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8 HYDROLOGY, HYDROGEOLOGY, GEOLOGY AND PEAT

8.1 Introduction

8.1.1 This Chapter considers the potential effects of the Beinn Ghlas Wind Farm Repowering (hereafter referred to as the Proposed Development) on geology, hydrology, hydrogeology and peat. It details the current environmental baseline in relation to this topic and identifies and assesses the potential significant effects on identified receptors. The assessment tables present the effects of each infrastructure section on the receptors identified. These effects are then grouped for the assessment section which discusses the overall effects. Where relevant, mitigation, management and monitoring measures are then discussed and the residual effects determined.

8.1.2 The Chapter presents associated links to other chapters or appendices such as **Volume 2, Chapter 6: Ecology** where there are potential interactions with the water environment and **Volume 4, Technical Appendix 6.10: Outline Biodiversity Enhancement and Habitat Management Plan (OBE-HMP)** of the EIA Report.

8.1.3 The assessment was undertaken by Fluid Environmental Consulting (Fluid) with inputs from Offshore Wind Consultants (OWC) in relation to the peat landslide hazard risk assessment (PLHRA). Further details are provided in Chapter 1: Introduction.

8.1.4 This chapter is supported by **Volume 3a, Figures 8.1 - 8.11** in Volume 3 of the EIA Report which are referenced throughout the text. The following technical appendices support the chapter and are also referred to throughout the chapter:

- **Technical Appendix 8.1: Good Practice Methods;**
- **Technical Appendix 8.2: Peat Survey Report;**
- **Technical Appendix 8.3: Outline Peat Management Plan (OPMP);**
- **Technical Appendix 8.4: Peat Landslide Hazard Risk Assessment;**
- **Technical Appendix 8.5: Private Water Supply Assessment;**
- **Technical Appendix 8.6: Groundwater Dependent Terrestrial Ecosystems Assessment; and**
- **Technical Appendix 8.7: Watercourse Crossing and Infrastructure with 50 m of Water Features Inventory.**

8.1.5 This chapter uses specific terminology which will be referred to throughout:

- **GWDTE** – Groundwater Dependent Terrestrial Ecosystems are habitats that are dependent on groundwater. They are specifically protected under the Water Framework Directive.
- **PLHRA** – Peat Landslide Hazard Risk Assessment. Peat landslides are caused by a combination of factors. To assess the risk of a peat slide occurring in a particular location all of these factors must be determined and then combined into a model which enables a map of peat slide risk to be produced.
- **PWS** – Private Water Supplies are any water supplies to residents and their land that are not supplied through the mains system – these can be surface water or groundwater fed.

- **Hydrologically/Hydrogeologically Connected** – a receptor that is hydrologically or hydrogeologically connected to a source and has potential surface water or groundwater pathways that directly link the two, e.g., the source is upgradient of the receptor in the same catchment.
- **DWPA** – Drinking Water Protection Area.
- **SSSI** – Site of Special Scientific Interest.
- **SAC** - Special Area of Conservation.
- **NGR** – National Grid Reference.
- **AOD** – Above ordnance Datum.

8.2 Statutory and Planning Context

8.2.1 There is a wide body of legislation and guidance that has been used in relation to the assessment with key documents listed below.

Legislation

- Water Environment (Controlled Activities) (Scotland) Regulations (CAR) 2011 (as amended) A Practical Guide, Version 9.3 June 2023;
- The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017 (amends and revokes the Private Water Supplies (Scotland) Regulations 2006);
- The Public Water Supplies (Scotland) Amendment Regulations 2017 (amends the Public Water Supplies (Scotland) Regulations 2014;
- The Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017 (as amended);
- National Planning Framework 4: National Spatial Strategy for Scotland, approved by Scottish Parliament on 11 January 2023; and
- The Water Framework Directive (WFD). The WFD is no longer law post-Brexit but its substance has been implemented in Scotland through the Water Environment and Water Services (Scotland) Act 2003 (WEWs Act) and the Water Environment (Controlled Activities) (Scotland) Regulations (CAR) 2011 (as amended in June 2023). The primary objective of the Directive is for all surface and coastal water bodies to achieve good chemical and ecological status, and groundwater bodies to achieve good quantitative and chemical status, 2021 or 2027. This required assessment of a much wider set of water quality parameters than had previously been used. SEPA have published River Basin Management Plans (RBMPs) which detail the current and target status of water bodies, and the means of achieving these targets (as last assessed in 2014 and 2020).

SEPA Guidance

8.2.2 The Pollution Prevention Guidelines (PPGs) are being replaced by the Guidance for Pollution Prevention (GPP) and include the documents referred to below, which are the principal documents used for guidance on preventing contamination of surface water from construction activities. Those relevant to the Proposed Development include:

- GPP1: Understanding your Environmental Responsibilities – Good Environmental Practices version 1.2 (SEPA, DAERA, NRW & NIEA, June 2021) replaces PPG1: General guide to the prevention of pollution (EA, SEPA & EHSNI, published 2013, withdrawn December 2015);
- GPP2: Above ground oil storage tanks (SEPA, NIEA & NRW, January 2018);

- GPP4: Treatment and disposal of sewage where no foul sewer is available (SEPA, DAERA, NRW & NIEA, 2021);
- GPP5: Works and maintenance in or near water (SEPA, DAERA, NRW & NIEA, January 2017);
- PPG6: Working at construction and demolition sites, second edition (EA, SEPA & NIEA, 2012. Withdrawn December 2015);
- GPP8: Safe storage and disposal of used oils (SEPA, DAERA, NRW & NIEA, July 2017);
- GPP21: Pollution incidence response planning, version 1.1 (SEPA, DAERA, NRW & NIEAEA, June 2021); and,
- GPP26: Storage and handling of drums and intermediate bulk containers, version 1.2 (SEPA, DAERA, NRW & NIEA, 2017June 2021).

Other SEPA Guidance Includes:

- SEPA Flood maps / Indicative River & Coastal Flood Map (Scotland) (SEPA January 2014, updated April 2018 and 2022);
- Temporary Construction Methods, Engineering in the Water Environment Good Practice Guide, WAT-SG-29 (SEPA; 2009);
- River Crossings, Engineering in the water environment, WAT-SG-25 (SEPA, 2010);
- Water Run-Off from Construction Sites, Sector Guidance, Sector Specific Guidance WAT-SG-75 (SEPA, 2021);
- SEPA Regulatory Position Statement – Developments on peat (SEPA, 2010);
- Land Use Planning System Guidance Note 4 (LUPS GU4) - Planning Guidance on On-shore Windfarm Developments (SEPA, September 2017);
- Land Use Planning System Guidance Note 2 (LUPS GU2) - Planning advice on Sustainable Drainage Systems (SUDS) (SEPA, August 2010);
- Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems, Land Use Planning System Guidance Note 31 (LUPS-GU31), version 3 (SEPA, 2017);
- Guidance on the Life Extension and Decommissioning of Onshore Wind Farms, SEPA Guidance version 1 (November, 2016);
- Developments on Peat and Off-Site Uses of Waste Peat version 1 (WST-G-052, 2017);
- Peatland Survey. Guidance on Developments on Peatland. Scottish Government, Scottish Natural Heritage (SEPA, 2017);
- Guidance on the Assessment of Peat Volumes, Reuse of Excavated Peat and Minimisation of Waste (Scottish Renewables, SEPA, 2012).

Other Relevant Guidance

- Environmental Impact Assessment Handbook, version 5 (SNH, HES, 2018);
- Control of water pollution from constructions sites. Guidance for consultants and contractors C532 (CIRIA, 2001);
- Environmental good practice on site C650 2nd Edition (CIRIA, 2005);
- Control of water pollution from linear construction projects: technical guidance C648 (CIRIA, 2006);
- Good practice during windfarm construction (Scottish Renewables, NatureScot, SEPA & Forestry Commission Scotland, July 2024);

- Managing Forest Operations to Protect the Water Environment Practice Guide (Forestry Commission Scotland, 2019);
- Practice guide for forest managers to assess and protect Groundwater Dependent Terrestrial Ecosystems when preparing woodland creation proposals (Forestry and Water Scotland Initiative, January 2018);
- Planning Advice Note 50 Controlling the Environmental Effects of Surface Mineral Workings (1996);
- Planning Advice Note 79: Water and Drainage (2006);
- Guidance on Road Construction and Maintenance (Forests and Water Guidelines Fifth Edition 2011, Forestry Commission);
- Design Guidance on River Crossings and Migratory Fish (Scottish Executive, 2000);
- Peat Landslide Hazard and Risk Assessments: Good practice Guide for Proposed Electricity Generation Developments (Scottish Government, Second Edition, 2017).

8.3 Consultation Undertaken

8.3.1 A Scoping Opinion Request was submitted to the Energy Consents Unit (ECU) on 30 June 2022. Following the submission, scoping responses and further site visits, a Gatecheck Consultation was submitted on 26 January 2024.

8.3.2 In undertaking the assessment, consideration has been given to the scoping responses and other consultation as detailed in **Table 8.1**.

Table 8.1: Summary of consultation responses relevant to this chapter

Consultee	Scoping/Other Consultation	Issued Raised	Response/Action Taken
The Energy Consents Unit (ECU) – on behalf of Scottish Ministers	Scoping Opinion dated 7 October 2022	The Scottish Ministers were satisfied with the scope of the EIA set out in the scoping report and have made comments on the following: Drinking water and private water supplies: • Consultation was required be undertaken with Scottish Water to confirm whether there are any assets affected. • Investigations for the presence of private water supplies which may be impacted was requested along with an assessment of the potential risks, impacts and any mitigation measures should be conducted. Hydrology, Geology and Hydrogeology: • A full impact assessment on peat was requested, including peat probing for all areas where the development is proposed. Peat Landslide and Hazard risk assessment (PLHRA): • A PLHRA was requested for areas where there was a demonstrable requirement for the assessment.	See further in this table and Public Water Supply section. A Private Water Supply Assessment is presented in **Volume 4, Technical Appendix 8.5**. A full impact assessment on peat has been completed as part of this chapter. Peat surveys undertaken and the Outline Peat Management Plan are detailed in **Volume 4, Technical Appendix 8.2** and **Technical Appendix 8.3** respectively. A PLHRA has been undertaken and is detailed in **Volume 4, Technical Appendix 8.4.**
SEPA	Scoping Opinion dated 29 August 2022 2	General comments: Engineering activities: • The site must be designed to avoid impacts upon the water environment. Disturbance and re-use of excavated peat and other carbon rich soils: • The submission must demonstrate how the layout has been designed to minimise disturbance and consequential release of CO_2. Disruption to Groundwater Dependent Terrestrial Ecosystems (GWDTE): • GWDTE are protected under the Water Framework Directive and therefore the layout and design of the development must avoid impact on such areas. General SEPA Scoping Advice detailed the need to map and assess: • all engineering works within and near the water environment	The design iterations are presented in **Chapter 2: Proposed Development and Design Evolution** and demonstrate avoidance of watercourses and buffer zones as far as is possible. Peat surveys and the Outline Peat Management Plan are detailed in **Volume 4, Technical Appendix 8.2 and 8.3** respectively. Peat and natural peatland have been avoided where possible. A GWDTE assessment has been completed in **Volume 4, Technical Appendix 8.6** and GWDTE have been avoided wherever possible.

Consultee	Scoping/Other Consultation	Issued Raised	Response/Action Taken
		including buffers, flood risk assessment and details of any related applications made under the Controlled Activities Regulations (CAR). Watercourse crossings must be designed to accommodate the 1 in 200-year flood event. • Impacts upon Groundwater Dependent Terrestrial Ecosystems (GWDTEs) and buffers. • Impacts upon groundwater abstractions and buffers. Where there are no abstractions within 250 m of excavations then this should be confirmed in the EIA Report. SEPA also state the following should be included: • Peat depth survey and table detailing re-use proposals, and a comprehensive site-specific Peat Management Plan. • Map and table detailing forest removal if on afforested area. If springs/flushes are found after felling, these must be marked, avoided and any infrastructure microsited off these sensitive areas. • Map and site layout of borrow pits. • Schedule of mitigation including pollution prevention measures. • Site Management Plan of pollution prevention measures. • Map of proposed surface water drainage layout. • Map of proposed water abstractions including details of the proposed operating regime. • Decommissioning statement.	A Private Water Supply Assessment is presented in **Volume 4, Technical Appendix 8.5.** Peat surveys and the Outline Peat Management Plan are detailed in **Volume 4, Technical Appendix 8.2** and **8.3** respectively. There is no forestry within the Site only the Site Access track margins. There are no borrow pits proposed as part of the application. Other measures such as Site Management Plan and waste water drainage layout will be provided in the detailed CEMP. Effects during the decommissioning phase are considered to be similar to that of construction, therefore detailed plans and requirements will be agreed when required.
NatureScot	Scoping Opinion dated 30 August 2022	NatureScot considered impacts on nationally important carbon-rich soils, deep peat and priority peatland habitat to be a key issue to be addressed in detail as part of the EIA. • Peat probing and NVC surveys were required in order to ascertain the quality and distribution of peatland and priority peatland habitats across the Site. • NatureScot requested that efforts be made to avoid the	Peat Surveys are detailed in **Volume 4, Technical Appendix 8.2** and NVC surveys for the Development Area and access track are detailed in **Technical Volume 4, Appendix 6.2** and **6.4** respectively.

Consultee	Scoping/Other Consultation	Issued Raised	Response/Action Taken
		siting of turbines and associated infrastructure on areas of nationally important peatland and areas of deep peat. • The EIA report should demonstrate that any significant effects have been overcome by siting, design or mitigation. • A peatland management plan and habitat management plan should be included in the EIA report. Scoping indicates that parts of the site are underlain with Class 2 peatlands, which are nationally important carbon rich soils, deep peat and priority peatland habitats. Even if peatland classifications change following site-specific surveys, we advise that efforts are made to avoid siting turbines and associated infrastructure on areas of nationally important peatland and areas of deep peat.	The siting of turbines and associated infrastructure on nationally important peatland and areas of deep peat has been avoided as far as possible. Areas of high-quality peatland have been assessed through a Peatland Condition Assessment (PCA) detailed in **Volume 4, Technical Appendix 6.3** and avoidance through design iterations is presented in **Volume 2, Chapter 2: Proposed Development and Design Evolution**. Mitigation measures are in the OPMP and Outline Biodiversity Enhancement and Habitat Management Plan (OBE-HMP) detailed in **Volume 4, Technical Appendix 8.3** and **Technical Appendix 6.10** respectively. This chapter demonstrates any residual effects on peatland as being not significant.
Marine Scotland Science (MSS)	Scoping Response April 2022	Advice in relation to freshwater and diadromous fish and fisheries. Atlantic salmon (Salmo salar), sea trout and brown trout (Salmo trutta) are of high economic value and conservation interest in Scotland. Onshore wind farms are often located in upland areas where salmon and trout spawning and rearing grounds may also be found. The Electricity Works (Environmental Impact Assessment) (EIA) (Scotland) Regulations (2017) state that the EIA must assess the direct and indirect significant effects of the proposed development on water and biodiversity, and in particular species (such as Atlantic salmon) and habitats protected under the EU Habitats. Directive. Salmon and trout are listed as priority species of high conservation interest in the Scottish Biodiversity Index and support valuable recreational fisheries. MSS issued generic scoping guidelines (https://www2.gov.scot/Topics/marine/SalmonTroutCoarse/Freshwater/Research/onshoreren) which outline how fish populations can be impacted during the construction, operation and decommissioning of a wind farm development and informs developers as to what should be considered, in relation	Fish Surveys The scope for baseline fish surveys was agreed with the local District Salmon Fishery Board and Fisheries Trust. Marine Scotland advice on freshwater and diadromous fish and fisheries in relation to onshore wind farm developments has been followed. Fish Habitat Survey presented with **Chapter 6, Technical Appendix 6.7**.

