

# Balliemeanoch Pumped Storage Hydro

Environmental Impact Assessment  
Report

Volume 1: Non-Technical Summary

ILI (Borders PSH) Ltd

July 2024

## Quality information

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## Abbreviations and Glossary

Acronym	Description
<b>ABC</b>	<b>Argyll &amp; Bute Council</b>
AIL	Abnormal Indivisible Loads
AWI	Ancient Woodland Inventory
CAR	Controlled Activities Regulations
CBC	Common Bird Census
CCP	Climate Change Plan
CEMP	Construction Environmental Management Plan
CLG	Community Liaison Group
CTMP	Construction Traffic Management Plan
DNO	District Network Operator
ECoW	Environmental Clerk of Works / Ecological Clerk of Works
ECU	Energy Consents Unit
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report (formerly Environmental Statement)
EU	European Union
GDL	Garden and Designed Landscape
GHG	Greenhouse Gas
GWDTE	Groundwater Dependent Terrestrial Ecosystem
GWh	Giga Watt hours
HES	Historic Environment Scotland
HV	High Voltage
<b>IALA</b>	<b>International Association of Marine Aids to Navigation and Lighthouse Authorities</b>
<b>ICCI</b>	<b>In-Combination Climate Change</b>
ILI	ILI (Borders PSH) Ltd (also referred to as the Applicant)
INNS	Invasive Non-Native Species
LCT	Landscape Character Type
LDP	Local Development Plan
LEMP	Landscape and Ecology Management Plan
LLA	Local Landscape Area
MMA	Materials Management Appraisal
MoD	Ministry of Defence
MW	Mega Watt
MWhrs	Mega Watt hours
NPF4	National Planning Framework 4
NSR	Noise Sensitive Receptor
NTS	Non-Technical Summary
OHL	Overhead Line
oLEMP	Outline Landscape and Ecological Management Plan
PANs	Planning Advice Notes
PMP	Peat Management Plan
PSH	Pumped Storage Hydro
PWS	Private Water Supply
SAC	Special Area of Conservation
SEPA	Scottish Environment Protection Agency
SES	Scottish Energy Strategy
SINC	Site of Importance for Nature Conservation
SLA	Special Landscape Area
SPA	Special Protected Area
SPP	Scottish Planning Policy
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage System
SWMP	Surface Water Management Plan
UKHO	UK Hydrographic Office
WLA	Wild Land Area
WMP	Water Management Plan
ZTV	Zone of Theoretical Visibility

## Definitions

Term	Description
The Applicant	ILI (Borders PSH) Ltd, the company responsible for the application for consent of the Development.
Amenity	The preferable features of a location which contribute to its overall character and the enjoyment of residents or visitors.
Baseline	Environmental conditions at specific periods of time, present on, or near a site, against which future changes may be measured or predicted.
British Standard	A standard is a published document that contains a technical specification, or other precise criteria designed to be used consistently as a rule or definition. Standards are designed for voluntary use and do not impose any regulations. However, laws and regulations may refer to certain standards and make compliance with them compulsory. Sometimes British Standards (BS) will be accompanied by the letters EN and/or ISO. These mean that the standard was developed as an European (EN) or International (ISO) standard and then adopted by the UK as a British Standard.
Conservation Areas	Conservation Areas are described by the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997 as " <i>areas of special architectural or historic interest, the character of which it is desirable to preserve or enhance</i> ". Local planning authorities are required to determine which parts of their area should be safeguarded due to their architectural or historic interest, to ensure that any new development pays respects to or enhances their character.
Construction Contractor	The individual or organisation who will be contracted to provide and manage the construction of the Development.
Construction Environmental Management Plan	Strategic document setting out best practice methods to minimise environmental impacts during construction. An outline CEMP has been produced for the Development ( <i>Appendix 3.1 (Volume 5: Appendices)</i> ).
Construction Traffic Management Plan	Strategic document that outlines the management of vehicle movements and interactions with the surrounding road network during the various stages of the construction process. A framework CTMP has been produced for the Development ( <i>Appendix 14.1 (Volume 5: Appendices)</i> ).
Cumulative Effects	The summation of effects caused by both intra-project (where a single receptor is affected by multiple aspects of a project, worsening the effect) and inter-project effects (where effects are exacerbated due to other reasonably foreseeable projects either in construction, consented or yet to be built).
Desk Based Assessment	Research based primarily on database and internet data gathering methods, and other third party data.
the Development	Balliemeanoch Pumped Storage Hydro
Development Site	Land within the red line boundary encompassing the Development
District Network Operator	The operator of a electricity distribution network
Dusk	During the period shortly after sunset
Effect	The consequence of an impact on the environment, multiplied by the sensitivity of the receptor.
Section 36 of the Electricity Act 1989	The application to construct, operate and decommission the Development will be made in accordance with the requirements of Section 36 of the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017, and will be submitted to the Energy Consents Unit (ECU) of the Scottish Government.
EIA Development	A development requiring EIA by virtue of its size, nature or location under Schedule 2 of the EIA Regulations.
EIA Regulations	For the Development the relevant EIA Regulations are the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2017. By virtue of its size, nature and location, the Development constitutes an 'EIA development' under regulation 6 and Schedule 2 of the EIA regulations.
Environmental Impact Assessment	The assessment of the likely significant environmental effects of the Development. Undertaken in accordance with the EIA Regulations.
Environmental Impact Assessment Non-Technical Summary	(This document). A report presenting a non-technical summary of the information provided in the EIAR (as defined above).

Term	Description
Environmental Impact Assessment Report	A report that includes such of the information referred to in Schedule 4 of the EIA Regulations as is reasonably required to assess the environmental effects of the Development.
Gardens and Designed Landscapes	The Historic Environment (Amendment) Scotland Act 2011 made it a statutory duty for HES to compile and maintain an Inventory of Gardens and Designed Landscapes in Scotland.
Groundwater	Water occurring in the ground which can be reasonably attributed to relatively geologically recent recharge and which can be reasonably considered to be wholesome (potable) unless it has been contaminated (altered) by anthropogenic activity.
Habitat	The environment in which populations or individual species live or grow.
Habitats Regulations	The Conservation of Habitats and Species Regulations 2017
Habitats Directive	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora
Heavy Goods Vehicle	A commercial road vehicle that is of a construction primarily suited for the carriage of goods or burden of any kind and designed or adapted to have a maximum weight exceeding 3,500 kilograms when in normal use and travelling on a road laden.
Hectare	A unit of area (10,000 m <sup>2</sup> / 2.471 acres).
Historic Environment	All aspects of the environment resulting from the interaction between people and places through time including all surviving physical remains of past human activity, whether visible, buried or submerged, and landscaped, planted or managed flora. Those elements of the historic environment that hold significance are called heritage assets.
IEMA Guidelines	Institute of Environmental Management and Assessment (IEMA) Guidelines, 2023
Impact	A physical or measurable change to the environment.
Inter-Project Effects	Combined effects from other projects on a shared receptor.
Intra-Project Effects	Combined effects on a single receptor from other sources of effect arising from different aspects of the Development. Also known as “in-combination effects”.
Kilometre	Measurement of distance (1,000 metres).
Landscape and Visual Impact Assessment	A tool used to identify and assess the likely significant effects of change resulting from development both on the landscape as an environmental resource in its own right and on people’s views and visual amenity.
Landscape Character	The distinct and recognisable pattern of elements that occur consistently in a particular type of landscape, and how this is perceived by people. It reflects particular combinations of geology, landform, soils, vegetation, land use and human settlement.
Laydown Area	A temporary construction compound area for the storage of materials, plant and equipment as well as containing site accommodation and welfare facilities, temporary car parking and temporary fencing.
Limits of Deviation	The maximum extent within which a development can be carried out as shown on any work plans. Allows for refinement of the preliminary design during detailed design.
Listed Building	A list of buildings of special architectural or historic interest compiled by HES for the guidance of local planning authorities in the exercise of their planning functions under the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1997. Buildings are graded as follows: Category A – Buildings of special architectural or historical interest which are outstanding examples of a particular period, style or building type.; Category B - Buildings of special architectural or historic interest which are major examples of a particular period, style or building type.; and Category C – Buildings of special architectural or historic interest which are representative examples of a period, style or building type.
Magnitude	A combination of the scale, extent and duration of an impact.
Mitigation	Action proposed to avoid, prevent, reduce and where possible offset adverse effects arising from the whole or specific elements of a development.
Outline Surface Water Management Plan	A document outlining the approach to onsite surface water and foul water drainage. An Outline Surface Water Management Plan for the Development is included as <i>Appendix 11.5 (Volume 5: Appendices)</i>
Realistic Worst Case	Selection of the most environmentally detrimental parameter for assessment within the EIA.
Receptor	A component of the natural, created, or built environment such as a human being, water, air, a building, or a plant that has the potential to be affected by the Development.
Red line boundary	The area of land over which consent for the Development will be sought and within which the Development will be constructed

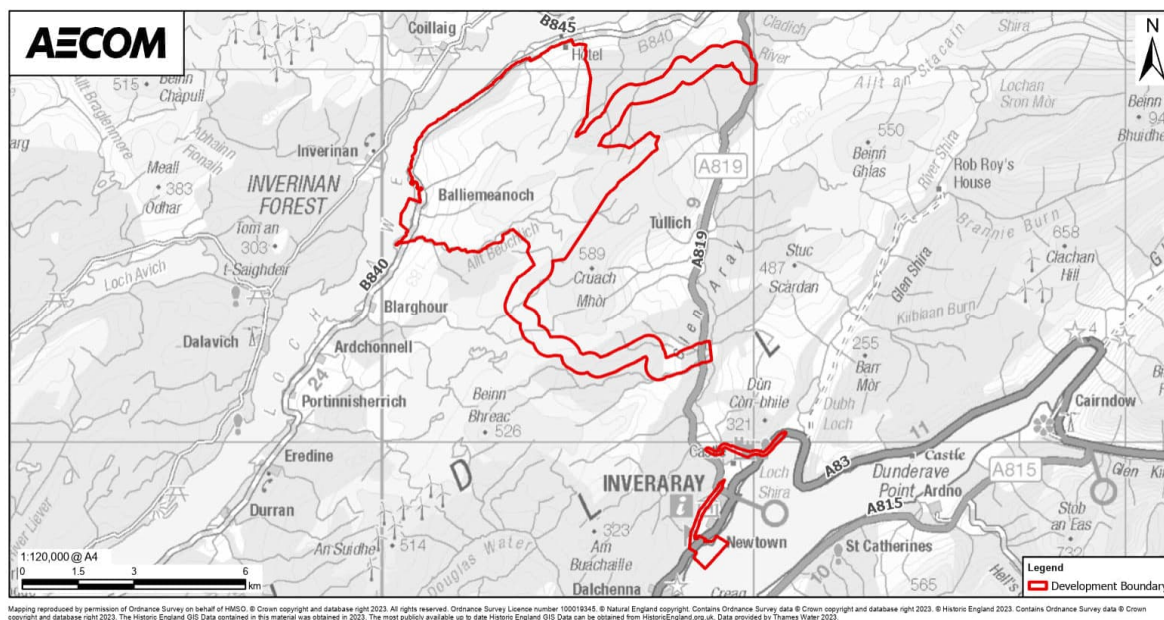
Term	Description
The Reservoirs Act	The Reservoirs Act provides a legal framework with regards to responsibilities and requirements for inspection and maintenance of reservoirs, in order to ensure the risk presented by such structures is acceptable.
Residual Effect	Those effects of a development that remain following the implementation of mitigation measures.
Rochdale Envelope	The establishment of a series of maximum development extents.
Scheduled Monument	Scheduled monuments are of national or international importance and are protected under the Ancient Monuments and Archaeological Areas Act 1979.
Section 36 Application	Planning application for consent under Section 36 of the Electricity Act 1989
Section 36 Consent	Consent under Section 36 of the Electricity Act 1989 to construct, operate and decommission the Development.
Sensitivity	A term applied to specific receptors, combining judgements of the susceptibility of the receptor to the specific type of change or development proposed and the value related to that receptor.
Site of Special Scientific Interest	A site statutorily notified under the Nature Conservation (Scotland) Act 2004 as being of special nature conservation or geological interest. SSSIs include wildlife habitats, geological features and landforms.
Special Area of Conservation	Areas of protected habitats and species as defined in the Habitats Directive, also known as an European site as defined in the Habitats Regulations.
Special Protection Area	Classified for rare and vulnerable birds, and for regularly occurring migratory species, as defined in the EC Birds Directive (2009/147/EC), also known as an European site as defined in the Habitats Regulation.
Species	A group of organisms that seldom or never interbreed with individuals in other such groups, under natural conditions; most species are made up of subspecies or populations.
The Act	The Electricity Act 1989.
The Baseline	Existing environmental conditions.
Topography	The natural or artificial features, level and surface form of the ground surface.
Visual amenity	The value of a particular area or view in terms of what is seen.
Visual effect	Change in the appearance of the landscape from available viewpoints as a result of development.
Visual receptors	Individuals and/or defined groups of people who have the potential to be affected by the visual appearance of a development.
Water Framework Directive	Council Directive 2000/60/EC establishing a framework for Community action in the field of water policy as implemented in Scotland through the Water Environment and Water Services (Scotland) Act 2003 and related regulations.
Wild Land Area	Wild land areas are defined by NatureScot as the most extensive areas of high wildness. They are identified as nationally important in Scottish Planning Policy but are not a statutory designation.
Zone of Theoretical Visibility	Areas from which a specified element of a development may be visible. Hence, the development would not be visible beyond the ZTV.



# 1. Introduction

## 1.1 Overview

ILI (Borders PSH) Limited (hereafter referred to as 'the Applicant') is proposing to build a pumped storage hydro (PSH) project. Balliemeanoch Pumped Storage Hydro (hereafter referred to as 'the Development') is located approximately 4.4 km to the south of the village of Portsonachan and 9 km northwest of Inveraray in Argyll and Bute and is location within the community council areas Glenorchy & Innishail for the main development area and Inveraray for associated temporary works to aid construction of the Development. The largest element of the project, the Headpond or Upper Reservoir, is located at Lochan Airigh which sits at approximately 360 m above ordnance datum (AOD) and 3 km to the east of the Balliemeanoch Farm Steading. A new temporary Marine Facility including a jetty to aid the delivery by sea loch of large components required during construction of the Development is to be located south of Inveraray off the A83. *Figure 1 Site Location*, below, shows the location of the Development Site.



**Figure 1 Site Location Plan**

### 1.1.1 Legislation and Planning Policy Context

As the Development will comprise an electricity generating plant with a gross electrical output in excess of 50 MW, consent to construct and operate will be required from the Scottish Ministers under Section 36 of the Electricity Act 1989. The Section 36 Application will be prepared in accordance with the requirements of the Act and submitted to the Energy Consents Unit (ECU) of the Scottish Government. The Scottish Ministers will also be requested to give a direction for planning permission to be deemed granted under Section 57(2) of the Town and Country Planning (Scotland) Act 1997.

The EIAR and this NTS have been prepared with reference to all relevant international, national, regional, and local policy. Details of these are discussed in each technical chapter of the EIAR Main Text (Volume 2) but in greater detail within the Planning Statement submitted with the application.

## 1.2 Purpose of this Document

The purpose of this document is to provide a summary of the EIAR (Environment Impact Assessment Report) in non-technical language. EIA provides an assessment of the Development's likely significant environmental effects. The main volumes comprising the EIAR are available separately as follows. All documents have been produced by AECOM Ltd, aside those specified below within brackets, on behalf of the Applicant:

- Volume 1: Non-Technical Summary

- Volume 2: EIAR Main Text
  - 1. Introduction
  - 2. Project and Site Description
  - 3. Evolution of Design and Alternatives
  - 4. Approach to EIA
  - 5. Landscape and Visual Amenity (with DGA Forestry providing Appendix 5.5 Forestry)
  - 6: Terrestrial Ecology
  - 7: Aquatic Ecology
  - 8: Marine Ecology (with Ocean Ecology providing Appendix 8.1 Intertidal Survey Report)
  - 9: Ornithology
  - 10: Geology and Soils
  - 11: Water Environment
  - 12: Flood Risk and Water Resources
  - 13: Cultural Heritage
  - 14: Access, Traffic and Transport
  - 15: Noise and Vibration
  - 16: Socio-Economics and Tourism
  - 17: Climate
  - 18: Marine Physical Environment and Coastal Processes
  - 19: Shipping and Navigation (Anatec)
  - 20: Commercial Fisheries (Brown and May Marine)
  - 21: Summary of Effects and Conclusions
- Volume 3: Figures - contains the figures relating to the EIAR chapters.
- Volume 4: Visualisations - contains photomontages, projecting how the Development will sit within the surrounding landscape.
- Volume 5: Appendices - contains supporting Appendices to the EIAR. The Appendices include detailed technical information such as raw data, survey reports and plans that are cross referenced where relevant within Volume 2 of the EIAR.
- Volume 6: Confidential Appendices – contains supporting Appendices which are only provided to certain competent bodies due to the nature of the information which is contained within them.

The NTS focuses on discussion of residual effects. These are defined as those effects of a development that remain following the implementation of mitigation measures. They have been described during construction, operation and decommissioning of the Development. Where likely significant effects have not been identified, it can be concluded that residual effects have not been identified, and therefore no additional mitigation is required.

The NTS is structured as follows:

- Section 2: Site and Project Description
- Section 3: Evolution of Design and Alternatives
- Section 4: Approach to EIA
- Section 5: Assessment Findings
- Section 6: Cumulative Effects
- Section 7: Overall Conclusions

## 1.3 The Applicant

The Applicant is part of Intelligent Land Investments Group Plc (ILI), a Scottish clean energy developer who has been developing renewable energy projects for over 15 years. This has included onshore wind, solar and run river hydro schemes, with their focus now on energy storage.

ILI seeks to play its part in meeting Scotland's future energy needs and contribute to world leading climate change and net zero targets. It has developed a portfolio of nationally significant battery and PSH projects.

Energy storage projects will be of critical importance as we move towards 100% renewable energy generation, as they provide the balancing and back-up services a secure and efficient energy system requires.

ILI's lead PSH project, Red John, received Section 36 consent and deemed planning permission from the Scottish Government in June 2021 and has now moved to the pre-development phase. In recognition of this success, ILI was a finalist in the 2021 Scottish Green Energy Awards and in the Regen Green Energy Awards 2023.

Further details on ILI are provided at <http://www.ili-energy.com/>

## 1.4 The Application

This NTS and other documentation prepared to support the Section 36 Application are available for download from the Argyll and Bute Planning Portal website: <https://www.argyll-bute.gov.uk/planning-and-environment/find-and-comment-planning-applications> and the ECU website: <http://www.energyconsents.scot/>.

The EIAR will be available for viewing at the following locations:

- Oban, Lorn and the Isles Argyll & Bute Council office at Municipal Buildings, Albany Street, Oban PA34 4AW
- Dalmally Village Hall
- Portsonachan Village Hall
- West Lochfyneside Parish Church, Inveraray

### 1.4.1 How to Make Representations

Any representations regarding the Section 36 Application should be made as per guidance on Scottish Government, Energy Consents website at:

<https://www.gov.scot/publications/energy-consents-how-to-support-or-object-to-an-application/>

Which advises that representations can be made by email to The Scottish Government, Energy Consents Unit mailbox at: [representations@gov.scot](mailto:representations@gov.scot)

Or by post to:

Energy Consents Unit, Energy Division, Scottish Government, 4th Floor, 5 Atlantic Quay, 150 Broomielaw, Glasgow, G2 8LU.

Representations should be dated and should clearly state the name (in block capitals) and full return email or postal address of those making representation. All representations to the Scottish Government will be copied in full to the planning authority, and made available to the public on request, unless individuals request otherwise.

### 1.4.2 How to Get a Copy of the Application Documents

Electronic copies of the application documents (with the exception of Volume 6: Confidential Appendices) can be made available at a fee of £10 per USB pen drive. A paper copy of the Non-Technical Summary can be made available free of charge. Cheques should be made payable to AECOM Ltd, with your name and address on the back.

To request copies of the EIAR documents please contact the Balliemanoach PSH Project Team at the following address:

Balliemanoach PSH Project Team, AECOM, 1 Tanfield, Edinburgh EH3 5DA

E-mail: [pumpedstorage@aecom.com](mailto:pumpedstorage@aecom.com)

Information on the Development will also be available on the Development website: <https://www.balliemeanochpsh.co.uk/> and requests for copies of the EIAR may be submitted through the queries form.

