapter 8-Temporary Traffic Measures and Signs at Roadworks". All contractors will be provided with a site induction pack containing information on delivery routes and any restrictions on routes; Temporary construction site signage will be erected along the identified construction traffic routes to warn people of construction activities and associated construction vehicles; A construction traffic speed limit (for example, 25 kph) will be imposed through sensitive areas and on the wind farm site; The construction material 'lay down' areas in the site will allow for a staggered

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			delivery schedule throughout the day, avoiding peak and unsociable hours (i.e. before 6 am and after 10 pm); An integral part of the progress meetings held with all trade contractors is the delivery schedule pro-forma. All contractors will be required to give details of proposed timing of material deliveries to the Site. At this stage, they will be given a specific area for delivery; The CTMP and the control measures therein would be included within all trade contractor tender enquiries to ensure early understanding and acceptance / compliance with the rules that would be enforced on this project; Under no circumstances will HGVs be allowed to lay-up in surrounding roads. All personnel in the team will be in contact with each other and with Site management, who in turn will have mobile and telephone contact with the subcontractors; All vehicles accessing the wind farm site will either have roof mounted flashing beacons or will use their hazard lights; Roads will be maintained in a clean and safe condition; A wheel cleaning facility will be installed on-site during the construction period in order to reduce mud and debris being deposited onto the local road network; In addition, any dust generating activities will be minimised where practical during windy conditions, and drivers will adopt driving practices to minimise the creation of dust. Where conditions exist for dust to become friable, techniques such as damping down of the potentially affected areas will be employed; and To reduce dust emissions, vehicle containers/loads of crushed stone will be covered during both entrance and egress to the Site.
Chapter 8 Biodiversity	8.5	Construction	The Proposed Development has been designed to minimise works in the vicinity of watercourses and to minimise the need for new water crossings to reduce the risk of pollution and changes to watercourse morphology. A total of eight watercourse crossings are needed but there shall be no instream works during the various phases of the Proposed Development, as temporary bridging platforms/ Bailey Bridges will be used. The Proposed Development's drainage design has been designed specifically with the intention of having no negative impact on the water quality of the site and its associated rivers and lakes. No routes of any natural drainage features will be altered as part of the Proposed Development. Mitigation for all water features aims to preserve existing water quality ratings as a minimum. There will be no direct discharges to any natural watercourses, with all drainage

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			waters being dispersed as overland flows, as directed by the Ecological Clerk of Works (ECoW) to avoid erosion or siltation of existing watercourses in the process. All discharges from the proposed works areas will be made over vegetation filters at an appropriate distance from natural watercourses. Buffer zones of 60m around significant watercourses (catchment >0.25 km2) and 10m from minor watercourses (catchment <0.25 km2) have been used to inform the layout of the Proposed Development. A Sustainable Urban Drainage System (SUDS) will be installed. A minimum felling requirement of a 100m circular buffer from each turbine for the Proposed Development ensures that the minimum buffer size of 81m as required by guidance for turbines of this scale is adequately covered.
Chapter 8 Biodiversity	8.5	Construction	Implementation of the Peat Management Plan (PMP) (Technical Appendix 10-3) and Surface Water Management Plan (SWMP) (Technical Appendix 11-4). The CEMP (Technical Appendix 4-1) will be a key contract document that the contractor will be required to implement in full. Prior to construction the following additional measures will be undertaken: A site drainage system will be constructed to attenuate run-off, guard against soil erosion and safeguard downstream water quality. The drainage system will be implemented along all internal site access roads, storage areas, crane hardstand areas and temporary compound. The drainage system will include drainage ditches, settlement ponds, silt fencing and soakaways. The site-specific drainage scheme has been designed to manage the movement of surface water during the construction, operation, and decommissioning phases of the Proposed Development. An invasive species survey (ISS) will be carried out within one month prior to construction and measures to deal with any species identified within the baseline survey will be included in the Habitat Management Plan (HMP) and implemented prior to construction. The main Invasive Alien Species (IAS) of consideration is rhododendron due to its capacity to reduce the quality of habitat for Kerry slug. Measures will include: Plants to be cut and stumps removed. If stumps cannot be removed stumps to be spot sprayed with glyphosate. Brash piles to be erected around cleared areas to prevent mammal (primarily deer) ingress which can cause to spread. Details from the original survey are found in TA 8-1 and (Figure 8-3). Pre-construction surveys will be undertaken up to 200m from infrastructure with the 200m distance applied to account for potential otter presence, the survey will be

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			undertaken by a suitably qualified ecologist.
Chapter 8 Biodiversity	8.5	Construction	Works will be overseen by an ECoW and appointed by the Developer or the Contractor(s). The ECoW is responsible for: Undertaking regular Site inspections and overseeing all sensitive habitat removal and works at watercourse crossings. Ensuring implementation of biodiversity / habitat mitigation measures, as per the HMP. Being present during construction to undertake regular Site inspections. Undertaking toolbox talks to Contractors on regular rotation (to ensure all are informed as to their responsibilities with regard to sensitive environmental features (e.g. use of spill-kits, working near watercourses etc)). The ECoW will have the authority to stop works where significant effects are considered likely to occur, and to instigate control/mitigation measures to rectify noncompliance. He/she will work closely with the Construction Site Manager and Project Manager to provide advice as required. The ECoW will liaise with Contractors responsible for Environmental Management Plans (EMPs) where there is potential for ecological effects, including the following plans (not an exhaustive list); • Site Waste Management Plan • Water Quality Monitoring and Response Plan • Peat Management Plan • Construction Traffic Management Plan
Chapter 8 Biodiversity	8.5	Construction	Mitigation measures to protect the aquatic environment during construction are: Avoidance of sensitive aquatic areas by implementing a 60m construction zone buffer to significant watercourses (catchment >0.25km^2). Avoidance of sensitive aquatic areas by implementing a 10m construction zone buffer to minor watercourses (catchment <0.25km^2). For locations where works will be undertaken within water protection buffer zones, double silt fences will be installed around the watercourse to prevent sediment/silt infiltration into the watercourse. Works for stream crossings will be carried out during July to September working window for instream works. This working window is defined by Inland Fisheries Ireland (IFI) as July to September to avoid vulnerable spawning salmonids/lamprey that may be present in downstream environments outside of this window. Any works outside of

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			this period would require a derogation under the Local Authorities (Works) Act, 1949. There will be no works within watercourses at any time. There will be no direct dewatering to watercourses during the construction phase. All outflows from drainage associated with construction will be by diffuse overland drainage at appropriate locations and through settlement ponds. Cement, hydrocarbons, and any other potential pollutions will not be permitted to discharge to any waters, and control measures to prevent release of pollutants will include. Further details are provided in the CEMP. The SWMP includes several measures, including those below, to ensure no release of sediment to receiving waters: Wastewater emanating on-site (e.g. sewage, wastewater from Site office) will be taken off-site for disposal/treatment at controlled facilities. To this effect, welfare facilities for construction site workers will include self-contained port-a-loos with an integrated waste holding tank. No water will be sourced on the Site, nor will any wastewater be discharged to the Site. Settlements ponds and buffered outfalls to control and store development runoff to allow settlement prior to discharge at greenfield runoff rates. Other measures will include a water quality monitoring program, which will be implemented to monitor effects on the surface water quality regime during the infrastructure construction, operational and decommissioning phases of the Proposed Development, in order to; Demonstrate that the mitigation measures and surface water management is performing as designed. Provide validation that the in-place mitigation measures are not having an adverse effect upon the environment. Indicate the need for additional mitigation measures to prevent, reduce or remove any effects on the water environment, such as additional temporary settlement or filtration structures or short-term flocculant dosing to suit observed site conditions. The monitoring sites will be the two used during the aquatic surveys (TA 8-3, Figure 8-6) to provide a baseline to compare against. This will be undertaken on a monthly basis during construction and decommissioning by the ECoW, and every three months during the operational period by a Suitably Qualified Ecologist (SQE). The determinants to be collected will be the same as in the aquatic surveys.
Chapter 8 Biodiversity	8.5	Construction – Habitats	Reinstatement of habitats will be undertaken after each stage of the project is completed and in accordance with planning condition requirements within the

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			Habitat Management Plan (TA 8-5). Reinstatement will include reusing peat removed for the cable route on adjacent verges to prevent mitigate indirect drying effects and will employ stump-flipping to re-wet ground and avoid the removal for some brash off-Site. The methodology used for reinstatement will be agreed with the Planning Authority and implemented by measures outlined in detail within the HMP.
Chapter 8 Biodiversity	8.5	Construction – Fauna	The following measures will be implemented at the discretion of the ECoW and may therefore be limited to parts of the Proposed Development where there is deemed risk to a specific receptor. Downward-directed artificial lighting will be used to shine light to the working area only and reduce 'light leakage' that may temporarily affect bat flightlines. Excavations/holes will be covered at the end of each working day, or a wooden plank placed inside to allow faunal species to escape, should they enter the hole. Any temporarily exposed open pipe system will be capped to prevent wildlife gaining access. No in-channel obstructions (floodlighting, fencing or diversions) will be permitted within watercourses unless specifically authorised in writing by the relevant authority (i.e., EPA and/or a suitably experienced freshwater Ecologist). The Principal Contractor (PC) appointed to construct the wind farm will be responsible to ensure that there will be no use of machinery outside of the footprint of the Proposed Development to prevent accidental death of Kerry slug in areas that have not been surveyed or where slugs have not been translocated. The PC appointed for the construction phase will be responsible for ensuring that no machinery is allowed to enter lands outside of the development footprint to prevent damage to suitable Kerry slug habitat outside of the Proposed Development. To reduce the potential barrier effect of internal roads on the Kerry slug population underpasses will be provided underneath the road surfaces. Underpasses will be made of neutral to slightly acidic material and will have a minimum diameter of 30cm to reduce the likelihood of blockage. The existing impassable features to fish in watercourses at sites 7 and 8 will be removed the contractors under supervision of the ECoW and the ECoW will monitor these locations to confirm whether fish are subsequently able to pass (Figure 8.6). Frogs and spawn where encountered within the footprint of the works will be collected and relocated under licence during construction works. A Method Statement will be produced by the ECoW.