Consultee	Scoping/Other Consultation	Issued Raised	Response/Action Taken
		to freshwater and diadromous fish and fisheries, during the EIA process. In addition to identifying the main watercourses and waterbodies within and downstream of the proposed development area, developers should identify and consider, at this early stage, any areas of Special Areas of Conservation where fish are a qualifying feature and proposed felling operations particularly in acid sensitive areas.	
Fisheries Management Scotland (FMS) on behalf of the network of Scottish District Salmon Fishery Boards (DSFBs)	Scoping consultation response dated 5 August 2022	Due to the potential for such developments to impact on migratory fish species and the fisheries they support, FMS have developed, in conjunction with Marine Scotland Science, advice for DSFBs and Trusts in dealing with planning applications. We would strongly recommend that these guidelines are fully considered throughout the planning, construction and monitoring phases of the proposed development. • Link to advice on terrestrial windfarms • Link to DSFB & Trust contact details	Advice reviewed and included in assessment.
SEPA	Gatecheck response, 6 February, 2024	Satisfied that the issues raised in our scoping response of 25 August 2022 have been adequately addressed and look forward to being consulted on the full application in due course.	N/A
NatureScot	Gatecheck response,13 February, 2024	Content that the Applicant appears to have taken on board the advice we have provided to date with regards to the scope of the Environmental Impact Assessment (EIA). However, at this stage there is no opportunity to comment on the quality of the work undertaken. Section 2.5.6 it is stated "areas of deep peat (>1 m depth)" have been avoided regarding siting turbines and infrastructure. For clarification, peat depth of 0.5 m or more qualifies as deep peat. As per our scoping response, it would be helpful to gauge the assessment of potential impacts, if the attached Peatland Importance Table could be completed and included within the EIA Report.	N/A Areas of high-quality peatland have been assessed through a **Peatland Condition Assessment (PCA)** detailed in **Volume 4, Technical Appendix 6.3** and is also presented in the Peatland Importance Table in **Volume 4, Technical Appendix 6.12.** Avoidance through design iterations is presented in **Volume 2, Chapter 2: Proposed Development and Design Evolution.**
MSS	Gateway Response, standard April 2022	Developers should specifically discuss and assess potential impacts and appropriate mitigation measures associated with the following: • any designated area, for which fish is a qualifying feature, within and/or downstream of the proposed development area;	Presented within **Volume 2, Chapter 6, Technical Appendix 6.7.** Presented in the baseline section for **Volume 2, Chapter** 6 Ecology and throughout **Chapter 8.**

Consultee	Scoping/Other Consultation	Issued Raised	Response/Action Taken
		• the presence of a large density of watercourses; • the presence of large areas of deep peat deposits; • known acidification problems and/or other existing pressures on fish populations in the area; and • proposed felling operations. Recommends that a water quality and fish population monitoring programme is carried out to ensure that the proposed mitigation measures are effective. A robust, strategically designed and site-specific monitoring programme conducted before, during and after construction can help to identify any changes, should they occur, and assist in implementing rapid remediation before long term ecological impacts occur	Hydrological Features present on **Volume 3a, Figure 8.6 a to c.** Peat Surveys are detailed in **Volume 4, Technical Appendix 8.2** There is no forestry within the Site only the Site Access track margins. Water quality monitoring will be completed and is discussed in **Volume 2, Chapter 8** in **Section 8.14**
Argyll and Bute Council (A&BC)	PWS information Request, November 2023	List of 91 PWSs within 10 km of the Site centre provided with location, type and property name.	Presented within **Volume 4, Technical Appendix 8.5.**
Scottish Water	Scottish Water asset check, March 2024	Loch Nell and catchment are used for public water supply and are a surface water drinking water protection area (DWPA). Glen Lonan section of Direct Service Reservoir pipeline between Loch and Loid and Loch an Droghinn DWPA to the east of the Site and Taynuilt.	Asset plans purchased from Scottish Water and confirmation of surface water DWPA undertaken are discussed and presented in **Section 8.5** Private and Public Water Supplies and Abstractions and **Figure 8.6a to c** in Volume 3 of the EIA Report.
SEPA	Information request for licence water abstractions, March 2024	No response to date.	

8.4 Approach to the Assessment

Scope of Assessment

Effects Assessed in Full

8.4.1 The following were identified at the scoping stage for consideration in the assessment:

- changes in surface or groundwater quality due to oil and fuel spills or leaks, other chemicals stored on site and sediment release;
- alteration of the network and form of drainage;
- alteration of watercourse flow rates, sediment loading and geomorphology;
- impacts on the recharge and flow within shallow and deep groundwater systems;
- change to the geology or soils of an area through removal, erosion or dewatering, particularly peat;
- change to the geology or soils of an area through direct removal or from erosion due to the infrastructure changing the hydrological environment;

- dewatering of peat due to excavations or pumping;
- removal of peat; and
- an increase in the peat slide risk.

8.4.2 These impacts could potentially affect water users (public and private water supplies for domestic, livestock and irrigation use), fisheries or aquatic habitats and the status of water bodies.

8.4.3 These impacts could also potentially affect the geological resource, result in the release of carbon due to peat deterioration or removal and incorrect restoration or reuse, and a peat slide could impact on water users (private water supplies), fisheries or aquatic habitats, the status of water bodies, ecological habitats or human life.

Effects Scoped Out

8.4.4 On the basis of the desk based and field survey work undertaken, the professional judgement of the EIA team, experience from other relevant projects and policy guidance or standards, and feedback received from consultees, the following topic areas have been 'scoped out' of detailed assessment:

- Effects during the decommissioning period, as although it is recognised that effects will occur, these will be substantially less than during the construction period which represents a maximum case and restoration will be undertaken where infrastructure is no longer used.
- Effects during the construction and decommissioning period on any public or private water supplies that are not hydrologically connected to the Proposed Development, as discussed in the relevant section below,
- Effects during the construction and decommissioning period on any groundwater terrestrial ecosystems that are not hydrogeologically connected to the Proposed Development, as discussed in the relevant section below, and
- Effects during the operation period, as although it is recognised that effects will occur, these will be substantially less than during the construction period which represents a maximum case.

Baseline Methodology

8.4.5 The baseline geological, hydrological and hydrogeological conditions contained within and surrounding the Site have been described based on a desk study and various field surveys, detailed below.

Desk Study

8.4.6 The following data sources have informed the assessment:

- Centre for Ecology and Hydrology (CEH): National River Flow Archive (NRFA) website for river flow data (accessed December 2023, http://www.ceh.ac.uk/data/nrfa/data/search.html);
- Meteorological Office website for rainfall data (accessed December 2023, http://www.metoffice.gov.uk/climate/uk/averages/);
- Ordinance Survey Mapping 1:25,000 maps 360 and 376 and 1:50,000 maps 49 and 50;
- Google Earth and Bing map aerial imagery (accessed December 2023);

- British Geological Survey Mapping 1:50,000 Sheet 45W Connel Solid (1991) and 1:63,360 45 Oban Drift (1952) BGS Map Portal (accessed December 2023, https://webapps.bgs.ac.uk/data/MapsPortal/series.html?series=S50k&collection=PMAP&page=4&pageSize=100);
- British Geological Society GeoIndex Boreholes database, 1:50,000 (accessed December 2023, https://mapapps2.bgs.ac.uk/geoindex/home.html);
- British Geological Society Geology Viewer (accessed December 2023, https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/);
- National Soil Map of Scotland (accessed December 2023, https://map.environment.gov.scot/Soil_maps/?layer=1);
- SNH Carbon and Peatland Map 2016 (accessed December 2023 https://map.environment.gov.scot/Soil_maps/?layer=10);
- SEPA Water Classification Hub (accessed December 2023, https://www.sepa.org.uk/data-visualisation/water-classification-hub/);
- Hydrogeological Map of Scotland (Scale 1:625,000, Institute of Geological Sciences, 1988);
- Groundwater Vulnerability Map of Scotland (accessed December 2023) https://nora.nerc.ac.uk/id/eprint/17084/1/OR11064.pdf));
- SEPA Indicative River and Coastal Flood Map (accessed December 2023, https://map.sepa.org.uk/floodmaps);
- SEPA Flood Risk Geodatabase, ©SEPA 2023, this SEPA product is licenced under the Open Government Licence 3.0 (accessed March 2024, https://www.sepa.org.uk/environment/environmental-data/);
- Scottish Drinking Water Protected Area for surface water, Scottish Government Website Maps (accessed December 2023, https://www.gov.scot/publications/drinking-water-protected-areas-scotland-river-basin-district-maps/), and
- Multi-Agency Geographic Information for the Countryside (MAGIC) website (accessed December 2023, http://magic.defra.gov.uk/).

Field Surveys

8.4.7 The following field surveys were carried out to inform the assessment:

- Peat Surveys – Phase 1 (100 m grid) April 2022; Phase 2 (detailed probing) December 2022, February 2023 and October 2023; (**Volume 4, Technical Appendix 8.2**: **Peat Survey Report** of the EIA Report);
- Peatland Condition Assessment (PCA) and Groundwater Dependent Terrestrial Ecosystem Assessment (GWDTE) survey. This was undertaken by Dr Kate Massey (Alba Ecology Ltd) in April 2022 (**Volume 4, Technical Appendix 6.3** of the EIA Report) to determine the condition of peatland habitats and map the presence of potential GWDTEs within the vicinity of the proposed infrastructure;
- Private water supply (PWS) surveys - PWS potentially connected to the Proposed Development at different phases of the design were assessed through a combination of review of information from A&BC and a site visit in March 2023 (**Volume 4, Technical Appendix 8.5: Private Water Supply Assessment** of the EIA Report);
- Hydrological site visits for baseline and design inspection 2 to 4 March 2023, and to assess final infrastructure locations 16/17 October 2023. These site visits inspected the overall Site water features and determined construction constraints through the identification of sensitive hydrological and hydrogeological receptors (**Volume 3a, Figures 8.1** and **8.6 a-c** in Volume 3 of the EIA Report) and the

required watercourse crossings (see **Volume 4, Technical Appendix 8.7: Watercourse Crossing Inventory Infrastructure within 50 m of a Surface Water Feature** of the EIA Report);

- Peat Landslide Hazard Risk Assessment Walkover, East Point Geo – a walkover of the Site was completed in October 2022 (**Volume 4, Technical Appendix 8.4: PLHRA** of the EIA Report) to verify the geomorphology and other relevant mapping related to the assessment of peat slide risk.

Assessment Methodology

8.4.8 There are no published guidelines or criteria for assessing and evaluating effects on hydrology, hydrogeology, geology or soil within the context of an EIA. The assessment will be based on a methodology derived from generic Scottish Government EIA regulation guidance, IEMA guidance and SNH publication Environmental Impact Assessment Handbook Version 5 (April 2018). The methodology is also based upon relevant SEPA guidance including Assigning Groundwater Assessment Criteria for Pollutant Inputs (WAT-PS-10-01, SEPA, 2014). The methodology sets a list of criteria for evaluating the environmental effects, as follows:

- The type of effect (i.e. whether it is positive, negative, neutral or uncertain);
- The likelihood of the effect occurring based on the scale of certain, likely, or unlikely;
- Sensitivity criteria are based on the vulnerability of the receptor to the effect due to a particular activity, as well as the importance of the resource under consideration or designated value of the receptor; and
- The magnitude of potential impact in relation to the resource that has been evaluated, quantified using the scale high, medium or low and included the consideration of timing, scale, size and duration of a potential impact.

Study Area

8.4.9 The study area encompasses the whole of the Site, Site Access and a wider area related to the surface water catchments connected to the Site. The hydrological setting is illustrated on **Volume 3a, Figure 8.1** in Volume 3 of the EIA Report. It is assumed that hydrological effects are likely to have attenuated at distances from the Proposed Development infrastructure in excess of 2 km, although if a direct pathway exists to a sensitive receptor, e.g. a watercourse, these are considered further.

Sensitivity

8.4.10 Sensitivity criteria is based on both the ability of a receptor to accommodate the anticipated impact of the likely changes, as well as the importance of the resource under consideration or designated value of the receptor (e.g. an area of international significance has a higher value and therefore higher sensitivity than other areas of lower status). Evaluation of sensitivity of geology, hydrology, hydrogeology and peat requires a considerable degree of judgement, based on defined characteristics and values and professional experience.

8.4.11 The sensitivity criteria used in this assessment is presented in **Table 8.2**.

Table 8.2: Sensitivity criteria

Value	Description
Very High	Private water supply abstraction for human or stock consumption (surface water or groundwater). Public drinking water supply abstraction (surface water or groundwater). Surface water classified under the WFD as 'high' (or equivalent older chemical or biological monitoring designation). Groundwater classified under the WFD as 'good'. Watercourse designated under the Freshwater Fish Directive or known to have fish spawning grounds. Groundwater vulnerability to pollution Class 5. Internationally or nationally designated sites (e.g., Ramsar, SPA, SAC, SSSI, National Nature Reserves, Marine Nature Reserves). Habitats listed in Regional Biodiversity Action Plans or Annex I habitats. Internationally important species sensitive to hydrological change. Peat >2m in open terrain or >3m in forestry, densely drained, eroded or gullied open terrain.
High	Private water supply abstraction not for human or stock consumption (surface water or groundwater). Public non-drinking water supply abstraction (surface water or groundwater). Surface water classified under the WFD as 'good' (or equivalent older chemical or biological monitoring designation). Watercourse known to support important fishery population. Groundwater vulnerability to pollution Class 4. Sites designated at a regional level. Peat with depth between 1 m – 2 m in open and undegraded terrain or >2 m in forestry, densely drained, eroded or gullied open terrain. Other water dependent habitats.
Medium	Surface water classified under the WFD as 'moderate' (or equivalent older chemical or biological monitoring designation). Sites designated at a local level. Peat with depth between 0.5m – 1m in open and undegraded terrain or with depth between 1m – 2m in forestry, densely drained, eroded or gullied open terrain. Groundwater vulnerability to pollution Class 3 or 2.
Low	Surface water classified under the WFD as 'poor or bad' (or equivalent older chemical or biological monitoring designation). Groundwater classified under the WFD as 'poor'. Groundwater vulnerability to pollution Class 1. Non peat or peaty/organic rich soils less than 0.5 m in depth.

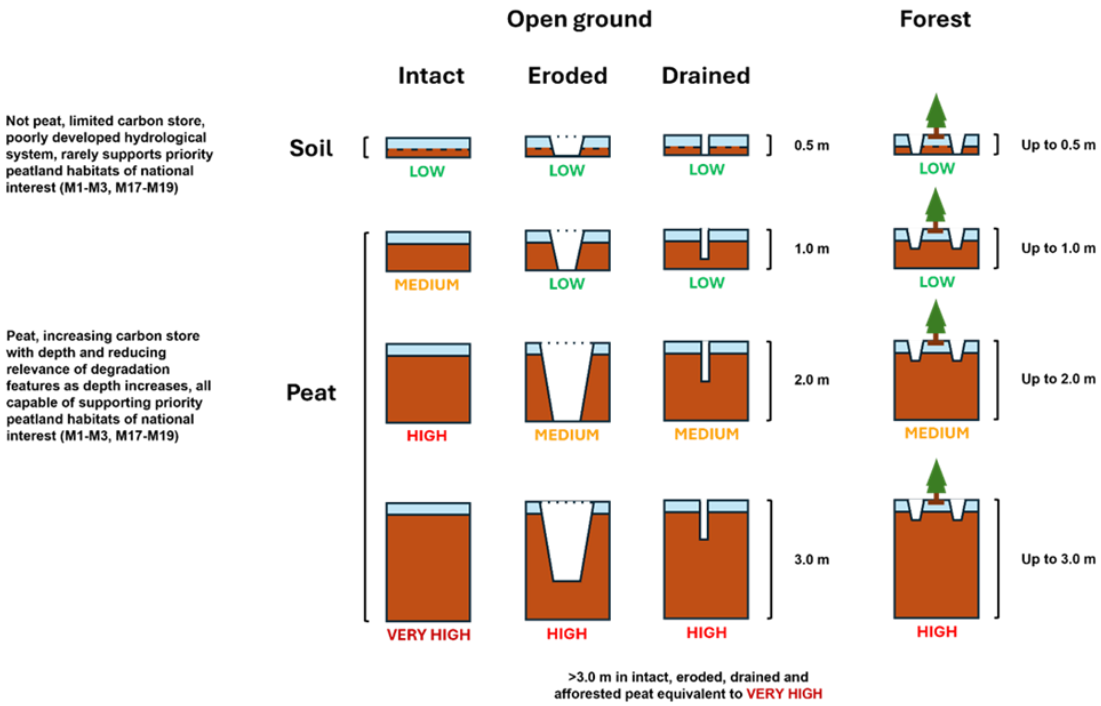
8.4.12 In addition to the criteria set out in **Table 8.2**, assessment of sensitivity of peat is based on the degree by which the peatland in its baseline condition has been degraded by natural or man-made activities. Uneroded, open peatland without evidence of drainage is considered to be of highest sensitivity, while peatlands degraded by forestry, drainage or erosion are considered to have a poorer baseline condition. A depth criterion is also

applied, in which deeper peats are considered to hold more carbon (for which peat volume is a proxy) and more likely to exhibit a functional hydrological system, with associated flood regulation benefits. **Plate 8.1** developed jointly by Fluid and OWC illustrates this approach with the sensitivity classification for each degradation and depth combination provided below the associated image, coloured using RAG (Red-Amber-Green) styling. The approach is based in part on the latest Peat guidance, UCN National Committee United Kingdom Peatland Programme Peatland Code Guidance v 2.1 (2024). The assessment of sensitivity does not take into account vegetation, which is assumed to be considered within the ecological impact assessment in **Volume 2, Chapter 6 Ecology**.