## 1.5 Background to the Development

Hydropower is an established electricity generation technology in Scotland. The first public hydro scheme was built by the Benedictine monks at Fort Augustus Abbey in 1891 to power the abbey and village at the southern end of Loch Ness. However, it was not until after World War II that the adoption of hydropower became widespread across Scotland.

The Hydro Electric Development (Scotland) Act 1943 drove the creation of the North of Scotland Hydro Electric Board. The efforts of the Board, combined with growing energy demands, in particular from the aluminium industry, resulted in significant developments in hydropower technology. By 1965, 54 main hydropower stations had been constructed with a total generating capacity of more than 1,000 megawatts (MW)<sup>1</sup>.

The first Scottish PSH scheme, Cruachan Power Station (440 MW), opened in 1965. At the time it was the first PSH of its scale in the world<sup>2</sup> and is still the largest operational hydropower scheme in Scotland.

Today, hydropower is a commercial technology that accounts for around 19% of Scotland's total energy generation<sup>3</sup>. As set out within the Energy Strategy: The Future of Energy<sup>4</sup>, and Draft Energy Strategy and Just Transition Plan<sup>5</sup>, further development of hydropower in Scotland, and PSH in particular, is supported by the Scottish Government in the pursuit of a flexible and resilient future energy network and power supply.

A Scotland-wide review of the untapped hydropower potential to identify locations suitable for PSH development was conducted by the Applicant. Through this review the potential for a PSH scheme utilising Loch Awe was identified.

The Development will discharge water from its Headpond back into Loch Awe, which is also utilised by the existing Cruachan scheme.

The Development is predominantly located within the catchment of the Allt Beochlich watercourse. The catchment consists of a number of small streams which ultimately flow into Loch Awe, these originate from smaller Lochs (Airigh, Dubh and Romach).

## 1.6 Concept of Pumped Storage Hydro (PSH)

The main principle of Pumped Storage Hydro (PSH) is to release water from an upper reservoir, or Headpond, to a lower reservoir, or Tailpond, when there is a demand to generate electricity and to pump water from a lower to an upper reservoir when there is either a low demand or excess supply of electricity. As the water transfers between the upper and lower reservoir, the water passes through the turbine either generating electricity or pumping to store energy depending on what mode the scheme is in.

PSH is currently the most efficient technology for storing large amounts of energy and is capable of generating and pumping in a relatively short period of time. PSH is complementary to variable intermittent energy sources such as wind and solar and is able to reduce the curtailment of excess generation by providing load and energy storage for the grid. Therefore, this Development can enable greater deployment of renewable energy into the grid and at the same time provide flexibility to generation plants to meet the demands from the grid.

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<sup>1</sup> Scottish and Southern Energy plc. Power from the Glens. <https://studylib.net/doc/7919719/power-from-the-glens>. [Accessed 13/02/2024].

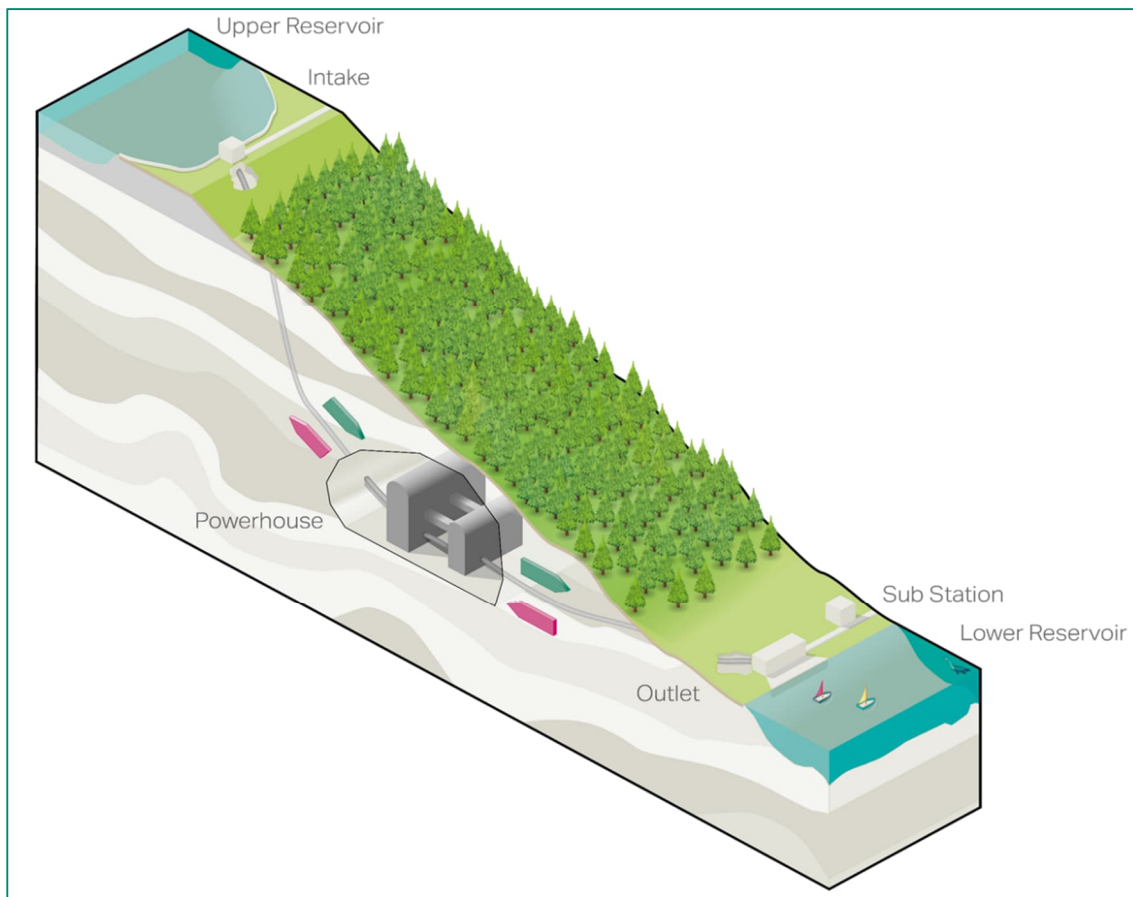
<sup>2</sup> Scottish Power. (2018). Cruachan. <https://www.visitcruachan.co.uk/pages/history.aspx>. [Accessed 13/02/2024].

<sup>3</sup> Scottish Government. (2021) Annual Energy Statement & Quarterly Statistics Bulletin, as reported within: Energy Statistics for Scotland - Q3 2023 Part 2. <https://www.gov.scot/binaries/content/documents/govscot/publications/statistics/2018/10/quarterly-energy-statistics-bulletins/documents/energy-statistics-summary---december-2021/energy-statistics-summary---december-2021/govscot%3Adocument/Scotland%2BEnergy%2BStats%2BQ3%2B2021.pdf> [Accessed 13/02/2024].

<sup>4</sup> Scottish Government. (2017, Errata published 2018). Scottish Energy Strategy: The Future of Energy. [Online]. Available: <https://www.gov.scot/Resource/0052/00529523.pdf>. [Accessed 13/02/2024].

<sup>5</sup> Scottish Government (2023) Draft Energy Strategy and Just Transition Plan <https://www.gov.scot/publications/draft-energy-strategy-transition-plan/>

The schematic below provides an indicative view of how a pumped storage system works. **Note that this is a diagrammatic illustration, and it therefore does not accurately represent the proposed scheme for the Development.**



**Insert 1.1: Schematic of a Typical Pumped Storage Hydro Scheme**

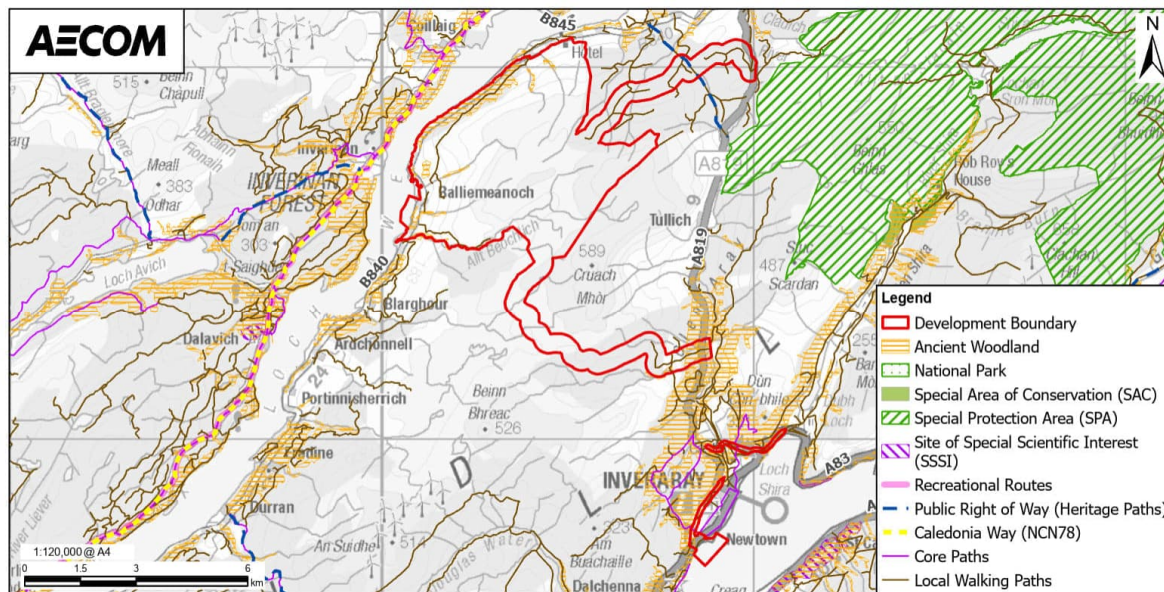


## 2. Project and Site Description

### 2.1 Site and Surroundings

The Development is located in the Argyll and Bute region, centred on national grid reference NN 03615 17578, approximately 4.4 km to the south of the village of Portsonachan and 9 km northwest of Inveraray, with the red line boundary shown on *Figure 1 Site Location Plan*, within *Section 1.1 Overview*, above. The Development Site is generally characterised by upland moorland plateau grazing land. The Headpond location at Lochan Airigh sits at approximately 360 m above ordnance datum (AOD) and 3 km to the east of Balliemeanoch Farm Steading. The Marine Facility is located south of Inveraray off the A83.

The environmental and social features within the Development Site boundary and surrounding the Development are shown on *Figure 2 The Surrounding Environment*, below.



**Figure 2 The Surrounding Environment**

The main Development Site slopes from the summit of Cruach na Gearr-choise (571 m AOD), along the eastern boundary of the Development Site, towards Loch Awe in the west. The proposed Headpond is located at Lochan Airigh (360 m AOD), which sits in the valley between Cruach na Gearr-choise (c. 571 m AOD) to the East and an unnamed summit (c. 470 m AOD) to the West. The topography at the Headpond is flat at ground level around Lochan Airigh (centre of the basin) and slopes up at approximately 12 % and 9 % from the centre of the basin to the northwest southeast, respectively.

The Tailpond inlet / outlet is located on Loch Awe, south of Balliemeanoch. The top level of the structure is at an elevation of 38.6 m AOD and extends approximately 80 m into Loch Awe. The existing ground slopes to the south-east at a gradient of approximately 14 % to the existing farmer's track, where it levels out and slopes steadily upwards to the proposed Headpond location in the east. The Balliemeanoch farmhouse is located approximately 400 m away from the proposed inlet / outlet location.

The Development Site is generally characterised by upland moorland plateau grazing land. The wider landscape includes a rocky coastland, upland glens and steep ridges and mountains. Loch Awe lies immediately to the north west of the Development Site and Loch Fyne lies immediately to the south, where the Marine Facility is located south of Inveraray off the A83. Beyond these lochs there are areas of higher ground, which are characterised by mountains and Wild Land Areas.

The land within the area of the proposed Headpond within the Development Site comprises an upland plateau moorland with craggy outcrops, used mainly for sheep grazing. The land capability for agriculture is class 6.3 "capable of only rough grazing due to intractable physical limitations; semi-natural vegetation provides grazing of low value" (Hutton Institute).

There is no woodland within the main area of the Development Site, with woodland pockets restricted to those located along proposed access tracks and a small area near the Tailpond inlet / outlet. These woodlands include plantation woodland along the existing, to be upgraded, access track off the A819 at the north; along the proposed new and upgraded existing tracks proposed to the west of Inveraray; and along the upgraded access to the north of Inveraray Castle, and as noted near the inlet / outlet on Loch Awe.

The proposed Development is predominantly located within the catchment of the Allt Beochlich watercourse. The catchment consists of a number of small streams, which ultimately flow into Loch Awe, these originate from smaller Lochs (Airigh, Dubh and Romach). The Development Site is organised into two main catchment areas: the Loch Awe catchment and the Loch Fyne catchment. The Loch Awe catchment covers the Headpond works and the inlet / outlet structure. While the Loch Fyne catchment includes the Inveraray bypass route and the Loch Fyne Marine Facility. The majority of watercourses within the Loch Awe catchment flow directly into Loch Awe. However, there are three sub catchments including Allt Beochlich that has a number of tributaries and lochans within its catchment, and Allt Mor which has some unnamed lochans and Claddich River.

There are no statutory environmental designations within the main area of the Development Site. Inveraray Castle Garden and Designed Landscape is located within the red line boundary, along the existing access track north of Inveraray Castle. However, the proposed Marine Facility would be situated within the Upper Loch Fyne and Loch Goil Marine Protected Area (MPA), which is located to the west of Inveraray.

Within the wider area, Glen Etive and Glen Fyne Special Protected Area (SPA) is located approximately 5 km to the east of the proposed Headpond and is designated for breeding golden eagle (*Aquila chrysaetos*).

Non-statutory long established (of plantation origin) woodland is located to the north and south of stretches of the proposed access route to the north of Inveraray Castle, in addition to a number of scattered category A and B Listed Buildings. There is one Scheduled Monument within the main Development Site – Balliemeanoch chapel and burial ground, which is located approximately 500 m north of the proposed tailrace tunnel.

There are no classified roads or tracks within the Development Site at the Headpond or Tailpond location. However, at Inveraray there is a <1 km section of classified road (A83) at the proposed jetty location.

Site access is proposed from the A819, which links the strategic trunk roads: A85 to the north at Dalmally and A83 to the south at Inveraray. It is anticipated the general construction access will come from the north and south along the A819. Construction access from the south will bypass Inveraray, via a section of unclassified existing track (to be upgraded) north of Inveraray Castle, which will connect the A83 to the A819.

Larger construction traffic, such as abnormal loads, will be delivered by boat to the proposed jetty, where they will be transported to site via the A819. Access to the A819 will be via an upgraded existing access track that runs to the north then east, from the A83, around the north of Inveraray. There are proposed upgrades to the existing unclassified road "Upper Avenue" at Inveraray and a new track linking this to the A83 at the proposed jetty location.

## 2.2 The Development

The following sections introduce a summary of the terminology and component parts of the Development. The complete arrangement of the Development can be seen on *Figure 3: Development Layout*, below and on *Figure 2.3 Above Ground Infrastructure (Sheets 1 & 2)* and *Figure 2.4 Below Ground Infrastructure (Volume 3 Figures)*. Full details on the Development description can be found within *Chapter 2: Project and Site Description (Volume 2 Main Report)*.

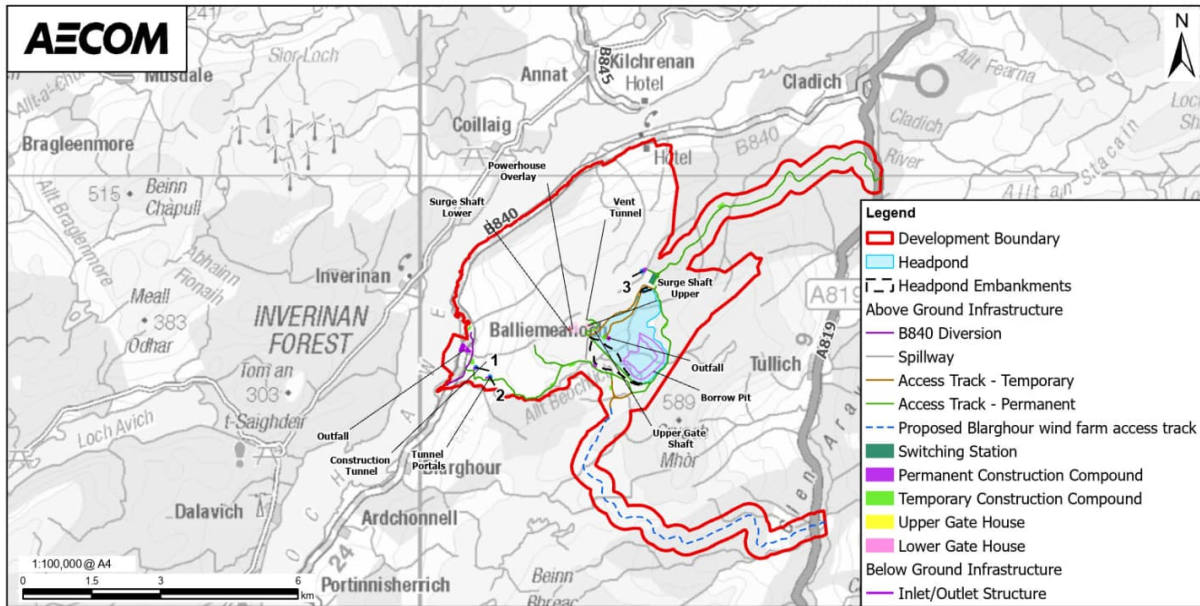


Figure 3: Development Layout (Sheet 1)

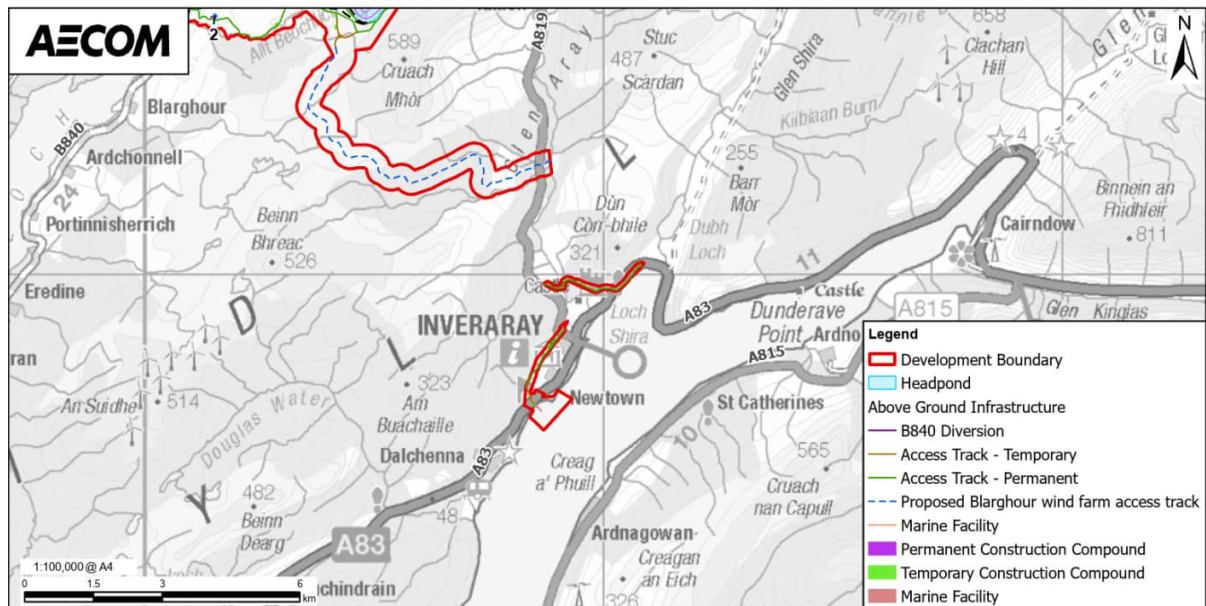


Figure 3: Development Layout (Sheet 2)

## 2.2.1 Above Ground Infrastructure

The below sets out a summary of the above ground infrastructure, which is shown on *Figure 4: Above Ground Infrastructure*, below.

### 2.2.1.1 Headpond

The Headpond is designed to hold approximately 59.6 million meters cubed (Mm<sup>3</sup>) of water with approximately 53.4 Mm<sup>3</sup> of it being used as the working volume during operation. Two embankments will retain the Headpond waterbody: Embankment 1, which is the largest of the two embankment structures and will be located to the western side of the waterbody, and Embankment 2, which is the smaller of the two embankment structures and is located to the north eastern side of the waterbody.