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
Chapter 8 Biodiversity	8.5	Operation – Habitats	A SQE will monitor the condition of sensitive habitats, including areas of restored wet heath, peat, and watercourses. Details of the monitoring programme are included in the HMP (TA 8-5). Materials and other temporary infrastructure will be removed off-site and all temporary construction areas will be reinstated. The proposed and upgraded access tracks will be left in place after completion of the construction phase as they will provide access for maintenance, repairs, and the eventual decommissioning phase. Hardstanding areas at each turbine location will be retained for use in on-going maintenance operations, with the edges blended to the adjacent contours with natural vegetation being allowed to re-establish.
Chapter 8 Biodiversity	8.5	Operation – Fauna	Following the approach outlined in NatureScot (2021) curtailment will be employed at locations where high levels of bat activity of high-risk bats was recorded. Leisler's bat activity at Turbine 8 and Turbine 2 was such that curtailment will be applied at these turbines as follows: Summer (June – mid-August and Autumn (mid-August – mid September); turbines 7 and 10. Autumn; turbine 8. Autumn; turbine 2. Curtailment involves raising the cut-in speed and NS recommends cut-in between 5.0 and 6.5m/s and at temperatures above approximately 10 or 11°C measured at the nacelle. During the first year a further 30 days of automated static monitoring will take place at the locations and seasons described again following NatureScot 2021 guidance. Following the 1st year of curtailment and survey, data will be reviewed, and results considered in tandem with carcass searches at which point the curtailment strategy will be revised if needed. This monitoring will accord with Best Practice as described in NatureScot (2021). Post-construction bat monitoring and bat carcass searches using dogs will be carried out. The survey will factor those turbines and periods where curtailment will occur (section 8.5), comparing turbines where no curtailment is intended. Predator removal rates will be informed by Scavenger removal trials. Electrofishing will occur in years 1 and 3 following the same methodology at the same 10 sites used in pre-construction surveys (TA 8-3).

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
Chapter 9 Ornithology	9.4	Pre-Construction	Surveys and pre-construction checks will be carried out to enable any protected or sensitive breeding or roosting locations to be identified within the Proposed Development. Breeding raptor surveys will be carried out to monitor for the presence of Hen harrier in the vicinity of the Proposed Development in the breeding season before construction commences. These should be carried out between April – July to inform the identified mitigation for this species by updating existing knowledge on the species' distribution on the Site. Surveys should take the form of breeding raptor surveys, with four surveys carried out monthly between April – July. During the breeding season when construction is occurring, a programme of ongoing surveys and checks will be carried out across the Site to check for the presence of breeding birds. These will focus on areas where construction is occurring, but also for Hen harrier, survey for any Hen harrier activity which may indicate the presence of breeding within the Proposed Development. Should any nests be identified then where possible, a no-disturbance buffer will be put in place by the ECoW within which no works will occur unless supervised by the ECoW. This buffer will be no less than 5m and will remain in place until the nest is no longer in use.
Chapter 9 Ornithology	9.4	Construction	Given the lack of knowledge of the species' response to wind farms, a Woodcock monitoring programme will be instigated, aiming to provide more information on how the Woodcock on the Site respond to the Proposed Development. This will involve targeted woodcock surveys prior to works commencing on Site to update the baseline data prior to carrying out a targeted programme of monitoring with a view to comparing levels of breeding woodcock activity pre and post construction to see if there is any spatial change in use of the Site pre and post construction, both in relation to the wind farm but also forestry use of the Site. Ideally this would involve use of a control site, if a suitable site can be identified, to enable conclusions about any identified changes in activity to be referenced to activity in other locales not subject to development. Surveys would take the format of repeated Woodcock activities prior to construction on both sites, and then following construction on both sites. Outcomes for this programme will look to identify if there is a displacement effect upon Woodcock, as has been predicted during operation, as a result of the development, enabling better assessment of the implications of wind farm

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			development on this species.
Chapter 9 Ornithology	9.4	Construction	Full details of all construction mitigation measures, including those identified as part of the process for providing biodiversity mitigation are provided in Technical Appendix 4-1 CEMP. These documents include detailed information on the following ecology related activities which will also be involved in delivering and overseeing the ornithological programme of mitigation and monitoring: Works will be overseen by an ECoW and their role and responsibilities are detailed in the CEMP. An ECoW will be present during construction to undertake regular Site inspections and oversee the monitoring/mitigation programme to ensure that effects on birds are managed to as low as reasonably possible and wildlife legislation is complied with. In addition, the ECoW will: Where possible, vegetation clearance will be undertaken outwith the breeding season (mid-March – August inclusive) which will protect active nests. However, if vegetation is required to be removed within the breeding season it will be searched by a suitably qualified ecologist no more than 24 hours before removal to check for the presence of nests. This will involve ecologists doing detailed and intensive surveys and hand searches of the vegetation in the area to be removed, checking it thoroughly, watching it over periods of time for any evidence of breeding activity Should any nests be identified, a no-disturbance buffer will be put in place by the ECoW within which no works will occur unless supervised by the ECoW. This buffer will be no less than 5m and will remain in place until the nest is no longer in use; Put in place nest protection of any nests identified as part of the ongoing surveys described in section 9.4.3. Disturbance buffers will use the distances identified in (Goodship & Furness, 2022) for those species listed in that document. For all other species, the nest shall be protected by at least a 5m buffer. The location and nature of buffers should be communicated to site staff as part of the updates on environmental protection measures. Once breeding has ended, the ECoW will confirm this and document the removal of the buffer; It is unlikely, given the historic pattern of breeding for Hen harrier, that any Hen harrier breeding should occur. However, should any breeding Hen harrier be identified then in line with published guidance on disturbance distances (Goodrow & Furness) a buffer of 500-750m will be established within which no access will occur until the nest is no longer active. The exception to this is use of access tracks, which can be used if

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			the nest established while the track was already in use. If the track was not in use, then the full buffer will apply.
Chapter 10 Soils, Geology and Hydrogeology	10.6	Construction	With reference to the baseline study, the design of the Proposed Development has accounted for the sensitivity of key geological and hydrogeological receptors. Where possible, sensitive receptors have been avoided during infrastructure design in order to reduce the potential impacts which may arise from works associated with each phase of the Proposed Development.
Chapter 10 Soils, Geology and Hydrogeology	10.6	Construction	Infrastructure components are shared with neighbouring developments and where feasible, existing forest road has been incorporated to reduce the need for new track, to minimise potential impact on sensitive receptors; Infrastructure has been positioned to minimise cut and fill requirements and impact on peat by avoiding areas of deeper peat; Blade fingers have all been specified as temporary infrastructure, only required during the construction and decommissioning of the Proposed Development and will not involve founded construction and permanent excavation of peat; Infrastructure has been positioned to maintain a minimum distance from watercourses (see Chapter 11 for details); and A Surface Water Management Plan (Appendix 11-4) and drainage strategy has been developed to ensure that; appropriate, robust and buildable SuDS techniques are incorporated for the prevention of erosion and the removal of silts and pollutants from construction runoff. permanent drainage at the development is designed to a sufficient hydraulic capacity to contain a pre-determined return period rainfall event. consideration is given to the control and monitoring proposals for the dewatering of excavations; and surrounding agricultural lands, heath and peat lands are not negatively affected by surface water runoff from the site.
Chapter 10 Soils, Geology and Hydrogeology	10.6	Construction	All Wind Turbine Generators (WTG)are positioned to maintain a minimum buffer of 60m from watercourses; Turbine locations are located close to the access tracks to minimise lengths of track required and therefore minimise damage to the peat environment; Where possible, WTGs were strategically positioned to target shallow areas of peat and avoid deeper areas/areas noted to be unstable in Appendix 10-2; and Sizing of hardstanding areas associated with WTGs have been minimised and

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			oriented so to reduce spatial area affected by works, i.e. reduce the level of excavation required.
Chapter 10 Soils, Geology and Hydrogeology	10.6	Construction	New proposed access roads were positioned to maintain a minimum buffer of 60m from watercourses, with the exception of watercourse crossing locations; and Track lengths between turbines have been minimised and follow shallower peat where possible to avoid causing instability and loss of peat resource following excavation of the roads.
Chapter 10 Soils, Geology and Hydrogeology	10.6	Construction	Peat repositories have been placed to maintain the minimum buffer of 60m from the watercourses; The peat repositories are on ground that does not exceed angles of 5°; and The areas have been shown as low risk with regards underlying peat stability when 1m of peat is placed on top (Peat Stability Assessment (PSA), Technical Appendix 10-2).
Chapter 10 Soils, Geology and Hydrogeology	10.6	Construction and Operational	Risk is outlined in the Construction Environmental Management Plan (CEMP) provided in Appendix 4-1, and any identified risks will be minimised by applying the mitigation principles as outlined in the PSA (Appendix 10-2) and Peat Management Plan (Appendix 10-3); Particular restricted areas have been identified as part of the EIAR, PSA (Technical Appendix 10-2). These consist of: Safety buffer areas - areas which shall be restricted for construction activity and must not be used for storage or side casting of peat or any overburden materials Peat stockpile restriction areas- areas that are not restricted for construction activity but must not be used for stockpiling of peat or any overburden materials A detailed method statement will be prepared prior to any element of work being carried out, as outlined in the CEMP (Appendix 4-1); A contractor with experience and excellent track record in wind farm development and management of peat shall be appointed for construction to ensure that the PMP is followed; Proposed peat repositories areas are located in areas of low peat instability risk, in accordance with the PRA (Appendix 10-2); There will be no vertical excavations into the peat, and the batter on the excavated peat slopes will not exceed a 1v:3h slope; Frequent monitoring of slopes associated with development will be undertaken during construction, and additional monitoring undertaken following heavy and/or

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			prolonged rainfall events at the discretion of the supervising geotechnical engineer; On the basis of the above point, when poor weather is forecast (e.g. heavy rainfall), new excavation of soils and peat shall be postponed until the weather improves, at the discretion of the supervising geotechnical engineer. Works shall continue on existing excavations (where safe to do so) to reduce the time of exposure of soils to the inclement weather; Excavated peat will be moved short distances from the point of extraction, i.e. side casting to begin with, followed by movement to the nearest storage space, i.e. borrow pit or peat storage area. Temporary stockpiling shall be avoided where feasible and heavily controlled if unavoidable. Controls shall include inspection by a qualified geotechnical engineer of designated areas, ensuring peat is not stored in the safety buffer or peat storage restriction areas (Appendix 10-2), slope monitoring around the temporary peat stockpiles, and a maximum peat stockpile height of 1m; Excavated surplus soils (non-peat) shall be reused on site as construction material wherever possible. If unsuitable, materials are to be placed in the excavated borrow pits to aid in reinstatement and rehabilitation of the excavated area; Peat related works will be subject to further detailed designed and checked by the relevant professionals, for example by a qualified geotechnical engineer, hydrologist, and/or drainage engineer; Excavation works will be monitored by a qualified geotechnical engineer; and Tree felling is only to be undertaken in areas of proposed infrastructure (see Figure 4-7), which has been designed to avoid areas of deeper peat and in areas of low peat instability risk. Felling buffers have been kept to a minimum, whilst balancing health and safety concerns with regards to wind-blow. The retention of trees where possible will ensure that slope stability is not adversely impacted in these areas, and will reduce surface run off. Tree stumps are to be left in place wherever possible to reduce disturbance to the soils and retain stabilising root structures.
Chapter 10 Soils, Geology and Hydrogeology	10.6	Construction and Operation	Temporary pumping of groundwater may be required to facilitate excavation and remove wastewater with high concentrations of suspended soils, however on the basis of the desk study information, groundwater in the bedrock is not expected to be significant / at high elevation (the GWB is found largely within a different type of rock, not present at shallow depth beneath the study area). In the event that conditions are significantly different to those predicted, the supervising geotechnical engineer will consider whether further detailed assessment or monitoring is required; Dust suppression techniques (misting/watering) during construction works will be