8.4.13 The sensitivity of any proposed development related to peat is therefore based on the percentage of its infrastructure on each category of peat as:

- **Very High** – >25% of the infrastructure is located on peat >2m in open terrain or >3m in forestry, densely drained, eroded or gullied open terrain;
- **High** – >25% of infrastructure is located on peat with depth between 1m – 2m in open and undegraded terrain or >2m in forestry, densely drained, eroded or gullied open terrain;
- **Medium** – >25% of infrastructure located on peat with depth between 0.3m – 1m in open and undegraded terrain or with depth between 1m – 2m in forestry, densely drained, eroded or gullied open terrain; and
- **Low** - >75% of the infrastructure is located on non-peat or peaty / organic rich soils less than <0.3m in depth, or peat <1m in depth that is in forestry, densely drained, eroded or gullied open terrain

Plate 8.1: Peat sensitivity



Criteria for Assessing Magnitude of Impact

8.4.14 The magnitude of impact has been considered as the change experienced from the current baseline conditions and has been considered in terms of the scale, size and duration of a potential impact.

8.4.15 The level of magnitude of impact is assessed using the criteria presented in **Table 8.3**.

Table 8.3: Magnitude of potential impact: assessment criteria

Magnitude	Summary
Very High	Impact resulting in loss of feature or use. Fundamental (long-term or permanent) changes to surface water, groundwater and geology (in terms of quantity, quality and morphology). Excavated peat volume associated with the infrastructure footprint and associated earthworks is >10% of the peat volume across the peat survey area within the Site.
High	Impact resulting in loss of part (<10%) of feature or use. Substantial but non-fundamental and short to medium term changes to the surface water, groundwater and geology (in terms of quantity, quality and morphology). Excavated peat volume associated with the infrastructure footprint and associated earthworks is >5% but <10% of the peat volume across the peat survey area within the Site.
Medium	Impact on feature or use. Detectable but non-substantial and temporary changes to the surface water, groundwater and geology (in terms of quantity, quality and morphology). Excavated peat volume associated with the infrastructure footprint and associated earthworks is >2% and <5% of the peat volume across the peat survey area within the Site.
Low	Impact but of insufficient magnitude to affect feature or use. No perceptible changes to the surface water, groundwater and geology (in terms of quantity, quality and morphology). Excavated peat volume associated with the infrastructure footprint and associated earthworks is <2% of the peat volume across the peat survey area within the Site.

8.4.16 The magnitude of the impact has been assessed based on the location of the receptor assessed and the proximity of infrastructure or construction activity taking place. The magnitude of impact takes into account the good practice and standard embedded mitigation methods described in Technical Appendix 8.1 of the EIA Report.

Criteria for Assessing Significance

8.4.17 The predicted significance of the effect was determined through a standard method of assessment based on professional judgement while considering sensitivity and magnitude of impact as detailed in **Table 8.4** below.

8.4.18 The combination of the sensitivity, magnitude of potential impact and likelihood combine to provide a matrix categorisation of significance (major, moderate, minor and negligible), subject to professional judgement.

8.4.19 **Major and Moderate** effects are considered to be significant in the context of the EIA Regulations. Where the significance of effect is assessed as being moderate or above, further site-specific mitigation is required.

Table 8.4: Significance of effect matrix

	Sensitivity			
Magnitude	**Very High**	**High**	**Medium**	**Low**
Very High	Major	Major	Moderate	Moderate
High	Major	Moderate	Moderate	Minor
Medium	Moderate	Moderate	Minor	Minor
Low	Minor	Minor	Minor	Minor

Nature of Effect

8.4.20 In addition to determining the significance of the effect, the assessment process also includes a qualitative description regarding the nature of the effect (**Table 8.5**). These terms add additional information about how the effect would affect receptors.

Table 8.5: Nature of effect

Term	Nature of effect descriptors
Adverse	An effect which has the potential to decrease receptor value or status relative to baseline conditions.
Beneficial	An effect which has the potential to increase receptor value or status relative to baseline conditions.
Short-term	Effects that persist only for a short time, e.g. during the construction (or decommissioning) phase only; includes reversible effects.
Medium-term	Effects that may persist until additional mitigation measures have been implemented and become effective.
Long-term	Effects that persist for a much longer time, e.g. for the duration of the operational phase (essentially until the development ceases or is removed/ reinstated); includes effects which are permanent (irreversible) or which may decline over longer timescales.
Temporary	A reversible effect where recovery is possible and for which effects would persist only for a short or medium-term.
Frequent	Refers to a recurring effect that occurs repeatedly; in some cases a lower level of impact may occur with sufficient frequency to reduce the ability of a receptor to recover effectively.

Difficulties and Uncertainties

8.4.21 The nature of some hydrological features means that some may not manifest themselves at all times, and may or may not be present as a result of extreme weather conditions. The fieldwork was undertaken in a range of weather conditions; however, it is possible that some small, minor features may have been missed as a result of their ephemeral or temporary nature.

8.4.22 It is possible that data is incomplete or not up to date from consultees for PWS and these are addressed further through a review of Ordnance Survey mapping and aerial imagery however it is possible some new properties have not been identified.

8.4.23 SEPA have not responded with respect to registered abstractions.

8.4.24 Final infrastructure adjustments have resulted in some very minor areas having fewer peat penetration probes than guidance however these are not considered to compromise the assessment. This includes temporary construction compound 1 (TTC1) and 2 (TTC2) and any associated access track.. Further details on construction compounds are provided in **Volume 2, Chapter 2, Proposed Development and Design Evolution**.

8.4.25 Overall, it is considered that there is sufficient information to enable an informed decision to be taken in relation to the identification and assessment of likely significant environmental effects on hydrology, geology and hydrogeology.

Assumptions

8.4.26 In regard to hydrology, management of water-borne pollution and protection of natural heritage areas, SEPA has statutory obligations in terms of the management and control of pollution into water resources in Scotland. Where careful design has avoided sensitive receptors, it would be reasonable to assume that the adoption of SEPA's Best Practice Guidelines will, in general, prevent pollution to acceptable standards and make the majority of any 'significant' effects unlikely. Best practice assumed to be in place during construction, and which has been considered in the assessment of effects, is set out in **Volume 4, Technical Appendix 8.1**: Good Practice Methods of the EIA Report. Further details on these measures, which are considered 'embedded mitigation' are provided below. Specific mitigation measures may be required in certain areas or at certain times of the site development, and these are set out in the assessment where relevant.

8.4.27 The assessment is undertaken assuming that good practice embedded mitigation methods are employed, but not taking into account additional mitigation and management.

8.5 Existing Environment

8.5.1 The following section describes the baseline hydrological, hydrogeological and geological conditions contained within and surrounding the Application Boundary. This includes the physical characteristics as well as designated waterbodies, water dependent habitats, their quality and their use.

Topography, Land Cover and Land Use

8.5.2 A review of Ordnance Survey (OS) mapping and aerial imagery (Google, 2023) was undertaken.

8.5.3 The Site is located to the south-east of Oban, south-west of Taynuilt, and north of Loch Awe in Argyll and Bute.

8.5.4 Access to the operational Beinn Ghlas Wind Farm is from the unclassified 'Glen Lonan Road' connecting Taynuilt to Oban and the wind farm access track. The A85 public road to the north and the Fearnoch Forest access track would be used for construction traffic and turbine component delivery.

8.5.5 The existing Beinn Ghlas wind farm is located in the centre of the Site, consisting of 14 Bonus (B44/600) wind turbines and a substation surrounded by rough grazing moorland.

8.5.6 The Site Access is predominantly through commercial forestry in the north and agricultural rough grazing hills south of Barguillean Farm.

8.5.7 Historical muir burning and extensive grazing has occurred to the west of the Site, however there was no evidence of recent muir burning.

8.5.8 There is an active hydro scheme on the Allt Nathais tributary at NGR 198230 728234 to the west of the Site Access and north-east of the Site. There are three hydro scheme intake dams on the headwaters / un-named watercourses of the River Lonan to the north of the Site at NGR NM 9758 2681, NM 9737 2690 and NM 9701 2706. These are piped north to the power turbine at approximately NGR NM 97530 28362. The hydro scheme dams form barriers to fish passage.

8.5.9 To the north-west of the Barguillean Farm area of the Site Access is an area of broadleaved woodland, to the south-east of the Site is the Nant forestry area, a combination of native deciduous woodland and commercial coniferous forestry and to the east is the Glen Nant SSSI and Etive woods SAC.

8.5.10 Around the Barguillean Farm area (adjacent to the central Site Access area) are numerous farm and nursery buildings and yards and earthworks being undertaken to the east south-east of Barguillean Farm during the March 2023 site visit.

8.5.11 To the east of Barguillean Farm a Scottish Water building and pipeline that runs alongside the public road.

8.5.12 The Site comprises low, rugged hills, scattered with small outcrops of rocks and scoured with steep sided streams. There is open moorland, predominantly upland heath and mires including bog pools on the higher ground and a mixture of rough grassland on the lower gradient slopes.

8.5.13 Land within the Application Boundary ranges from about 30 m Above Ordnance Datum (AOD) where it departs the A85 to 330 m AOD at the main area of the Site. The main area of the Site ranges from around 330 m AOD to a maximum of 461 m AOD at Carn Gaibhre rocky summit in the centre of the Site to 500 m AOD on the extreme western boundary. The Creag an Fhithich is another rocky named summit at 410 m AOD in the southern section of the Site.

8.5.14 The main area of the Site generally slopes down to the north towards Glen Lonan and Loch Etive and south-east toward Loch Nant from a high central ridge of which Beinn

Ghlas (to the west) and Carn Gaibhre are the peaks. The Site and Site Access is divided into four main hydrological catchments: River Nant to the south, River Nell / Fearnoch to the west, Allt Nathais to the north and Allt na h Airde to the north-east. The majority of the Site is within the River Nant Catchment and the majority of the Site Access is within the Allt Nathais catchment.

8.5.15 The hydrological context of the Site is shown in **Volume 3a**, **Figure 8.1 Hydrological Setting** in Volume 3 of the EIA Report.

Meteorological Summary

8.5.16 There are no known rainfall gauges or meteorological stations within or within close vicinity of the Site and Site Access. The nearest four stations to the centre of the Site are presented in **Table 8.6**.

Table 8.6: Nearest rainfall records

Meteorological Station Name	Annual Average Rainfall (mm) (1991 – 2020 average)	Distance and direction from centre of the Site (km)
Dunstaffnage (Met Office, 1991 – 2020)	1,728	~11 km north-west
Hazelwood Cottage (SEPA, 2014 – 2024)	2,423	~17 km south-west
Glen Strae (SEPA, 2014 – 2024)	2,754	~19 km north-east
Lephinmore (Met Office, 1991 – 2020)	1,957	~33 km south

8.5.17 There are no National River Flow Archives (NFRA) catchments connected to the Site. The nearest NRFA catchment (Avich at Barnaline Lodge, Station 89006) is approximately 12 km to the south of the centre of the Site and has an average annual rainfall of 2,341 mm (SAAR 1961-1990). The catchment statistics for the location of the Site indicate an average annual rainfall of 2,400 mm – 4,000 mm.

8.5.18 The average rainfall across Scotland is 1,570.9 mm, therefore the site is considered to have an above-average rainfall compared to the rest of Scotland.

8.5.19 The yearly average maximum temperature at Dunstaffnage (the nearest Met Office station to the Site) is 12.69°C, with maximum temperatures ranging, on average, from around 7.54°C in January to 11.39°C in August. The Site is located at a higher elevation (100 m AOD - 500m AOD) to Dunstaffnage (3 m AOD) and is therefore expected to have lower average temperatures.

8.5.20 Sunshine hours, on average, range from 32.4 hours in January to 192.1 hours in May. Average yearly total sunshine is 1,227 hours.

Soils

8.5.21 The distribution of soils over the site is generally controlled by the underlying geology, the topography and the drainage regime. The Scottish National Soil Mapping is presented in **Volume 3a, Figure 8.2** in Volume 3 of the EIA Report.

8.5.22 A review of the available soil mapping indicates the Site and the Site Access to be mostly underlain with peaty gleys.

8.5.23 Sections of the Site Access around Barguillean Farm and Dailnamac property in the extreme north are underlain with hummus-iron podsols, and the area south of these properties is underlain by Brown Earth.

Peat

8.5.24 The SNH (now NatureScot) Carbon and Peatland (2016) Map (**Volume 3a, Figure 8.3** in Volume 3 of the EIA Report) shows that the Site is predominantly located on Class 2 soil and Class 5 soil along the southern boundary. The mapping is a broad approach to peat across Scotland and is superseded by site specific habitat mapping and detailed peat probing surveys. The existing Site Access is located on mineral soils in the North and central area (around Barguillean Farm), Class 5 within much of the Fearnoch Forest section and a small localised area of Class 2 to the north of Am Barr to the north-west of Barguillean Farm.

8.5.25 Class 2 soil is considered to be nationally important carbon rich soils, deep peat, priority peatland habitat where areas are likely to be of high conservation value. Class 5 soils are carbon-rich and deep peat, where information takes precedence over vegetation data (there may be no peatland habitat recorded or include bare soils).

8.5.26 The spatial occurrence and depth distribution of peat across the Application Boundary (Site and Site access) has been investigated in accordance with the guidance in Scottish Government, Scottish Natural Heritage, SEPA (2017) Peatland Survey. Guidance on Developments on Peatland. High-density probing at all infrastructure locations to determine peat depth has been completed to enable appropriate and accurate avoidance, where possible. The peat probing and peat coring investigations confirmed the peat distribution, peat depth, peat characteristics and underlying geological conditions within the Site and Site Access. Full results of the peat surveys are described within **Volume 4, Technical Appendix 8.2**, and **Volume 3a, Figures 8.9a-c** and **8.10a-c** in Volume 3 of the EIA Report show the peat depth distribution across the Site and Site Access.

8.5.27 The following tasks have been completed to obtain a detailed understanding of the distribution and properties of peat at the Site:

- Phase I Habitat Survey and National Vegetation Classification (NVC) ecological habitat mapping (see **Volume 2, Chapter 6**);
- Phase I (April 2022) depth penetration probing on a 100m grid across the initial survey area (larger than the Site) that was considered for development (644 peat probes and 12 cores);
- Phase 2 (December 2022 and February 2023) depth penetration probing at all infrastructure and track locations at appropriate spacing (3,303 peat probes and seven cores);
- Phase 3 (October 2023) subsequent probing following infrastructure layout adjustment (1,085 peat probes and six cores);
- Development of a maximum depth of peat contour map (**Volume 3a, Figure 8.10** in Volume 3 of the EIA Report) to indicate the peat variation across the Site. The peat depth model presents an accurate peat depth surface with peat depths verified by coring;

- Examination of the variability of the depth of the acrotelm, the thickness of the catotelm and the thickness of amorphous peat; and
- Further mapping of areas peat erosion areas using aerial imagery and from site inspection for potential peat restoration areas (**Technical Appendix 8.3** of the EIA Report).