Embankment 1 will be up to 1,635 m long, approximately 482 m wide and approximately 95 m high, from existing ground – i.e. the embankment to lowest part of the embankment. The crest of the embankment will typically be a maximum of 10 m wide and will include a 5 m wide access track on the external side.



Embankment 2 will be up to 279 m long, approximately 85 m wide and approximately 13 m high, from existing ground – i.e. the embankment to lowest part of the embankment. The crest of the embankment will typically be a maximum of 10 m wide, there will be no access track along the top of Embankment 2.

The external slopes (dry side) of both embankments will be finished with soil and turf, with embankment 1 having horizontal benching. The inner slopes (wet side) will be lined. However, the rest of the Headpond (existing ground surface) will not be lined. The lining will be a waterproof system that would be either an asphalt or concrete lining (or equivalent).

#### **2.2.1.2 Headpond Inlet Outlet Structure**

The Headpond inlet / outlet structure is where the waterway exits the Headpond through the headrace. The structure will predominantly sit within the base of the Headpond at existing ground level directly behind the main embankment. This structure will incorporate the inlet / outlet for the high-pressure headrace tunnel and will predominately sit below the bottom water level of the Headpond. The structure will comprise a trashrack, stoplog, deck area with parapet wall around the deck and manhole for maintenance. The related mechanical equipment for operating the scour valve along with the gates will be housed within a timber clad frame on top of the embankment. This building will also denote the subsurface location of the Headpond inlet / outlet structure.

#### **2.2.1.3 Borrow Pit**

The Headpond will include one borrow pit within the Headpond interior. This borrow pit is required to excavate material for the construction of the Headpond embankments and compounds and reduce the reliance on delivery of material to site.

#### **2.2.1.4 Switching Station**

There will be a switching station within the Development, located within the footprint of permanent compound 15. The switching station consist of two secure electrical compounds, one controlled by the project and one controlled by the District Network Operator (DNO) and connects the Development to electricity grid. These areas will be fenced off from one another and have separate access. In addition to the switchgear, there will be parking, welfare and offices located within both sides of switching station.

#### **2.2.1.5 Tailpond Inlet / Outlet Structure**

The waterways will terminate at the Tailpond inlet / outlet structure situated on the eastern bank of Loch Awe. The inlet / outlet structure will be a maximum of 20 m deep (within the bank of Loch Awe) and extends approximately 80 m into Loch Awe from the lower gate house. The majority of the structure is either sub-surface within the bank of Loch Awe or beneath the water level of the Loch. The inlet / outlet structure consists of a screen, stoplog and rock armour.

The screen extends into Loch Awe and will be up to 150 m in width. To avoid fish and debris entrainment, the screens will be designed according to SEPA best practice guidance. The screen also acts and an energy dissipation measure to reduce the velocity of the water discharging from the Development. The screen is protected on each side by rock armour and is covered for its entire width by the roof of the Tailpond inlet / outlet structure. There will be a removable safety handrail on the edge of the inlet / outlet structure at Loch Awe's water's edge.

During operation, when the Development is pumping water up to the Headpond, water passes through the screen into the low-pressure tailrace tunnel, which connects to the lower gate shaft below the lower gatehouse. Water will flow vice versa when the Development is generating electricity.

The water levels within Loch Awe are variable, but on average there is approximately 1 m of freeboard between the removable roof of the Tailpond inlet / outlet structure and the top water level of Loch Awe. Due to the roof and the inclined slope of the screen, the screen will not be visible.

There are two gatehouses along with a permanent plant and equipment storage area, car parking and permanent office and welfare facilities, which will be surrounded by security fencing to the east of the inlet / outlet structure. The gatehouses will contain the mechanical equipment for operating the gate within the low pressure tailrace tunnel.

The B840 existing road will be required to be temporarily diverted during construction to allow for the construction of the inlet / outlet structure which will sit below the road once reinstated. More information on the B840 temporary diversion can be found in *Section 2.2.1.10 Access Tracks*, below.

Areas of permanent landscaped hardstanding and planting are incorporated into the design of the Tailpond inlet / outlet structure area.

### **2.2.1.6 Temporary Cofferdam in Loch Awe**

A temporary cofferdam with surrounding silt curtain will be built out into Loch Awe around the location of the Tailpond inlet / outlet structure for the duration of any works in the Loch Awe environment, which will both be removed at the end of the construction phase.

### **2.2.1.7 Temporary Marine Facility in Loch Fyne**

A temporary Marine Facility will be required within Loch Fyne to allow for the delivery of large AILs. The Marine Facility will take circa 12 months to construct, with piles installed from a jack-up barge. No dredging will be required for construction of the Marine Facility. The Marine Facility is designed to be temporary for delivery of AILs and will be removed after delivery of the last AIL. At the end of construction, the Marine Facility will be removed however the piles will remain in-situ. The piles will remain in place should the jetty be required for replacement components during the PSH's lifetime.

### **2.2.1.8 Compounds**

There will be both temporary and permanent compounds required for the Development. Eleven temporary compounds are anticipated to be required for the construction period and eleven permanent compounds are required to remain for the lifespan of the Development. Permanent compounds will be surrounded by palisade fencing up to 2.4 m in height.

Temporary compounds are anticipated to be unsealed (stone, aggregate or gravel surface) in nature and will be either floated (over peat) or built into the hillside depending on the site conditions and anticipated loads. Following the completion of the construction period, all temporary compounds will be removed and the ground fully reinstated to its previous condition.

### **2.2.1.9 Access Tracks Development Site Access**

Site access is proposed off the A819, which links the strategic trunk roads A85 to the north at Dalmally and A83 to the south at Inveraray. It is anticipated the general construction access will come from the north and south along the A819. Construction access from the south will bypass Inveraray via a section of unclassified existing track (to be upgraded) north of Inveraray Castle which will connect the A83 to the A819.

Larger construction traffic, such as AILs, will be delivered to the proposed jetty, where they would be transported to site via the A819. Access to the A819 will be via an upgraded existing access track that runs to the north, then east, from the A83, around the north of Inveraray. There are proposed upgrades to the existing unclassified road "Upper Avenue" at Inveraray and a new track linking this to the A83 at the proposed jetty location.

### **Temporary B840 Realignment**

A section of the B840 is located at the Tailpond inlet / outlet structure at Loch Awe. The realigned section of the B840 will be located to the east of the existing alignment and will divert from Balliemanoach Farm route southwards and rejoin to the north of the bridge over Allt Boechlich. The temporary realigned portion of road will, for approximately half its length, utilise an existing farm track which will be upgraded.

Access along the B840 will be maintained at all times with the temporary section constructed prior to removal of the existing road section. Post-construction, the B840 will be reinstated to its former route and the new sections of the road, which are not currently part of the existing farm track, removed and the ground reinstated to its former use. The upgraded existing farm track section will remain permanently.

### **Permanent Access Tracks**

Access into the site will be off the A819 into Keppochan Forest to the proposed switching station. The alignment will follow existing forestry access which will be upgraded. Sections of new access track will be required to join the existing forestry tracks within the plantation. New sections will be either excavated or floating depending on ground conditions.

From the switching station, the access track is routed southwards around the eastern side of the Headpond and will connect to the Blarghour Wind Farm access track (if constructed). The access track continues westwards to the farmers track/temporary B840 diversion. There will also be a permanent access track along the top of the Headpond and connecting to three permanent compounds, in addition to another branch off to two permanent compounds west of the Headpond.

## Temporary Access Tracks

Four sections of temporary access tracks will be required during construction. The temporary access tracks are as follows:

- From the existing B840 to the compound at tunnel portal 1 to allow for construction traffic to access the Tailpond inlet / outlet working area. The temporary track is required to restrict impact on public traffic along the B840 diversion.
- From the proposed switching station into the Headpond to access the proposed temporary compound within the Headpond. The access track within the Headpond will be left in-situ for access to the inlet / outlet structure.
- Branches off the section above and is routed around the northern side of the proposed Headpond to the proposed permanent access along the western Embankment. This allows access around the Headpond prior to the construction of the western Embankment.
- From the temporary Marine Facility to Upper Avenue to allow for movement of vehicles transporting AILs from the Marine Facility to the site.

The construction corridor required for temporary access tracks will be a maximum of 30 m to allow for two-way vehicular traffic, drainage and peat mounds. The temporary access tracks will typically be unsealed in nature and will be removed following the completion of the construction phase. Tree protection measures, dust screens and fencing to separate working areas from trees will be implemented along the temporary access track within the Ancient Woodland Inventory (AWI) listed woodland area.

## Public Road Crossing

During construction, the temporary realigned B840 will be crossed by a temporary access track. During the construction phase, it is intended that the Crossing will consist of semi-permanent traffic two-way signalling system given the duration of construction. The Crossing will be a conventional crossroads that will cross the public road where grade and visibility is optimal to reduce the impact on the public roads as far as practical. The crossroads will have temporary signage and line markings warning drivers of road layout ahead. Priority will be given to the public road users. The crossing will be removed following the end of the construction phase when the temporary access track and temporary B840 diversion are removed and B840 reinstated to its former alignment.

## Public Paths

In order to maintain public safety during the construction phase, temporary safety signage will be required. Core paths and forestry paths will largely remain open and accessible to all users during construction. To maintain public health and safety, diversions to certain forestry paths, such as the SA128, may be necessary. It is not expected that diversions to recreation routes will be required during operation.

### 2.2.1.10 Grid Connection

A grid connection agreement has been made between the Development and the DNO. The grid connection route is anticipated to be to Creag Dhubh substation, which is located north east of the Development Site. Within the Development Site, a high voltage cable will be routed from the underground transformer gallery, through the power tunnel to permanent compound 15, from here the cable will be undergrounded to the switching station. The exact route of the grid connection from the Development Site to Creag Dhubh is currently unconfirmed. The grid connection location at Creag Dhubh is at NGR NN08739 19509, approximately 4.0 km north east of the Development Site.

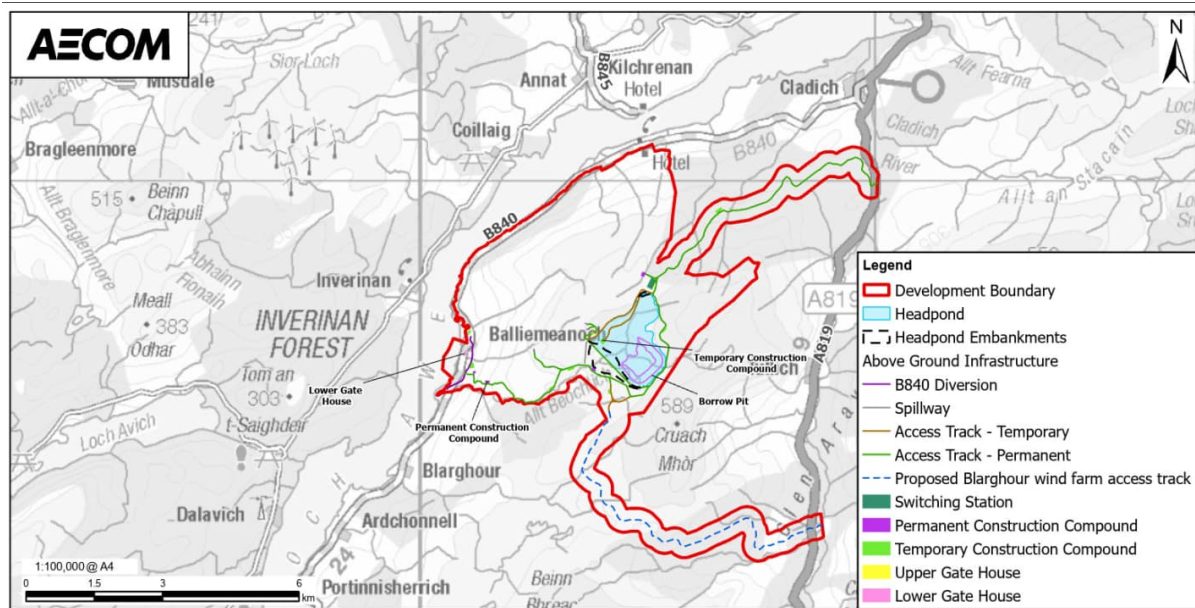


Figure 4: Above Ground Infrastructure (Sheet 1)

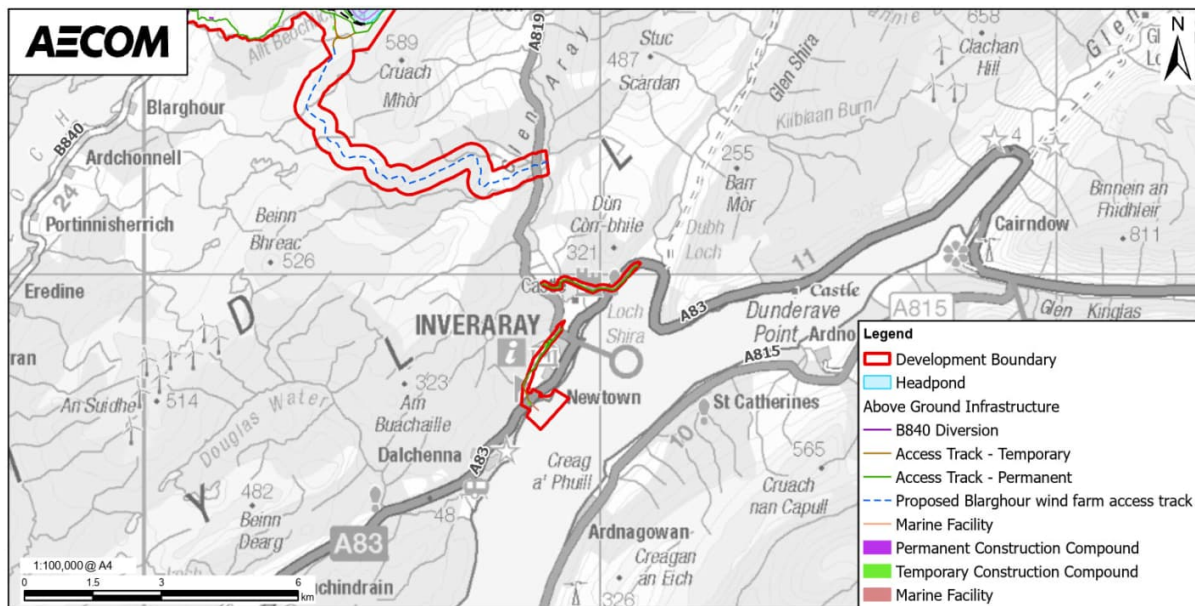


Figure 4: Above Ground Infrastructure (Sheet 2)

## 2.2.2 Below Ground Infrastructure

The section below sets out a summary of the below ground infrastructure which is shown on *Figure 5: Below Ground Infrastructure*.

### 2.2.2.1 Waterways

The waterways comprise of the high-pressure tunnel, low-pressure tunnel, the spillway, the scour pipe and the surge shafts.

1. High pressure tunnel: also known as the headrace, connects the Headpond inlet / outlet to the pump turbines within the power cavern, and is controlled via the Main Inlet Valve (MIV) located within the power cavern. This tunnel will be approximately 670 m in length and a maximum internal diameter of up to 13 m.
2. Low pressure tunnel, also known as the tailrace, connects the pump turbines within the power cavern to the outlet / inlet in the Tailpond. This tunnel will be approximately 2.3 km in length and a maximum internal diameter of up to 13 m.

3. Spillway & scour pipes: Located adjacent to the inlet / outlet at the top of Embankment 1, the spillway, which is an open cut trench, is used to drain any excess water from the Headpond. The spillway drains into an unnamed river that drains into Allt Beochlich. Within the trench at the bottom of the Headpond will be the scour pipe. This pipe joins the spillway pipe within a chamber below the Headpond. Along with the spillway, the scour is used for the scouring and draining down of the Headpond in an emergency situation.
4. Surge shafts: associated with the high-pressure and low-pressure tunnels and will be located along the waterways to contain pressure fluctuations within the hydraulic system. The low-pressure tunnel surge shaft will be underground. The high-pressure tunnel surge shaft will be underground and will extend to ground level (the top of the surge shaft will be covered by a steel grate and contained within a permanent compound but may have a section cut/filled into the hillside and fenced (which will be determined at detailed design stage).

#### **2.2.2.2 Power Cavern**

The power cavern is the main underground component of the Development, split into three sections:

1. Powerhouse: largest section containing the pumphouse, generator, switchgear, compressors, gantry crane, cable gallery, offices, and the control room. The powerhouse can be accessed via the access tunnel portal (tunnel portal 2).
2. Transformer cavern: will be approximately 70 m from the powerhouse. The transformers will be housed within the transformer cavern, along with a gantry crane and the draft tube gate. The transformer cavern can be accessed via the power tunnel portal (tunnel portal 3).
3. Main inlet valve (MIV) cavern: connected by galleries, the MIV cavern is the smallest section and will contain the gantry crane, sump and main inlet valve with counterweight.

The power cavern complex is located approximately 460 m below ground level. There is a ventilation tunnel from the power cavern, the ventilation shaft does not have a tunnel portal and comes to ground level. At ground level the shafts will be housed in a permanent compound and cordoned off by adequate safety measures.

#### **2.2.2.3 Tunnels**

Underground tunnels comprise of the construction and emergency egress tunnel, access tunnel, power cable tunnel and vent tunnel.

1. Construction and emergency egress tunnel: accessed via tunnel portal 1 and provides access to / from the power cavern. Post-construction, the Construction and Emergency Egress Tunnel will also be utilised for the operational phase for maintenance, plant/equipment movements and an emergency exit.
2. Access tunnel: provides access to the powerhouse via tunnel portal 2. It will be used for both the construction and operation phases and therefore is a permanent feature of the Development. During operation, the access tunnel will be utilised for operational workers travelling to the powerhouse.
3. Power cable tunnel: provides access to the transformer cavern via tunnel portal 3.
4. Ventilation tunnel: provides ventilation into the power cavern, via tunnel portal 2. The heat and moisture environment can directly affect the operation safety of electrical equipment and the health of workers, the ventilation tunnel helps regulate this.

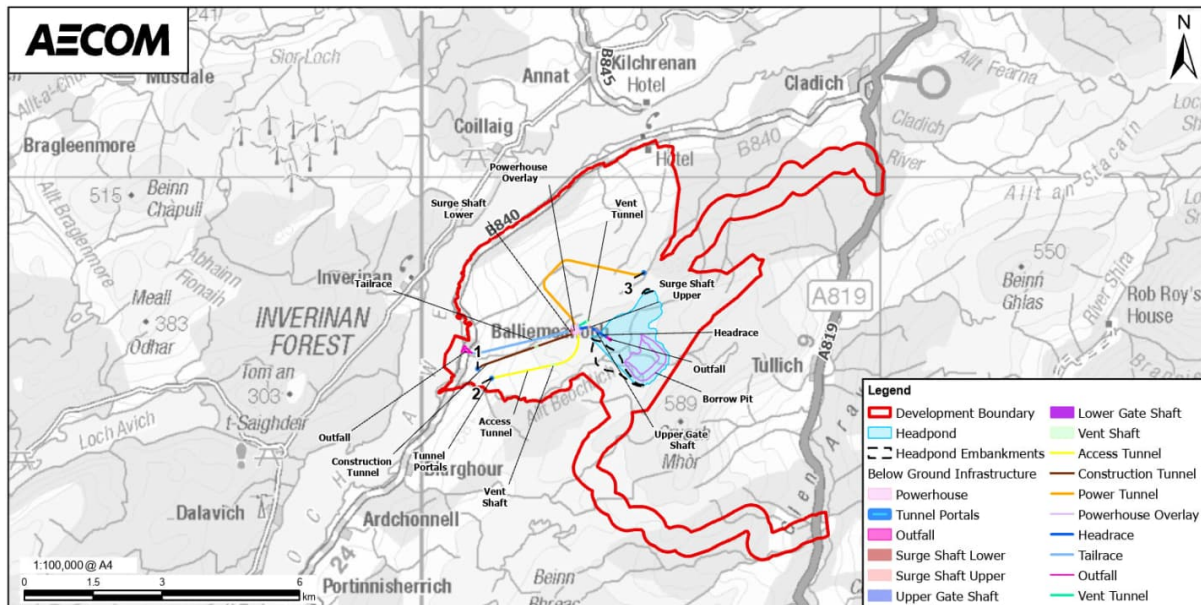


Figure 5 Below Ground Infrastructure

## 2.3 Construction Programme

The lifespan of the Development covers the following four phases:

- Pre-Construction – initial works that enable the construction of the Development;
- Construction – the building and commissioning of the Development;
- Operation – the period when the Development is active and has the potential to generate electricity; and
- Decommissioning – the end of operational use and the removal and/or making safe of the Development.