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			implemented as necessary; Excavation works will be monitored by a qualified geotechnical engineer; and The earthwork will not be scheduled to take place during severe weather conditions if they present a risk to materials management or stability.
Chapter 10 Soils, Geology and Hydrogeology	10.6	Construction and Operation	Works will be undertaken in accordance with the PMP and the CEMP; A stone buttress shall be constructed to contain the peat at the Peat Repositories, which will help prevent the flow of peat material and prevent oversaturation of the soils (see Figures 4-9a to 4-9f and 4-8a to 4-8d for further details); Intermediate buttresses may be installed within the peat repositories to aid in the placement and stability of placed peat, these berms are to be shaped to align with the contours of the repository, as detailed in the PRA and PMP. The surface of the placed peat should be shaped to allow efficient run-off of surface water from the peat storage areas into the Proposed Development drainage system; Upper acrotelm layers shall be placed on the surface right way up to promote vegetation growth. This growth will aid in stabilising the stored peat material and help in preventing it from becoming saturated following heavy period of rain; Drainage features, such as silt fencing, and settlement ponds have been incorporated into the design to capture any sediment/nutrient laden run-off from the Peat Repositories and reduce risk of oversaturation of the soils; and Movement monitoring posts shall be placed at all peat repositories, both upslope and downslope. Movement monitoring posts will be observed at least once a day with more frequent inspections when adjacent works are happening. Should movements be recorded the frequency of these inspections should be increased and at the discretion of the supervising geotechnical engineer works instructed to stabilise any potentially unstable slopes and/or cease adjacent works. Record should 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 shall be recorded with reference to the post numbering system.
Chapter 10 Soils, Geology and Hydrogeology	10.6	Construction and Operation	Excavations will be constructed and backfilled as quickly as possible to minimise risk of erosion; Excavations will pause during and immediately following periods of high rainfall if they present a risk to materials management or stability; Excavated soil and rock will be stored appropriately in accordance with the CEMP

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			(particularly Section 4.7) to reduce sedimentation in run-off, with bunding and silt fences, for example, as required; and No stockpiles outside of the designated peat storage areas will be left on-site after the construction phase has ended.
Chapter 10 Soils, Geology and Hydrogeology	10.6	Construction and Operation	Prior to commencement of earthworks, the work corridor will be delineated and plant will be required to stay inside the designated boundary. This will limit damage to peat and soils outside of designated areas; and, Excavations will be conducted from access tracks wherever possible.
Chapter 10 Soils, Geology and Hydrogeology	10.6	Construction and Operation	A Waste Management Plan (WMP) is included as Annex B of the CEMP (Appendix 4-1) which provides detail on the control of all site-generated construction waste and the storage and disposal of the waste; Contaminated soils are not anticipated, but if encountered will be stored, removed, and treated/disposed of in accordance with waste management legislation; Material which is temporarily stored on-site will be stored appropriately, separate to clean materials, with covers and bunding as necessary; Classification and assessment of waste materials will be conducted as quickly as possible to ensure minimal exposure time to the receiving environment; and Concrete wash water handling areas will be suitably located and managed to prevent pollution of the environment.
Chapter 10 Soils, Geology and Hydrogeology	10.6	Construction and Operation	All potentially polluting liquids will be stored in containers and/or fully bunded areas and using the necessary equipment in accordance with the CEMP (Appendix 4-1); Refuelling of plant machinery will be carried out at dedicated refuelling stations. Refuelling of immoveable cranes, for example, shall be undertaken with care; protective /bunding matting shall be placed beneath the refuelling point during this time to capture any accidental spillage; Construction plant will be checked regularly for leakages and will undergo maintenance on a regular basis (within the construction compounds wherever possible); Construction traffic will be limited to allocated areas of the Proposed Development; Emergency spill kits will be readily available across the Proposed Development area to enable quick and effective reaction if accidental release, leakage or spillage of potentially polluting substances occurs; and Wastewater will be contained within, and collected from the containerised welfare units and removed via a permitted waste contractor.

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
Chapter 10 Soils, Geology and Hydrogeology	10.6	Operation	Visual inspections of areas of stored peat and peat slopes adjacent to wind farm components will be undertaken twice a year. Inspections will be undertaken by a qualified engineering geologist/geologist/geotechnical engineer/civil engineer, with photograph surveys; Monitoring of the monitoring posts installed at construction stage shall be carried out twice a year. Should movements be recorded the frequency of these inspections should be increased and, at the discretion of the appointed geotechnical engineer, works instructed to investigate the cause of the movement. Record should 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 shall be recorded with reference to the post numbering system; Engineered solutions will be designed and implemented for areas of noticeable erosion or areas of suspected instability associated with the Proposed Development infrastructure, as and when required. Design will be undertaken by a qualified engineering geologist/geologist/geotechnical engineer/civil engineer; The monitoring results will ultimately be utilised to provide a final conclusive assessment of peat stability in areas where the peat is subject to ongoing monitoring. The production of this assessment shall be at the discretion of the designated site Geotechnical Engineer, and monitoring shall only cease when the conclusions have been accepted by the relevant stakeholders. It is likely that any minor settlement will have ceased well before the operation phase of the windfarm is complete, but in the unlikely event that any ongoing monitoring requirement is identified, then a mitigation plan will be developed and implemented following the principles outlined in this EIAR; and Areas no longer in use (i.e. the construction compounds and blade fingers) shall be allowed to naturally revegetate. The turbine zones cleared for felling shall also be allowed to naturally revegetate, although no tree planting shall occur in these areas. Presence of vegetation shall slow run-off and reduce potential for soil erosion in these areas.
Chapter 10 Soils, Geology and Hydrogeology	10.6	Operation	All potentially polluting liquids will be stored in containers and/or fully bunded areas and using the necessary equipment in accordance with the CEMP; The substation shall be situated on hardstand which will prevent downward migration of any escaped pollutants into the subsoils/ groundwater; and Emergency spill kits will be readily available on study area to protect against accidental release, leakage or spillage of potentially polluting substances.

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
Chapter 10 Soils, Geology and Hydrogeology	10.6	Decommissioning	During decommissioning all potentially polluting liquids will be stored in containers and/or fully bunded areas and using the necessary equipment in accordance with the CEMP; Refuelling of plant machinery will be carried out at dedicated refuelling stations; Refuelling of immoveable cranes, for example, shall be undertaken with care; protective /bunding matting shall be placed beneath the refuelling point during this time to capture any accidental spillage; Plant will be checked regularly for leakages and will undergo maintenance on a regular basis (within the construction compounds wherever possible); Construction traffic will be limited to allocated areas of the Proposed Development; Emergency spill kits will be readily available across the Proposed Development area to enable quick and effective reaction if accidental release, leakage or spillage of potentially polluting substances occurs; and Wastewater will be contained within and collected from the containerised welfare units and removed via a permitted waste contractor.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.5	Construction	As a precautionary measure, and in accordance with the guidance previously adhered to for wind farm projects, buffer / exclusion zones to 'major' and 'minor' watercourses were adopted as constraints in the design layout, and for incorporation as a construction buffer in relation to construction activities in proximity to watercourses. Major watercourses are those where catchment within Site is >0.25 km2. Minor watercourses represent tributary channels within the Site where the catchment area was less than 0.25 km2. Avoidance measures have been developed in accordance with legislation and best practice guidance. Mitigation for all water features aims to preserve existing water quality ratings as a minimum. Establishment of intact vegetated buffer zones between infrastructure and water features allows: Protection of water quality by filtering runoff within riparian vegetation before it enters the watercourse; Space for natural fluvial processes such as channel shape and planform adjustment, which help restore and maintain the natural dynamic balance of river systems and associated habitats; Establishment of vegetation to stabilise banks and reduce soil erosion; Access for the maintenance and inspection of watercourses and for dealing with

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			any residual risk of pollution incidents; and Habitat for plants and animals to form part of a habitat network. The rationale adopted in relation to water feature buffers is informed by knowledge, understanding and experience of similar developments whereby infill, disturbance, construction activity or storage of materials within 50 m of natural (major) watercourses should be avoided. A conservative approach has been adopted for the Proposed Development and a 60 m buffer has been applied to major watercourses within the Site.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.5	Construction	Major watercourses identified and requiring application of a buffer to the proposed turbines and infrastructure are largely as per OSI close scale vector mapping and were subject to ground truthing within the Proposed Development site. A conservative 60m buffer has been applied to the major watercourses identified in the baseline assessment, i.e., where catchment within Site is >0.25 km2.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.5	Construction	Minor watercourses were given buffers of 10m based on SEPA guidance (Guidance for Pollution Prevention GPP5: Works and Maintenance in or Near Water, 2018) in the absence of equivalent guidance in Ireland, and represent tributary channels within the Site where the catchment area was less than 0.25 km2. Many are the sources / upper reaches of the more identifiable downstream channels and appear as grass / heather-covered depressions in the land. They are distinct and easily identifiable on aerial imagery but often harder to differentiate from the surrounding land at ground level during dry conditions. Others are more defined channels cut into peat.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.5	Construction	All other minor drainage features (mapped or otherwise) comprising; dry or partially dry forestry ditches, ephemeral drains, dry track drainage, grips, peat cuttings or other drainage features, are not significant in the context of Proposed Development hydrology and habitat potential. Such features will be managed during and following construction by means of diversion and / or temporary blocking (with prior settlement features upstream of, and outside, the drainage channel), using filtration check dams or similar, in order to prevent residual indirect potential pollution downstream caused by connectivity to downstream waterways.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.5	Construction	Conservative minimum hydrological buffer zones are adopted and implemented. The buffer widths adopted exceed those recommended in industry guidance. The allowance provided gives due consideration to the nature of peat soil conditions at the Proposed Development site, antecedent weather, moisture and base flow, and

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			a significantly increased factor of safety in all instances given the significance of fishery interests within downstream catchments, including aquatic qualifying interest species of the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC. Discretion has been adopted where applying buffers to 'other drainage features' based on observed site conditions and using professional judgement. Given the number of ephemeral features, peat drains, and artificial drainage features (in the context of site hydrology and habitat potential), it is not practical or necessary to apply buffers to all 'surface water drains' (as per GPP5). Protection of other drainage features will be implemented via observational design at the time of implementing the development to suit site conditions and will include appropriate buffer strips or other appropriate temporary measures. Such an approach is routine and well understood and managed by the onshore wind development sector. Such features will be managed during and following construction by means of diversion and / or temporary blocking (with prior settlement features upstream of, and outside, the drainage channel), using filtration check dams or similar, in order to prevent residual indirect potential pollution downstream caused by connectivity to downstream waterways. Buffers are indicated on Surface Water Management drawings included at Appendix 11-4. New infrastructure is designed to lie outside hydrological buffer zones for major and minor watercourses. This includes those elements of the works associated with earthworks and greatest potential for spillage or leakage of chemical pollutants, i.e.: All turbine bases, crane pads and associated working areas; All borrow pits; Temporary and permanent spoil and peat repositories; and Enabling works compound, substation and construction compound, fuel and chemical storage areas and any other platforms. New permanent access tracks are to lie outside of buffer zones; with the exception of unavoidable crossings of water features and a section (approximately 60 m) of new track at the westernmost section of the Site which marginally encroaches on a 60 m buffer to facilitate access. At that location, additional mitigation (silt fencing) to manage potential increased risk due to encroachment on the buffer is proposed; refer to drainage plans in the site SWMP (Appendix 11-4).