8.5.28 The following list summarises the results of the various phases of the peat survey and subsequent interpreted peat depth contouring across the Site and Site Access:

- Peat cover is fairly sporadic across much of the Site and Site Access. Its distribution is controlled by the undulating nature of the topography with localised rocky outcrops and depressions resulting in areas of deeper peat between crags and knolls and thinner peat or thin organic soils on the steeper slopes around the rocky outcrops;
- Pockets or localised areas of peat exist up to 7.15m in depth. These areas are most substantial in the central, north-eastern and western parts of the Site.
- In addition to these substantial peat areas there are large areas with shallow or no peat, particularly in the south-east and north of the Site, with shallow areas spread across the Site;
- Acrotelm thickness was an average depth of 0.17m across the Site and Site Access;
- Rate of refusal / the 'feel' method indicated the majority of probes to be located over bedrock, silt or grit, with bedrock being the most commonly recorded substrate (73.7% of probes);
- The coring results have generally verified the depth of penetration probing to be representative of peat depth within 0.1m; and
- There is no peat (0 – 0.5m depth) at 60.8%, peat (>0.5m – 1.0m depth) at 25.7% and peat (>1.0m) at 13.5% of the Site and Site Access.

8.5.29 Although the peat can be considered 'blanket peat', it does not spread continuously across this Site and Site Access, tending to be concentrated in topographical depressions located between rocky outcrops. The majority of the peat is relatively thin at <1.0m in depth with locally deeper patches in broader flatter areas. The deepest depth of penetration probes within the Site were localised to small pockets in areas of lower topographical gradient.

8.5.30 The peat pockets are fairly well spread across the Site with perhaps a slightly higher concentration in the centre, along the northern boundary and in the south. There is limited peat along the Site Access although some occasional pockets of peat were encountered including a short section about 500m west of Barguillean Farm

8.5.31 The peat survey results demonstrate that the distribution of peat (defined as >0.5m depth of peaty carbon rich soils) is significantly less than shown on SNH Carbon and Peatland Map 2016 (**Volume 3a, Figure 8.3** in Volume 3 of the EIA Report). Instead of showing large continuous areas of peat across the Site, as suggested on the SNH map, the peat survey data shows very localised pockets of peat within topographical depressions, plateaus, saddles and flat areas. It should also be noted that the quality and degree of modification of the overlying habitat varies in response to factors including peat depth, topography, history of land management and natural processes.

Peat Geomorphology

8.5.32 The majority of the site comprises localised areas of peat on flatter ground extending into thinner organic soils over ridge side slopes with few discernible features of geomorphological interest. Where peat is at its deepest, it has sometimes been subject to erosion, leaving small areas of hagging, occasionally drained by dendritic and linear gullies. This said, there are relatively few areas of bare peat, and many of the hagged areas have partially recovered with ample vegetation in the floors of the hagged areas.

8.5.33 There are occasional small-scale bog pools, but no major bog pool complexes.

8.5.34 Further information on the geomorphology is presented in **Volume 4, Technical Appendix 8.4 Peat Landslide Hazard Risk Assessment** of the EIA Report**.**

Peat Slide

8.5.35 Construction work on peat has the potential to cause peat instability, which may affect peat soils (and their inherent carbon stores), peatland habitats and nearby watercourses, infrastructure or land uses. A Peat Landslide Hazard Risk Assessment (PLHRA) has been undertaken and is documented in **Volume 4, Technical Appendix 8.4** of the EIA Report. The PLHRA includes detailed site mapping verified by field walkover survey, qualitative and quantitative assessments of peat stability, identification of on- and off-site receptors and calculation of risks associated with peat landslides.

8.5.36 While there are one or two very small-scale instances of minor instability, there was no evidence of previous peat landslides or incipient failure.

8.5.37 The landslide susceptibility approach for peat slides results (shown on **Volume 3a, Figure 8.4.9** of **Volume 4, Technical Appendix 8.4** of the EIA Report) indicate that the vast majority of the site has a 'Low' or 'Very Low' landslide likelihood. There are isolated pockets of Moderate likelihood in the east and west of the Site. There are no areas identified with 'High' or 'Very High' landslide susceptibility and only localised areas of 'Very Low' likelihood.

8.5.38 In total, eight potential source zones were identified where proposed infrastructure overlapped with Moderate or higher likelihood of Factors of Safety <1.4 (under both the baseline and crane-loaded assessments). Key receptors identified were areas of near-natural blanket bog (assigned as such as part of the Peatland Condition Assessment, see **Volume 4, Technical Appendix 6.3** of the EIA Report) and watercourses, both of which were assigned a Medium sensitivity (and consequence in the event of a landslide impact). GWDTE were assigned a High consequence rating. There are no designated watercourses within the Site.

8.5.39 Eight runout pathways (or zones) were defined from the potential source zones and their connectivity with receptors identified. Calculated risks were generally Low or Negligible for six of the eight runout zones, with two of the zones calculated with Medium risks (Zones 22 and 23) (**Volume 3a**, **Figure 8.4.10** of **Volume 4**, **Technical Appendix 8.4** of the EIA Report):

- Zones 22 and 23 are associated with link track to the main access, Zone 22 being above a tributary of the Laggan Burn and Zone 23 just north of the construction compound. Both occur on floating track sections and the calculated Medium risk levels relate to high crane-loaded Factors of Safety rather than high value

receptors. Risks can be mitigated by demonstrating a reduced likelihood of failure at these locations, reducing the potential consequences, or modifying the mode of construction from floating to cut and fill (because the likelihood is associated with floating construction)

Peatland Condition Assessment (PCA)

8.5.40 The PCA survey walkover survey was led by highly experienced habitats surveyor Dr Kate Massey (MCIEEM) of Alba Ecology Ltd. in April 2022 (**Volume 4, Technical Appendix 6.3** of the EIA Report).

8.5.41 Consideration of the condition of the peatland habitat was based on the Peatland Action Guidance for PCA (Peatland Action, 2016). PCA bases the condition of blanket bog on indicators such as bog-moss cover, extent of bare peat and evidence of grazing and burning (Peatland Action, 2016). The PCA recognises four broad categories of peatland condition:

- Near-Natural - peat forming bog-mosses dominant, with no recent fires, little or no grazing pressure and little or no bare peat, heather is not dominant.
- Modified – bare peat is in small patches, fires may be recent, grazing impacts are evident, bog-mosses are absent or rate, extensive cover of heather or purple moor-grass.
- Drained – within 30m either side of an artificial drain or a revegetated hagg or gully system.
- Actively Eroding – actively eroding hagg/gully system, extensive continuous bare peat surfaces.

8.5.42 Following the NVC, the Site was determined to feature complex terrain with blanket bog peatland habitats mainly in valley bases and on shallow slopes. Almost 70% of the PCA study area contained blanket bog peatland vegetation.

8.5.43 All the blanket bog within the ecology Study Area had been subject to some degree of modification e.g. through climate change and nitrogen deposition, historic burning and drainage and extensive grazing pressure was noted across the ecology Study Area, but particularly in the west of the of the study area. The condition of the blanket bog habitat was variable across the ecology Study Area and was on a continuum from very wet bog exhibiting characteristics of Near-Natural blanket bog to highly Modified and Actively Eroding areas.

8.5.44 Around 1% of the study area was found to host blanket bog of a near-natural condition. This habitat contained complexes of bog-pools, bog-mosses hummocks and a relatively intact bog-moss layer which was generally thick and included many species. There were limited signs of grazing impacts of artificial drainage. Near-natural bog on the site was often located in within a basin or valley, with likely deep or very deep peat. It was more frequently recorded in the Western part of the Study Area, with some locations adjacent to the current wind-farm infrastructure.

8.5.45 Around 66% of the Study Area was found to host blanket bog of a lightly modified or modified condition. Lightly modified bog denotes bog habitat which was damp with frequent to abundant bog-mosses, however still clearly exhibiting modifying influence, typically grazing pressure. This accounted for around 9% of the study area. Blanket bog in a modified condition was present across the site. It is characterised by there being little to no bog pools present, a depleted/absent bog-mosses layer and frequent evidence of

grazing pressure. Historic burning, drainage and particularly grazing were given as reasons for the modified nature of the blanket bog.

8.5.46 Around 720 m of historic drainage was identified and mapped in the west of the ecology Study Area, generally straight and between 0.4 m-0.7 m deep. These were often infilled with bog-mosses or other vegetation such as cotton grass and there was little evidence of vegetation change due to drainage either side of the drains, however it is still possible that these drainage channels could still be functional despite the presence of vegetation. Therefore, it would likely be beneficial to the blanket bog to block the drainage ditches.

8.5.47 Around 1% of the Study Area was classed as areas actively eroding or recovering from erosion. Actively eroding areas denote blanket bog habitats with extensive bare peat surfaces, considered all to be modified, drained and actively eroding. They were described as having clear potential for peatland restoration. Recovering erosion areas were those characterised by old erosion features that had less exposed peat than those classed as Actively Eroding with vegetated tops often covering the once bare peat surface. Despite restoring naturally, these areas were still considered to have some restoration potential and have been included as part of the proposed peat restoration measures.

8.5.48 A further GWDTE specific mapping walkover was undertaken by Alba Ecology which recorded very small springs and spring heads across the site (**Volume 4, Technical Appendix 6.3** of the EIA Report in Volume 3 of the EIA Report). These are considered further in the GWDTEs section of this report.

Geology

8.5.49 Digital solid and drift geological maps were sourced from the British Geological Survey (BGS) Digimap (1:50,000 scale) website and reviewed to provide geological information on the Proposed Development. The geology was further reviewed using the scanned BGS 1:50,000 Sheet 45W Connel Solid geology (1991) and 1:63,360 45 Oban Drift geology (1952). The superficial geology is shown on **Volume 3a, Figure 8.4** in Volume 3 of the EIA Report.

8.5.50 The BGS drift geology shows that the majority of the Site is devoid of any significant superficial deposits with just limited soil cover over bedrock. There is a small section at the southern boundary of the Site shown to have an area of alluvium and hummocky glacial deposits and a small section of the existing Site Access and public road to the west of Barguillean Farm having alluvial deposits.

8.5.51 The BGS bedrock mapping (**Volume 3a**, **Figure 8.5** in Volume 3 of the EIA Report) shows the majority of the Site and the Site Access to be underlain by the Lorn Plateau Volcanic Formation comprised of andesite and basalt. This was formed approximately 393 to 424 million years ago at the end of the Silurian Period and beginning of the Devonian Period.

8.5.52 Smaller areas of the Lorn Plateau Volcanic Formation characterised by the presence of Rhyolite and Dacite underlay areas in the extreme western section and the central section of the Site, including Carn Gaibhre and to the south.

8.5.53 Numerous (~35 plus) narrow (~10m) strips of the North Britain Siluro-Devonian Calc-Alkaline Dyke Suite ranging from several hundred metres to several kilometres long underlay scattered areas throughout the Site and occasionally on the along a south-west

to north-east axis. This formation comprises of igneous bedrock formed approximately 358 to 444 million years ago at the end of the Silurian and beginning of the Devonian periods.

8.5.54 The underlying geology has resulted in a series of ridges and troughs which are aligned south-west to north-east across the Site, and which collectively dip gently to the southwest.

8.5.55 Outcrops of bedrock were observed during the site walkover associated with rocky summits, and along watercourses and track cuttings on the existing Site Access.

8.5.56 There are two south-west to north-east aligned geological faults within the Site. One is the western section and a smaller one in the central section.

8.5.57 No evidence of significant mining is known in the Site or was observed during the site visits. One borrow pit was observed to north-east of the existing substation around NGR NM 98733 26256.

8.5.58 There are no publicly available BGS borehole logs or Geological Conservation Review (GCR) area records available the Application Boundary and within 1km of the Application Boundary.

Hydrogeology

8.5.59 The igneous rock deposits that underly the majority the Site and Site Access are low productivity aquifers that are relatively impermeable with low porosity to groundwater. Groundwater flow is therefore likely present in weathered zones near the surface. The bedrock on Site will only yield small, localised quantities of groundwater.

8.5.60 The Site and Site Access are devoid of superficial deposits with the exception of peat and a small section of alluvial deposits to the west of Barguillean Farm. The peat, which is present across much of the Site, but not continuously, is relatively impermeable. Alluvial deposits where present in the valley bottoms associated with water drainage and watercourses, can be relatively permeable and act as a perched localised aquifer above the relatively impermeable bedrock.

8.5.61 SEPA's Environmental Hub database indicates that the Site is underlain by the Oban and Kintyre groundwater body (ID: 150698) that covers an area of 2,663 km^2. The quality of the groundwater has been classified by SEPA as Good with High confidence and the quantity of groundwater has been classified as Good with High confidence in 2020. No trends for pollutants have been identified for this waterbody by SEPA and future objectives for the groundwaters are to remain as Good classification.

8.5.62 The Site is classified as being groundwater vulnerability 5 (highly vulnerable based on a scale of 5 being the highest vulnerability and 1 the least vulnerable). This means that it is considered as being vulnerable to pollutants not readily adsorbed or transformed and that pollution incidents will have a rapid travel time through or over the rocks if a pathway is available.

8.5.63 It should be noted that all groundwater in Scotland is classified as being a drinking water protection area (DWPA).

Groundwater Dependent Terrestrial Ecosystems (GWDTEs)

8.5.64 The National Vegetation Classification (NVC) survey was undertaken across the Study Area and is presented in **Volume 2, Chapter 6: Ecology.**

8.5.65 The NVC survey identified 69 potentially groundwater dependent habitats and 19 potentially groundwater dependent target notes within the buffer zones associated with all proposed infrastructure. These are presented within **Volume 4, Technical Appendices 6.3** and **6.9** of the EIA Report. Potential GWDTEs are shown in **Volume 3a, Figure 8.6.1** and the potential GWDTEs are assessed fully in **Volume 4, Technical Appendix 8.6: GWDTE Assessment** of the EIA Report.

8.5.66 The following types of habitats and target notes were ruled out of being groundwater dependent: i) spatially more extensive areas situated on areas of non-aquifer bedrock geology and drift deposits, ii) those with low floristic value not usually associated with groundwater dependence, and iii) those that lack a clear mechanism of groundwater discharge, due to the geological, hydrogeological and topographical setting. Habitats ruled out on this basis included the following: M15 - Scirpus cespitosus - Erica tetralix wet heath; M23 - Juncus effusus/acutiflorus – Galium palustre rush-pasture; M25 - Molinia caerulea – Potentilla erecta mire; W1 - Salix cinerea - Galium palustre woodland; MG10 - Holcus lanatus – Juncus effusus rush-pasture; MG9 - Holcus lanatus - Deschampsia cespitosa grasslands and U6 - Juncus squarrosus - Festuca ovina grassland, as the hydrogeological setting of these habitats was not considered able to support true groundwater dependence in these potentially 'moderate' likelihood GWDTEs. The rationale is further detailed in **Volume 4, Technical Appendix 8.6 GWDTE Assessment** of the EIA Report and resulted in 21 polygons and 19 target notes with potential groundwater dependence.

8.5.67 Further specific analysis of these areas was completed which identified a total of six target notes that are considered to be groundwater dependent. Five of these are M11 flush habitats (TN7.9.24, TN7.3.68, TN7.3.160, TN7.9.1 and TN7.9.27) and the other, TN 7.9.7, is an M6a acid flush.

Hydrology

Catchments

8.5.68 The Site and the Site Access is located within three main surface water catchments: The River Nant, River Nell/Foechan Mhor and Allt Nathais (**Volume 3a, Figures 8.1** and **8.6a – 8.6c** in Vol 3 of the EIA Report). These and associated sub-catchments are detailed in **Table 8.7**.