Construction is expected to last up to 7 years including the pre-construction works. The construction work is anticipated to peak within years 2 and 3 of construction as the tunnelling construction and the Headpond construction are the two biggest operations and they are likely to be sequenced in parallel.

### 2.3.1 Pre-Construction

The pre-construction phase incorporates:

- Site clearance
- Compound set up
- Construction of the permanent access tracks
- Construction of the temporary access tracks
- Sustainable drainage systems
- Public path diversions
- Construction of the Marine Facility

### 2.3.2 Construction

The construction phase incorporates:

- Headpond construction
- Tailpond construction
- Tunnel construction



- Waterways construction
- Switching Station construction
- Power cavern construction
- Access Track maintenance
- Public path diversions
- Commissioning

Materials management has been a key design principle to minimise and surplus material by balancing the material that is generated from the cutting, drilling and excavation activities with the construction activities.

The construction of the Development will require task-specific vehicles, plant and equipment in addition to general construction equipment.

Electrical power will be required on the Development Site for various aspects of construction. It may be possible for a temporary connection to be made to the local distribution network. A grid connection would reduce fuel consumption on the Development site and reduce noise from on-site generators. However, it is anticipated that this will not be available across the whole Development Site and for the full duration of the construction phase. Therefore, it has been assumed that construction power will also be supplied by portable generators fuelled by natural gas or diesel. It is assumed that most of the smaller works, not requiring the use of construction plant or machines, will use handheld petrol generators and equipment.

The number of construction staff on the Development Site will vary according to the construction activities being undertaken and will be confirmed by the Construction Contractor upon appointment. These will range from admin and transportation of staff to construction and machine operators. It is expected that up to 1,000 personnel will be employed on site during the construction phase at its peak. The average number of personnel working on the Development Site over the construction period will be up to 500. As this will be subject to the requirements of the Construction Contractor this estimate could change.

The welfare and other facilities required for the personnel will be located within temporary compound 8. For some critical path activities where 24 hour working is required, it is anticipated that on-site accommodation facilities will be required for a small proportion of the workforce.

Given the rural location of the site, there are a number of options that have been considered to accommodate workers on or near the site, including potential for park and ride. As a result this has been considered within *Chapter 16: Socio-economics, Recreation and Tourism* (Volume 2 Main Report), and an Outline Workers Housing Strategy has been produced in *Appendix 16.2: Outline Housing Strategy* (Volume 5 Appendices). The applicant is committed to identifying and developing a detailed Workers Housing Strategy at the appropriate time that will support the project's delivery, provide quality accommodation for the non-home-based workforce and maximising the socio-economic benefits for communities within Argyll and Bute.

### 2.3.3 Operational Phase

The expected lifetime of a PSH scheme is reported in academic literature to be around 100 years. This is considered to be a conservative estimation as Ffestiniog Power Station and Cruachan Power Stations were commissioned in 1963 and 1965 respectively and are still in good operational condition having had some relatively minor refurbishment works. It is expected that the civil works (tunnels and embankment) will have an operational life of up to 100 years. However, throughout this period it is expected that the electrical plant will require refurbishment or major overhaul every 25 years.

Once commissioned, PSH schemes typically require very little maintenance. However there will be regular inspections to ensure the safety of the Headpond. Under the Reservoirs (Scotland) Act 2011, the operator of a reservoir must appoint a Supervising Engineer from a 'panel' of engineers pre-approved by the Scottish Government. The Supervising Engineer will monitor the Headpond, supervise operations and conduct visual inspections. Inspection must also be conducted with a minimum frequency of every two years by an Inspecting Engineer who is an independent, panel engineer.

There will be internal lighting within the access tunnels and the power cavern. Further to this, external lighting is expected to be required at the tunnel portals and at the switching station. At the Headpond and Tailpond, external lighting will be required for access. The lighting will only be used when needed rather than from dusk to dawn.

Once the Development is fully commissioned, the working water volume will pass between the Headpond and Loch Awe in order to provide storage and generate electricity at peak times. It should be noted that a PSH scheme will tend to operate on cycles that are dictated by the energy markets. It is therefore considered unlikely that there will be many days when the Development will complete a full pump / generate cycle in a single day due to fluctuation in energy demand. An application for a Controlled Activities Regulation (CAR) license will be made shortly after the submission of the Section 36 Application. The Applicant has been in consultation with SEPA over the requirement and extent of the CAR license.

The permanent access tracks will be sealed and maintained as an asphalt road after the completion of the construction phase. The exception is to the existing access at Inveraray Castle Park and Gardens where the permanent access will be reinstated to the existing width with local widening in places. The temporary access tracks will be reinstated after the completion of the construction phase. During the operational phase access to the temporarily diverted core paths will be reinstated.

### **2.3.4 Decommissioning**

Hydropower assets are very durable and, consequently, it is very rare for large-scale hydro projects to be decommissioned. Rather, they may be refurbished or adapted. However, if decommissioning became necessary, then it is envisaged that at the end of its operational life, the Development can be decommissioned as follows:

- Water would be drained from the Headpond and released at an agreed rate and timescale through the appropriate licensing regime into Loch Awe;
- The pump turbines and associated mechanical and electrical plant will be removed;
- The power-house and transformer gallery will be stripped of equipment and the entrances to the power cavern blocked off;
- The waterways and tunnel portal entrances will be blocked off with local spoil;
- The Tailpond inlet / outlet structure will be removed;
- The control building and substation will be removed;
- To prevent any incident with the Headpond filling up, the scour valves will remain open, and the spillway pipe and the Headpond inlet / outlet structure will be left in place.

Under the Reservoirs (Scotland) Act 2011, the Headpond does not need to be drained, as long as ongoing maintenance is undertaken.

Decommissioning effects would be those which would occur as a result of the dismantling and draining of the Development at the end of its operational life (as outlined above) and would typically be similar to those assessed for construction. The Development has a design life of 100 years; however, it is anticipated that rather than be decommissioned, components of the Development would be replaced to extend the Development's operational life. Given the lifespan of the development, with the effects of decommissioning being similar to that of construction, and the requirement for a decommissioning plan at the end of its lifespan, decommissioning effects have been scoped out of assessment. Notwithstanding, where information is deemed appropriate to be included this has been outlined within the relevant specialist assessment chapter.



## 3. Evolution of Design & Alternatives

### 3.1 Introduction

This chapter sets out the alternatives considered by the Applicant and the evolution of the design that has led to the Development as it is described in *Chapter 2: Project and Site Description*.

Under Schedule 4, paragraphs 2 and 3 of the EIA Regulations, developers are required to provide “a description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.”

### 3.2 Consideration of Alternatives

#### 3.2.1 Alternative location

The Development was identified as part of a Scotland wide review of potential PSH locations conducted by the Applicant. There is a precedent for renewable energy generation in the Argyll and Bute region and specifically for PSH. The topography and geology of Loch Awe provide suitable conditions for PSH in this location.

Consideration was given to the option to increase capacity of existing schemes as part of a review of alternatives, however the Applicant is not the owner of any existing assets that could be expanded upon. The nearby Cruachan scheme was already being investigated, and no other suitable PSH sites were identified that would fit with both the project and Applicant’s needs or ability to develop due to ownership.

#### 3.2.2 Alternative Technology

There are few, if any, energy storage technologies which can provide the grid scale services of pumped storage hydro. Alternative storage technologies are either too small (batteries) to provide the necessary long durations required, or largely unproven (compressed air) and, in the case of ancillary services such as fast response, more carbon intense (open cycle gas).

PSH schemes provide benefits by balancing the electricity supply and demand. Recharge occurs at periods of low demand and stores excess energy generated by baseload and intermittent power stations so that this energy can be re-released at peak times. This is especially beneficial in Scotland where an increasing percentage of electricity is coming from wind power, the delivery of which is intermittent and therefore PSH schemes support renewable energy generators by providing greater stability to the grid. PSH can also provide ancillary services to the grid.

### 3.3 Evolution of Design

The design process was iterative and progressed with consideration for engineering feasibility, environmental constraints and consultation responses. The evolution of the design of the development has been developed through six key stages.

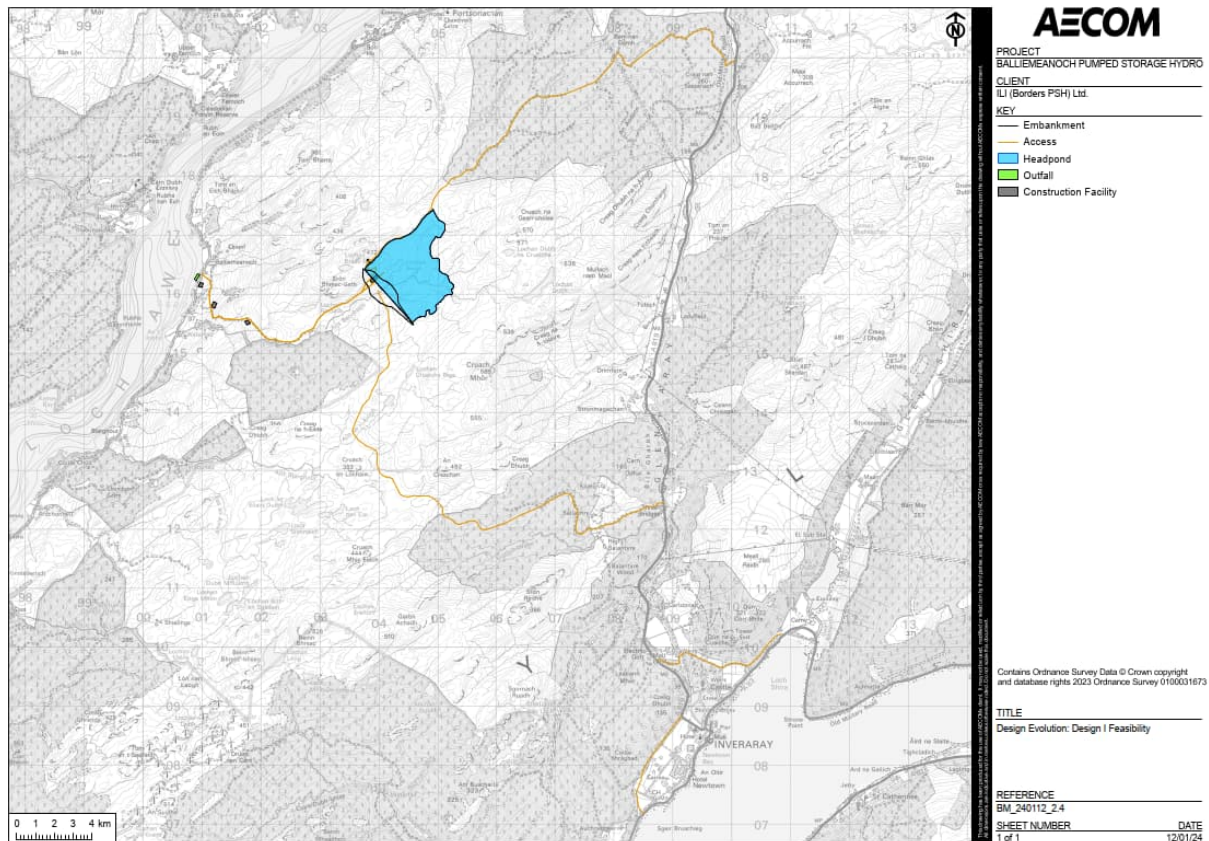
#### 3.3.1 Design I: Feasibility

The Applicant identified Loch Awe’s potential for developing a PSH scheme as a natural Tailpond with the creation of a Headpond utilising the natural landform. The Applicant developed a preliminary layout that utilised the natural landform around Lochan Airigh as the Headpond and Loch Awe as the Tailpond.

Key features of this design iteration included:

- Headpond comprised one embankment – embankment 1 to the west, maximum height above existing ground 110 m.
- Tailpond inlet / outlet within Loch Awe.
- Access to the site off the A819 following existing forestry tracks southwards to the Headpond location.
- Secondary access from the south off the A819 following Blarghour Wind Farm access. Noting that this access would only be utilised should the wind farm be constructed, and the necessary land rights secured.

- A traffic study was undertaken to review the route to the site which indicated the following would be required within the design to ease pressures on the local road network:
  - Requirement for a Marine Facility to deliver large components such as a tunnel boring machine, if required;
  - Access off the A83 to the A819 through Inveraray Castle grounds access to avoid Inveraray town centre; and
  - Access from the Marine Facility along proposed upgraded Upper Avenue, Inveraray, for material delivery from the Marine Facility.



**Figure 6 Design I: Feasibility**

### 3.3.2 Design II: Scoping

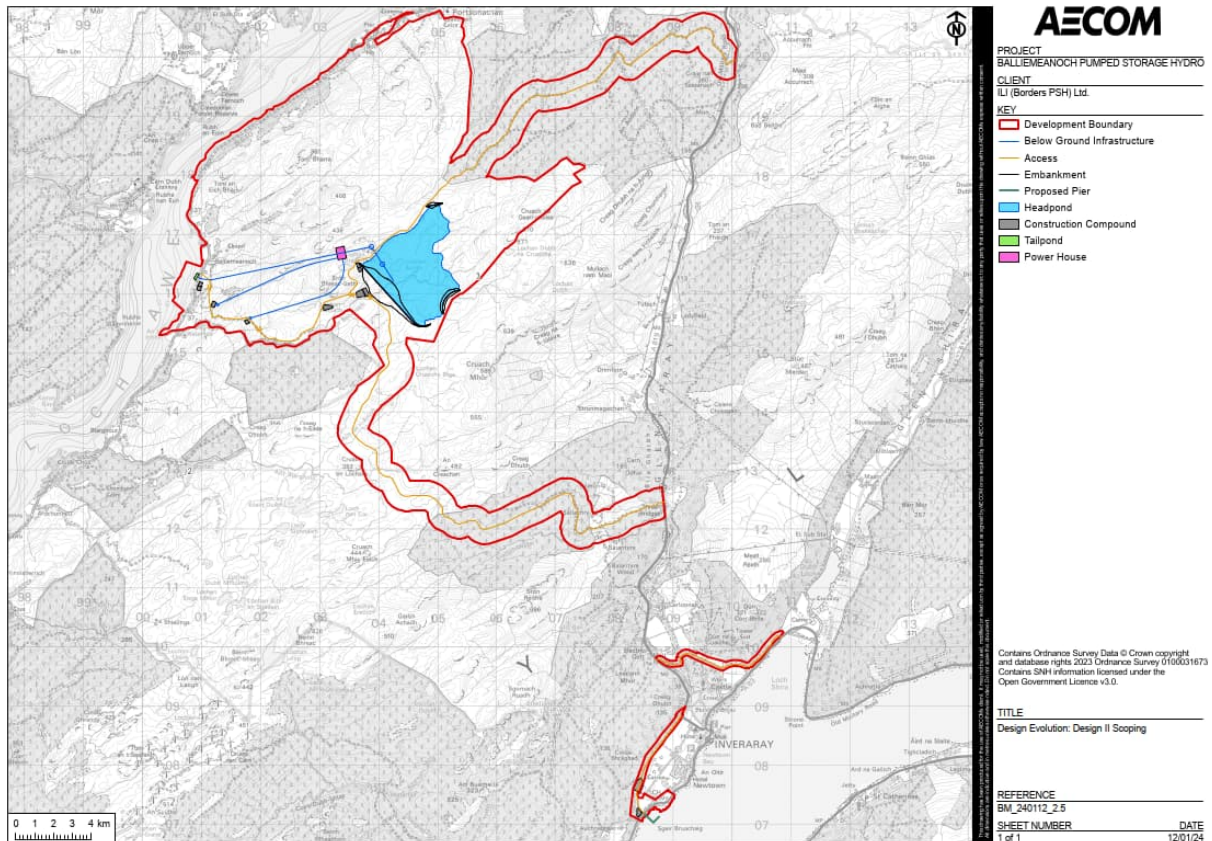
The design evolved to incorporate two new embankments to increase the capacity of the scheme:

- Embankment 2 to the north-east, maximum height above existing ground 13 m;
- Embankment 3 to the south-east, maximum height above existing ground 10 m.

After a high-level environmental assessment the design was changed to reduce impacts:

- Embankment 1 was reduced from 110 m to 92 m to reduce visual effects.
- Two possible switching station locations: one at the north western edge of the Headpond, the second to the north east of the Headpond off the internal access track south of Keppochan and Upper Sonachan Forest.
- Eight construction compounds locations were identified avoiding key sensitive receptors.
- Identification of location for the intake tower within the Headpond.

The Marine Facility was drafted to accommodate the size of vessels that may be necessary to deliver a tunnel boring machine (if required) and other AILs.



**Figure 7 Design II: Scoping**

### 3.3.3 Design III: Post Scoping

Key changes to the design, to reflect feedback from the Scoping Opinion, as well as a bathymetric and topographic surveys of the two lochs, included:

- Increasing the size of the red line boundary at the southern side of the Headpond to accommodate construction activities, and south of Inveraray to include the Marine Facility. This enabled further design optimisations including:
  - Siting of the temporary compounds to minimise habitat loss and visual prominence using existing landform and tree cover.
  - Consideration of wider landscape and habitat restoration opportunities.
  - Alignment of the Marine Facility to minimise visual effects from local residents and from recreational paths.
- Removal of the south eastern embankment which slightly increased the size of the Headpond. However the removal of the embankment reduced landscape and visual effects. Removing an embankment also reduced vehicle movements of materials.
- Diverting the B840 to accommodate Tailpond inlet outlet (temporary or permanent diversion tbc).
- Moving tunnel portal 1 due to B840 road diversion.
- Removal of the intake tower to reduce landscape and visual effects from elevated views within landscape designations and Wild Land Areas (WLAs) to the north. The intake evolved to be embedded into the Headpond and therefore not visible above Top Water Level.
- Addition of an access track running on top of Embankment 1 to access new compounds.
- Removal of the access track to the north of the Headpond shown in Section 3.3.2 Design II: Scoping and addition of an access track around the eastern extents of the Headpond.



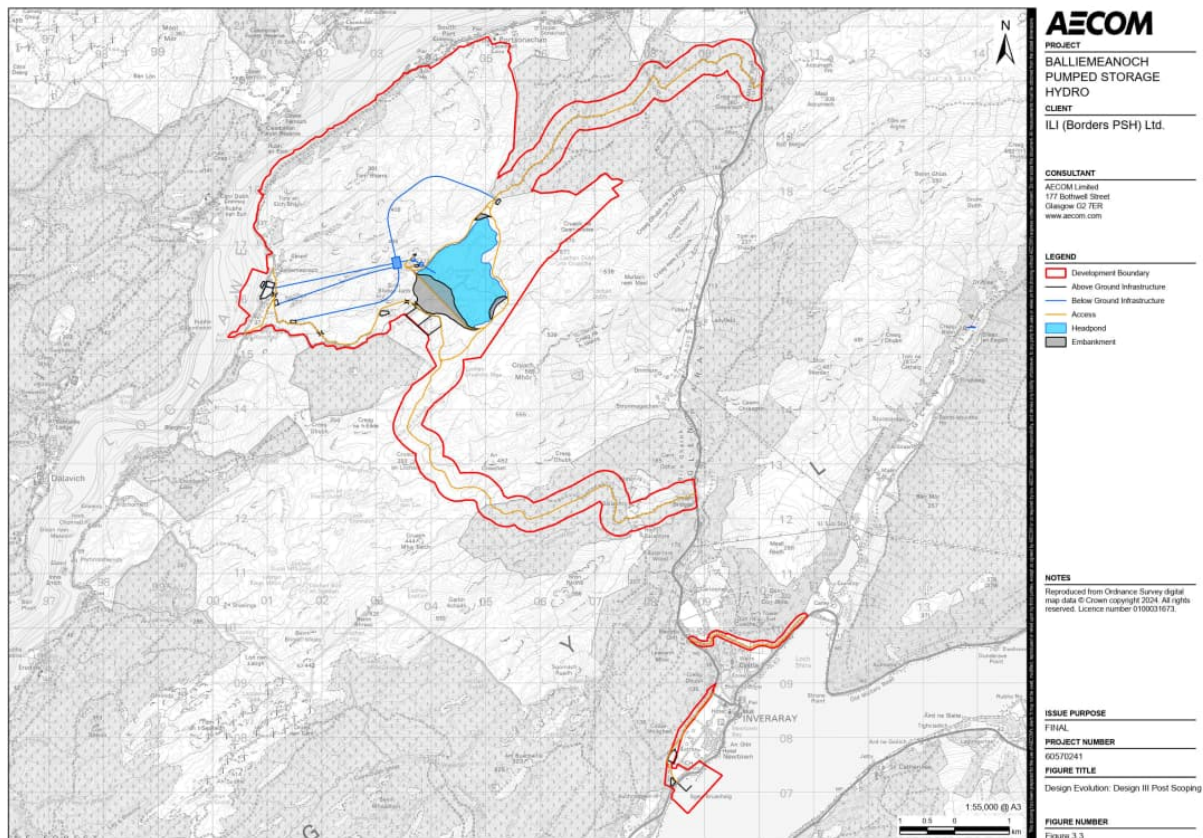


Figure 8 Design III: Post-Scoping

### 3.3.4 Design IV: Post Public Consultation

Key changes to the design following public consultation include:

- Jetty to be temporary, in order to reduce long-term effects on nearby residential properties. Once the jetty has been demobilised, only the piles would remain partially visible above lower water levels.
- Design and layout of jetty to reduce potential visual effects on nearby residential properties, whilst balancing the geo-technical constraints and lighting requirements.
- Change in location, layout and use purpose of construction compound near the Marine Facility to reduce effects on nearby residential properties and take account of existing vegetation and landform to partially screen the appearance and operation of the temporary compounds.
- Showing within the design of how the proposed new and upgraded Access Tracks could be utilised by recreational users through inclusion of benches, information signage (on the PSH and walking/cycling routes available through the site), warning signage (at the Headpond and inlet / outlet) and directional signage.