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			Careful consideration has been given to the routing of access tracks in order to avoid / limit crossing of watercourses. Where crossings are proposed, appropriate design measures shall be incorporated to control or reduce the potential effect of the Proposed Development on the receiving environment. The route of the 110kV grid connection is designed to lie outside of buffer zones; with the exception of an unavoidable crossing of a water course where the route is co-located with an existing track. At that location, additional mitigation in response to weather and measures stated in relation to working in proximity to water to manage potential increased risk due to encroachment on the buffer is proposed; refer also to the SWMP (Appendix 11-4). Any other development in buffers (including felling) will adopt additional mitigation to control surface water as set out in the site SWMP (Appendix 11-4).
Chapter 11 Hydrology, Water Quality and Flood Risk	11.5	Construction	The proposed infrastructure layout within the Site is such that no development (tracks, turbines or other significant infrastructure) is sited within 250 m of any known or potential potable water abstraction identified in the previous screening assessment. No further constraint is required.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.5	Construction	All development is sited within Flood Zone C, as defined in the OPW Guidelines (OPW, 2009), with the exception of where access tracks are required to cross watercourses within the site. OPW PFRA flood mapping indicates that the site is not in an area at risk of pluvial flooding. Infrastructure is designed to ensure that conveyance of watercourse and surface water is not impeded by providing drainage culverts / under track crossings where necessary. Drainage infrastructure to be installed ensures a standard of flood protection from surface water for the 1% AEP / 1 in 100-year rainfall event, including allowance for Climate Change. Site drainage and watercourse crossings shall allow passage of watercourse flows as considered within Appendix 11-1 Flood Risk Assessment and accompanying drainage management drawings and 'Watercourse Crossing Schedule' in Appendix 11-4 Surface Water Management Plan.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.5	Construction	The Proposed Development adopts a surface water management plan / site drainage design using the principles of Sustainable Drainage, promoting the principles of onsite retention of flows and use of buffers and silt removal techniques. All drainage related mitigation measures will be encompassed by a robust and

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			proven SuDS design proposed as part of the Proposed Development which will be used to control drainage and silt management on the site. The proposed on-site drainage is set out in detail at Appendix 11-4: Surface Water Management Plan and the accompanying set of drainage drawings. The drainage manages flood risk to the Proposed Development, provides environmental protection and manages water quality and silt / suspended sediment, and avoids unnecessary disruption to existing hydrological patterns by adhering to the following principles: Track and hardstanding drainage adopts SuDS principles and ensures that runoff from new track and hardstanding shall be reduced to the pre-development greenfield rate. The drainage system caters for protection for up to a 1 in 100-year / 1% AEP rainfall event including allowance for climate change; The drainage plan adopts sub-catchments to manage runoff from the Proposed Development where sub-catchments mimic natural topography to avoid "crossing catchments" which could locally affect flood risk; Drainage maintains existing overland flow routes and channels. Existing natural flow paths are maintained through the use of piped crossings under road alignments at natural depressions and at regular intermediate intervals; Drainage minimises transporting rainfall runoff in long linear drainage swales by providing regular channel "breakouts", whereby water is encouraged to flow overland, thus maintaining existing natural hydrological patterns; Drainage reducing surface water flow rates and volumes by attenuating runoff from tracks and hardstands "at source" by providing check-dams in swales, whereby the flow velocity and rate of discharge is artificially reduced to mimic natural properties. This provides an additional layer of protection rather than relying solely on "end of line" attenuation basins; Drainage provides attenuation and settlement ponds at main surface water discharge locations at end of drainage "runs", where runoff from significant new impermeable areas is treated and attenuated before being discharged, either by dispersal overland, or over a riparian zone adjacent to a watercourse; and Proposals include temporary drainage and settlement features at borrow pits, which are a potential source of sediments and reduced quality runoff due to dust and sludge caused by rock breaking, crushing and heavy plant movements. Drainage design will reduce chemical, silt and other suspended pollutant transport

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			by providing a "treatment train" of two to three stages of pollutant removal to all surface water runoff, nominally by: Ensuring that drainage swales are designed to convey flows at a low velocity by using a wide, flat-bottomed drain; Providing settlement and filtration features in all linear drainage swales (check dams, filtration dams) to reduce flow velocity and encourage settlement; Encouraging appropriate vegetation growth in the base of all linear drainage to provide additional filtration of water; Providing settlement ponds at discharge locations in order to provide treatment to contaminated runoff prior to discharge; Discharging surface water runoff over undisturbed vegetated ground, hence allowing any remaining silts and other pollutants to drop out of flows before entering the watercourse (having the effect of polishing the runoff); and Preventing the discharge of surface water runoff flows directly to existing watercourses or drainage. Discharges will be via SuDS and buffer zones which will act as a filter strip, allowing deposition of suspended solids and other pollutants. Consideration specific to the proposed infrastructure elements are documented in the detailed site-specific drainage management / SuDS design – refer to Appendix 11-4: Surface Water Management Plan and accompanying drainage drawings.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.5	Construction	The Proposed Development design includes the upgrading of sections of existing access track associated with the existing commercial forestry workings. As such, the proposed upgrade works (maintenance of existing running surface and associated drainage) will encounter the current track drainage which is locally significant in terms of drainage function. In these instances, additional mitigation measures will be deployed where necessary, including placement of temporary silt barriers (e.g., check dams) within retained and replacement drains.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.5	Construction	The number of watercourse and drainage crossings has been minimised through the principle of avoidance at the layout design stage. The Proposed Development will result in the following crossings of major and minor watercourses: 7 no. crossing of major watercourses; and 1 no. crossings of a minor watercourse. Crossings are designed to accommodate the track width and minimise length of

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			affected channel. Hydraulic design of crossings has been undertaken as per the guidance and requirements provided in CIRIA C786 "Culverts, Screen and Outfall Manual", with primary parameters as follows: Width of the culvert will be greater than the width of the active drainage channel; Alignment of the culvert will suit the alignment of the drainage channel, i.e. preserve the existing direction of flow; The slope of the culvert will not exceed the slope of the bed of the existing drainage channel; Detailed design of crossings will comply with OPW Section 50 guidelines, which will include providing freeboard to design flood levels and ensuring no increase in flood risk elsewhere as a result of the bridge / culvert. Detailed hydraulic design of culverts and similar structures post permission is normal and accepted practice for wind farms in Ireland; and Fisheries shall be protected by adopting the guidance stated in 'Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters' as published by Inland Fisheries Ireland (2016). Hydraulic design of crossings has been undertaken as part of this assessment and details are provided in a 'Watercourse Crossing Schedule' included as part of Appendix 11-4: Surface Water Management Plan. Culvert form (type) detailed in the Watercourse Crossing Schedule is informed by site-specific assessments (i.e., Chapter 8: Biodiversity and Appendix 8-3 Aquatic Ecology). Clear-span / bottomless crossings are required at the proposed 8 no. crossings to: Ensure preservation of the stream habitats (substrate for spawning etc.); and To avoid instream works during the construction of the crossings that could adversely affect water quality (i.e., bed disturbance causing release of sediment etc). Design drawings for bottomless / clear-span crossings have been provided as part of the planning application and are included as part of the Drainage Management Drawings within Appendix 11-4: Surface Water Management Plan. Consultation and approval will be sought from all relevant stakeholders and regulators, in accordance with Office of Public Works Section 50 guidelines at the pre-construction detailed design stage for all works in and affecting watercourses and drains. Any temporary bridging structure shall be of a temporary bridging platform / baily

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			bridge that themselves that can be erected without in-channel works. Temporary culverts or any other proposal causing disturbance of the stream bed or bank to allow far-bank access will not be permitted.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.5	Construction	Peat repositories and borrow pits which are to be backfilled with spoil are sited outside buffer zones; however, they have the potential to be a source of sediment that would cause reduced quality runoff requiring treatment. All repositories are sited outside hydrological pollution prevention buffers. Measures that will be implemented in full to control reduced quality runoff from spoil comprise filtration of runoff through boundary aggregate bunds and across intact vegetated buffers. Peat slide risk and associated potential effects to downstream water quality from peat repositories and borrow pits, and associated mitigation, is considered in Chapter 10: Soils, Geology and Hydrogeology.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Construction	Due to the hydrological connection between the Proposed Development site and sensitive downstream receptors i.e., Lough Leane (a nutrient sensitive area that has been subject to algal blooms) and the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (including the River Clydagh with aquatic qualifying interests), a project-specific quantitative water quality modelling assessment has been undertaken (as detailed in Technical Appendix 11-2: Water Quality Assessment), which assesses the potential effect of the Proposed Development taking into account embedded and designed mitigation. The purpose of the assessment was specifically to assess the surface water discharge from the Site and the potential for effects to downstream environmental receptors caused by: potential for reduced quality construction phase runoff discharged in site drainage containing elevated levels of suspended solids that would affect SAC qualifying interests in the Clydagh River and downstream, and potential nutrient release associated with felling operations affecting Lough Leane. The assessment determined compliance of surface water discharges from the Site with established Environmental Quality Standards (EQS) for existing / baseline conditions and during the proposed pre-construction felling and construction phase. Further information on the assessment process and detailed results is provided in Appendix 11-2: Water Quality Assessment.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Construction	Lough Leane has previously been subject to historic eutrophication and excessive nutrient-loading. The potential release associated with felling operations affecting Lough Leane has been included for quantitative assessment because of historic

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			algae bloom events in the Lough and the feedback during stakeholder consultation that there were assertions in the past that these were related to forestry in the catchment. As stated above (section 11.3.17), water quality data was obtained during baseline sampling while pre-existing commercial forestry operations were ongoing on the site of the Proposed Development and on adjacent land. This is relevant because the effect of felling, which is proposed as part of the Proposed Development, was captured within the existing baseline. No exceedances of established water quality thresholds were identified within the baseline dataset that suggested deterioration attributable to on-going commercial forestry operations. The maximum total suspended solids and turbidity values recorded were reflective of natural seasonal wet conditions, coinciding with the winter sampling immediately after a period of heavy rainfall. In short, sufficient evidence was available to determine that nutrient release from felling to date is not causing water quality issues in the Site or surrounds. To ensure a precautionary analysis that reflects the planning history and stakeholder concerns, assessment of the effects of nutrient release associated with felling operations, a quantitative assessment of the water quality parameters primarily responsible for eutrophication (i.e., phosphorous and nitrogen) have been assessed at Lough Leane by 'far field dispersion modelling'. A detailed 1D ICM water quality model of the River Clydagh / River Flesk has been developed to model the watercourse from immediately downstream of the Site Boundary to its confluence with Lough Leane (refer to Technical Appendix 11-2: Water Quality Assessment for further details on the modelling approach). For each of the nutrients modelled, downstream dispersion through the River Clydagh / River Flesk catchment is such that concentrations drop below the legislative limits and levels do not exceed the relevant EQS threshold levels at the point of discharge to Lough Leane. The assessment outcome demonstrates that the predicted effect of felling as a result of the Proposed Development would cause no measurable effect to concentrations of nutrients entering Lough Leane from the River Clydagh / River Flesk catchment. The outcome is consistent with previous studies which indicate that existing pressures in Lough Leane are as a result of agriculture and urban wastewater discharges in the wider lough catchment.
Chapter 11 Hydrology,	11.6	Construction	To assess potential effects to the River Clydagh (including the SAC) and its primary