8.5.69 The majority of the Site is within the headwaters of the River Nant and River Nell/Foechan Mhor catchments with the majority of the Site Access within the Allt Nathais catchment.

8.5.70 The majority of the Site drains to the south within the River Nant catchment via Eas Ruadh and un-named tributaries of the Laggan Burn, the Allt Carnaich and the Garbh Allt into Loch Nant. Loch Nant discharges to the River Nant that flows northwards to discharge to Loch Etive, north of Taynuilt.

8.5.71 The northern section of the Site drains to south via un-named tributaries of River Lonan which flows west to Loch Nell before discharge as River Nell/Foechan Mhor before discharging to Loch Foechan near Kilmore.

8.5.72 The Site drains in all directions via a series of minor watercourses. In the west, a series of minor watercourses fall south-west to join the Garbh Allt, which, in turn, joins the Abhainn Cam Linne shortly before it enters Loch Nant. The northernmost of these minor watercourses is named Eas Ruadh.

8.5.73 In the south of the Site, there are two minor watercourses, the Allt Carnaich, which issues below Carn Gaibhre and falls past Lochan Creige Ruaidhe to meet Loch Nant, and a minor watercourse that is deflected north-east by the ridge topography to join Laggan Burn and then Loch Nant.

8.5.74 In the north-east of the Site, a series of minor watercourses fall north-east, the southernmost joining Laggan Burn and the northern watercourses being unnamed tributaries of the River Lonan.

Table 8.7 Summary of Hydrological Catchments Connected to the Site

Main Catchment	Catchment	Sub-catchment 1	Sub-catchment 2	Sub-catchment 3
OS Mapping 1:250,000			OS Mapping 1:50,000	OS Mapping 1:25,000
River Nant	Loch Nant	Garbh Allt	Eas Ruadh and un-named tributaries	Un-named tributaries
		Allt Carnaich	Un-named tributaries	Un-named tributaries
		Laggan Burn	Un-named tributaries	Un-named tributaries
River Nell / Foechan Mhor	Loch Nell	River Lonan	Un-named tributaries	Un-named tributaries
Allt Nathais	River Luachragan	Eas na Laraiche Moire		
		Allt an Taillir		
		Allt na Seabhaig		

8.5.75 The Site Access mostly drains north to the Allt Nathais catchment via the River Luachragan, Eas na Laraiche Moire, Allt na Seabeag, the boating loch, Allt an Taillir and other un-named tributaries. The Allt Nathais discharges to Loch Etive north of the Application Boundary.

8.5.76 The watercourses and main catchments are shown on **Volume 3a, Figures 8.1 and 8.6a to 8.6c** in Volume 3 of the EIA Report**.**

Water Features

8.5.77 The assessment of the hydrology of the Site was undertaken through the review of OS 1:50,000 scale, 1:25,000 scale and 1:10,000 scale mapping together with aerial imagery.

The overall Site water features were inspected during a site visit and construction constraints determined through the identification of major hydrological and hydrogeological receptors. The site visit included an assessment of site drainage patterns, springs, water supply sources, sensitive features, water quality field measurements, watercourse crossings assessments and identification of potential source to receptor pathways. A GPS linked photographic record of over 200 photos of hydrological, hydrogeological, geological, topographical and ecological features have been obtained.

8.5.78 Watercourses within the Site are small first or second order streams. Much of the minor watercourses on Site are headwaters and sinuous in nature with small steep V-shaped valleys. They are generally small upland watercourses, with some potential to feed into larger watercourses downstream.

8.5.79 There are three small lochans within the site all located to the north or north west of the Carn Cairbhre summit **Volume 3a, Figure 8.6c** in Volume 3 of the EIA Report. There are some isolated bog pools on the Site and a number of small drainage flush lines.

8.5.80 Although the upland plateau has been subject to wind farm construction, there are relatively few artificial drains.

8.5.81 There is a hydropower scheme abstraction weir located at NGR NM 98230 28234 on the main upland stem of the Allt Nathais. This comprises of a concrete weir and offtake.

8.5.82 Observations and SEPA records on Site and along the Site Access indicated that the watercourses in the vicinity had impassable barriers for fish migrations, such as weirs, piped sections and culverted crossings.

8.5.83 A Scottish Water compound is present at NGR NM 99184 29190 with the signage 'Glenlonan TWS 002402' and posts indicating a water pipeline route were observed alongside the existing public road. This was verified through purchase of plans from Scottish Water.

Water Quality

8.5.84 River basin management plans (RBMPs) set the legally binding locally specific environmental objectives that underpin water regulation (such as permitting) and planning activities. SEPA has introduced water monitoring and classification systems that will provide the data to support the aim of the Water Framework Directive (WFD).

8.5.85 The classification system covers all rivers, lochs, transitional, coastal and groundwater bodies, and is based on an ecological classification system with five quality classes (High, Good, Moderate, Poor and Bad). The classification system has been devised following EU and UK guidance and is underpinned by a range of biological quality elements, supported by measurements of chemistry, hydrology (changes to levels and flows) and morphology (changes to the shape and function of water bodies). Small water bodies (rivers with <10 km² catchment, lochs <0.5 km²) are not classified under the WFD and, therefore, do not have target objectives under the RBMP.

8.5.86 SEPA has classified that all watercourses within the catchment of the Site and Site Access as being less than 10 km^2 and therefore are not monitored under the River Basin Management Plan. The exception is the Allt Nathais catchment containing the Site Access.

8.5.87 The Allt Nathais (ID: 10306, 8.2 km in length) has been classified as Moderate overall condition by SEPA in 2022 with High access for fish migration, water flows and levels, physical condition, freedom from invasive species and water quality.

8.5.88 Loch Nant (ID:100250, 2.1 km^2 in area) to the south of the Site is classified as Good overall condition with High access for fish migration, freedom from invasive species and water quality; and Good water flows and levels and physical condition. Neither the Laggan Burn, Garbh Allt or Allt Carnich watercourses upstream of Loch Nant are classified by SEPA.

8.5.89 The River Nell / Feochan Mhor watercourse (upstream of Loch Nell) (ID:10303, 12.2 km in length) is classified as Moderate overall condition by SEPA in 2022.

8.5.90 Loch Etive is a transitional body (ID 200073, 29.1km^2) to the north of the Site Access and is classified as Good overall condition with High for water quality, invertebrate animals, plankton and hydromorphology and Good for fish and overall ecology.

8.5.91 Field water quality measurements were recorded during the site visits in March 2023 and are presented in **Table 8.8**. The water quality results generally exhibit good water quality which is acidic in nature, typical of drainage in upland moorlands.

Table 8.8: Field Water Quality Measurements

Location	pH	Temperature (°C)	Electrical Conductivity (µS/cm)	Turbidity (NTU)
WQ2 River Luachragan NM 96818 32094	6.20	2.4	110	0.00
WQ4 Unnamed tributary to Allt an Taillir NM 97209 30307	6.40	2.3	82	0.64
WQ5 Allt na Seabhaig NM 97057 29800	6.65	4.2	89	0.47
WQ10 Unnamed tributary to the Allt Nathais NM 98156 28537	7.20	4.2	113	0.60
WQ12 Unnamed tributary to the Allt Nathais NM 98273 27362	6.60	6.0	74	0.00
WQ13 Unnamed tributary to the Allt Nathais NM 98441 26801	6.58	6.2	105	0.00
WQ15 Unnamed tributary to Laggan Burn NM 98669 26050	7.04	5.9	97	1.78
WQ18 Unnamed tributary to Laggan Burn	7.33	4.8	111	1.78

Location	pH	Temperature (°C)	Electrical Conductivity (µS/cm)	Turbidity (NTU)
NM 98045 26065				
WQ19 Unnamed tributary of River Lonan NM9761326189	7.38	5.6	116	0.00

River Flows

8.5.92 There are no flow records for the watercourses on the Site as all the catchments on the site are less than 10 km^2 in area. The nearest flow monitoring station is a compound weir monitoring station on the River Avich at Barnaline Lodge (Station ID 89006, NM971139, 50.9 m AOD) approximately 12 km south of the Site. This is a considerable distance away and not hydrologically connected to the Site.

8.5.93 A combination of the impermeable geology and the peatland hydrology could result in a slightly flashy response in the downstream watercourses. Base flows in the watercourses are unlikely to dry up as the peatlands will sustain them due to steady seepage from the low permeability deposits.

Flooding

8.5.94 A review of the SEPA Flood Map indicates that there is no risk of river or fluvial flooding for the majority of the Site. Fluvial flood risk is shown on **Volume 3a, Figure 8.1 Hydrological Context**.

8.5.95 To the north of the Site, the River Lonan is shown to have an area of fluvial flood risk and the Allt na h-Airde has an associated area of surface water flooding with the watercourse.

8.5.96 The River Luachragan in the northern most section of the Site Access is shown to have a wide fluvial flood risk zone. Downstream of the application boundary the lower reaches of the Allt an Taillir and Allt Nathais have fluvial flood zones, which becomes a wide area below the confluence of these two watercourses.

8.5.97 Based on SEPA Flood risk mapping there are no properties shown to be at risk of surface water or fluvial flood risk within 1km of the Application Boundary.

8.5.98 Loch Etive to the north of the Application boundary is shown to have a risk of coastal flooding around the boundary of the shoreline of the sea loch.

8.5.99 Surface water flood risk zones on the Site are limited to the immediate vicinity of waterbodies, localised areas between summit saddles where gradients are low and along watercourses and drains. No proposed infrastructure is located within these areas, with the exception of watercourse crossings, an approximately 120 m section of new track along a minor ephemeral drain and the existing substation building to be upgraded.

8.5.100 The existing Site Access to the north-west of the loch within Angus's Garden near Barguillean Farm is shown to have some localised surface water flood risk. An area of surface water flood risk is also present upgradient of the existing Site Access track on the Allt an Taillin watercourse..

Watercourse Crossings

8.5.101 A total of 26 watercourse crossings are required for the Proposed Development. Of these, 22 are existing crossings to be reused, extended or replaced and only four are new watercourse crossings.

8.5.102 The four new crossings are all of 1:50,000 scale OS mapping watercourses.

8.5.103 Of the 22 existing crossings to be re-used, extended or replaced, one is a single span crossing and 21 are culverted crossings, 15 are watercourse crossings shown on the 1:50,000 scale OS Mapping, six are of watercourses shown on the 1:25,000 scale OS mapping and one is shown on the 1:10,000 scale OS mapping (minor crossings).

8.5.104 The number of watercourse crossings have been limited where possible, and where required, will be designed to improve on existing crossings to improve habitats and fish migration, where possible. The replacement of existing culverted crossings with bottomless arches or box crossing could be beneficial to improve migratory fish, otter and water vole passage particularly along the section of existing access tracks where fish are more likely to be present. Further information on the fish, otter and water vole presence is presented in **Volume 2**, **Chapter 6: Ecology**.

8.5.105 Watercourse crossings will be subject to appropriate SEPA CAR licencing and will be designed to allow the conveyance of a 0.5% AP (200 year) flow event plus an allowance for climate change and freeboard. Additionally, mitigation will put in place to control and attenuate runoff during all phases of the development and crossings will be regularly check and maintained during operation.

8.5.106 The watercourse crossing locations are shown on **Volume 3a, Figures 8.6a to 8.6c** in Volume 3 of the EIA Report. The details of the crossings are presented within **Volume 4, Technical Appendix 8.7** of the EIA Report.

Private and Public Water Supplies and Abstractions

Public Water Supply

8.5.107 There are no known public water supply sources within the Site or within 1km of the Proposed Development infrastructure and the Site is not shown to be within a Surface Water Drinking Water Protection Area (DWPA) based on the Scottish Government's 2014 published mapping of surface water DWPAs. However, consultation with Scottish Water has confirmed that Loch Nell, which is used for a public water supply is within the catchment of the Site and approximately 9.8 km downstream to the north-west of the Site. Therefore, Scottish Water considers the northern section of the Site to be with the Loch Nell surface water DWPA, albeit a significant distance away that would allow for significant dilution of any runoff the Site effecting the public water supply.

8.5.108 Consultation with Scottish Water also highlighted that the following lochans to the south-east of the Site are surface water DWPA's: Loch an Leoid and Loch an Droighinn. Whilst these public water supply lochans are not hydrologically connected to the Site, there is a Scottish Water pipeline from these reservoirs to Taynuilt that runs along the existing public road east of Barguillean Farm and the Scottish Water Glenlonan TWS 003402 compound is located at approximately NGR NM 99190 29190 (**Photos 1** and **2**).

Photo 1 Scottish Water Glenlonan TWS sign

Photo 2 Scottish Water compound adjacent to existing track.

8.5.109 The plans for these Scottish Water assets were purchased so that the indicative pipeline route could be considered as a receptor.

8.5.110 Scottish Water infrastructure and relevant surface water DWPAs are shown on **Volume 3a, Figures 8.6** and **8.6b** in Volume 3 of the EIA Report**.**

8.5.111 The Site is classified as a groundwater DWPA; however, it should be noted that the whole of Scotland is classified as a groundwater DWPA.

Abstractions

8.5.112 Consultation has been undertaken with SEPA to determine if there are any licensed abstraction within a 1km of the Application Boundary. At the time of writing no response has been received.

8.5.113 There is a known inlet for a hydro power scheme located on an unnamed tributary to the Allt Nathais around 50 m east of the Site Access track at NM 98230 28234 (**Photos 3** and **4**).

Photo 3 Hydroscheme intake weir downstream

Photo 4 Hydroscheme intake weir upstream

8.5.114 There are three hydroscheme intake dams on the headwaters / un-named watercourses of the River Lonan to the north of the Site at NGR NM 9758 2681, NM 9737 2690 and

NM 9701 2706 (**Volume 4, Technical Appendix 6.7 Survey of Fish Habitats**). The turbine house for these intakes is at approximately NGR NM 97530 28360 and is shown on Volume 3a, **Figure 8b**..

Private Water Supplies

8.5.115 Private water supply (PWS) records for the council area were obtained from A&BC and reviewed together with OS mapping and imagery to identify properties potentially reliant on PWSs that could be hydrologically connected to the Site.

8.5.116 A Site visit was undertaken in March 2023 to visit potential PWSs hydrologically connected to the Site. Two PWSs (Barguillean Farm PWS and Bar Glas and Bar Bheag PWS) were originally identified with the potential to be connected to the Site Access from the Barguillean Farm area of the Site.

8.5.117 Following further design iterations, including the Site Access, the PWS information was reviewed again and site visits undertaken to confirm the location of the Lonan House PWS and the Dailnamac PWS.

8.5.118 An additional PWS at a property known as Achnameadhonach was also identified and the abstraction location confirmed.

8.5.119 Five PWS abstraction points were identified that were potentially hydrologically connected to the Application Boundary:

- PWS 1 (type A1) supplies Barguillean Farmhouse, Josephine's Wing (self-catering cottage), Granary Cottage and farm buildings. PWS 1 source is taken from a spring at approximately NGR NM 98157 28481 located in close proximity to the existing Barguillean Farm access track and approximately 25 m from the closest section of proposed new excavated track.
- PWS 2 (type B) supplies Bar Glas and Bar Beag properties and its source is from a wide diffuse area that becomes a small watercourse with dam at approximately NGR NM 97922 28513 200 m north-west of the proposed new excavated track section.
- PWS 3 (type B) supplies Lonan House and its source is from a burn, the Allt na h-Airdh, at approximately NGR NM 99050 28950, approximately 95 m distance south and downgradient of a 280m section of the public minor road.
- PWS 4 (type B) supplies the Dailnamac property directly from the Eas na Làraiche Mòire watercourse. The water is abstracted from the watercourse at NGR NM 97315 31810 source and is about 200m west of the existing track to be upgraded however it is separated by a topographical boundary. The source is also about 500m downstream of where the Eas na Làraiche Mòire watercourse crosses the existing track to be upgraded (watercourse crossing 3).
- PWS 5 (type B) supplies Achnameadhonach and its source is from a burn, the Allt Nathais, at approximately NGR NM 98571 30627. The water is abstracted via a basic intake located in woodland, feeding into a settling tank. From there, it is gravity-fed to the property.