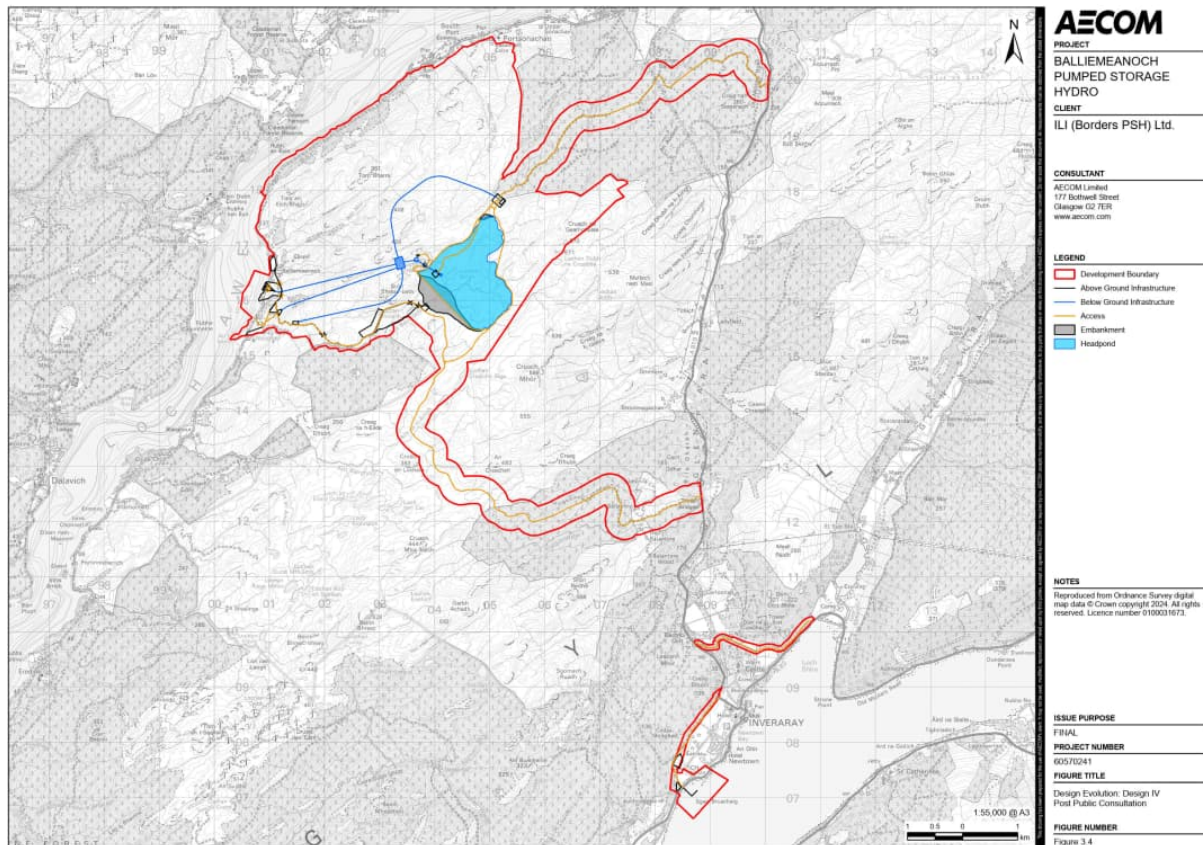


Figure 9 Design IV: Post Public Consultation

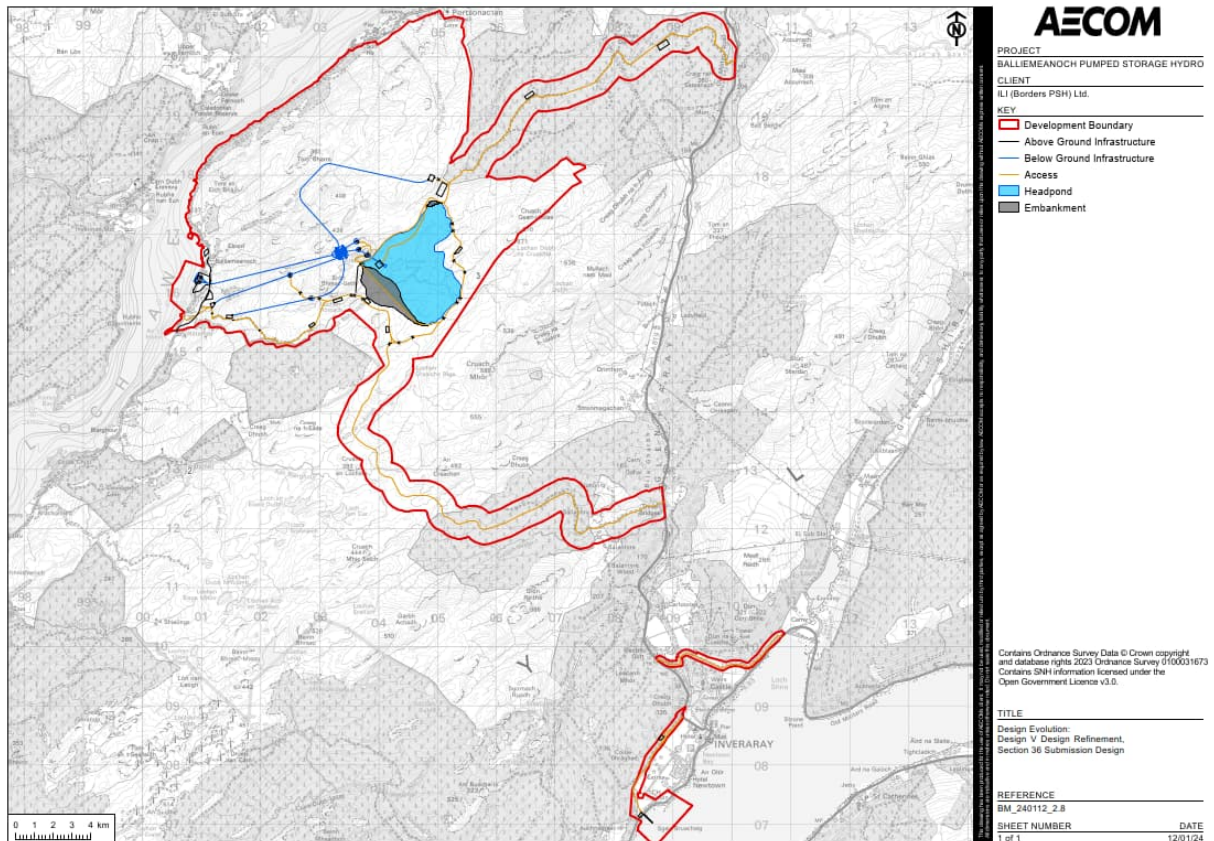
### 3.3.5 Design V: Design Refinement

This design was the result of two design workshops held with landscape and visual and ecology specialists and was submitted with the Gate Check Report. The updates are as a result of refined engineering feasibility requirements and environmental constraints.

- Tracks realigned to reduce landscape and visual effects, in particular the tracks leading to permanent compounds to route around the eastern side of the hill as opposed to the west;
- Refinement of Inveraray jetty positioning and layout due to landscape and visual effects in terms of alignment within the loch and to ensure that the extent of hardstanding at the loch shore is minimised;
- Tunnel portal 3 introduced as substation relocated (power tunnel previously entered the substation directly). The tunnel will be used for delivery of AILs and repurposed as the power tunnel post construction. The orientation of tunnel portals to minimise visual prominence, such that there would be no visibility from more sensitive views to the north of the site.
- Landscape restoration proposals were developed to aid visual integration of the Tailpond. These are comprised of native woodland mixes to assimilate the inlet / outlet structure, gate house buildings, and tunnel portals 1, 2, and 3. Some areas of planting could be undertaken at early stages of construction to enable the screening effect of operational infrastructure in a shorter duration.
- Wider landscape and habitat restoration proposals were developed to aid landscape integration. The scale of broadleaf woodland within the site seek to maximise, native woodland planting extending east from the loch shore towards the Headpond maximising tree cover within the glens and lower slopes and strengthening the overall landscape fabric within the site whilst also reducing the scale of proposed manmade infrastructure.
- Building and structure heights at permanent compounds 17 and 18 were limited to integrate with the existing landform to avoid visual prominence, whilst also avoiding deep peat and more susceptible areas of bog. The location of these structures is set against the backdrop of plantation forestry to reduce visual effects.

- Temporary compound 22, the Jetty and access track were relocated to an existing borrow pit within plantation forestry to avoid visual prominence from nearby visual receptors and views across Loch Fyne.
- Tracks realigned to avoid deep areas of peat as identified during peat probing, in addition to floating tracks included in the design to reduce impacts on peat;
- Change in compound number and layout taking into account topography, avoidance of heritage assets, ecological receptors, watercourses, deep peat and improved gradient;
- Introduce a borrow pit in the Headpond due to material shortage;
- A number of changes to reduce impacts on ecological receptors including:
  - Switching station relocated and resized to accommodate the required switching gear and to avoid ecological wetter bog habitat.
  - Permanent compound 13 relocated to avoid wetter bog habitat.
  - At the Tailpond, the extent of woodland loss beside Loch Awe was reduced below that originally proposed.
  - Temporary compound 2 was reduced to be confined only to the agricultural field, with no further impact on woodland beside Loch Awe.
  - Temporary compound 4 was relocated to avoid impact on wet rushy habitat that constitutes a potential Groundwater Dependent Terrestrial Ecosystem and supports greater floristic diversity than the heavily-grazed grassland currently present.
  - Temporary compound 7 was re-shaped so that it no longer impinges on an existing grazing exclusion area, mainly affecting low quality wet heath and acid grassland degraded by overgrazing.
  - Permanent compound 20 and associated access track were slightly moved to avoid deep peat area.
  - The permanent track/bridge near permanent compound 9 was slightly moved to avoid a species-rich rocky riparian area.
  - Temporary compound 11 and associated access track were initially moved to avoid significant deep peat that also supports a locally rare sphagnum moss; subsequently, these elements were further adjusted to avoid a bog area with two substantial bog pools and a steep slope with species-rich vegetation.
  - The temporary access track just north of the small northern Headpond embankment has been altered to avoid a base-rich flush containing bog orchid.





**Figure 10 Design V: Design Refinement**

### 3.3.6 Design VI: Section 36 Submission Design

Design VI: Section 36 Submission Design is the iteration of the Development design for which Section 36 Consent is being sought and upon which the assessments contained in Chapters 5 to 20 of the EIA Report (Volume 2 Main Report) have been based.

Changes from Design V include:

- Minor design changes to the above ground access tracks connecting to the proposed Blarghour Wind Farm access track.
- Temporary compound 13 was also removed to avoid the proposed overhead line (OHL) from the proposed Creag Dhubh Substation within the Upper Sonachan and Keppochan Forest. An alternative location was not proposed due to the proposed felling and ground conditions in the Forest.

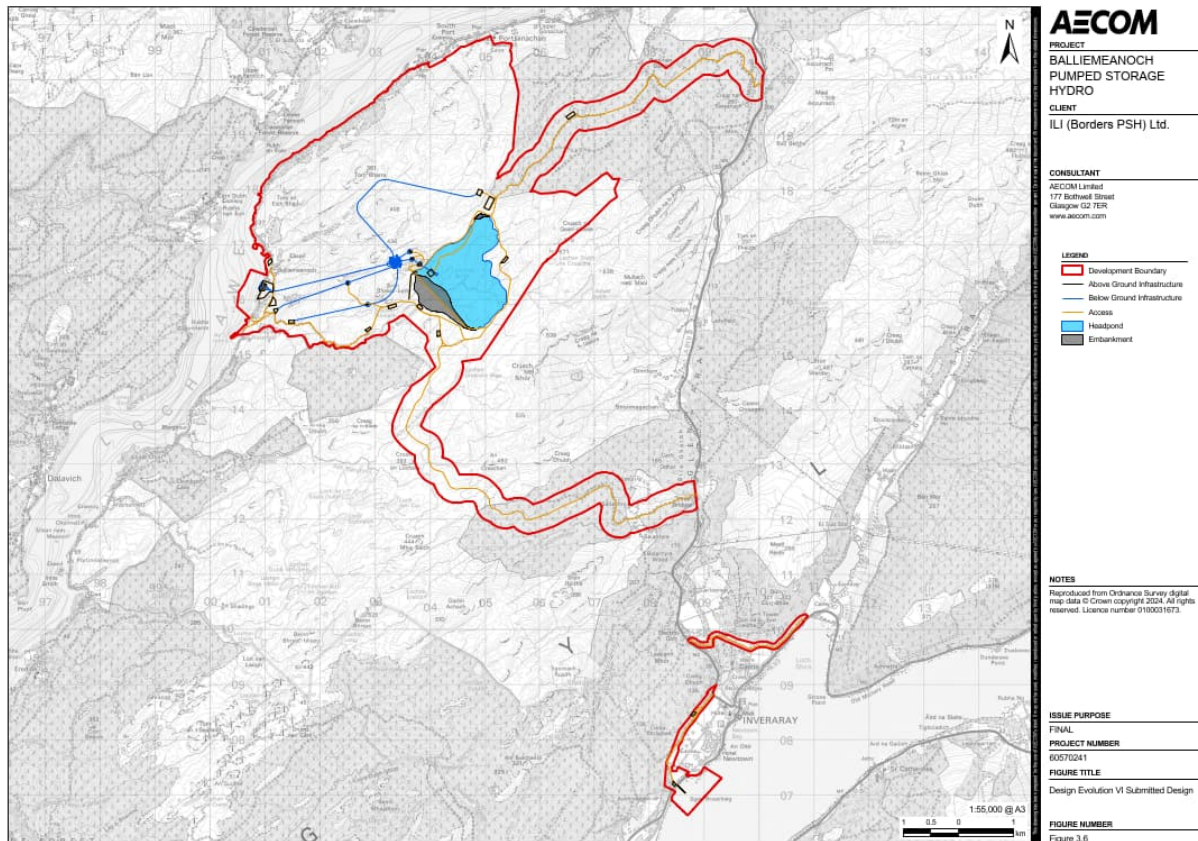


Figure 11 Design VI: Section 36 Submission Design

### 3.4 Detailed Design and Optimisation

The design process resulting in the Design VI: Section 36 Submission Design has been refined to incorporate key environmental and engineering information gained to date. Post consent there will be elements of the Development that will be subject to **detailed design** informed by further site investigation works, confirmed operational requirements and the working practices of the Construction Contractor. At this stage the construction materials and methods will be finalised. There is also the potential for engineering improvements and optimisations such as a smaller Power Cavern or reducing the capacity of the Headpond itself.

### 3.5 Embedded Mitigation

Where possible, mitigation measures have been incorporated into the Development design and construction. Through iterative assessment, potential impacts have been predicted and opportunities to mitigate them identified with the aim of preventing or reducing impacts as much as possible. This approach provides the opportunity to prevent or reduce potential adverse impacts from the outset. This embedded mitigation approach has been taken into account when evaluating the significance of the potential impacts.

Once these measures are incorporated into the design, they are termed 'embedded measures'. Embedded measures relevant to the construction phase are described within each technical chapter of the EIAR. For the operational phase, such embedded measures will be represented primarily in the design, e.g., the choice of infrastructure components. Embedded measures are therefore either incorporated into the design from the outset or identified through the assessment process.

Along with any measures required for legislative compliance, the Development will also incorporate industry standard control measures, which are common practice on construction sites, into the embedded measures. These are described in each technical chapter of this EIAR.

The following mitigation is embedded into the Development (note this list is not exhaustive and is in greater detail within the EIAR (Volume 2: Main Report)):

- An Outline Construction Environmental Management Plan (CEMP) which sets out the environmental management framework to be adopted during construction and measures to be implemented to



minimise construction environmental impacts. The Outline CEMP also outlines other management plans which will be developed and finalised by the Construction Contractor including:

- Pollution prevention;
  - Construction noise;
  - Emergency response and flood risk management plan;
  - Waste management plan;
  - Ecological management plan;
  - Biosecurity measures;
  - Dust management; and
  - Tree protection during construction
- Framework Construction Traffic Management Plan (CTMP) which sets out measures to be implemented to minimise adverse effects from construction traffic.
  - Topic specific management plans covering the following topics:
    - Outline Landscape and Ecology Management Plan (LEMP) – which outlines the holistic landscape and ecological reinstatement measures including enhancement, planting, management;
    - Outline Peat Management Plan (PMP) – which details the management of peat;
    - Outline Water Management Plan (WMP) – which outlines how water quality will be maintained, watercourse protection and the protection of private water supplies;
    - Outline Access Management Plan – which outlines the diversions, closures and management of recreational and formal access routes and paths within the Development Site and connections to them outside the red line boundary.
  - A draft Workers Housing Strategy – demonstrates the options for accommodating construction workers employed by the scheme during the approximate seven year construction period.
  - Materials Management Appraisal to aid materials balance and reuse
  - A Surface Water Management Strategy Plan (SWMP) will be prepared building on the requirements set out in the flood risk assessment.

## 4. Approach to EIA

### 4.1 Assessment of Receptors

For each specialist topic area, sensitive 'receptors' are identified which may be affected by the Development. This includes living organisms, habitats, natural resources, receptors in the historic environment in or around the Development Site, which could be adversely affected during construction of the Development, during the operation of the Development, or during decommissioning of the Development.

The assessment methodology used for the EIA Report was broadly the same for all topic areas. For each topic, the assessment of significance is informed by the sensitivity of the existing or baseline environmental conditions or character, and the magnitude of the change to the existing conditions or baseline character which is expected to occur as a result of the Development.

The value or sensitivity of the receptors is assessed according to the relative importance of existing environmental features on or near to the site, or by the sensitivity of receptors, i.e. whether they are likely to be robust enough to be unaffected by the Development or alternatively are highly susceptible to the type of effects likely to occur.

**Table 4.1 Generic Guidelines for the Assessment of Value / Sensitivity**

<b>Sensitivity</b>	<b>Definition</b>
Very High	The receptor has little or no ability to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.
High	The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or of national importance.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value or is of regional importance.
Low	The receptor is tolerant of change without detriment to its character, is low environmental value, or local importance.
Negligible	The receptor is resistant to change and is of little environmental value.
Very High	The receptor has little or no ability to absorb change without fundamentally altering its present character, is of very high environmental value, or of international importance.

## 4.2 Measurement of Magnitude of Environmental Impact

The magnitude of potential effects on environmental baseline conditions is identified through consideration of the Development. Where the design is not yet fixed, we have considered the parameters and assessed the “worst case” scenario to ensure that the assessment is robust and describes the fullest extent of likely effects. The setting of parameters for assessment in this way is sometimes referred to as the “Rochdale Envelope” approach. The assessment of magnitude of changes takes into account the scale or degree of change from the existing situation as a result of the effect being considered; and the duration and reversibility of the effect, as well as consideration of relevant legislative or policy standards or guidelines.

To this end, where flexibility in parameters for the Development (such as the height of the embankment) has been provided, the Applicant has assessed the realistic worst case and it is made clear in each ‘topic’ assessment what this constitutes.