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
Water Quality and Flood Risk			tributaries on the Site as a result of release of suspended sediment in runoff from proposed site drainage, hydraulic modelling has been carried out to simulate the transport and dispersal of the relevant water quality parameters. The aim of the 2D 'far field study' is to assess compliance of total suspended solids within the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC with EQS threshold levels and adherence with the relevant EU Water Quality Directives. A detailed Infoworks ICM 2D hydrodynamic river model of the River Clydagh has been developed, allowing accurate determination of total suspended solids concentrations in the SAC in the vicinity, and immediately downstream of the Proposed Development (refer to Technical Appendix 11-2: Water Quality Assessment for further details on the modelling approach). Model simulations reflect the embedded design which ensures that settlement is provided to manage all runoff up to clay range particles which are in suspension, and which are unlikely to settle without use of flocculent or similar. Measures such as settlement ponds and swales are common industry practice and considered as primary mitigation in EIA terms. The results of the model show that total suspended solids concentrations do not exceed EQS threshold levels along the River Clydagh or its tributaries, except along a short stretch of watercourse 'River Clydagh Tributary -1', downstream of a proposed outfall. However, downstream of this reach, total suspended solids concentrations fall below threshold levels and reduce further still when the watercourse discharges into the River Clydagh. Recommended limits are not exceeded at any point within the SAC. Maps showing distribution of concentrations are included at Technical Appendix 11-2: Water Quality Assessment. The assessment outcome demonstrates that the predicted effect of discharges from the Site as a result of the Proposed Development would cause no significant adverse effect to concentrations of total suspended solids in the SAC, and no significant effect to qualifying interests.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Construction	The overarching principle of operation is to undertake comprehensive water quality monitoring. In the unlikely event that there is a deterioration in water quality as a result of the works, the contractor will respond to changes in water quality before that change is of a magnitude that would cause a significant environmental effect, primarily by ceasing work either site-wide, or stopping work in a local catchment where the pressure affecting water quality can be identified on a sub-catchment by sub-catchment basis. Work will be allowed to recommence after water quality has returned to below the specified threshold (refer to Technical Appendix 11-3).

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			The approach is precautious and addresses submissions made during consultation in relation to the potential effect of the Proposed Development on the water environment, which have previously centred on the contention that historic algae bloom events in Lough Leane were related to forestry in the catchment. Specifically in relation to the potential effect of forestry clearance; as described in the Water Quality Assessment (Technical Appendix 11-2), approximately 57 ha of the proposed felling area (equivalent to approximately 38% of the total proposed based on Coillte data) was felled as part of ongoing commercial operations during the period of design evolution and environmental assessments (i.e., 2 years). This included the period when water quality data was being gathered without any notable exceedance of EQS standards observed. Nonetheless, a precautionary approach has been adopted for the purposes of the assessment. Details in relation to how the adaptive response is to be managed is set out in a Water Quality Monitoring and Response Plan (Technical Appendix 11-3). Water quality monitoring will be implemented and will gather further baseline data (for 12 months prior to the commencement of pre-construction felling) and will monitor effects on the surface water quality during construction (including felling), operational (12 months post-construction) and decommissioning phases of the Proposed Development. The Plan will ensure that Environmental Quality Standards and established thresholds are not exceeded during the project construction phase (including felling), with high frequency snapshot monitoring of ambient physical chemical water quality indicators, and continuous monitoring of key parameters (including Turbidity, Ammonium Nitrogen and Molybdate Reactive Phosphorous) relevant to a response from felling or release of nutrients. Exceedances shall initiate a response plan which will require work (felling / earthworks / civil works) to cease on the site, or within the sub-catchment (as set out above). Works shall only recommence when monitoring has determined that specific water quality parameters have returned to acceptable levels. Monitoring and analysis shall be undertaken by a suitably qualified Environmental Consultant / ECoW who has specific hydrology (and water quality) experience. Monitoring results shall be compared against the legislative limits / water quality target levels detailed in Technical Appendix 11-2 and Technical Appendix 11-3 as well as future pre-commencement baseline water quality data that is planned to be gathered as part of the Plan. Proposed maximum threshold limits are defined in Technical Appendix 11-3 that are below quality standard levels. If limits are

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			exceeded or are expected to be exceeded at any time during these phases, works on site or within the sub-catchment shall cease. Works shall only recommence when monitoring has determined that specific water quality parameters have returned to acceptable levels determined by the Environmental Consultant / ECoW. The procedure for determining water quality standards, exceedance thresholds, minimum monitoring locations and monitoring frequencies, and protocol for implementing adaptive response (review of existing mitigation effectiveness, work stoppage) and restarting work is as set out in Technical Appendix 11-3: Water Quality Monitoring & Response Plan.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Construction	The works programme for the construction phase will take account of weather forecasts and predicted rainfall in the region. Monitoring of weather forecasts and initiating the Response Plan shall be the responsibility of a suitably qualified Environmental Consultant / ECoW. Work will be suspended or scaled back if heavy rain is forecast. The extent to which works will be scaled back or suspended will relate directly to scale and nature of the work proposed, the proximity to a receiving watercourse, and the amount of rainfall forecast. The following forecasting systems are available and will be used on a daily basis at the site to direct proposed construction activities: General Forecasts: Available on a national, regional, and county level from the Met Eireann website (www.met.ie/forecasts). These provide general information on weather patterns including rainfall, wind speed and direction but do not provide any quantitative rainfall estimates; MeteoAlarm: Alerts to the possible occurrence of severe weather for the next 2 days. Less useful than general forecasts as only available on a provincial scale; 3-hour Rainfall Maps: Forecast quantitative rainfall amounts for the next 3 hours but does not account for possible heavy localised events; Rainfall Radar Images: Images covering the entire country are freely available from the Met Eireann website (www.met.ie/latest/rainfall_radar.asp). The images are a composite of radar data from Shannon and Dublin airports and give a picture of current rainfall extent and intensity. Images show a quantitative measure of recent rainfall. A 3-hour record is given and is updated every 15 minutes. Radar images are not predictive; and, Consultancy Service: Met Eireann provide a 24-hour telephone consultancy service. The forecaster will provide interpretation of weather data and give the best

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			available forecast for the area of interest. Using the safe threshold rainfall values below will allow work to be safely controlled (from a water quality perspective) in the event of forecasting of an impending high rainfall intensity event. Works will be suspended if forecasting suggests any of the following is likely to occur: >10 mm/hr (i.e. high intensity local rainfall events); >25 mm in a 24-hour period (heavy frontal rainfall lasting most of the day); or, >half monthly average rainfall in any 7 days. Prior to works being suspended the following control measures shall be completed: Secure all open excavations; and Provide temporary or emergency drainage to prevent back-up of surface runoff. Contractor will avoid working during heavy rainfall and for up to 24 hours after heavy events to ensure drainage systems are not overloaded. ECoW shall check drainage after rainfall event and prior to recommencement of works.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Construction	During all phases of the Proposed Development, the site manager will ensure that mitigation measures as identified within this assessment are fully implemented and that activities are carried out in such a manner as to prevent or reduce effects. The following construction and decommissioning phase-specific measures will be implemented. The following sections should be read in conjunction with the construction management information provided within Chapter 4: Description of Development, which includes the Construction Environmental Management Plan (CEMP) and Appendix 11-4: Surface Water Management Plan. To ensure best practice on site and to help avoid pollution release to watercourses, IFI 'Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters' (2016) will be adhered to. The Guidance on Pollution Prevention (GPP) series, relevant in similar adjacent jurisdictions, will be consulted (as additional examples of best practice) and complied with to help avoid pollution release to watercourses.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Construction	All equipment, materials and chemicals required for the Proposed Development will be stored away from any watercourse (i.e. outside previously stated buffer zones). Chemical, fuel and oil stores will be sited on impervious bases in accordance with GPP2: Above Ground Oil Storage Tanks and within a secured bund of 110% of the storage capacity. Storage space shall be located within the three temporary construction compounds (as described in Chapter 4: Description of Development);

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			the same conditions shall apply where materials are stored at main working areas (e.g. turbine cranepads).
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Construction	Standing machinery will have drip trays placed underneath to prevent oil and fuel leaks causing pollution. Spill kits will also be available in designated areas throughout the Proposed Development. Refuelling of vehicles and machinery will be carried out on an impermeable surface in designated areas, away from any watercourse or drainage ditches (i.e., outside previously stated buffer zones).
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Construction	On-site maintenance (outside of construction compounds) to construction plant will be avoided in all practicable instances, unless vehicles have broken down necessitating maintenance at the point of breakdown. Suitable measures in accordance with a Pollution Prevention Plan (PPP) will be put in place prior to commencement of maintenance in this instance comprising spill kit, drip trays, absorbent booms.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Construction	Measures to prevent discharge of alkaline wastewaters or contaminated storm water to watercourses will be determined before commencement of works. Concrete contaminated water will be discharged to a lined basin in order that it be contained for authorised disposal off site. Wastewater spillage will be minimised by using settling tanks and recycling water. Spill kits will also be available in designated areas throughout the Proposed Development.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Construction	Mess and welfare facilities will be required during the construction phase and will be located at the construction compounds. Foul effluent disposal shall be via chemical facilities with periodic tankered removal by a licensed waste haulier for licensed offsite disposal (i.e., there shall be no emission of treated or untreated foul effluent on the site).
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Construction	Work in or near water is expected to be limited to construction of drainage outfalls and pre-construction felling. Within watercourse buffer zones, works will be managed and limited in accordance with the weather so that execution of the works are undertaken during periods of low flow and low rainfall, in order to minimise contact with water.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Construction	Construction of watercourse crossings will be managed and limited in accordance with the previous section "Responding to Weather" so that execution of the works are undertaken during periods with low rainfall and low river water levels. Work will adhere to any working period restrictions imposed by Inland Fisheries Ireland. Construction will be strictly as per the design for each identified watercourse crossing and will fully implement all SuDS and additional mitigating measures indicated within