8.5.120 PWS1 source and infrastructure is potentially connected to the existing Site Access and sections of the proposed new Site Access and therefore has the potential to be impacted by the Proposed Development.

8.5.121 PWS2 source is not hydrologically connected to the Proposed Development and the new section of access track is further away than the existing one, therefore this is scoped out of the assessment.

8.5.122 PWS3 source is not hydrologically connected to the Proposed Development and therefore is scoped out of the assessment.

8.5.123 PWS4 is hydrologically connected to the existing Site Access to be upgraded and has the potential to be impacted by the Proposed Development.

8.5.124 PWS5 is hydrologically connected to the existing Site Access to be upgraded and has the potential to be impacted by the Proposed Development.

8.5.125 These PWSs are considered further in Volume 4, **Technical Appendix 8.5** of the EIA Report and shown on **Figure 8.5.1a** and **8.5.1b**..

Designated Sites

8.5.126 The relevant designated sites are shown on **Volume 3a, Figure 8.1** in Volume 3 of the EIA Report.

8.5.127 There are no international or national designated sites located within the Application Boundary. The nearest designated site is the Glen Nant SSSI, Glen Nant National Nature Reserve (NNR) and Loch Etive Woods SAC located to the east of the site and site access. These designated sites are 15 m from the Application Boundary at their closest points. These are within a separate hydrological sub-catchment and therefore not hydrologically connected to the Proposed Development infrastructure.

8.5.128 Approximately 175m east and north-east of the northern section of the existing Site Access, at its closest point, is another area of the Loch Etive Woods SAC and the Airds Park and Collie Nathais SSSI. These are within the catchment of the Site Access being within the Allt Nathais catchment.

8.5.129 Approximately 1.5 km west of the northern section of the existing Site Access, at its closest point, is another area of the Loch Etive Woods SAC and the Clais Dhearg SSSI. These are not hydrologically connected to the Proposed Development.

8.5.130 The details of the relevant designated sites are listed below:

- Loch Etive Woods SAC (total area 2642ha) has been designated primarily for the Annex I Habitats *Tilio-Acerion* forest, occurring within deeply-incised rocky gorges associated with Glen Nant and in the nearby Coillie Leitire, and old sessile oak woods, of which Loch Etive Woods is one of three sites representing old sessile oak woods in the south-west highlands, also supporting important populations of the rare butterfly *Carterocephalus palaemon*. Non-primary qualifying features of the site include the presence of the Annex I Habitat Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior*, and the Annex II species otter (*Lutra lutra*).
- Glen Nant SSSI for biology (502 ha) has been designated due to being one of the largest extents of upland oak woodland in the Lorn area, supporting rich lichen and bryophyte assemblages and providing habitat for a nationally-rare species of cranefly *Tipula luridorostris*.
- The Glen Nant National Nature Reserve (338 ha) is contained within the boundaries of the Glen Nant SSSI. This NNR is also designated as a category IV protected area by the International Union for the Conservation of Nature.

Designated for oakwoods, birchwoods, hazelwoods, lichens and mosses. Glen Nant is amongst a collection of Scottish sites that are the European headquarters for rare Lichens and mosses. Non-native trees are being felled in the higher areas as part of the restoration process of the rainforest.

- Airds Park and Coille Nathais SSSI for biology (356 ha) has been designated for upland oak woodland, supporting populations of the marsh fritillary (*Euphydryas aurinia*) butterfly.Loch Etive is a SEPA designated Shellfish Water Protection Area (SWPA 37) and designated by the Food Standards Scotland (FSS).

Fish and Other Water Dependent Species

8.5.131 Evidence of otter (spraints) and potentially (however not confirmed) water vole was recorded within the Site and Site Access areas. No Fresh Water Pearl Mussel (FWPM) were recorded in the Site. This is discussed further in **Volume 2, Chapter 6: Ecology** of this EIA report.

8.5.132 A qualitative walkover survey of stream habitats was carried out in June 2022 and detailed in **Volume 4, Technical Appendix 6.7 Fish Habitat Survey** of the EIA Report and **Volume 2, Chapter 6: Ecology**.

- A waterfall (Eas nan Clag at NN 01280 26580) on the River Nant makes all of the streams draining the south side of the side impassable to migratory salmonids. Due to steep gradients, it is clear that those reaches of the small watercourses draining north towards the River Lonan are also naturally inaccessible to migratory salmonids. As a result, the only species of conservation interest potentially present in streams are resident brown trout *Salmo trutta* and European eel *Anguilla anguilla.* The latter may be able to access areas inaccessible to salmonids due to their ability to climb and crawl over certain obstacle types.
- The hydroscheme on the Allt Nathais tributary at NGR NM 98230 28230 to the west of the Site Access and north-east of the Site and three hydroscheme intake dams on the headwaters / un-named watercourses of the River Lonan to the north of thee Site at NGR NM 9758 2681, NM 9737 2690 and NM 9701 2706, form barriers to fish passage.
- Most of the surveyed watercourses were small and steep with relatively little flow and offered poor habitat for fish.
- Good trout habitat was found in the Laggan Burn in the east of the Site, and in the lower reaches of Eas Ruadh to the south-west of the Site.
- Trout were seen in Laggan Burn and Eas Ruadh and some of their tributaries.
- The un-named tributary of the Laggan Burn in the east of the Site has the potential for Brown Trout.
- No trout or other fish species were seen in other surveyed watercourses on Site. It should be noted that the watercourses of the existing Site Access were not surveyed.

General Site Conceptualisation

8.5.133 The Site is characterised by low permeability superficial peat deposits over low permeability bedrock which is occasionally exposed on ridges or in areas where water has eroded the overlying superficial deposits. The low permeability of both the superficial deposits and the bedrock will allow limited infiltration of rainfall and relatively high runoff rates. Groundwater movement within the superficial deposits is therefore also slow.

8.5.134 Groundwater dependent M11 flush habitats are frequent across the Site sustained by base-rich flows where shallow groundwater is present within near-surface cracks and discontinuities within the bedrock.

8.5.135 On the basis of the baseline information and professional judgement, the key sensitive receptors identified for the Site and carried through to detailed assessment are:

- Surface watercourses, lochs and lochans;
- Barguillean Farm, Bar Ghlas and Bar Bheag, Dailnamac and Achnameadhonach PWSs located in the vicinity of the access track;
- GWDTEs; and
- Peatland Habitats.

8.5.136 A summary of the Sensitive receptors identified on Site and potentially connected to the Site are summarised in **Table 8.9**.

Table 8.9: Sensitive Receptors

Sensitive Receptors		Sensitivity	Rationale/Designations
Terrestrial	Non peaty or peaty / organic rich soils <0.5m in depth	Low	Guidance on Developments on Peatland - Site Surveys
	Peat <1.0m in depth or modified peatland	Medium	Guidance on Developments on Peatland - Site Surveys
	Peat in open moorland (non-drained, eroded or forested) >1.0m depth	High	Guidance on Developments on Peatland - Site Surveys
Groundwater	Shallow groundwater within 250m PWS	Very High	Supplies Barguillean Farm and Bar Ghlas and Bar Bheag PWSs and maintains water dependent habitats and peat saturation
	Shallow groundwater	Low	Limited resource and no users
	Deep Groundwater	Low	Limited resource and no users
Surface Watercourses and Waterbodies	Loch Etive	High	Shellfish
	Allt Nathais Catchment		
	Allt Nathais	Very High	Supplies Achnameadhonach PWS
	River Luachchragan, Allt an Taillir, Allt na Seabhaig	High	Watercourses that allow fish passage for protected species. Flood risk lower reaches Allt Nathais and River Luachchragan
	Eas na Làraiche Mòire	Very High	Supplies Dailmanac PWS
	Un-named Boating lochan	High	Contains trout
	Minor watercourses	Medium	Connected to the Allt Nathais but fish passage is not possible, including upgradient of the hydro power dam

Sensitive Receptors		Sensitivity	Rationale/Designations
	River Nell/ Feochan Mhòr Catchment		
	All 1:25 k and 1:50 k watercourses upgradient of the River Lonan	Medium	Connected to the River Lonan but fish passage is not possible, including upgradient of the hydro power dam Upper reaches of Scottish Water DWPA
	River Lonan	High	Upper reaches of Scottish Water DWPA
	Loch Nell	Very high	Scottish Water public water supply
	River Nell/ Feochan Mhòr	Medium	River Nell/ Feochan Mhòr classified as 'moderate' condition under the WFD
	Loch Nant Catchment		
	Watercourses upgradient of existing substation	Medium	Connected to Laggan Burn but fish passage not possible due to culverted crossings
	Laggan Burn – down gradient of the watercourse crossing at the existing Substation. Garbh Allt, Eas Ruadh	High	Potential for protected brown trout fish habitat
	All 1:25 k and 1:50 k tributaries of Loch Nant (with exception of those listed above)	High	Connected to Loch Nant, classified as 'Good' condition under the WFD Potential for protected fish habitat
	Loch Nant	High	Potential for protected fish habitat

Note, Receptors not potentially connected to the Proposed Development have been scoped out and therefore not included in this table.

Implications of Climate Change

8.5.137 The climate change projections in the west of Scotland for the 2060s, when the operational period of the Proposed Development is likely to end, highlight that in the 2060s, summer and winter temperatures are likely to be greater than the current baseline (greater for summer), with winter rainfall increasing and summer rainfall decreasing.

8.5.138 The summary of the relevant climate change projections using the UK Climate Change Projections 2018 (UKCP18) are):

- Temperatures are projected to increase, particularly in summer;
- Winter rainfall is projected to increase and summer rainfall is most likely to decrease;
- Heavy rain days (rainfall greater than 25mm) are projected to increase, particularly in winter;

- Near surface wind speeds are expected to increase in the second half of the 21st century with winter months experiencing more significant effects of winds; however, the increase in wind speeds is projected to be modest; and
- An increase in frequency of winter storms over the UK.

8.5.139 The projected climate change scenario is likely to affect the baseline conditions in relations to the water and soil environment in the following ways:

- Deterioration in peatland habitat condition: Predicted changes in the pattern of rainfall will lead to a deterioration in the condition of the peatland habitats. Dry conditions in the summer period will draw down the water table, reducing the suitability of affected areas for sustaining peat-forming vegetation, such as abundant Sphagnum moss cover and increase drying rates at the exposed peat margins.
- Habitat loss for peatlands and other upland habitats: Increased winter rainfall may exacerbate existing erosion rates, leading to direct loss of peatland habitat.
- Habitat loss for wetlands: Drier conditions in summer may in the long-term result in the loss of these habitats.
- Increase in flooding in winter: Increased winter rainfall is likely to increase peak flows and therefore flooding extents.
- Higher potential erosion and therefore sediment transfer to watercourses due to increased winter rainfall.
- Water resources: Less snow on the ground in winter and drier summers will lead to a reduction in groundwater recharge for groundwater water supplies and reduction in water quantity and quality in summer months for surface water resources.
- Higher intensity rainfall events will increase runoff, flooding potential and potentially reduce water quality as water will have less time to filtrate through vegetation and shallow soils.
- Climate change will affect the water quantity and quality of water resources used for PWSs and Scottish Water public drinking water supplies. Evidence of this was observed generally in parts of Scotland in summer 2021 and 2022 where river levels were very low with algal blooms present, and shallow springs used for generations experienced drought.

Future Baseline in the Absence of the Proposed Development

8.5.140 The predicted environmental conditions and potential changes which may occur in the absence of the Proposed Development are outlined below. This includes natural changes, including climate change (see above), land use practices and future developments:

- Continued deterioration of many of the peatland habitats through erosion and drying out. Although some areas are showing signs of natural restoration the majority are degrading,
- Continuation of rough grazing in open moorland areas increasing erosion, drying and ground poaching,
- Continued impediment of natural water flows and fish migration by the use of culverted watercourse crossings and hydro scheme or abstraction weirs within the catchments.
- Changes to rainfall in terms of intensity and duration which may lead to higher flows and longer drought periods which may reduce water availability at times for surface water PWS.

- Continuation of commercial coniferous woodland plantations, forestry activities and new commercial forestry activities including tracking, borrow pits, drainage alteration, watercourse crossings, felling, ground disturbance and risks for sediment release and acidification of watercourses.
- Removal of existing wind farm infrastructure with the potential for small areas of peat restoration where hardcore materials are removed.

8.6 Embedded Mitigation

8.6.1 A number of embedded mitigation measures have already been applied as part of the iterative design process (see below and Chapter 2: Proposed Development and Design Evolution of the EIA Report), to avoid the higher value areas of peatland, GWDTEs, waterbodies and watercourses.

Design Considerations

8.6.2 Where possible, the following principles have been adhered to in the design of the Proposed Development:

- All wind farm infrastructure has been sited with an objective to maintain at least a 50m 'buffer zone' from natural watercourses and water bodies (including bog pools) shown on 1:50,000 scale and 1:25,000 scale Ordnance Survey mapping.
- Infrastructure, where possible, is located outside of flood zones, with the exception of watercourse crossings.
- Wind farm infrastructure was designed to minimise the number of new watercourse crossings and existing access tracks have been utilised where possible.
- All wind farm infrastructure has been designed to avoid, where possible, peatland and deeper peat, as well as potential peat slide hazard risk areas, taking into consideration other constraints. Peat deposits were identified across 39.2 % of the Site (1.68 km^2) during the peat depth surveys. Peat deposits were mostly present in pockets at depressions and near waterbodies across the area surveyed. The locations of turbines and infrastructure have been designed to avoid deeper peat deposits where possible, considering the other constraints on the Site. Further investigation subsequent to planning approval on the ground conditions and micro-siting of the tracks and turbines will be undertaken to ensure the minimal amount of peat is disturbed and to identify detailed peat slide mitigation.
- Floating track is proposed to be used where track is located on peat >0.5m depth for greater than 50m in length to reduce peat excavation, where feasible considering other constraints, to reduce peat extraction.
- Where good quality peat is required to be extracted it will be appropriately reused and restored within close proximity to where it is extracted, with no requirement for temporary storage.
- During the detailed design and construction phase, sections of track will be surveyed and micro-sited to optimise the distance from water bodies, check for otter evidence, minimise peat disturbance and peat slide hazard.
- Forest felling will be minimised and restricted to the minor areas upgrading the existing Site Access.
- Concrete will either be delivered to the Proposed Development in a "ready mix" form or processed in a concrete batching plant located onsite within the

construction compound. Concrete batching on Site will require a water supply from a water body on Site or imported in tankers and stored at the batching site. Each turbine foundation requires approximately 150m^3 of water for concrete production, including washdown, with a pour likely to occur every three days. A water supply of 50m^3 per day or 0.6 litres per second would therefore be required for the operation of the batching plant. If this supply is sourced from within the Site a licence for abstraction will be obtained from SEPA post-consent.

Micrositing

8.6.3 Micrositing of infrastructure up to 50 m may be required to take account of local conditions. In the event that this is required, consideration will be given to the potential effects on hydrology, geology and peat, including proximity to watercourses, water features, the presence of peat and PLHRA.

8.6.4 Where micrositing is required, where possible, this will not reduce the proximity to the sensitive hydrological, hydrogeological, geological and peat features identified.

8.6.5 A suitably qualified Ecological / Environmental Clerk of Works (ECoW) and Geotechnical Engineer will be present on site during the construction period to provide initial onsite advice for micrositing.

Good Practice Measures

8.6.6 **Volume 4, Technical Appendix 8.1** of the EIA Report details the good practice techniques that will be employed during construction and operation**.** These techniques are assumed to be in place for the purposes of the assessment, thus they are not considered as mitigation but as an inherent part of the construction process. The list in **Volume 4, Technical Appendix 8.1** of the EIA Report is not exhaustive and guidance and good practice literature will be used when construction commences. Where required, mitigation measures are additional measures which are specific to the source-pathway-receptor at risk to address likely significant risks.