**Table 4.2 Generic Guidelines for the Assessment of Magnitude**

<b>Magnitude</b>	<b>Definition</b>
High	Total loss or major alteration to key elements/features of the baseline conditions such that post development character/composition of baseline condition will be fundamentally changed.
Medium	Loss or alteration to one or more key elements/features of the baseline conditions such that post development character/composition of the baseline condition will be materially changed.
Low	Minor shift away from baseline conditions. Changes arising from the alteration will be detectable but not material; the underlying character/composition of the baseline condition will be similar to the pre-development situation.
Negligible	Very little change from baseline conditions. Change is barely distinguishable, approximating to a ‘no change’ situation.
High	Total loss or major alteration to key elements/features of the baseline conditions such that post development character/composition of baseline condition will be fundamentally changed.

## 4.3 Measurement of Significance of Environmental Effects

A combination of the magnitude of the effect and the sensitivity of the receptor determines the significance of effect (Table 4.3). For instance, when a receptor that is deemed very sensitive to change is exposed to an environmental impact of high magnitude, the resultant effect on the receptor will be classed as Major. It should be noted that this general approach is a framework and should not be treated as a matrix.

The issue may have a positive or negative impact on the receptor. Therefore, the significance of effects is reported using a seven-point scale, from: Major Adverse; Moderate Adverse; Minor Adverse; Negligible; Minor Beneficial; Moderate Beneficial; to Major Beneficial. For some assessments, professional judgement has been applied. Where this is the case, it is indicated in the topic chapter and the variation will be explained clearly and fully.

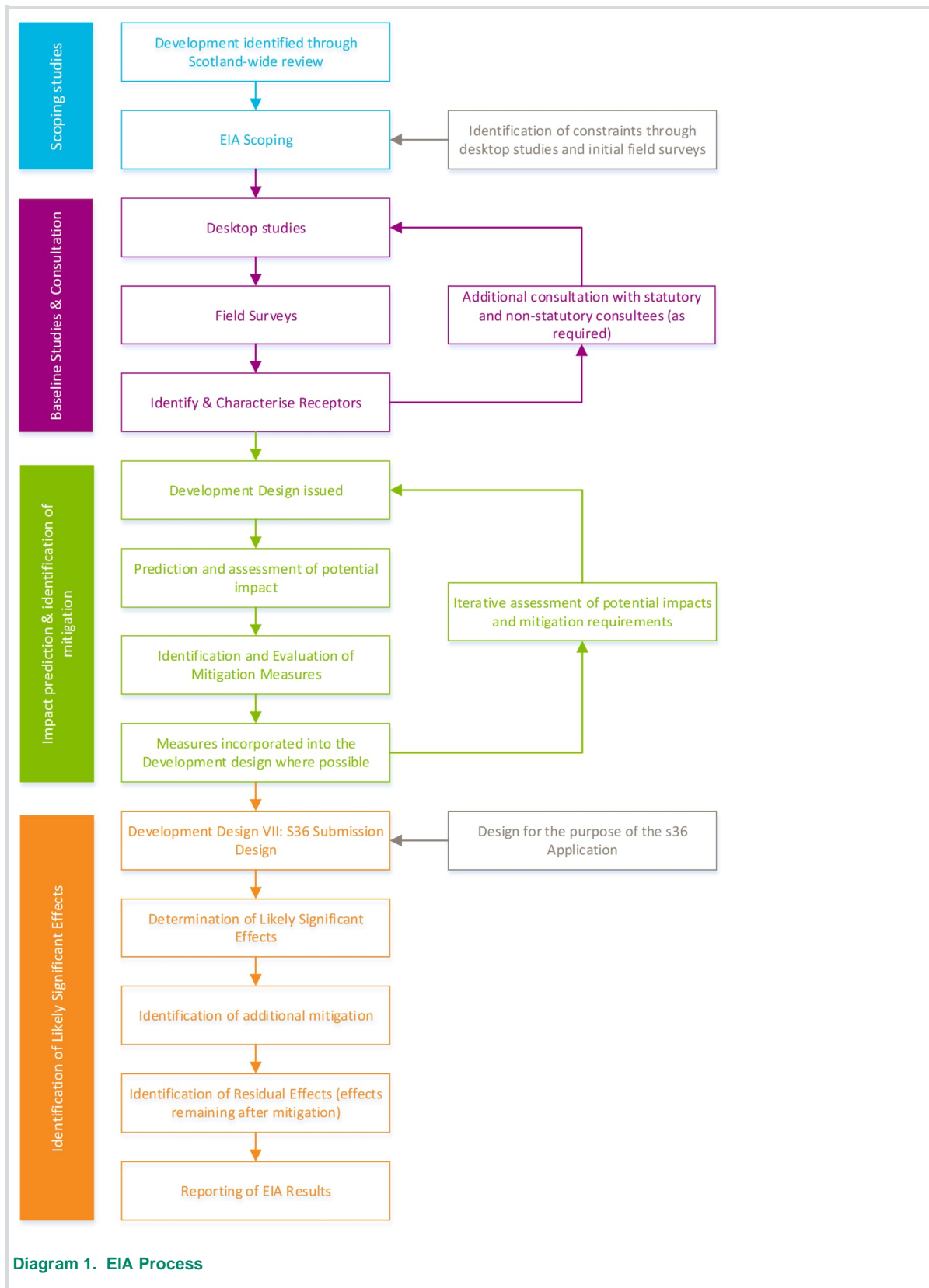
Generally, effects which are Major or Moderate are considered to be significant. Minor and Negligible effects are considered to be not significant.

**Table 4.3 Classification of Effects**

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

A significant adverse effect is not necessarily one that would make the Development unacceptable, nor is a significant beneficial effect necessarily one that would make the Development acceptable. The purpose of identifying the significant effects (adverse and beneficial) is to ensure that all parties, in particular decision makers, are aware of the environmental impacts (in particular those which are likely to be significant) of the Development and consider these alongside other material considerations in determining this application.

The EIA process can be summarised within the flow chart on the following page..



## 4.4 Consultation

The Applicant has engaged with multiple stakeholders as part of the pre-application process. Meetings have been undertaken with the following stakeholders including two public consultation events on the 19<sup>th</sup> July 2023 at the Inveraray Inn and the 7<sup>th</sup> August 2023 in Dalmally Community Hall. Approximately 76 people attended the two exhibitions over the two days. Further details can be found in the Pre-Application Consultation Report, which has been submitted with this application.

**Table 4.4 Overview of Key Meetings**

<b>Date</b>	<b>Consultees in Attendance</b>	<b>Discussion</b>
13 <sup>th</sup> September 2021	Community Councils	Introductory meeting to the Applicant and the Development
27 <sup>th</sup> October 2021	Argyll & Bute Council	Introductory meeting to the Applicant and the Development
28 <sup>th</sup> March 2022	Marine Directorate (formerly Marine Scotland)	Introductory meeting to the Applicant and Development and scope of the EIAR
28 <sup>th</sup> March 2022	ECU	Introductory meeting to the Applicant and Development and scope of the EIAR
12 <sup>th</sup> October 2023	Argyll & Bute Council	Meeting to discuss the proposed temporary workers accommodation
26 <sup>th</sup> October 2024	South Loch Awe-side Community Company (SLACC)	Private viewing of the public exhibition during their annual general meeting
16 <sup>th</sup> March 2023	NatureScot	Meeting to discuss site access for their upcoming site visit and validity of our bird survey data
12 <sup>th</sup> October 2023	Argyll & Bute Council	Meeting to discuss the proposed temporary workers accommodation and the approach to the planning application
19 <sup>th</sup> March 2024	SEPA	Meeting to discuss the potential effects and mitigation required
1 <sup>st</sup> May 2024	ECU	Meeting with ECU to discuss Gate check consultee responses

## 5. Assessment Findings

### 5.1 Introduction

The EIA Report identifies the key environmental topics that have been assessed. For each assessment topic, the EIA Report describes the methodological approach to assessment, provides existing information on the local environment (the environmental 'baseline'), and describes the potential effects on that environment during construction, operation and decommissioning.

The environmental topic areas reported on in the EIAR are summarised below.

### 5.2 Landscape & Visual (see Chapter 5)

This section summarises the Landscape and Visual Impact Assessment (LVIA) and potential effects on landscape character and visual amenity arising from construction, operation and decommissioning of the Development.

A desk based study, consultation exercise and field survey were undertaken to inform the assessment. The Study Area was determined by a combination of Zone of Theoretical Visibility (ZTV) analysis and professional judgement which identified which views of the Development are likely to be possible, and field survey. Viewpoints were selected to represent the experience of different types of visual receptor (viewer) including settlements and residential properties, transport and recreational routes and other outdoor locations.

Field work was undertaken by Chartered Landscape Architects within summer 2023 to inform the iterative design process, assess the existing character of the landscape and visit representative viewpoints. This was carried out between 10<sup>th</sup> and 13<sup>th</sup> July 2023 and between 16<sup>th</sup> and 17<sup>th</sup> November 2023. Seasonal differences are taken into consideration within the LVIA, and the operational year 1 assessment on landscape character and visual amenity reports the worst-case scenario when broadleaf vegetation would not be in leaf. Viewpoint photography was captured within April 2022, June 2023, September 2023 and November 2023.

#### 5.2.1 Residual Effects

All mitigation measures for the LVIA are embedded and are detailed in the oLEMP (*Appendix 5.4, Volume 5: Appendices*). The purpose of this LEMP is to set out the proposed strategy to mitigate potentially adverse effects of the Development on habitat features within the Development Site boundary and on the landscape and visual resource, and to provide enhancement where appropriate and feasible.

The objectives proposed by this oLEMP, which are intended to jointly fulfil both biodiversity and landscape aims, are:

- Reinstatement of temporarily-lost habitats, including grassland sowing and heathland sowing;
- Restoration and rehabilitation measures including peat bog / upland rehabilitation, natural regeneration and steep mountainside enhancement;
- Replacement of felled forestry plantation, where lost to widen existing tracks for access, with productive woodland, heathland and grassland planting to enhance the structure and diversity of species;
- Native woodland planting, sympathetic to the composition of existing natural woodland and in suitably-natural locations, to enhance and expand existing woodland features within the landscape, including alongside rising glens and adjacent to existing forestry, as well as to integrate and reduce the scale of the Tailpond part of the Development;
- Secure the management of newly created replacement habitats; and
- Form the basis of potential planning conditions related to the implementation and restoration of the Development Site.

The LEMP also outlines the long-term management principles that would run concurrently with the operational lifetime of the Development. The final plan and execution of these works would be subject to planning conditions and would be the responsibility of the appointed Construction Contractor.

Photomontages are provided in Volume 4: Visualisations. All mitigation measures for the landscape and visual assessment are embedded. Whilst residual significant effects remain in the initial years of operation for some very

limited landscape and visual receptors (at Viewpoint 5 and for watercraft on Loch Awe), no additional mitigation is available that would be effective in further reducing effects.

Representative viewpoints can be found on *Figure 5.7: Representative Viewpoints and Operational ZTV* within Volume 3 Figures, also reproduced as *Figure 11: Representative Viewpoints*, below.

### 5.2.1.1 During Construction

**Table 5.1: Residual Effects on Landscape Character during Construction**

Major Adverse Effect	Moderate Effect	Adverse	Minor Adverse Effect	Negligible Effect	Adverse	Neutral Effect
LCT 40 Craggy Upland - Argyll	Inveraray Castle GDL		East Loch Fyne (Coast) LLA	Ardkinglas and Strone GDL		Ardanaiseig House GDL
LCT 53 Rocky Coastland - Argyll	North Argyll LLA		LCT 34 Steep Ridges and Mountains	LCT 37 Upland Glens - Argyll		
-	West Loch Fyne (Coast) LLA		LCT 39 Plateau Moor & Forest - Argyll	-		-
-	WLA 09 Loch Etive Mountains			-		-
-	LCT 35 Rugged Mountains			-		-

**Table 5.2: Residual Effects on Visual Amenity during Construction**

Major Adverse Effect	Moderate Effect	Adverse	Minor Adverse Effect	Negligible Effect	Adverse	Neutral Effect
Viewpoint 1 – Dun Na Cuaiche, Inveraray	Viewpoint 2 - Minor road - near A815		Viewpoint 3 - Kilmaha	Viewpoint 9 - Dorlin - Point		-
Viewpoint 5 – Loch shore off coastal road between Inverinan and Dalavich	Viewpoint 4 - Dalavich Jetty		Viewpoint 10 - Ardanaiseig GDL	Viewpoint 14 - Beinn - a' Chleibh		-
Viewpoint 6 – Inverinan	Viewpoint 8 - Ben Cruachan		Viewpoint 11 - A85	Viewpoint 15 - Ben Lui -		-
Viewpoint 7 – Eilean na Moadail peninsula	Viewpoint 18 - A815 – St Catherines		Viewpoint 13 - Ben Eunaich	Viewpoint 16 - Duncan - Bann Macintyre Monument		-
Viewpoint 12 – Stob Garbh				-		-
Viewpoint 17 – Loch Awe watercraft			-	-		-
Viewpoint 19 – A83 lay-by			-	-		-

### 5.2.1.2 During Operation (Year 1):

**Table 5.3 Residual Effects on Landscape Character during Operation (Year 1)**

Major Effect	Adverse	Moderate Effect	Adverse	Minor Adverse Effect	Negligible Effect	Adverse	Neutral Effect
-		LCT 40 Craggy Upland - Argyll		North Argyll LLA		Inveraray Castle GDL	Ardkinglas and Strone GDL
-		LCT 53 Rocky Coastland - Argyll		LCT 35 Rugged Mountains		West Loch Fyne (Coast) LLA	Ardanaiseig House GDL
-		-		WLA 09 Loch Etive Mountains		East Loch Fyne (Coast) LLA	-
-		-		-		LCT 34 Steep Ridges and Mountains	-

Major Effect	Adverse	Moderate Effect	Adverse	Minor Adverse Effect	Negligible Effect	Adverse	Neutral Effect
-		-		-	LCT 37 Upland Glens - Argyll	-	-
-		-		-	LCT 39 Plateau Moor & Forest - Argyll	-	-
-		-		-			-

**Table 5.4 Residual Effects on Visual Amenity during Operation (Year 1)**

Major Adverse Effect	Moderate Effect	Adverse	Minor Adverse Effect	Negligible Effect	Adverse	Neutral Effect
Viewpoint 5 - Loch shore off coastal road between Inverinan and Dalavich	Viewpoint 4 - Dalavich Jetty	-	Viewpoint 1 - Dun Na Cuaiche, Inveraray	Viewpoint 9 - Dorlin Point		-
Viewpoint 7 - Eilean na Moadail peninsula	Viewpoint 6 - Inverinan		Viewpoint 2 - Minor road - near A815	Viewpoint 10 - Ardanaiseig GDL	-	-
Viewpoint 17 - Loch Awe watercraft	Viewpoint 8 - Cruachan	- Ben	Viewpoint 3 - Kilmaha	Viewpoint 11 - A85		-
-	Viewpoint 12 - Garbh	- Stob	Viewpoint 18 - A815 – St Catherines	Viewpoint 13 - Eunaich	- Ben	-
-	Viewpoint 19 - A83 lay-by		-	Viewpoint 14 - Beinn a' Chleibh	-	-
-			-	Viewpoint 15 - Ben Lui		-
-			-	Viewpoint 16 - Duncan Bann Macintyre Monument	-	-

**5.2.1.3 During Operation Year 15:**

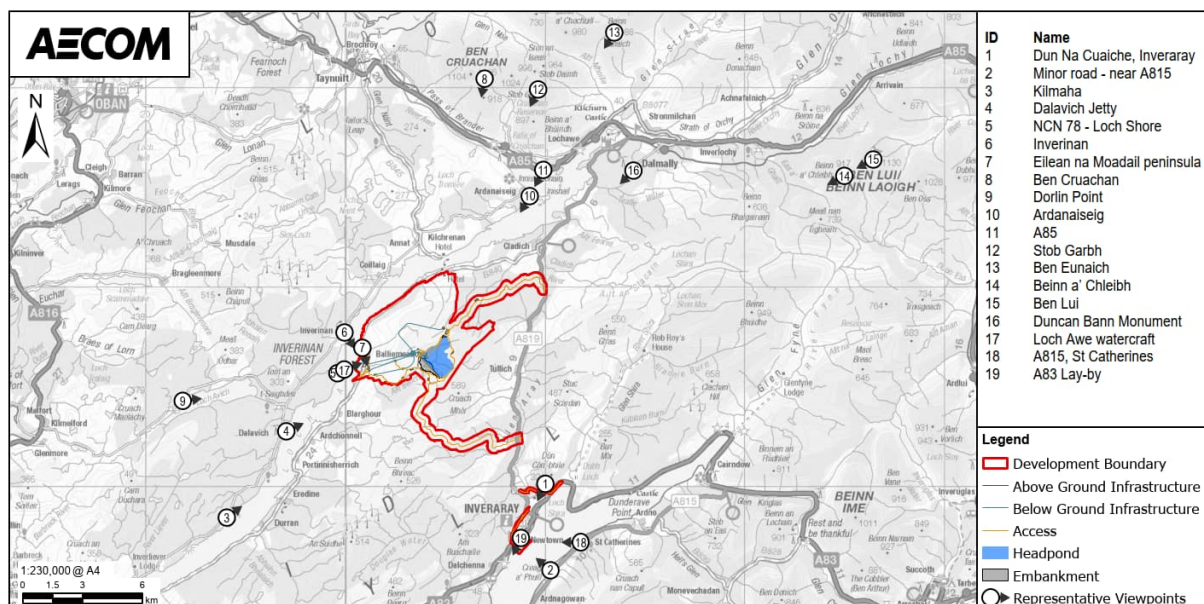
**Table 5.5 Residual Effects on Landscape Character during Operation (Year 15)**

Major Effect	Adverse	Moderate Effect	Adverse	Minor Adverse Effect	Negligible Effect	Adverse	Neutral Effect
-		-		North Argyll LLA	Inveraray Castle GDL	Ardkinglas and Strone GDL	
-		-		LCT 35 Rugged Mountains	West Loch Fyne (Coast) LLA	Ardanaiseig House GDL	
-		-		LCT 40 Craggy Upland – Argyll	East Loch Fyne (Coast) LLA		
-		-		LCT 53 Rocky Coastland – Argyll	WLA 09 Loch Etive Mountains		
-		-		-	LCT 34 Steep Ridges and Mountains		
-		-		-	LCT 37 Upland Glens – Argyll		
-		-		-	LCT 39 Plateau Moor & Forest – Argyll		



**Table 5.6 Residual Effects on Visual Amenity during Operation (Year 15)**

Major Adverse Effect	Moderate Effect	Adverse	Minor Adverse Effect	Negligible Effect	Adverse	Neutral Effect
-	Viewpoint 4 – Dalavich Jetty		Viewpoint 3 - Kilmaha	Viewpoint 1 - Dun Na Cuaiche, Inveraray		-
-			Viewpoint 5 - Loch shore off coastal road between Inverinan and Dalavich	Viewpoint 2 - Minor road - near A815		-
-			Viewpoint 6 - Inverinan	Viewpoint 9 - Dorlin Point		-
-			Viewpoint 7 - Eilean na Moadail peninsula	Viewpoint 10 - Ardanaiseig GDL		-
-			Viewpoint 8 - Ben Cruachan	Viewpoint 11 - A85		-
-			Viewpoint 12 - Stob Garbh	Viewpoint 13 - Ben Eunaich		-
-			Viewpoint 17 - Loch Awe watercraft	Viewpoint 14 - Beinn a' Chleibh		-
-				Viewpoint 15 - Ben Lui		-
-				Viewpoint 16 - Duncan Bann Monument		-
-				Viewpoint 18 - A815 – St Catherines		-
-				Viewpoint 19 - A83 lay-by		-



**Figure 11 Representative Viewpoints**

**5.2.1.4 Decommissioning**

Decommissioning of PSH schemes is extremely rare and in the unlikely event that the Development was to be decommissioned, the Headpond would remain in situ. As a result, potential effects on the landscape and visual resource during decommissioning would be no worse than those assessed during the construction and operational phases of works.

## 5.2.2 Conclusions - Landscape and Visual

The above tables demonstrate that there are no expected significant effects at operation on local landscape designations as noted in Policy 4 of NPF4. The implementation of embedded mitigation inherent within the design such as measures set out within the CEMP and LEMP have minimised and offset the impacts where possible.