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			this proposal and further detailed at the design stage. For purposes of developing design, the proposed mitigation will include: Prior planning of access to both banks to allow installation of abutments / foundations for clear-span / bottomless structures, which may include erecting temporary bridging structures; Installation of silt fences parallel to the watercourse channel in the vicinity of the proposed crossing, between culvert / bridge footings and the river bank; Installation of small cut-off drains to prevent natural surface runoff entering area of construction activity; Installation of filtration or other silt entraining features within the watercourse channel immediately downstream of the works location.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Construction	SuDS, comprising temporary drainage and silt management features will be constructed prior to earthworks (including preliminary or enabling works including pre-construction felling) proceeding to construct any linear works (tracks / hardstanding areas / cable routes), turbine bases, and other infrastructure. Drainage will be provided to temporary earthworks. Permanent drainage will be installed in advance of or in parallel with completion of tracks and hardstanding areas; a planning design for permanent drainage is shown in Technical Appendix 11-4: Surface Water Management Plan. Temporary measures will include: Temporary silt fences erected in areas where risk of pollution to watercourses has been identified e.g. watercourse crossing locations and areas where felling lie within watercourse buffer zones; Placing temporary filtration silt fences within drainage channels where required; Installing temporary constructed settlement features such as sumps or settlement ponds / lagoons in areas where water is to be discharged. Principles and design standards for sizing of treatment are stated in Technical Appendix 11-4; Upslope cut-off drainage channels approximately parallel to the proposed track alignment installed in advance of any excavated cuttings for the track or turbine hardstanding areas; Drains, natural flow paths and cut-off drain outlet locations will be identified and charted, in order to ensure that piped crossings can be installed in advance of or adjacent to the track construction; Settlement ponds will be constructed in advance of commencing excavations for

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			foundations and at any other locations where dewatering of reduced quality runoff is expected; and Trackside drainage swales will be installed in parallel with track construction. Note that this may require that drainage swales are reformed on an ongoing basis as temporary track alignments are modified to their eventual finished design level. The prevention measures described above will be in place at all times during the construction phase to prevent the conveyance of silts to receiving watercourses.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Construction	Cable laying works associated with the 110kV grid connection route will be managed and limited in accordance with the weather so that execution of the works is undertaken during periods with low rainfall likely to coincide with low superficial groundwater levels in order to reduce the likelihood of runoff entering the excavations. Excavation of cable trenches will be carried out over short distances, with frequent backfilling of trenches to minimise opportunity for the ingress of water into open trenches. Temporary silt traps will be provided in longer trench runs and on steeper slopes and spoil will be stored in line with a spoil management plan, which will be produced as part of the CEMP / CMS at the pre-construction stage. Cable laying is further addressed in Technical Appendix 4-1 CEMP, Technical Appendix 4-3 Underground Cable Construction Methodology and Technical Appendix 10-3 PMP, bearing in mind that these are live documents to be updated in line with the conditions of the planning permission if granted.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Construction	Soil and subsoil excavation, movement and placement will be undertaken in accordance with best practice guidelines and measures outlined in Technical Appendix 10-3 PMP, including: Material stockpiles shall be located at least 60 m away from watercourses, including site ditches, to reduce the potential for sediment to be transferred into the wider hydrological system. Excavated material other than peat will be used as engineering fill for the Proposed Development, where drainage will be captured in the proposed temporary and permanent drainage plan described previously; and excess excavated material will be used to backfill borrow pits where runoff will be managed by borrow pit drainage described separately. Areas of stockpiled storage will not be permitted to obstruct the flow of overland surface water with specific drainage to spoil mounds to be provided (refer to Technical Appendix 4-3 Underground Cable Construction Methodology and Technical Appendix 10-3 PMP);

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			Inspection of any stockpile areas will be carried out, particularly following periods of dry or wet weather. If turfs are identified as drying, they shall be moved to a permanent reinstatement area or temporary irrigation shall be carried out until such a time as permanent reinstatement is possible. All temporary storage of peat material shall be carried out in accordance with the rules outlined in Technical Appendix 10-3: Peat Management Plan. Inspection of temporary stockpiles is the responsibility of the ECoW; Irrigation of peat turves will be agreed in advance with the ECoW and Geotechnical Engineer. Should wetting of turves be required in order to prevent desiccation, mitigation will be adopted to prevent run-off or discharge to any adjacent watercourses; Care shall be taken during peat excavation to ensure it is segregated from other soil types ,as material reinstatements/ and reuse requirements are different for varying material as outlined in Technical Appendix 10-3: Peat Management Plan. Particular care will be taken to review recorded peat depths and excavation volumes throughout the construction phase and will be reviewed within the construction phase Peat Management Plan and CEMP; Peat shall be separated and stored by type, namely the acrotelmic and catotelmic layers; Catotelmic peat will only be reinstated within the peat repository areas and the borrow pit areas. Peat excavated will only be used for reinstatement where such reuse poses no risk of polluting watercourses and evidence can be provided (i.e., from confirmatory GI, groundwater and surface water monitoring) that the required water table at the chosen location can be maintained; Construction sequencing shall minimise the temporary stockpiling of peat, ensuring reinstatement accommodation space for generated peat materials. Were necessary, peat shall be stockpiled for a minimal amount of time prior to placement/reuse. Stockpile will be subject to the inspection by the ECoW and geometry restrictions as outlined in Technical Appendix 10-3. Inspection will be the responsibility of the ECoW and will be carried out at regular intervals not exceeding three days, particularly after heavy rainfall or prolonged periods of dry weather; Temporary stockpiling will be carried out outside of the watercourse and environmental buffers, and the buffer areas outline in Technical Appendix 10-3 Peat Management Plan. An observational approach will be used to monitor the acrotelmic and catotelmic peat materials. Placement may be as landscaping, side casting for suitable acrotelmic peat, and catatelmic peat with a high

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			decomposition will be placed within the peat repositories, or within the excavated borrow pit cells; Temporary storage will be safe in so far as it protects the structure and integrity of the excavated peat. Excessive disturbance to the peat material can cause loss of fabric and compressive strength, and such disturbed peat will not be suitable for reinstatement and will need to be placed within the peat repository areas or excavated borrow pit cells. Reinstatement of peat and peat turves will be completed during the construction phase at the earliest practicable opportunity to avoid prolonged storage. Visual inspection of all temporary stockpiled and reinstated peat material will be carried out by the project Geotechnical Engineer; Peat stockpile locations will be selected to limit re-handling as far as reasonably possible; and Excavated peat shall be stored and reused as close as possible to the immediate area. As part of the detailed CEMP, a spoil management strategy (informed by confirmatory construction-stage ground investigations and construction-stage peat stability assessment) will be developed by the appointed competent contractor for the development, which will include management of surface water.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Construction	Turbine base foundations will be on bedrock or other hard strata above bedrock and, therefore, deep excavations into bedrock and the associated bedrock aquifer are not proposed. Dewatering below the bedrock aquifer groundwater table is, therefore, not anticipated. Dewatering of excavations may be required, depending on groundwater levels and flow, although based on the existing site investigation information, significant shallow groundwater is considered to be unlikely. Confirmatory ground investigations will include rotary boreholes for bedrock core collection and assessment of bedrock quality. Boreholes will be installed with standpipe installation and seasonal groundwater monitoring will be carried out to identify any variations in the groundwater levels. Four borrow pits are planned which shall be 5 m deep in bedrock, subject to the results of the confirmatory ground investigations and the encountered bedrock quality. Bedrock groundwater from fracture flow and shallow groundwater encountered at these locations will require dewatering. All contaminated groundwater or rainfall runoff collected in excavations will be discharged via settlement ponds or filter strips prior to entry to the receiving water

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			environment. Temporary pumping of groundwater will be carried out as required to facilitate excavation and remove wastewater with high concentrations of suspended soils into settlement features. The earthworks will not take place during severe weather conditions if they present a risk to materials management or stability. Any settlement lagoons or filter strips associated with dewatering will be regularly inspected, particularly after periods of heavy rainfall and prior to periods of forecast heavy rainfall. Maintenance (to clear blockages or remove silt) will be carried out in periods of dry weather where practicable.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Construction	Loose track material generated during the use of access tracks and the construction compound will be prevented from reaching watercourses by maintenance of surface water drainage systems installed at aggregate based hard standing areas. In dry weather dust suppression methods such as by dust suppression bowser will be employed.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Construction	All SuDS and additional pollution prevention measures installed will be subject to a regular maintenance regime for the life of the construction phase in order to maintain functionality of all features. This will comprise: Unblocking of drains; Maintenance of access road and other hard standing surfaces; Replacement of filtration features; and Removal of silt build-up from settlement and filtration features.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Operation	Mitigation of the effects of the Proposed Development will comprise the following: Ensure best practice is adhered to at the Proposed Development and avoid pollution release to watercourses by incorporating Pollution Prevention Guidance notes into management policy; Permanent welfare facilities will be installed as part of control building / substation facilities. Foul effluent will be disposed of through the use of sealed cesspools or chemical facilities with periodic tankered removal by a licensed waste haulier for licensed offsite disposal (i.e., there shall be no emission on the site); Continuation of monitoring for the specified phase (12 months) of the operational life of the development (after commissioning) for validatory purposes. Monitoring results shall be retained and reported on monthly for inspection by the local authority or EPA if required; and Cyclical maintenance of permanent SuDS drainage features installed during the

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			construction phase, including unblocking of drains, maintenance of access road and other hard standing surfaces, and removal of silt build-up from settlement features. A maintenance programme is included in Technical Appendix 11-4: Surface Water Management Plan.
Chapter 11 Hydrology, Water Quality and Flood Risk	11.6	Decommissioning	Activities associated with the decommissioning phase at the end of the operating design life are generally as per those for the construction phase, and as such, mitigation measures outlined in the construction phase will be followed as appropriate during the decommissioning phase of the Proposed Development. The Irish Wind Energy Association (IWEA) states that when decommissioning a wind farm "the concrete bases could be removed, but it may be better to leave them under the ground, as this causes less disturbance". As a result, the turbine foundations, hardstanding, cable ducting, access tracks and associated infrastructure will be left in-situ, as it is considered that it will cause less environmental damage than removal. With regards to water quality, it is recommended that a similar approach to the construction and operational phase procedures be employed during decommissioning phase, i.e., a review of measured chemical parameters in relation to relevant EQS at the time of decommissioning, pre-decommissioning baseline chemical data and expected natural chemical ranges is to be undertaken by a suitably qualified professional Environmental Consultant / ECoW. Notwithstanding changes in requirements by the planning authority, environmental regulators or stakeholders, decommissioning phase monitoring would comprise 6 months pre-decommissioning baseline monitoring, continuous and grab sample monitoring for the duration of decommissioning, and in-situ / grab sample monitoring for a 6-month period on completion of decommissioning.
Chapter 12 Air and Climate	12.7	Construction, Operation and Decommissioning	The following mitigation measures will be adhered to during all phases of the Proposed Development: Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager; Display the head or regional office contact information; Record all dust and air quality complaints, identify causes, take appropriate measures to reduce emissions in a timely manner, and record the measures taken; Make the complaints log available to the local authority when asked; Record any exceptional incidents that cause dust and/or air emissions, either on or

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			off site, and the action taken to resolve the situation in the log book; Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period; Avoid site runoff of water or mud; Keep site fencing, barrier and scaffolding clean using wet methods; Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on site keep them covered; Cover, seed or fence stockpiles to prevent wind whipping; Ensure all vehicles switch off engines when stationary – no idling vehicles; Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable; Impose and signpost a maximum speed limit of 15mph and 10mph on unsurfaced access tracks and work areas; Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, for example suitable local exhaust ventilation systems; Ensure an adequate water supply on the Proposed Development for effective dust/particulate matter suppression, using non-potable water where possible and appropriate; Use enclosed chutes, conveyors and covered skips; Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods; Avoid bonfires and burning of waste materials; Allow re-vegetatation of earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable; Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoils, as soon as practicable; Avoid scabbling (roughening of concrete surfaces) if possible; Ensure sand and other aggregates are stored in bunded areas and are not allowed

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place; Ensure fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery; For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately in order to prevent damage/leakage, and to prevent dust emission; Avoid explosive blasting, using appropriate manual or mechanical alternatives whenever practicable; Use water-assisted dust sweepers(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use; Avoid dry sweeping of large areas; Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport; Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable; Record all inspections of haul routes and any subsequent action in a site log book; Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving to site where reasonable practicable); Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits; Ensure effective water suppression is used during decommissioning operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground; and Bag and remove any biological debris or damp down such material before decommissioning.
Chapter 13 Noise	13.8	Construction	No significant effects have been identified in respect of construction noise; therefore, no mitigation is required. However, the following presents best practice control measures for construction noise that will be implemented during the construction phase.