8.6.7 To ensure all reasonable precautions are taken to avoid negative effects on habitats, protected species and aquatic interests, a suitably qualified ECoW will be appointed prior to the commencement of construction and they will advise the Applicant and the Principal Contractor on all ecological and hydrological matters.

8.6.8 The risk of peat slide can be mitigated through good engineering practice prior to construction, during construction and post construction as set out in **Volume 4, Technical Appendix 8.4** of the EIA Report. All construction activities and operational decisions that involve disturbance to peat deposits should be overseen by an appropriately qualified geotechnical engineer with experience of construction on peat sites.

8.7 Assessment of Likely Significant Effects

8.7.1 The assessment of effects is based on the project description as outlined in **Volume 2, Chapter 2**: **Proposed Development and Design Evolution**.

8.7.2 The following section describes the potential effects of the Proposed Development during the construction phase in relation to the sensitive receptors of the Site highlighted in **Table 8.9**, prior to additional mitigation and management, but assuming that all embedded mitigation and good practice methods are employed. The purpose of this

assessment is to identify areas of the Proposed Development infrastructure where specific mitigation and management measures are required to mitigate any significant (Major or Moderate) effects. The assessment of effect significance has been undertaken based on the assessment of baseline conditions across the Site and with reference to the significance criteria in **Table 8.2**.

8.7.3 Where the significance of effect is assessed as being moderate (significant) or above with good practice and standard mitigation applied, further site-specific (additional) mitigation is required. Where applicable, the additional mitigation and the residual significance of effects are summarised and discussed below.

8.8 Assessment of Potential Effects - Construction

8.8.1 The potential effects on hydrology, hydrogeology, geology and peat, are considered for each element of the infrastructure associated with the Proposed Development and are discussed below.

8.8.2 Possible hydrological, hydrogeological and geological effects resulting from the construction of the Proposed Development are related to five main factors as detailed below:

- Erosion and Sedimentation Effects.
- Alteration of Flow, Natural Drainage Patterns/ Runoff Volumes and Rates.
- Increase in the Magnitude or Frequency of Flooding Events.
- Potential Pollution events affecting Groundwater and Surface Water Quality.
- Alteration of Geology, including peat.

Erosion and Sedimentation Effects

8.8.3 Unmanaged erosion/sediment deposition and suspended solids generated from ground disturbance and new infrastructure, could be transported to receptors directly by surface run-off or could cause modification to stream channel morphology. This can result in smothering of habitats and effects on both terrestrial and aquatic flora and fauna, especially fish. Potential effects may occur from the following:

- Construction of access tracks (the total length of the Site Access and Internal Access Tracks would be approximately 12.83 km of which 2.71 km is new access track (1.6 km floating) with associated new watercourse crossings and 8.52 km is existing access track and watercourse crossings which would need to be upgraded). Construction of the excavated tracks will involve stripping and stockpiling of material to expose underlying soils or bedrock, potentially increasing runoff and the potential for transportation of sediment. Floating tracks will involve building the track on the existing surface vegetation mat with geotextile layers, minimising excavation of peat, however side slopes will be required.
- Construction of four new watercourse crossings and possible replacement of 20 existing watercourse crossings increasing the potential for increased runoff of silt and debris and erosion.
- Removal and stockpiling of material for each turbine foundation base and crane hardstanding, which could result in increased silt run-off.
- Dewatering of shallow groundwater and direct rainfall into excavations (potentially containing silt and other debris), which may result in transportation of

fine sediments into watercourses. This would be compounded by increased movement over and around these disturbed environments.

- Extreme rainfall events which could result in the overflowing of existing onsite drainage and resulting erosion and sediment transport, as well as the potential failure of pollution prevention measures to operate under high runoff flow conditions.
- Vehicle movements around the Site transporting silt off site.
- Rock, topsoil, peat storage and reuse.
- Forest felling runoff.
- Peat slides of material into watercourses.

Effects on Surface Water Features

8.8.4 Infrastructure within the Site and Site Access has been located, in so far as possible, over 50 m from watercourses or waterbodies (shown on 1:50,000 scale and 1:25,000 scale OS mapping), with the exception of where tracks approach watercourse crossings at the locations presented in **Volume 4, Technical Appendix 8.7** of the EIA Report.

8.8.5 The sensitivities of the watercourses and waterbodies within the catchments on the Site are generally **Low to Medium**. Those downstream of the Site and on the Site Access where protected fish may be present are **High**. Those supplying a PWS are considered **Very High**.

8.8.6 Infrastructure adjacent to a Very High Sensitivity Receptor is:

- Approximately 185 m of upgraded track within the Fearnoch Forest section of the access track is within 50 m of the Eas na Làraiche Mòire (tributary to the Allt Nathais; Very High sensitivity). The proposed track upgrade is 22 m in distance from the Eas na Làraiche Mòire at its closest point and over 500 m upstream of PWS 4 Dailnamac property source. Temporary construction compound 2 is located about 1.5 km upstream of PWS 5 Achnameadhonach property source.

8.8.7 Infrastructure adjacent to High sensitivity receptors are listed below:

- Approximately 280 m of upgraded track is within 50 m of River Luachragan (tributary to the Allt Nathais; High sensitivity) in the north of the Site Access track. The proposed track upgrade is 7 m distance from the River Luachragan at its closest point with very steep gradients down to the watercourse;
- Approximately 385 m of upgraded track within the Fearnoch Forest section of the access track is within 50 m of the Allt an Taillir (tributary to the Allt Nathais; High sensitivity). The proposed track upgrade is 6 m distance from the Allt an Taillir at its closest point;
- Approximately 390 m of upgraded track is within 50 m of the Allt na Seabhaig (tributary to the Allt Nathais; High sensitivity) and approximately 263 m of upgraded track is within 50 m of a tributary of the Allt nah Seabhaig in the south of the Fearnoch Forest access track. The proposed track upgrade is 5 m from the tributary to the Allt na Seabhaig at its closest point; and
- Approximately 188 m of the north of the Barguillean Farm access track is within 50 m of a tributary to the Allt Nathais (High Sensitivity). It is 13 m from the watercourse at its closest point.

8.8.8 Infrastructure located directly on a Low sensitivity receptor:

- A section of approximately 120 m new track follows an ephemeral drain / tributary of an 1:50k watercourse and along an M6a flush. (This design was chosen to

avoid near natural / active peatland habitats which is considered to be a higher sensitivity).

8.8.9 The magnitude of impact on these features is generally considered to be **Low** due to the implementation of good practice methodologies and that much of the existing Site Access track only requires minor upgrading. When combined with the Medium to Very High sensitivity of the watercourses there is likely to be a direct, temporary, short-term adverse effect which is considered to be **Minor (not significant)**.

8.8.10 Where infrastructure is in close proximity to the High sensitivity receptors listed above, the magnitude of impact is considered to be **Medium**. Areas that are within 10m and /or on steep slopes adjacent to **High** sensitivity watercourses are more likely to have adverse effects, however as the increased level of sensitivity is only due to fish and any effects are considered to be short term and would not have a significant effect on the fish population the significance of effect is still considered to be **Minor (not significant)**.

8.8.11 It is noted that most of the infrastructure located within watercourse buffers is associated with upgrades to the existing Site Access track and these will be undertaken on the side of the track further from the watercourse. careful embedded water management and monitoring, as outlined in **Volume 4, Technical Appendix 8.1**

8.8.12 Where infrastructure is located within 50m of **Very High** sensitivity receptors (PWS) the significance of effect is higher and is discussed below in Effects on PWS. The ephemeral drain and M6a flush habitat north of watercourse crossing 16 is of **Low** sensitivity, however as the Proposed new track is located over the drain alignment the magnitude of impact is **Very High** as the track will require the rerouting the ephemeral drain and cause the direct loss of the M6a flush habitat. Therefore, the significance of effect is **Moderate (Significant).**

Effects on PWS

8.8.13 Three PWS sources were identified in hydrological connection to the proposed excavated Site Access track and could potentially be affected by the Proposed Development (**Volume 4, Technical Appendix 8.5** of the EIA Report). These are all assessed as **Very High** sensitivity due to their usage for human consumption:

- Barguillean Farm PWS 1 (supplying Barguillean Farmhouse, Josephine's Wing (self catering cottage), Granary Cottage and farm buildings) lies 25 m east of the proposed Site Access track (new track section upgrade) and there is the potential for a **Medium** magnitude of impact. A **Moderate** significance of effect is therefore assessed for potential sedimentation effects to this receptor.
- Dailmanac PWS 4 is sourced from the Eas na Làraiche Mòire watercourse which is connected to a section of the existing Site Access track to be upgraded and two existing track watercourse crossings, therefore there is a **Medium** potential magnitude of impact. The abstraction is approximately 500m downstream from the nearest works and due to embedded mitigation, the distance and dilution effect, there is unlikely to be an effect however if it occurred it would have a **Moderate (significant)** significance of effect on this receptor.
- Achnameadhonach PWS 5 is sourced from the Allt Nathas watercourse which is connected to the temporary construction compound 1, which requires no excavation as hardstanding is already present, and associated existing Site Access track. The abstraction is about 1.5 km downstream of the nearest works and due to the lack of excavation required, embedded mitigation, the distance

and dilution effect, the likelihood of their being an adverse effect is unlikely but if it occurred it would have a **Moderate (significant)** significance of effect on this receptor.

8.8.14 Therefore, there is a potential for there to be a significant adverse effect on these water supplies without additional mitigation. Mitigation for these PWS is described in **Volume 4, Technical Appendix 8.5** of the EIA Report.

Alteration of Flow, Natural Drainage Patterns / Runoff Volumes and Rates

8.8.15 The development of tracks and cable trenches has the potential to alter natural drainage on the Site by the creation of altered preferential flow pathways. If constructed against the topographic gradient, roads could act as barriers to run-off resulting in the ponding of water. If constructed in line with the gradient, the development of preferential flow down the roadway could occur. This has been considered in the design where possible with other constraints.

8.8.16 Changes to the natural drainage and runoff rates could affect sensitive water dependent habitats, such as bog habitats, as well as fish and protected species habitats (e.g. otter and water vole).

Effects on GWDTEs

8.8.17 The infrastructure of the Proposed Development has been designed to avoid, as far as is practicable, areas that have been identified as GWDTEs, with the exception of existing track that requires upgrading. The GWDTE assessment is presented in **Volume 4, Technical Appendix 8.6** of the EIA Report and six GWDTEs were identified that were both actually groundwater dependent and potentially hydrogeologically connected to the Proposed Development infrastructure. These are presented on **Volume 3a, Figure 8.8** in Volume 3 of the EIA Report.

8.8.18 The M6a acid flush at TN 7.9.7 identified by the ecological surveys is groundwater dependent and will be affected by the Proposed Development. The flush will likely be lost along with the associated ephemeral watercourse due to the proposed track disrupting the hydrological regime. It is very small in size, ephemeral and is not a good example of the community type. It is not considered ecologically important to the Site as a whole. This is assessed above in Erosion and Sedimentation Effects - Effects on Surface Water Features.

8.8.19 Five M11 flushes, a base-rich floral community found in alpine settings dependent on groundwater flow through the weathered zone of the bedrock, were also identified and considered at risk from the Proposed Development:

- Target note 7.9.24 could be affected due to proposed track and turbine infrastructure upgradient. This infrastructure is situated close to a spur feature with a limited upgradient catchment, and is around 120 m upgradient of the feature at its closest point. It is therefore unlikely that this feature will be lost due to the proposed infrastructure;
- Target note 7.3.68 could be effected due to its close proximity to proposed new floating track. While the use of floating track may preserve hydrogeological continuity, micro siting of new track 50 m to the north west is recommended for this habitat if feasible;

- Target note 7.3.160 is at risk of an impact due to the potential for the upgradient infrastructure to intercept flow. Monitoring is recommended during the construction phase for this habitat as there is a low to moderate likelihood that this habitat could be affected;
- Target note 7.9.1 could be effected due to its location directly downgradient of the track; however this could be substantially reduced through micrositing the track about 20 m downgradient and the use of pipe culverts to allow downgradient flow from the feature to cross under the proposed track; and
- Target note 7.9.27 will likely be lost due to its proximity to the proposed turbine infrastructure unless micrositing is possible as it is located immediately adjacent to proposed excavations for T06.

8.8.20 M11 flush habitats are abundant across the Site, typically found below steep slopes where shallow groundwater in the sub-surface weathered zone of the bedrock exits to the surface. The GWDTE walkover survey (**Volume 4, Technical Appendix 6.3** of the EIA Report) identified a total of 33 M11 flushes across the specific walkover area whilst the vegetation assessment of proposed turbine locations (**Volume 4, Technical Appendix 6.9** of the EIA Report) identified a further seven M11 flush features just within the direct vicinity of proposed infrastructure. Whilst these habitats are groundwater dependent and highly sensitive, only five of the 40 M11 flush features recorded during the Site survey are considered to be threatened by the development with the rest being avoided through design. None of these features were observed to feed into larger GWDTEs and therefore GWDTE impacts will be limited to these features themselves, which are small and of relatively low ecological importance individually.

8.8.21 For these reasons, the sensitivity of these GWDTEs are considered to be **Low,** magnitude of potential impact is **Medium** (for the indirect effects to M11 habitats) to **Very High** (for the direct effects to the M6a habitat), therefore, the adverse effect on these habitats through flow alteration over the Site as a whole has been assessed as having a **Minor (not significant)** for the M11 habitat to **Moderate (significant)** significance of effect for the M6a habitat. Mitigation for these GWDTEs is described in **Volume 4, Technical Appendix 8.6** of the EIA Report.

Effects on PWS

8.8.22 As stated for effects from sedimentation and erosion, the three PWS sources identified in close proximity to the proposed excavated Site Access track are presented in **Volume 4, Technical Appendix 8.5** of the EIA Report and have **Very High** sensitivity due to their usage for human consumption. It is highly unlikely that any significant alteration of flow would occur for either PWS4 or PWS5 due to the size of the surface water catchments associated with the abstractions therefore the magnitude of impact is considered to be **Low** resulting in a **Minor (not significant)** significance of effect.

8.8.23 PWS 1 supplies the Barguillean Farmhouse, Josephine's Wing (self catering cottage), Granary Cottage and farm buildings and is located adjacent to the existing track and approximately 25m distance east of the proposed new track section at its closest point. The bedrock is a low productivity aquifer and therefore any groundwater flow will be within a weathered zone of about 1 m depth and will mimic the topography. It is likely that the catchment for this supply originates from the slopes to the south south-west, which include sections of the existing and the proposed new sections of the track. The existing track activities and the new proposed track section construction have the potential to

disturb the groundwater supply and quality by disturbing the ground conditions during maintenance, excavations and earthworks, poor management of runoff and/or a potential pollution incident. There is the potential for a **Medium** magnitude of impact on this **Very High** sensitivity receptor. A **Moderate** (**significant**) significance of effect is therefore assessed for potential flow effects to this receptor.

8.8.24 Therefore, there is a potential for there to be a significant adverse effect on this water supply without additional mitigation. Mitigation for PWS 1 is described in **Volume 4, Technical Appendix 8.5** of the EIA Report.

Increase in the Magnitude or Frequency of Flood Events

8.8.25 Impermeable areas of the Proposed Development could increase the runoff rates from the Site and drainage management is required to attenuate runoff. The track network and turbine layout has been designed to avoid, as far as is practicable, areas that have been identified as at risk of flooding, with the exception of watercourse crossings. Good practice methods employed for flow attenuation and SUDs along with the infrastructure having semi permeable surfaces.

8.8.26 Therefore, flood hazard has been assessed to be low sensitivity for the majority of the Site. The amount of infrastructure present in each catchment is no greater than 2 % of the catchments and with the good practice methods employed for flow attenuation and SUDs along with the infrastructure having semi permeable surfaces the magnitude of impact on flooding is assessed as **Low** and therefore the significance of effect will be **Minor (not significant)**.