One **Significant** effect remains at operation on visual amenity at Viewpoint 4 -Dalavich jetty. Views of the Headpond main embankment and part of the waterbody infrastructure and surrounding permanent infrastructure would remain. Over time the appearance of the embankment would appear less contrasting with the occasional movement of plant like that of other farming and forestry operations. Embedded mitigation measures, including the establishment of native woodland and bog restoration would help to assimilate the appearance of tracks and slightly reduce the scale of the contrast of the Headpond into the view. However, the appearance of the Headpond would remain noticeable and in contrast to the composition and balance of features in views.

## 5.3 Terrestrial Ecology (See Chapter 6)

This section summarises the potential impacts and effects of the construction, operation (including maintenance) / restoration of the Development on terrestrial ecology features. It also provides a summary of committed mitigation and/or enhancement measures identified to minimise or compensate for adverse effects on these features.

The first studies were desk-based and looked at statutory designated sites with terrestrial ecology interests within 10 km of the Development Site, of which there are two: Loch Etive Woods SAC (approximately 6.3 km north west and 6.8 km north east of the Development Site), and Glen Shira SAC (approximately 5.5 km from the Development Site). National and local statutory designations within a 2 km radius and non-statutory designated sites within 1 km were also reviewed with none within the study areas. Within 1 km of the Development footprint there are ancient woodland inventory (AWI) strips and patches of ancient semi-natural woodland (ASNW) in the AWI along Loch Awe and extending in places inland. In the vicinity of Inveraray, the AWI shows further localised extents of ASNW, and also more extensive long-established plantation.

The following ecological surveys have been undertaken to establish the ecological baseline:

- Phase 1 Habitat
- NVC
- Otter
- Bats
- Water Vole
- Pine marten
- Wildcat
- Red Squirrel
- Badger
- Other notable mammals
- Wild deer
- Amphibians and reptiles
- Terrestrial invertebrates
- Invasive non-native species

### 5.3.1 Residual Effects

Further to the embedded mitigation described in *Chapter 3: Evolution of Design and Alternatives* which includes pre-construction surveys, employing an Ecological Clerk of Works (EcoW), standard tree protection measures, and employing good construction practices, additional mitigation will also be implemented including:

- Micro-siting of infrastructure
- Demarcation of sensitive areas prohibiting vehicles, materials and personnel
- Deer exclusion from the upload rehabilitation zone
- Access tracks or compounds affecting potential groundwater dependent ecosystems (GWDTE) or other wetlands will be made permeable
- Watercourse crossings will be constructed as clear-span structures and the natural bed and channel of watercourses retained
- Otter holt monitoring including use of camera traps

- Directional lighting
- Species protection plans
- Biosecurity management plans, and
- Implementing a LEMP which provides biodiversity mitigation and enhancement.

Full details of mitigation can be found within *Chapter 6: Terrestrial Ecology* (Volume 2: Main Report).

#### 5.3.1.1 During Construction

The residual effects of those pre-mitigation effects whose significance is Negligible or No effect remain so. Residual effects for those pre-mitigation effects that are non-negligible are as follows:

- Direct loss of ancient semi-natural woodland – minor loss to the Tailpond will be partially mitigated by the translocation of ground flora / soil to nearby retained woodland and adjacent ground currently degraded by caravans, and associated planting of appropriate tree species. The residual effect is therefore considered **Not Significant**;
- Direct loss of blanket bog – the proposed mitigation, primarily the oLEMP measure of a peatland/upland habitat rehabilitation zone around the Headpond, with exclusion of deer, conservation-level livestock grazing and cessation of all burning, is considered to result in eventual amelioration of the unmitigated effect of blanket bog loss. Therefore, there would be a temporary adverse effect which would be **Significant**, but which is considered ameliorated to a permanent adverse effect in approximately 20 years, which is **Not Significant**;
- Hydrological impact on retained blanket bog – the above Outline LEMP measure of a peatland/upland habitat rehabilitation zone is considered to result in effects being **Not Significant**;
- Direct loss of species-rich ledge/ravine habitat, GWDTE and other notable habitats and flora – the loss of the smallest and least diverse of the four recorded species-rich ledge/ravine habitats and mitigation will protect retained GWDTE and other notable habitats and flora as far as possible resulting in a residual effect of **Not Significant**;
- Direct loss of otter habitat and refuges – the mitigation will protect otters from direct harm, protect retained refuges and minimise disturbance in retained habitat, however the loss of otter habitat and refuges to the Headpond will remain, therefore the residual effect is considered to be **Not Significant**;
- Disturbance of otter – primarily owing to significant disturbance of otter refuges prior to their above loss at the Headpond, the residual effect is considered to be **Not Significant**;
- Direct loss of water vole habitat and refuges – the mitigation will protect retained water vole habitat and refuges, but the losses to the Headpond will remain, therefore the residual effect is considered to be **Not Significant**;
- Mortality of water vole during construction – the mitigation will ensure that, prior to construction, the current distribution of water vole burrows in the Headpond will have been determined, and a licensed mitigation approach (such as displacement) will have been developed to discourage water vole presence in the Headpond area. Therefore mortality of water voles, although it may still infrequently occur, is **Not Significant**.

#### 5.3.1.2 During Operation

The residual effects of those pre-mitigation effects whose significance is given as Negligible or No effect remain so. Residual effects for those pre-mitigation effects that are non-negligible are as follows:

- Impact of loss of wild deer habitat on retained blanket bog, GWDTE and other notable habitats – the uncertain minor increase in deer pressure on these habitats beyond the Development, through loss of grazing habitat to the Headpond and peatland/upland rehabilitation zone, is considered to be **Not Significant**.

### 5.3.2 Conclusions – Terrestrial Ecology

In summary, with mitigation in place there are not considered to be any residual effects that exceed Local significance, thus all effects are **Not Significant**. However, it should be noted that the amelioration of the effect of blanket bog loss by the proposed rehabilitation of retained blanket bog, as set out in the Outline LEMP, is estimated to come to fruition in approximately 20 years, thus there would still be a medium-term effect of Regional Significance, which would be **Significant**, changing to **Not Significant** over time.

## 5.4 Aquatic Ecology (see Chapter 7)

This section summarises the likelihood of significant effects by the Development on aquatic ecological designated sites, habitats, species or ecosystems.

The site for the Development is situated between freshwater and brackish Lochs (Loch Awe and Loch Fyne respectively). The majority of survey locations assessed as part of this assessment are small headwater streams that arise in uplands between Loch Fyne (brackish) and Loch Awe (freshwater) and run through a variety of conifer plantations, broadleaved woodland, open field and moorland areas.

A desk study was carried out to identify any international designated sites within 10 km of the red line boundary and other national statutory and local non-statutory designated sites and notable habitats and species within 2.5 km of the red line boundary. The Development does not lie within any statutory site designated for nature conservation. However three statutorily designated sites are located within the study area: Glen Etive and Glen Fyne SPA, Glen Shira SAC and Loch Etive Woods SAC. All three sites were not considered further within the aquatic ecology assessment as there is no hydrological connectivity between the Development and the designated sites. There are no non-statutory designations for nature conservation within 2.5 km of the Development which have influence over aquatic ecology investigations within the area of influence of the Development.

The desk study identified records of invasive non-native species (INNS), with Japanese knotweed, New Zealand willowherb, American skunk cabbage, Canadian pondweed, Nuttall's waterweed and New Zealand pigmyweed all present. No protected macrophyte species, macroinvertebrate species of national or local designation or freshwater pearl mussel were identified in the study area. Fish data highlighted records of protected or Scottish biodiversity list species: Atlantic salmon, brown/sea trout, arctic char, lamprey, and European eel. Additional records of common and widespread fish species were also present and included Minnow, Perch, Pike, Roach, three-spined Stickleback, and Stone loach.

The non-native rainbow trout *Oncorhynchus mykiss* was also identified, although it is assumed specimens are escaped stocked fish or farmed fish, as there are no self-sustaining populations within Scotland.

The following field surveys were undertaken to establish the aquatic baseline:

- Aquatic Habitats – Flowing Watercourses and Lochs & Lochans
- Freshwater pearl mussel habitat surveys
- Macrophyte survey;
- Macroinvertebrate survey;
- Fish eDNA surveys
- Electric fishing surveys
- Invasive non-native species

### 5.4.1 Residual Effects

Further to the embedded mitigation described in Section 3, additional mitigation will also be implemented by means of the Controlled Activities Regulations (CAR) licence, supervision by the Aquatic EcoW to ensure water management measures prevent run off, the translocation of fish to a suitable nearby receptor site, biosecurity measures are carried out during construction to prevent the spread of INNS, pre-construction surveys, and a 'soft start' to piling works. . Additional mitigation measures during operation are proposed by means of a hydrological assessment to ensure the water levels in Loch Awe remain within the historic range in order to maintain the continued operation of the Loch Awe barrage and the fish lift. Future monitoring is also recommended to evaluate the presence of aquatic INNS, regular monitoring and maintenance of the inlet / outlet in the shore of Loch Awe, the monitoring of permanent culverts to ensure no lasting effects on fish passage.

The following is a list of residual effects identified:

#### 5.4.1.1 During Construction

- Construction of the cofferdam on the shoreline of Loch Awe, including piling, de-watering, and substrate removal: **No Significant Effects** on Loch Awe habitat, fish assemblages in Loch Awe, macrophytes or macroinvertebrates.

- Watercourse crossings for temporary access roads, including culverting of watercourses: **No Significant Effects** on Allt Criche (tributary of Erralich Water), Erralich Water, River Array, Unnamed tributary of River Array or other Low value watercourses or supporting fish species including Atlantic salmon, brown/sea trout, and other fish, aquatic macrophytes or macroinvertebrates.
- Construction of the Headpond and Headpond Embankments, including land take and transport of excavated material: **No Significant Effects** on watercourses of low value, Loch Awe, Lochan Breac-liath, smaller water bodies or as a result of the loss of Lochan Airigh.
- Transport of excavated tunnel material to Headpond via dump trucks, and spoil management of material from tunnelling works, including general plant movement throughout the Development Site: **No Significant Effects** on Loch Awe, macrophytes, macroinvertebrates and fish species including Atlantic salmon and brown/sea trout.
- Temporary site drainage, including SUDs, settlement ponds, temporary ditches, and other drainage features: **No Significant Effects** of temporary site drainage.
- Potential spread or introduction of INNS: **No Significant Effects** on Loch Awe, other watercourses and water bodies, fish assemblages in Loch Awe, fish species including Atlantic salmon and brown trout within watercourses, macrophytes or macroinvertebrates.

#### 5.4.1.2 During Operation

- Fluctuating water levels in Loch Awe have the potential to impact upon fish passage at the Loch Awe barrage and associated fish lift. As a result, there would likely be a **Significant Effect** on migratory fish species in Loch Awe and River Awe, including Atlantic salmon, brown/sea trout, European eel, and lamprey species.
- Effects on water levels in Loch Awe: **No Significant Effects** on Loch Awe habitats of high value, and aquatic macrophytes, macroinvertebrates, and other fish species in Loch Awe, including Arctic char.
- Inlet / Outlet structure on Loch Awe shoreline, including Screen during Operation: **No Significant Effects** on Loch Awe, fish species of high value in Loch Awe (Atlantic salmon, brown/sea trout, arctic char, European eel, and lamprey species), migratory fish species in Loch Awe (Atlantic salmon, brown/sea trout, European eel, lamprey species) or other fish species, macrophytes, and macroinvertebrates in Loch Awe.
- Watercourse Crossings for Permanent Access Roads, Including Culverting of Watercourses: **No significant effects** on watercourses Atlantic salmon in Allt Criche (tributary of Erralich Water), Brown trout, aquatic macrophytes, macroinvertebrates, and other fish.
- Headpond and Embankments, including Land Take and Drainage: the loss of Lochan Airigh through construction of the Headpond and embankments is assessed in the construction effects section, and is **Not Significant** in EIA terms.
- Spread of INNS through the Development Site as a Result of Operation of the Development: The effects of the introduction of INNS on different receptors during operation are consistent with construction effects assessed above and are **Not Significant**.

### 5.4.2 Conclusions – Aquatic Ecology

In summary, with mitigation in place such as within the CEMP, surface water management plan, CAR licence and Biosecurity Management Plan, one **Significant** effect remains during operation on migratory fish species in Loch Awe. All other effects on aquatic ecology are considered to be not significant.

## 5.5 Marine Ecology (See Chapter 8)

This section summarises the potential impacts and effects to marine ecology and nature conservation that are considered as part of the EIA of the Development. The Marine Facility is located south of Inveraray and is comprised of a jetty constructed into Loch Fyne, a sea loch extending from the Firth of Clyde. This jetty will facilitate the delivery of large, abnormal loads, reducing pressures to the local road network during the construction of the main PSH Development. The construction and operation of the jetty has the potential to affect marine ecological receptors in the vicinity of this Marine Facility.



The marine ecology assessment sets out a review of the existing marine ecological baseline conditions and assesses the potential permanent and temporary impacts from the Development. The marine ecological receptors that are considered in *Chapter 8: Marine Ecology (Volume 2: Main Report)* are:

- Benthic ecology (including invasive non-native species; INNS);
- Fish and shellfish;
- Marine mammals; and,
- Relevant designated sites.

Marine ecological baseline conditions were established by undertaking a combination of desktop review of published information, project-specific survey data, and consultation with relevant organisations including NatureScot and Marine Directorate (formerly Marine Scotland). Where relevant, this information has been used to inform marine ecological baseline characterisation for the Development.

A variety of important marine habitats and organisms occur within the Study Area which may be subject to impacts from project activities. The Development occurs within the Upper Loch Fyne and Loch Goil Marine Protection Area (MPA), which is designated for the protection of burrowed mud habitats, flame shell beds, horse mussel beds, ocean quahog aggregations, and sublittoral mud and mixed sediment communities. Project-specific benthic surveys observed the Priority Marine Features (PMF) 'burrowed mud' and 'kelp and seaweed communities on sublittoral sediment'. Kelp and seaweed communities comprise the majority of the habitat in the shallow nearshore region of the Study Area, whereas burrowed mud is primarily observed in deeper waters.

Loch Fyne is a sea loch, with numerous rivers that run into the loch which have been identified as important locations for diadromous fish species. As such, Atlantic salmon, brown trout, European eel, and lamprey may all be present within the Study Area, with Atlantic salmon and sea trout included in Argyll and Bute Council's (ABC) local biodiversity action plan. Additionally, tows within the upper loch have reported the presence of demersal fish including cod, haddock, and hake, which may be present near the Development.

Marine mammals may also be occasional visitors to the area, although no resident populations have been recorded within Loch Fyne. The Outer and Inner Hebrides are known to support resident populations of several marine mammal species, such as harbour porpoise, bottlenose dolphin, and minke whale. Although these species are not considered resident within Loch Fyne, occasional individuals from other populations may occur. Occasional grey seals may occur near the Development but they are not considered resident. Harbour seal have been observed in greater numbers within the Loch, particularly during the summer moult period and individuals may occur near the Development.

### 5.5.1 Residual Effects

All mitigation measures for marine ecology are embedded mitigation measures which include:

- Vibratory piling wherever possible and impact piling only used where necessary to drive the pile toe into bedrock. Where impact piling is used, the project will follow Joint Nature Conservation Committee (JNCC) guidance with details set out within the Construction Contractor's CEMP;
- Measures in the Loch Fyne Marine Biosecurity Plan (Gov Scot, 2020) relevant to construction methods used in the marine environment will be adopted and incorporated into the project CEMP;
- All vessels will follow all current regulations and good practice guidelines to minimise risk of collision, pollution, and spread of invasive non-native species.

#### 5.5.1.1 During Construction

There are no significant residual effects on Marine Ecology during construction, with all effects on the following assessed as minor adverse or negligible and therefore **Not Significant**:

- Benthic Ecology:
  - Permanent loss of benthic habitat due to installation of piles;
  - Habitat modification from introduction of artificial surfaces on the seabed;
  - Temporary disturbance of benthic habitats;
  - Temporary increase in suspended sediment concentration (SSC) and sediment deposition;
  - Reduction in water quality;

- Introduction and spread of INNS.
- Fish and Shellfish Ecology:
  - Effects from underwater sound;
  - Temporary increase in SSC and sediment deposition;
  - Reduction in water quality.
- Marine Mammal Ecology:
  - Effects from underwater sound;
  - Airborne sound and visual disturbance;
  - Vessel presence and collision risk;
  - Reduction in water quality.

#### 5.5.1.2 During Operation

There are no significant residual effects on Marine Ecology during operation with all effects on the following assessed as negligible and therefore **Not Significant**:

- Benthic Ecology – Disturbance to habitats and species due to scour from hydrodynamic change; and
- Fish and Shellfish – Disturbance to habitats and species due to scour from hydrodynamic change

### 5.5.2 Conclusions – Marine Ecology

With the inclusion of the embedded mitigation, no significant effects on marine ecological receptors were identified. As such, all residual effects of the Development demonstrate that there are no expected significant effects during construction and operation on marine ecology/biodiversity.

## 5.6 Ornithology (See Chapter 9)

This section summarises the potential impacts and effects of the construction, operation (including maintenance) / restoration of the Development on bird species. It also provides a summary of committed mitigation and/or enhancement measures identified to minimise or compensate for adverse effects on ornithological features. This section will not disclose information on certain raptor or other rare species regarded by NatureScot as being vulnerable to persecution. For which reason the precise location of breeding sites of these species are confined to Confidential Appendix 9.1: Schedule 1 Birds (*Volume 6: Confidential Appendices*) which is not made publicly available for the reasons stated.

The first studies were desk-based and looked at international nature conservation designations within 10 km of the Development Site (or further afield where there is clear connectivity, for example through hydrological linkage or where the qualifying species are known to range over a wider distance), national sites within 2 km and local sites within 1 km. Records of important bird species were reviewed within 1 km of the Development Site, this being extended to 6 km for protected raptor species.

Ornithological surveys took place from November 2018 to February 2021 to determine the presence and potential impacts of the proposed development upon any birds and their habitats. Territory analysis was undertaken to determine breeding activity and to estimate territorial locations of important bird species and computer models used to predict habitat use of golden eagles.

A single international nature conservation designation exists within the desk study area: Glen Etive and Glen Fyne Special Protection Area (SPA). The sole qualifying feature of the SPA is breeding golden eagle. There are no Local Nature Conservation Sites within 1 km of the Development Site.

Field surveys identified the following important bird species present within the study areas in the context of the assessment:

- Moorland breeding birds including: Common sandpiper, cuckoo, curlew, goldeneye, golden plover, mistle thrush, oystercatcher, skylark, spotted flycatcher, snipe, song thrush, tree pipit, whinchat, common crossbill, lesser redpoll, siskin, and grasshopper warbler.

- Waders including: Golden plover, common sandpiper, curlew, golden plover, oystercatcher and snipe.
- Schedule 1 and red listed passerines including: Common crossbill, spotted flycatcher, tree pipit, whinchat, cuckoo, lesser redpoll mistle thrush, song thrush and skylark.
- Raptors including: Golden eagle, white-tailed eagle, hen harrier, peregrine, osprey, barn owl and short-eared owl.
- Divers: No breeding by red-throated divers or black-throated divers within the survey area was identified or suspected during the 2019 breeding season. One sighting of red-throated divers was noted on one waterbody within 1.5km of above-ground infrastructure and black-throated divers were never observed during the course of ornithological field survey for the Development.
- Black grouse: no confirmed leks identified with three black grouse flushed during a site walkover.
- Breeding bird assemblages at Inveraray including: Bullfinch, common sandpiper, crossbill, greenfinch, lesser redpoll, mistle thrush, oystercatcher, siskin, spotted flycatcher, song thrush, tree pipit, and wood warbler.
- Low numbers of non-breeding coastal water birds including: turnstone, redshank, herring gull, oyster catcher, shag, red-breasted merganser, mallard, curlew, and greylag geese.

### 5.6.1 Residual Effects

In addition to the embedded mitigation, a number of specific mitigation measures have been implemented to minimise the adverse effects on ornithological features. These include a range of measures which will be adopted to ensure that impacts on the hydrology of wetland habitat (including bog and wet heath) will be implemented. In addition exclusion zones around suspected nest locations will be implemented to ensure that the accidental destruction of the nests is avoided and to minimise disturbance to the birds. A full programme of monitoring and surveys for sensitive bird species, namely lekking black grouse, breeding waders, breeding raptors and breeding divers will also be undertaken in the breeding season prior to commencement of construction and in the breeding seasons throughout the construction phase. Full details of the pre- and during-construction ornithological monitoring programme will be set out in the Species Protection Plan for the Development, to be submitted to ABC and NatureScot in advance of the commencement of construction.