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			In accordance with established best practice voluntary control measures are proposed including the use of quiet plant, work within defined hours, and timing of construction traffic/deliveries. BS 5228 states that the 'attitude of the contractor' is important in minimising the likelihood of complaints and therefore consultation with the local authorities will be required along with providing information to residents on intended activities. The construction works on-site will be carried out in accordance with: EC noise limits for certain items of construction equipment as listed in BS5228 that limit noise emissions from a variety of construction plant; and The guidance set out in BS 5228: 2009. Potential breaches of the BS 5228 noise limit may occur for 4-5 hours (during the whole project) at R52. The small timeframe means that the breaches are not considered significant. The use of construction plant with quieter noise levels than those assumed as part of this assessment would be considered to further reduce the risk of disturbance. A noise control plan will be produced that includes: Procedures for ensuring compliance with statutory or other identified noise control limits; Procedures for minimising noise from construction related traffic on the existing road network; Procedures for ensuring that all works are carried out in accordance with the principle of "Best Practicable Means"; and General induction training for site operatives, and specific training for staff having responsibility for particular aspects of controlling noise from the site. A pre-blasting noise management programme to be prepared (in the event that blasting is required) which would identify the most sensitive receptors that could be potentially affected by blasting noise. The programme will contain details of the proposed frequency of blasting, and proposed monitoring procedures. The operator will inform the nearest residents of the proposed times of blasting and of any deviation from this programme in advance of the operations. The programme will also contain contact details which will be provided to local residents should concerns arise regarding construction and blasting activities. In addition, each blast will be designed carefully to maximise its efficiency and to reduce the transmission of noise.

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			Any planned deliveries during night-time and/or other sensitive hours have the potential to wake or disturb the residents of neighbouring properties. As a result, any such events, if unavoidable, will be agreed with the local authority dealing with the development and residents will be kept informed of these activities prior to any night-time deliveries taking place. Use of noise barriers is not considered necessary for reducing the noise impact for any of these activities as the relevant limits are predicted to be met. In planning the construction site layout the contractor will ensure that a 'good housekeeping' policy is applied at all times and as far as reasonably practicable that amongst other things, existing hedges, tree screens and the topography will be utilised to screen construction sites temporary earth mounding or other temporary screening will also be included, where appropriate, within the confines of land take for construction sites.
Chapter 13 Noise	13.8	Operation	Mitigation is required as predicted noise levels from the Proposed Development, when assuming unrestricted operation, do not meet the derived limits at R65 during the night-time and at R153 during day and night-time. It should be noted that, for the candidate turbine considered, it is possible to mitigate the turbines to meet the noise limits without requiring any turbines to be shut down, but by use of noise reduced operation modes. A curtailment strategy which ensures predicted noise levels meet the noise limits is given at Table 13-18 and Table 13-19 for daytime and night-time respectively. The sound power levels associated with these reduced noise operation modes are given at Technical Appendix 13-4.
Chapter 14 Archaeology, Architectural and Cultural Heritage	14.4	Construction	To partially offset the impact of the Proposed Development on the setting of the archaeological landscape, it is proposed to incorporate information boards on publicly accessible area within pertaining to the archaeological, architectural and cultural heritage historical of the Clydagh Valley as part of the development. As part of an advance works programme prior to construction, a combination of advance geophysical survey (where practical) and advance archaeological test trenching will be carried out by a suitably qualified archaeologist under licence, along the proposed grid connection cable route. In addition, advance archaeological test trenching (where practical) will be carried out by a suitably qualified archaeologist under licence, along the proposed access route in the vicinity of CH078. Results from these archaeological works shall be compiled in a detailed report. This report will be submitted to the National Monuments Service

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			(DHLGH). As part of an advance works programme prior to construction, an underwater archaeological survey will be undertaken for all watercourses where they are traversed by the Proposed Development. A systematic advance programme of archaeological field-walking surveys will also be carried out within construction areas in forestry plantations following tree felling to confirm the conditions predicted in this assessment i.e., that they contain no visible surface traces of potential unrecorded archaeological or architectural heritage sites. All ground disturbance associated with the construction of the Proposed Development will be monitored by a suitably qualified archaeologist working under licence as issued by the minister (DoHLGH) under section 26 of the National Monuments Acts (1994-2014). In the event of archaeological features, finds and/or deposits being encountered during the monitoring, all relevant authorities will be notified immediately. Preservation in-situ or preservation by record (excavation) may be required. Where groundworks have a direct effect on the Cummeennabuddoge/Clydaghroe townland boundary (CH057), a suitably qualified archaeologist will monitor excavation works and create a full descriptive, photographic and survey record of the CH site prior to the removal of any components. A report will be complied on completion of the monitoring and sent to the Local Authority and National Monuments Service. As part of an advance works programme prior to construction, a combination of advance geophysical survey (where practical) and advance archaeological test trenching will be carried out by a suitably qualified archaeologist under licence, along the proposed grid connection cable route. In addition, advance archaeological test trenching (where practical) will be carried out by a suitably qualified archaeologist under licence, along the proposed access route in the vicinity of CH078. Results from these archaeological works shall be compiled in a detailed report. This report will be submitted to the National Monuments Service (DHLGH). As part of an advance works programme prior to construction, an underwater archaeological survey will be undertaken for all watercourses where they are traversed by the Proposed Development. A systematic advance programme of archaeological field-walking surveys will also be carried out within construction areas in forestry plantations following tree felling to

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			confirm the conditions predicted in this assessment i.e., that they contain no visible surface traces of potential unrecorded archaeological or architectural heritage sites. All ground disturbance associated with the construction of the Proposed Development will be monitored by a suitably qualified archaeologist working under licence as issued by the minister (DoHLGH) under section 26 of the National Monuments Acts (1994-2014). In the event of archaeological features, finds and/or deposits being encountered during the monitoring, all relevant authorities will be notified immediately. Preservation in-situ or preservation by record (excavation) may be required.
Chapter 14 Archaeology, Architectural and Cultural Heritage	14.4	Operation	To partially offset the impact of the Proposed Development on the setting of the archaeological landscape, it is proposed to incorporate information boards on publicly accessible area within pertaining to the archaeological, architectural and cultural heritage historical of the Clydagh Valley as part of the development.
Chapter 14 Archaeology, Architectural and Cultural Heritage	14.4	Decommissioning	The decommissioning phase will utilise all existing internal site roads and public roads and will not involve any further ground disturbance. Turbines will be removed from site using the same transport methodology adopted for delivery to site initially.
Chapter 14 Archaeology, Architectural and Cultural Heritage	14.5	Decommissioning	On decommissioning of the Proposed Development, it is proposed that, should turbine foundations remain in place they will be covered with earth and allowed to revegetate naturally.
Chapter 15 Shadow Flicker	15.3	Operation	Shadow flicker effects have been minimised as far as practicable through the iterative design process as described in Chapter 3 which resulted in only two properties being within the shadow flicker study area. While the Proposed Development strikes the best balance between the minimisation of shadow flicker and achieving the objectives of the project, shadow flicker effects remain at both receptors. Technological mitigation is available, and widely implemented, on wind farm developments where shadow flicker is predicted. These mitigation measures effectively limit (curtail) the operation of turbines during the infrequent and rare periods when shadow flicker occurs. The wind turbines will each be fitted with shadow flicker curtailment software, inherent to their design, to facilitate their shut down as required. If shadow flicker is predicted to occur based on the prediction model, the software

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			will safely shut down the turbines at the predetermined times based on the prediction model. This approach will be implemented, as necessary, to ensure that the levels of shadow flicker do not exceed the 2006 or 2019 Guideline values once the turbines have completed their safe shutdown cycle. The Applicant has committed to zero shadow flicker subject to the time needed for safe shutdown during community consultations and will curtail on this basis. The level of turbine curtailment required to ensure that shadow flicker limit values are not exceeded will have an imperceptible effect on the overall renewable energy output of the proposed development. Within 12-months of the commencement of commercial operations, a shadow flicker survey will be undertaken by a suitably qualified person to verify the results of the prediction model and to ensure the effective operation of the curtailment software. Monitoring will be undertaken when and where the model predicts shadow flicker is expected to occur. The data which will be collected during the survey will include:- The date, time, location (turbine ID) and duration of the measurement; Sunlight intensity and direction; Wind speed and direction/rotor angle; and Time, date and duration of any sensor triggered curtailment. A site visit will be carried out by a suitably qualified person during each calendar season, to obtain representative samples of year-round conditions, and to monitor the site when shadow flicker is predicted to occur to verify the effectiveness of the technological solutions. In addition, should any third party complaints be raised in respect of shadow flicker at any time during the lifetime of the proposed development, additional specific monitoring will be undertaken as per the methods described above. The primary proposed mitigation is curtailment. Other options will be discussed with the affected homeowner, including: Installation of appropriate window blinds in the affected rooms of the residence; Planting of screening vegetation; and Other site-specific measures which might be agreeable to the affected party and may lead to the desired mitigation. If agreement can be reached with the homeowner, then it will be arranged for the above options to be implemented in cooperation with the affected party as soon as

EIA Report Chapter	Section Number	Applicable Phase	Mitigation Commitments
			practically possible and for the full costs to be borne by the wind farm operator.
Chapter 16 Material Assets (including Telecommunications and Aviation)	16.3	Operation	Aviation Safety Lighting will be fitted.
Chapter 16 Material Assets (including Telecommunications and Aviation)	16.4	Construction	Mitigation measures were undertaken in the design phase through mitigation by avoidance i.e., the known routes of the telecommunication links were plotted and a buffer was applied to them, outside of which the proposed turbines were located. Compliance with the EMC Directive 2014/30/EU will mean that the electromagnetic emissions from devices used will not cause interference to other equipment. During the consultation process, 2RN requested for a protocol agreement between 2RN and Cummeennabuddoge DAC to be signed. The protocol agreement will be in place prior to construction.