Potential Pollution events affecting Groundwater and Surface Water Quality

8.8.27 Pollution of watercourses could potentially occur through the following pathways:

- Oil and chemical spills from:
  - Oil leakages during vehicle movements or when on standby;
  - Refuelling areas such as the compound; and/or
  - Chemical/fuel storage areas.
- Leakage of cement powder or liquid concrete during batching, transportation or pouring. Concrete is highly alkaline (high pH) and changes in the pH balance could affect the water quality and the species that depend on baseline conditions.
- Plant washing and vehicle wheel wash areas.
- Improper management of onsite waste.
- Poor sanitary plumbing.
- Poor water storage.
- Sedimentation and erosion (as previously discussed).

8.8.28 The construction compound will be constructed with an impermeable membrane and any surface water runoff along with any pollutants will be routed through an oil/water separator as part of good practice procedures.

8.8.29 The concrete batching plant, if required, will also be located on an impermeable membrane within the construction compound, both for the area where batching occurs and the washout area.

8.8.30 Even taking into account the application of good practice there is still a small risk of potential fuel spillage onsite due to the number of vehicles, and the potential for leaks or accidents.

8.8.31 The magnitude of impact of potential pollution from the above pathways is **Low**. The sensitivity of onsite receptors is assessed as being medium to high. Therefore, the likely effect on surface water from pollution is assessed as **Minor (not significant)** and no additional mitigation above good practice methods are likely to be required.

Effects on PWS

8.8.32 In accordance with the precautionary approach taken for the three hydrologically connected PWS with respect to erosion and sedimentation the same approach is adopted for pollution. A **Medium** magnitude of impact is therefore assigned on these **Very High** sensitivity receptors. A **Moderate (significant)** significance of effect is therefore assessed for potential pollution effects to this receptor.

8.8.33 Mitigation for these PWS is described in **Volume 4, Technical Appendix 8.5** of the EIA Report.

Loss, Degradation and Disturbance of Peat Resource

8.8.34 The excavation and handling of peat during construction — particularly for site access tracks, wind turbine bases, cable trenches and crane hardstands — has the potential to result in direct loss and degradation of peat resource. Peat may also be disturbed indirectly through changes to local hydrology which, if unmanaged, can lead to desiccation or oxidation of peat soils adjacent to infrastructure. Disturbance can also affect carbon storage potential and ecological functions associated with peat-forming habitats.

8.8.35 The layout of infrastructure has been informed by peat probing, with design iterations aiming to avoid areas of deep peat, particularly those associated with active peatland habitats. Where avoidance has not been possible due to topographic or engineering constraints, peat will be managed in accordance with good practice measures outlined in **Volume 4, Technical Appendix 8.3**. This includes micrositing, minimising excavation volumes and safe storage and reuse protocols.

8.8.36 Peat disturbance also has the potential to contribute to instability if infrastructure is sited on or near areas of marginal stability or steep slopes. Peat landslide hazard assessments have been undertaken to inform layout decisions and appropriate mitigation (see **Volume 4, Technical Appendix 8.4**). Peat landslide is specifically considered as a separate effect below.

Effects on Peat Resource

8.8.37 Much of the main infrastructure is not located on peat, or is on peat <1m in depth. Furthermore, all of the peatland associated with the infrastructure footprint, except for a small section of floated track, is considered to be modified (**Volume 4, Technical Appendix 6.3 Peat Condition Assessment** of the EIA Report) and the best quality peatland has been avoided by design. All excavated peat is therefore considered to be modified.

8.8.38 While overlap with peat occurs across the Site, extensive efforts have been made to minimise overlap with the deepest peat deposits, locating turbines away from carbon-rich soils where possible, or on shallower depths if this cannot be achieved.

8.8.39 Further attempts to prevent peat excavation have been made by making use of the existing forest road network, existing access tracks and where possible the existing wind farm access tracks.

8.8.40 Where new roads are required, opportunities to use floating track (and therefore avoid peat excavation) have been used wherever possible. An important constraint on floating track construction is gradient, which must not exceed 5% (or 2.86°).

8.8.41 Greater than 75% of the infrastructure is on peat <1m depth therefore the sensitivity for the infrastructure as a whole is **Medium** based on the matrix set out in **Table 8.2** and **Plate 8.1**.

8.8.42 The peat survey area totals 4,280,438 m^2 with 1,676,921 m^2 of peat (probe depths >0.5 m) identified across the Site. The construction of the Proposed Development will require the excavation of 43,864 m^3 of peat (8,050 m^3 of acrotelm and 43,864 m^3 of catotelm), which is equivalent to 4.94 % of the total peat volume within the Peat Survey Area, 888,582 m^3. As the excavated peat is between 2 and 5 percent of the total peat onsite, the magnitude of impact on peat is assessed as **Medium** in accordance with **Table 8.4**.

8.8.43 A **Medium** magnitude of impact on a **Medium** sensitivity receptor is assessed as being of **Minor** Significance (**not significant**) if the excavated peat from the Proposed Development can be appropriately re-used as presented in **Volume 4, Technical Appendix 8.3** (EIA Report, Volume 4).

8.8.44 The **Minor** adverse effect on peat resource has the potential to become a **Minor** beneficial effect depending on the degree of success of both the translocation for the restoration of degraded peat detailed in **Volume 4, Technical Appendix 8.3**.

Peat Landslide Hazard Risk Assessment

8.8.45 Construction work on peat has the potential to cause peat instability, which may affect peat soils (and their inherent carbon stores), peatland habitats and nearby watercourses, infrastructure or land uses. A peat landslide hazard and risk assessment (PLHRA) has been undertaken and is documented in **Technical Appendix 8.4** of the EIA Report. The PLHRA includes detailed site mapping verified by field walkover survey, qualitative and quantitative assessments of peat stability, identification of on- an off-site receptors and calculation of risks associated with peat landslides.

Effects on Surface Water Features

8.8.46 A total of eight potential landslide source zones, run-out pathways and their connectivity with receptors were identified where proposed infrastructure overlapped with Moderate or higher likelihood Factors of Safety <1.4. Key receptors identified were areas of near-natural blanket bog (assigned as such as part of the Peatland Condition Assessment, see **Technical Appendix 6.3** of the EIA Report) and watercourses, both of which were assigned a **Medium** sensitivity, (and consequence in the event of a landslide impact). GWDTE were assigned a High consequence rating.

8.8.47 Calculated risks were generally Low or Negligible for six of the eight runout zones, with two of the zones calculated with Medium risks (Zones 22 and 23) (**Volume 3a, Figure 8.4.10**).

8.8.48 These zones include an area above a tributary of the Laggan Burn (**Medium** sensitivity) and an area just north of the construction compound. The Medium risk stated in the PLHRA corresponds to a **Moderate (significant)** significance of effect

Summary of Significance of Effects during Construction Phase

8.8.49 The majority of the infrastructure will result in an overall significance of effect that is **Minor (not significant)** for erosion/sedimentation of watercourses, for alteration of natural drainage patterns, runoff volumes and rates, pollution and disturbance of peat. The exceptions to this are:

- A 120m section of track of **Moderate (Significant)** significance that follows an ephemeral drain / tributary of an 1:50k watercourse and also overlays an M6a flush;
- **Moderate (Significant)** significance of effect for erosion/sedimentation of watercourses, for alteration of natural drainage patterns, runoff volumes and rates, and pollution of Barguillean Farm PWS 1; and erosion/sedimentation and pollution of Dailnamac PWS 4 and Achnameadhonach PWS5; and
- **Moderate (Significant)** significance of effects for peat slide risk from runout zones 22 and 23 on the Laggan Burn and a tributary of the Laggan Burn.

8.9 Operation

8.9.1 Effects during the operational phase for all sensitive receptors, with the exception of drainage management and watercourse crossing management have been scoped out, as although it is recognised that effects will occur, these will be substantially less than during the construction phase which represents a worst-case scenario.

8.10 Decommissioning

8.10.1 Effects during the decommissioning phase will be similar, but of lower magnitude, to that of the construction phase, and detailed plans and requirements will be agreed when required.

8.11 Mitigation Measures

8.11.1 This section outlines the proposed mitigation measures to reduce the significance of any effect identified as being significant.

8.11.2 To reduce the significance of effect of activities that have been assessed as potentially **Moderate (Significant)** above, and to reduce the likelihood of other **Minor** effects, the following additional mitigation and management measures are required:

Sedimentation, pollution and drainage or flow alteration

8.11.3 The new 120m section of access track along an ephemeral drain with the area of an M6a flush will be microsited to the west where possible to avoid the drain, avoidance of the infrastructure crossing at the confluence and the M6a habitat.

8.11.4 A robust drainage management plan will be developed and implemented in order to mitigate potential impact on the three PWS receptors identified in proximity to the proposed excavated Site Access track. In addition, monitoring of water quality and flow will be undertaken and an alternative supply will be identified for Barguillean Farm PWS, Dailmanac PWS and Achnameadhonach PWS to be connected in case of any significant impact on this receptor.

8.11.5 Full details of these mitigation measures will be provided in a Construction Environmental Management Plan (CEMP) which would be prepared and agreed with A&BC post consent as part of a planning condition. Production and implementation of a robust CEMP containing drainage management plan (DMP), pollution prevention plan (PPP), water quality monitoring plan (WQMP) and emergency incident response plan (EIRP) for the access track will reduce the likelihood of an adverse pollution, sedimentation or alteration of natural drainage.

PLHRA

8.11.6 The mitigation measures outlined in **Volume 4, Technical Appendix 8.4** of the EIA Report in regards to peat landslide hazard in the two runout zones that have the highest level of risk, 22 and 23 are:

1. Demonstrate reduced likelihood of failure by collecting location-specific geotechnical data on the peat and underlying substrate, undertaking site-specific stability analysis using high resolution topographic data (e.g. LiDAR, drone-acquired or topo-surveyed DTMs) and re-running loaded analyses in light of this new information. If this demonstrates higher Factors of Safety (i.e. lower likelihoods) then these locations may be de-risked.
2. If 1. does not demonstrate the required reduction in likelihood, changing the mode of track construction to cut and fill would mitigate the risk from undrained loading.
3. If 2. is not practical or appropriate (to be determined as part of the detailed design process), temporary catch-fences could be installed for the duration of construction (i.e. the period during which cranes would be using the tracks). These would be installed downslope of the floating track sections to mitigate any movement of peat downslope of the fences. In addition, good practice measures (such as allowing the tracks to fully consolidate during construction and limited passage by cranes to dry periods) would further minimise the likelihood of instability.

8.11.7 Full details of these mitigation measures will be provided in a Construction Environmental Management Plan (CEMP) which would be prepared and agreed with A&BC post consent as part of a planning condition.

8.12 Residual Effects

Residual Construction Effects

8.12.1 The residual effects represent the likely significant effects of the Proposed Development on the environment taking account of practical and available mitigation measures as described above.

8.12.2 Production and implementation of a robust CEMP containing DMP, PPP, WQMP and EIRP for the access track will reduce the likelihood of an adverse pollution or sedimentation effect on the three PWSs connected to the Proposed Development infrastructure. In addition, identification of an alternative temporary and potentially permanent source to be connected in the event of an adverse impact on the Barguillean Farm PWS 1, Dailnamac PWS 4 and Achnameadhonach PWS 5 will mitigate any flow or quality adverse effects on the end users of this supply, reducing the significance of the residual effects of sedimentation, flow alteration and pollution from **Moderate (significant)** to **Minor (not significant)**.

8.12.3 The current location of a section of the access track over an ephemeral drain and an M6a flush results in a **Moderate (significant)** significance of effect. The only option to reduce this effect is to microsite the infrastructure to the west so that both features can be maintained. This would be determined at detailed design stage but should be undertaken if possible.

8.12.4 The mitigation measures presented in 8.11 to reduce the PLHRA risks are considered sufficient to reduce the significant of effect from **Moderate (significant)** to **Minor (not significant)**, particularly given that all three mitigation options are available.

8.13 Cumulative Effects

8.13.1 The potential cumulative effects of the Proposed Development and other wind farm developments within 5 km are considered. Operational wind farms are assumed to be part of the existing environmental baseline.

8.13.2 The nearest wind farm development is the operational Carraig Gheal Wind Farm approximately 4.5 km to the south of the Proposed Development. Part of this wind farm falls within the catchment of the River Nant, but within a separate sub-catchment (Abhainn Cam Linne) to the Proposed Development. The rest of the wind farm is within a separate catchment to the Proposed Development.

8.13.3 The following proposed wind farms are located in the vicinity of the Proposed Development:

- Corr Cnoch wind farm is located approximately 5 km to the west and within the same surface water catchment as T07, part of T06 and some access track. Given the presence of the hydropower intakes downstream of these infrastructure and the distance, the significant effect on the watercourses within the Feochan Mhor/ River Neil catchment is considered to remain as **Minor (not significant)**.
- Cruach Clenamacrie wind farm is located to the west of the Fearnoch Forest access track and will share part of the northern end of the proposed Beinn Ghlas access track. In this area the access track is already present with only minimal

upgrading required and has already been taken into account in the assessment which concludes all effects to be **Minor**.

8.13.4 Following the successful implementation of the mitigation measures outlined in **Section 8.11** cumulative impacts of the Proposed Development during construction and during operation will be **Minor**.

8.14 Monitoring

8.14.1 A Water Quality Monitoring Plan (WQMP) will be produced and implemented as part of the CEMP and approved by A&BC as part of the planning conditions post consent. Water Quality Monitoring will be undertaken before, during and after construction of sensitive watercourses and the PWSs downstream of the Proposed Development. A similar control catchment with no infrastructure will be monitored for comparison.

8.14.2 During the construction phase, an Ecological Clerk of Works (ECoW) or Hydrological Clerk of Works (HCoW) will undertake observations and monitoring regarding drainage management during construction workings.

8.14.3 Further ecological surveys will be undertaken by an ECoW prior to earthworks in each area to check for protected species etc. Peat reinstatement, restoration and enhancements will be monitored for the lifetime of the development, with a higher frequency of monitoring during the construction and immediate period post construction to ensure good peatland recovery. Further details relating to ECoW expected roles and responsibilities are provided in **Volume 2, Chapter 6 Ecology**.

8.14.4 The ECoW will be responsible for monitoring and ensuring peat excavations, peat storage and peat reuse will be accordance with best practice and **Volume 4, Technical Appendix 8.3 OPMP.**

8.14.5 A geotechnical risk register and further peat landslide hazard risk assessment (PLHRA) will be undertaken following the review of further ground investigation information. Geotechnical monitoring will be undertaken in accordance with further detailed assessments as discussed in **Volume 4, Technical Appendix 8.3 PLHRA**.

8.15 Decommissioning

8.15.1 During decommissioning of the Proposed Development, potential impacts on the hydrological, hydrogeological and geological environment are expected to be less than those encountered during the construction phase and therefore “not significant”. No specific mitigation measures are therefore identified above and beyond best practice embedded mitigation. The decommissioning of the Proposed Development would adhere to the latest legislative and guidance requirements at the time.

8.16 Summary of Effects

8.16.1 **Table 8.10** summarises the predicted significant effects of the Proposed Development on the hydrology, hydrogeology, geology and peat prior to mitigation and with mitigation.

Table 8.10: Summary of effects

Potential impact	Significance	Mitigation	Significance of Residual Effect
Construction Phase			
Sedimentation, flow alteration and pollution: Barguillean Farm PWS, Dailmanac PWS and Achnameadhonach PWS	**Moderate**	Production and implementation of a robust CEMP including DMP, PPP, WQMP and EIRP.for the access track to minimise likelihood of adverse impacts through sedimentation and pollution. Identification of an alternate source to be connected in case of adverse impact on existing supply.	**Minor (not significant)** Mitigation reduces the level of significance due to reduction of risk of sedimentation and flow alteration and alternate supply source to be used in the case of a temporary impact on the supply through flow alteration reducing the risk of adverse impact on supply end users.
Flow alteration: Ephemeral drain and GWDTE (M6a flush)	**Moderate**	Avoidance by micrositing.	**Minor (significant) only if micrositing is possible.** It is likely the M6a flush will be limited to these features themselves, which are small and of relatively low limited ecological importance individually. This option was considered less of a negative effect than traversing through near natural peatland habitat.

8.17 References

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