19.3 Impact Interactions

This section describes the potential interactions between the impacts identified through assessments presented in Chapter 5-17 of this EIAR.

19.3.1 Population and Human Health – Landscape and Visual Impact Assessment

Chapter 6: Landscape and Visual Impact Assessment of this EIAR predicts no significant effects on vehicular, recreational or settlements or residential receptors during any phase of the Proposed Development. Neither are any of the 27 viewpoints assessment are predicted to experience significant effects. Accordingly, no significant effects on population and human health are predicted during any phase of the Proposed Development.

19.3.2 Population and Human Health – Soils, Hydrology and Hydrogeology

Chapter 10: Soils, Hydrology and Hydrogeology identifies the potential for peat landslide to have an effect of people during the construction and operational phases of the Proposed Development (no potential risk is identified for the decommissioning phase).

A Peat Stability Risk Assessment (Appendix 10-2 of this EIAR has been conducted with the assessment concluding the peat stability risk for the proposed infrastructure is negligible to low.

19.3.3 Population and Human Health – Hydrology, Water Quality and Flood Risk

Chapter 11 – Hydrology, Water Quality and Flood Risk identifies that the construction phase of the Proposed Development has the potential to give rise to some water pollution as a result of site activities, and any water pollution could have a potential significant effect on other users of that water within the catchment.

Potential surface water abstractions for human consumption were identified as part of the assessment with no abstractions identified with the potential to be affected by the Proposed Development. Accordingly, there is no potential for interaction between Population and Human Heal

19.3.4 Population and Human Health – Air and Climate

Chapter 12: Air and Climate of this EIAR has identified no significant effect on human receptors during any phase of the Proposed Development.

19.3.5 Population and Human Health – Noise

Chapter 13 Noise has determined that there will be short term breaches of the applicable noise level at Receptor 52 during the construction phase of the Proposed Development due to the construction of an access track in the vicinity of this receptor

(construction phase), however, the short duration of this activity means that the effect would be non-significant.

Significant noise impact is predicted at R65 during the night-time and R153 during the operational phase of the Proposed Development. This will be mitigated through the use of a turbine specific curtailment strategy making use of reduced noise operational modes. Deployment of this mitigation means that no significant residual noise and population and human health are predicted.

19.3.6 Population and Human Health -Shadow Flicker

Shadow Flicker has the potential to cause disturbance and annoyance to residents, however, there is no evidence of impacts on health. Chapter 15: Shadow Flicker of this EIAR identifies the potential for shadow flicker at two properties during the operation phase of the Proposed Development.

Application of curtailment in the form of automated shutdown of the appropriate turbines during the times when potential shadow flicker may occur will reduce the flicker experienced at those properties to zero.

19.3.7 Population and Human Health – Risk of Major Accidents

Chapter 17: Risk of Major Accidents identified no significant risk of major accidents with the potential to affect population and human health during any phase of the Proposed Development.

19.3.8 Landscape and Visual Impact Assessment –Archaeology, Architectural and Cultural Heritage

Chapter 14 Archaeology, Architectural and Cultural Heritage has identified that the Proposed Development (operational phase) will have a long-term negative moderate (indirect –visual) effect on the surrounding archaeological, architectural and cultural heritage landscape, specifically CH083 The Paps Archaeological Landscape.

Chapter 6: Landscape and Visual Impact Assessment identifies a significant effect on the landscape resources within the Proposed Development Site and on the Kerry County Council (KCC) Visually Sensitive Area during the operational phase of the Proposed Development. This area partially overlaps with the Paps Archaeological Landscape. The interaction of the effects on these designated areas is considered to be a **significant effect**.

19.3.9 Traffic and Transport-Air and Climate

The increase in traffic volumes associated with the construction and decommissioning phases of the Proposed Development has the potential to result in increasing air pollution from dust arising due to movements of vehicles on unsurfaced roads within the site.

Chapter 7: Transport and Access has determined that the increase in traffic volumes on the road network is non-significant; however, Chapter 12: Air and Climate has determined that there is the potential for a significant negative effect due to dust arising as a result of vehicle movements within and exiting the site during the construction and decommissioning phases.

A number of mitigation measures is therefore proposed which, when implemented will reduce the impact to Non-Significant.

There will be no increase in overall traffic volumes during the operational phase of the Proposed Development and no associated effects on air and climate.

19.3.10 Traffic and Transport – Noise

According to the transport assessment undertaken as part of this EIA (presented in Chapter 7 of this EIAR), the increase in traffic volumes as a result of the construction of the Proposed Development would be no more than 15% along the existing road network. Therefore, the contribution to the overall noise environment would be negligible and Non-Significant.

The effect on noise receptors as a result of decommissioning is considered to be the same as construction. There is no predicted effect as a result of the operational phase.

19.3.11 Traffic and Transport – Major Accidents and Natural Disasters

Chapter 17: Major Accidents and Natural Disasters identifies that he construction of the Proposed Development will result in an increase in road traffic volumes on public highway which potentially increases the risk of a road traffic collisions (RTC). As any RTC would require the involvement of emergency services all RTCs are considered as Major Accidents for the purpose of that assessment.

The Chapter concludes using an average of the annual RTC statistics compiled as part of the traffic statistics of 27 collisions per year, the construction of the Proposed Development is not likely to result in a single additional RTC over the course of the 24 month construction period.

Similar impacts would be expected for decommissioning with negligible effects anticipated for operation. Accordingly no significant effects are anticipated for any phase of the Proposed Development.

19.3.12 Biodiversity – Ornithology

The Proposed Development has the potential to affect the ecological and ornithological receptors and of the designated site the qualifying species of the Statutory Designated Sites in the vicinity of the Proposed Development Site. The effects on these sites is considered in the Natura Impact Assessment (NIS) accompanying the consent application.

However, there is no overlap between the qualifying species or habitats of the designated sites.

Whilst the Proposed Development will have effects on both biodiversity and ornithology; those effects are considered separately in Chapters 8: Biodiversity and 9: Ornithology.

19.3.13 Biodiversity – Hydrogeology

The Proposed Development will result in the loss of peat and the associated plant communities during the construction phase of the Proposed Development. The habitats associated with the peat will be restored and enhanced in accordance with the measures identified in Chapter 8: Biodiversity with new and restored habitats reaching maturity during the operation phase.

There will be no effect of biodiversity during the decommissioning phase as only the above ground structures will be removed with no disturbance to habitats and species.

19.3.14 Biodiversity – Hydrology

Chapter 8: Biodiversity identifies that there is the potential for the construction of the Proposed Development to result in pollution reaching the watercourses on Site which then in-turn drain into the River Clydagh as part of the SAC. Pollution could change the water quality, biology and chemistry of the watercourses flowing through and draining the Site and consequently the aquatic species they support.

The water quality assessment presented in Chapter 11: Hydrology, Water Quality and Flood Risk has determined that predicted effect of discharges from the site as a result of the Proposed Development would cause no significant adverse effect to concentrations of suspended solids in the SAC, and no significant effect to qualifying interests.

However, the assessment for the release of nutrients into the River Clydagh as a result of pre-construction felling, concludes that without mitigation there would be a potentially major adverse effect which would affect qualifying interests in the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC.

This requires the implementation of the mitigation measures presented in Chapter 11: Hydrology, Water Quality and Flood Risk. With the implementation of those measures the residual effect on both water quality and biodiversity receptors

19.3.15 Biodiversity – Noise

The noise effects of the Proposed Development would be limited to short term disturbance during the construction and decommissioning and would be non-significant. The noise generated during the operational phase is not considered to have the potential in impact on biodiversity receptors.

19.3.16 Ornithology – Noise

The noise effects of the Proposed Development would be limited to short term disturbance during the construction and decommissioning and would be non-significant. The noise generated during the operational phase is not considered to have the potential in impact on ornithology receptors.

19.3.17 Soils, Geology and Hydrogeology – Hydrology Water Quality and Flood Risk

Interaction between surface and groundwater are considered in Chapter 11: Hydrology, Water Quality and Flood Risk which determined that excavations required as part of the construction phase may result in the discharge of contaminated water to surface water receptors. Mitigation in the form of settlement ponds and filter strips to reduce any potential impact in that instance.

The Proposed Development will include permanent and temporary spoil storage. Exposed soils have potential to release fine sediments in surface water runoff or where excavations come in contact with surface watercourses. Measures to control reduced quality runoff from spoil comprise filtration of runoff over intact vegetated buffers, and / or collection and treatment of runoff in settlement features.

Storage of peat may also cause barriers and affect preferential surface water flow routes. Consequently, temporarily or permanently redirected surface water flows may starve areas where water currently flows, or cause flooding of areas where water currently does not flow.

Spoil drainage will be designed on a bespoke basis for spoil storage areas to allow controlled dewatering and prevent washout of suspended solids to the receiving water environment.

With the application of the mitigation measures described in Chapter 11: Hydrology, Water Quality and Flood Risk, the residual risk to hydrology receptors is considered as Not Significant.

19.3.18 Soils, Geology and Hydrogeology – Major Accidents and Natural Disasters

Chapter 17: Major Accidents and Natural Disasters identifies peat landslide as posing a risk of a major accident. As discussed above the peat stability risk has been determined to be low to negligible with the associated low risk of a major accident as a result of peat landslide. This applies to all phases of the Proposed Development.

19.3.19 Hydrology Water Quality and Flood Risk – Major Accidents and Natural Disasters

Chapter 17: Major Accidents and Natural Disasters identifies flooding as posing a risk both to the Proposed Development through a natural disaster and a major accident as a result of the Proposed Development.

Flood Risk Assessment undertaken as part of this EIAR (Technical Appendix 11-1). This concludes that the Proposed Development is not considered as being at risk of flooding.

The alteration of natural drainage systems and changes in land use can result in increased run off rates and cause flooding downstream.

The Proposed Development will include the removal of forestry and a change in habitat; however, this is not dissimilar to the changes experienced through the normal crop rotation on the Proposed Development Site and will not result in a significant change to the hydrological regime (see Chapter 11 of this EIAR).

Accordingly, there is no significant risk of a major accident or natural disaster as a result of the Proposed Development.

19.4 Mitigation Measures

Where any potential interactive negative impacts have been identified above, a full suite of mitigation measures has been included in the relevant Chapters of the EIAR. The implementation of these mitigation measures will reduce or remove the potential for these effects. Information on potential residual effects and their significance is also presented in each relevant Chapter.

19.5 Conclusion and Residual Effects

The interaction of the effects of the Proposed Development during the operational phase on the KCC Visually Sensitive Area in the area partially overlapping with the Paps Archaeological Landscape. is considered to be a **significant effect**.

No other significant effects have been identified.

19.6 References

EPA. (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports (Online) Available at https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf Accessed 20/10/22

European Commission (2011, 2014). Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (as amended by Directive 2014/52/EU). [Online]. Available at: https://environment.ec.europa.eu/law-and-governance/environmental-assessments/environmental-impact-assessment_en [Accessed 19/12/2023]