An Outline Landscape and Ecological Management Plan has been drafted for the Development and submitted as part of the Section 36 Application. The oLEMP sets out a range of measures that will be implemented by the Development. This is intended to a) mitigate landscape and ecological/ornithological impacts, and b) beyond this deliver biodiversity and general environmental enhancement. Additional information on the objectives proposed by the Outline LEMP can be found within Section 5.2.1 above.

Full details on mitigation measures can be found within *Chapter 9: Ornithology (Volume 2: Main Report)* and *Confidential Appendix 9.1: Schedule 1 Birds (Volume 6: Confidential Appendices)*.

#### 5.6.1.1 During Construction

One temporary **Significant** residual effect remains with the implementation of mitigation. This effect is displacement of golden eagle during the construction phase, which cannot be mitigated. At worst, this could last for the entire duration of the construction phase (7 years), but in reality is likely to be less, as works at either end of the construction programme would be much reduced in intensity. At these times, displacement as a result of human activity can reasonably be expected to be much less intense.

All other residual effects during construction on ornithological features are **Not Significant**.

#### 5.6.1.2 During Operation

- One permanent **Significant** residual effect remains with the implementation of mitigation. This effect is permanent loss of habitat for golden eagle. However, this conclusion has been reached on a very precautionary basis, and it is possible that habitat enhancement delivered by the LEMP could, in the medium-term, reduce effects on golden eagle to not significantly adverse, or to be positive.

All other residual effects during operation on ornithological features are **Not Significant**.

### 5.6.2 Conclusions - Ornithology

With the implementation of mitigation measures, in particular the Outline LEMP and preconstruction and during construction monitoring, surveys and species protection plans, two **Significant** effects remain: one temporary

during construction on displacement of golden eagle and one operational due to permanent habitat loss for golden eagle. However it should be noted that with implementation of the Outline LEMP it is reasonable to assume that this permanent effect could in the medium term reduce to **Not Significant** or positive.

## 5.7 Geology and Soils (See Chapter 10)

This section summarises the geology and ground conditions impact assessment for the effects on the Development. A desk study along with a targeted peatland survey were carried out to establish the baseline geological conditions of the site. The assessment considers the potential for likely effects on the Geology and Soils as a result of the Development.

A desk study was carried out on the geology and ground conditions for the study area covering the Development red line boundary (RLB) plus a 250 m buffer. The desk study comprised reviewing online sources, mapping, and consultation with SEPA.

Following the desk study site surveys were undertaken in order to obtain information on peat coverage across the Development Site to inform the site design and layout to minimise disruption to peatlands and post-construction site reinstatement and restoration measures. Peat probing was carried out along the northern access route and around the Headpond and surrounding areas with a total of 766 peat probes taken (an additional 216 probes to that proposed by SEPA).

Other than peat, no other features associated with geology or ground conditions (including contaminated land, fault lines and seismic activity) have been identified as a sensitive receptor therefore impacts have been scoped out.

Approximately 20,110,000 m<sup>3</sup> of bulked material will be excavated in order to construct the Headpond embankments from the tunnelling operations, above and below ground excavations and from the Headpond borrow pit. The Material Management Assessment (MMA) provides detailed calculations of the balance of the Development and can be seen in *Appendix 10.1 MMA (Volume 5: Appendices)*. As demonstrated in the MMA, there will be no excess material generated from the construction of the Development, with all of the excavated material used on site.

It is the intention to source aggregate for the construction of the embankments from an on-site borrow pit, located within the Headpond. Sourcing aggregate from within the site rather than from an off-site quarry has the overall benefit of reducing the number of heavy good vehicles (HGV) on public roads and associated carbon footprint. The location of the borrow pit has been influenced by environmental considerations to minimise the impacts on ecology, peatlands, cultural heritage, hydrology and landscape as described within the relevant technical chapters of the EIAR. The final location, number and estimate of material from each potential site will be determined once full ground investigation works and testing have been completed.

### 5.7.1 Residual Effects

Embedded mitigation and additional mitigation measures for peat include:

- Layout developed to minimise infrastructure in areas of peat > 1.0 m where possible. Where unavoidable floating access tracks and alternative construction methods to be utilised.
- Peat within the Headpond in elevations below BWL (374m AOD) to be left in-situ and not disturbed.
- Appropriate peat guidance to be adhered to.
- Outline Peat Management Plan (*Appendix 10.2, (Volume 5: Appendices)*) to be implemented and updated to Final PMP post consent.

#### 5.7.1.1 During Construction

The construction of above-ground infrastructure will require excavation, storage, re-use and waste disposal of peat deposits. Residual effects on peat through the minimisation of peat disturbance reducing the magnitude of the effect. The significance of effect is therefore considered **Not Significant**.

#### 5.7.1.2 During Operation

Peat excavated during the construction phase will be permanently displaced from the areas required for above ground infrastructure. At the end of the construction phase, all peat will be reused on site.

Operationally, most of the works will be undertaken underground, within permanent above ground compounds or for maintenance purposes. As such, during operation, there is expected to be no further impact on peat.

### 5.7.1.3 Decommissioning

At the decommissioning phase of the project, it is expected that a specific decommissioning consent will be issued at the time. Due to the project lifespan (~ 100 years) any life extension, re-use or repowering will be subject to a detailed of the Development infrastructure, namely the Headpond embankments, underground powerhouse, tunnels and waterways, at the time of decommissioning. Should life extension, re-use or repowering not be an option at decommissioning, the scheme will be decommissioned. Permanent compounds and access tracks may be removed and reinstated to pre-construction condition, in accordance with best practice guidance and agreement from the relevant consenting authority and landowners. As such, during decommissioning, there is expected to be no further impact on peat.

## 5.7.2 Conclusions – Geology and Soils

Through the implementation of the embedded mitigation resulting from the evolution of design to minimise impacts on peat, no significant effects are anticipated on geology and soils.

## 5.8 Water Environment (see Chapter 11)

This section summarises the assessment undertaken that identifies and assesses the potential effects of the Development on the water quality of surface water features, fluvial hydromorphology (how rivers move and change over time as they interact with sediment and debris) of watercourses and the geomorphology of freshwater lochs/lochans, and quality, flows, and levels of groundwater features. There is interaction between topics with flood risk and water resources addressed within *Section 5.9* below, which considers the potential effects on hydrology, flood risk and water resources. A Water Framework Directive assessment on designated water bodies was also undertaken (*Appendix 11.2 (Volume 5: Appendices)*).

A desk study was carried out to determine the baseline upon which effects have been assessed and included a Study Area of 1 km buffer around areas of new development or temporary works within which water features may be affected. For those water features, the baseline also considers downstream attributes beyond the 1km Study Area as water quality impacts can sometimes propagate along watercourses. Consideration has also been given to any surface water or groundwater bodies or water dependent ecological sites outside this Study Area up to 2 km from the Development Site boundary if it is considered that they might be hydraulically linked.

A walkover survey was also undertaken to identify and characterise surface water receptors, to consider flow pathways between water features and across the Study Area, and to make general observations about the characters of the landscape and other relevant features that could influence the sensitivity and importance of water features and the prediction of potential effects from the Development. Water quality samples were also collected from Lochan Airigh and Beochlich, and upstream and downstream reaches of Allt Beochlich.

The proposed Headpond location lies over Loch Airigh and a portion of the Allt Beochlich with the ground elevation reducing towards Loch Awe to the west of the Headpond. The Development is surrounded by Loch Awe, Loch Fyne, and several small lochs and watercourses associated to them. The land use is predominantly open moorland, interspersed with large areas of coniferous plantations, and with improved grassland for livestock and small urban developments along the fringes of Loch Awe and Loch Fyne. A complex pattern of watercourses and small lochs drain this upland area towards Loch Awe and Loch Fyne.

A Private Water Supplies (PWS) assessment was also conducted. It was determined that all PWS can be scoped out of further assessment either because they are distant from the nearest works, situated along the Blarghour Wind Farm access track, which is not considered in this assessment or have no pathways present. Mitigation is still however included to monitor the situation throughout construction with additional mitigation to be implemented if necessary.

### 5.8.1 Residual Effects

Embedded mitigation includes but is not limited to: site design to avoid water features and applying a 50 m buffer from water features wherever possible, inclusion of sustainable drainage and / or proprietary drainage measures, development design to incorporate a suitably sized screen mesh on the inlet / outlet to reduce scour, compensation flows, design of watercourse crossings, adherence to good practice guidelines, a Water Management Plan (WMP),



CAR licence, a Construction Contractor's CEMP, and a Sediment Management Plan (SMP). Additional mitigation includes a Water Quality and Flow Monitoring Plan which sets out a programme of water quality monitoring pre- and during construction works and operation. Further details of mitigation can be found within *Chapter 11: Water Environment (Volume 2: Main Report)* and *Appendix 11.5: Outline Water Management Plan (Volume 5: Appendices)*.

The residual effects during construction and operation are summarised below:

#### 5.8.1.1 During Construction

There were considered to be minor adverse residual effects (**Not Significant**) during construction on:

- Water quality at Loch Awe from sediment run off
- Water quality at Loch Awe from contaminated run off
- Water quality at Loch Fyne from sediment run off
- Water quality at Loch Fyne from contaminated run off
- Water quality at River Array and tributaries from sediment run off
- Water quality at Allt Neochlich and tributaries from sediment run off and contaminated run off
- Water quality at Lochan Beochlich from sediment run off and contaminated run off

There were considered to be Low adverse residual effects (**Not Significant**) during construction on:

- Hydromorphology at Allt Beochlich and tributaries from the construction of embankment and Headpond
- Hydromorphology at Allt Beochlich and tributaries from the diversion or over pumping of river during construction resulting in disruption to sediment transport.

#### 5.8.1.2 During Operation

One moderate adverse (**Significant**) effect remains during operation following the implementation of mitigation. This effect is on thermal stratification within Loch Awe. Additional mitigation including a programme of water quality monitoring is proposed that will be defined in a Water Quality and Flow Monitoring Plan.

All other effects were considered to be minor adverse (**Not Significant**) on:

- Water quality at Loch Awe due to changes in water level leading to a concentration of pollutants in a still water body.
- Water quality at Loch Awe due to Headpond discharges
- Water quality at Loch Awe due to discharge of concrete residues from Headpond
- Water quality at Loch Awe due to potential risk of algal blooms
- Hydromorphology at Allt Beochlich and tributaries due to the loss of some of catchment with numerous tributaries, resulting in changes to the downstream flow regime due to the dam and the reduction in sediment transport downstream due to the dam and inundation of reaches.

#### 5.8.1.3 Decommissioning

The potential impacts that may occur during decommissioning would be similar to those described for the construction phase, plus the need to dewater the Headpond and restore the site where structure have been built. Decommissioning of the Development Site should seek to restore the Development Site to its pre-development form, restoring water bodies and features. Although it has been agreed during the EIA scoping process that decommissioning impacts can be excluded from the EIA, on the basis that their scale and type of impact would be consistent with those predicted for the construction phase, the outcome of restoring the site will likely be beneficial overall. Reference to decommissioning and site restoration is therefore included to ensure that appropriate plans, measures and future commitments are recognised and can be captured in any consent granted.

## 5.8.2 Conclusions – Water Environment

Following the implementation of embedded mitigation through good practice guidelines with reference to the CEMP, WMP and a SMP, as well as additional mitigation, it is anticipated that one **Significant** (moderate adverse) effect will remain during operation. All other effects on the water environment are considered to be **Not Significant**.

## 5.9 Water Resources and Flood Risk (See Chapter 12)

This section summaries the potential effect on flood risk and water resources from the Development and assessed the likelihood of significant effects. Details of water quality, hydromorphology and hydrogeology are covered in Section 5.8: Water Environment (above).

A water resource assessment was undertaken to assess the current water usage within Loch Awe and to determine the impact of the Development. The assessment reviewed the current water usage and working parameters for the key receptors. It assesses the potential impact on water resources as a result of the Development and addresses appropriate mitigation measures to reduce the impact of the Development including outlining the operational rules.

A Flood Risk Assessment was also undertaken to evaluate the impact of the Development on flood risk from the construction and operation of the Development.

### 5.9.1 Residual Effects

The assessment of residual effects below assumes that the embedded mitigation is implemented. Additional mitigation includes that within the CEMP, which outlines the contents of the Emergency Response and Flood Risk Management Plan. This contains measures to be implemented to avoid any significant adverse effects to the identified receptors during the construction phase. Any Sustainable urban Drainage Systems (SuDS) for surface water storage will be suitably designed. The Outline Surface Water Management Strategy (SWMS) will also ensure suitable design of surface water drainage for the Development.

Abstraction of large quantities of water from Loch Awe during periods of low water levels can have a negative effect on the ability to maintain flow within the River Awe. The significant effect of abstraction, as mentioned above, needs to be mitigated against, therefore it is proposed that abstraction is limited based on a minimum water level of 35.95 mAOD in Loch Awe.

To ensure this mitigation procedure is in place, a monitoring arrangement and control procedures will be installed at the inlet / outlet structure on Loch Awe to measure the water level, and if necessary, stop the abstraction of water if below the level limit, set out by the operating regime. The operating regime sets out the upper and lower bounds of loch level for the scheme to operate. Pumping will not take place if the loch level is at or below the minimum level and generating will not take place if the loch is at or above the maximum level.

The mitigating effect, the operation regime, additionally mitigates against the impact on fish passage at the Awe Barrage. The operating regime is based on the historical variation of Loch Awe, to allow for viability of fish passage. The fluctuation of Loch Awe, posed by the Development is within the existing operating parameters. Therefore, there should be a negligible effect of fish passage at the Awe Barrage.

Any operational discharges or abstractions required by the Development will be regulated by the CAR license, as supervised by SEPA. Therefore, the appropriate operational levels for either activity will be agreed and secured by this regulatory regime. The assessment suggests a minimum level of 35.95 mAOD and a maximum level of 37.65 mAOD outside of which the Development will not operate.

The implementation of the above-mentioned operation regime will ensure that the abstraction of water from Loch Awe will have a negligible impact on available water resource.

#### 5.9.1.1 During Construction

There are considered to be negligible (**Not Significant**) residual effects – in terms of flooding due to temporary increase in impermeable area and compacted ground, temporary water storage and increased flow due to dewatering activities – at all receptors:

- Offsite properties
- Onsite users
- The development
- And loch awe, river awe and operation of the loch awe barrage.

#### 5.9.1.2 During Operation

There are considered to be negligible (**Not Significant**) residual effects on:

- Loch Awe, River Awe, and operation of Awe Barrage from an increase in flood level in Loch Awe during flood conditions

- Offsite properties, onsite users and Development from an increase in flood levels in Loch Awe during flood conditions.
- Onsite users from the fluctuation of water level within Loch Awe.
- Offsite properties, onsite users, Development infrastructure, and Loch Awe, River Awe and Awe Barrage from risk of flooding from the Headpond during operation.
- Offsite properties, onsite users and development infrastructure from an embankment breach.
- Offsite properties and Onsite Users from the reduction in water levels in Loch Awe during low flows.

There are considered to be low (**Not Significant**) residual effects on:

- Loch Awe, River Awe and Awe Barrage operation, Offside properties and Development infrastructure from the fluctuation of water level within Loch Awe.
- Loch Awe and River Awe Water Level from reduction in water levels in Loch Awe during low flows.
- The Development from reduction in water levels in Loch Awe during low flows.

#### 5.9.1.3 Decommissioning

The Headpond catchment is insignificant compared to the total Loch Awe catchment therefore the loss of storage will not have a flood risk downstream of the River Awe. Compliance with the Reservoirs (Scotland) Act 2011 (the Reservoirs Act) and related regulations i.e. the Reservoirs (Scotland) Regulations 2016 will ensure that the short and temporary term impacts due to the decommissioning of the Development will be Negligible and therefore **Not Significant** in EIA terms.

### 5.9.2 Conclusions – Water Resources and Flood Risk

There are no predicted significant flood risk effects on any identified receptors during construction, operation or decommissioning. The implementation of embedded mitigation such as the CEMP, Outline Surface Water Management Strategy, monitoring and maintenance plans, and CAR licence have minimised residual effects as far as reasonably practicable.

In addition the Development will be required to comply with the Reservoirs Act, and have a Panel Engineer approve the finalised design of the Embankment and Headpond. The Development will be subject to stringent regular inspections throughout its operational life.

## 5.10 Cultural Heritage (See Chapter 13)

This section summarises the potential effect on heritage assets (archaeological remains, historic buildings and historic landscapes) that are likely to arise from construction, operation, and decommissioning of the Development.

A desk study exercise and site walkover was undertaken to identify the location, type and significance of heritage assets and their setting. Two study areas were established to identify the assets and inform the baseline study. A study area of 1 km from the main red line boundary (covering the Headpond and Tailpond) was used to provide detailed baseline information for the assessment, with a reduced 500 m Study Area used for the red line boundary for the Marine Facility and temporary access works near Inveraray. A wider 3 km Study Area was also defined in order to identify assets which may be affected by the Development through change in their setting.

Assets where there is the potential for physical impacts during construction include:

- Lochan Airigh Sheilings – A complex of possible shielings, consisting of at least five structures has been recorded near the Buimme Dhubh burn under the footprint of the proposed embankment.
- Possible Standing Stone – A possible standing stone was recorded in the upland area of the Development during the walkover. The Development will completely remove the feature through the construction of the Headpond.
- Possible Shieling/Area of Agricultural Activity – A possible earthwork/stone feature was recorded during the walkover survey near a watercourse on the lower slopes of Sròn Bhreac-liath. The Development will completely remove all features associated with the asset through the construction of the embankment.

- Dumarton-Tarbet-Inveraray-Tyndrum Military Road – The alignment of a section of the military road constructed as part of the 18<sup>th</sup> century road building programme under General Wade is located within the northeast section of the Development Site. The Development will involve upgrading an existing access track as it crosses the alignment of the Military Road.
- Drove Road – The alignment of a former road or track, assumed to have been used as a drove road, has been recorded through 18<sup>th</sup> century mapping. The Development will involve upgrading an existing access track as it crosses the alignment of the drove road. All traces of the original drove road would appear to have been lost in this area due to the presence of an existing track and commercial forestry operations.
- Balliemeanoch – The remains of at least one unroofed building are recorded to the south of Balliemeanoch Farm and the Allt na fainge burn. The construction of the temporary access track should avoid the asset, and the asset would be fenced off during to construction to avoid any accidental damage. However, if the track had to be moved slightly due to ground conditions/topography, it has the potential to result in the partial loss of the feature.
- Allt Beochlich settlement remains – Remains associated with the small settlement of Allt Beochlich are located near an area of an existing track that will be widened as part of the Development. The upgrade of the existing track should avoid all assets, and any features near the upgraded track would be fenced off during to construction to avoid any accidental damage. However, if the track widening did encroach on earthworks linked to the complex there is the potential for the construction to result in the partial loss of the features.
- Inveraray Castle Garden and Designed Landscape – All works within the Garden and Designed Landscape are temporary, and are required to bring key components to the main construction site, as well as provide a temporary access for staff to avoid increased traffic movement within the settlement of Inveraray. Works proposed within the Garden and Designed Landscape are limited to access track upgrades, and the construction of one temporary compound/laydown area, the installation of a temporary jetty, and the construction of a short section of temporary access track to service the temporary jetty. There is also the potential for temporary impacts on setting on this asset.

Assets where there is the potential for impacts on setting during operation include:

- Balliemeanoch Chapel Scheduled Monument
- Carn Dubh Crannog Scheduled Monument
- Keppochan Cup Marked Stone Scheduled Monument.

### 5.10.1 Residual Effects

A number of embedded mitigation measures will be utilised to reduce potential effects resulting from the Development. Additional mitigation measures could include micro-siting of access tracks, or reducing the working width of access tracks within the Limits of Deviation, to avoid heritage assets, as well as the protection of assets near work areas through fencing. Embedded landscape mitigation, such as planting to provide screening, as well as the design of the above ground infrastructure, has also been developed to reduce impacts on setting.

The assessment of residual effects considers various elements of additional mitigation including archaeological survey, excavation, publication and an archaeological watching brief of topsoil and subsoil removal during construction.

#### 5.10.1.1 During Construction

One feature is considered to have **Significant** adverse residual effects, in EIA terms, on the Possible Standing Stone – It should be noted that this is a worst-case scenario based on the asset being a prehistoric standing stone, and investigations may find this not to be the case. The feature will be completely removed through the construction of the Headpond.

Minor (**Not Significant**) residual effects are considered likely on:

- Loch Airigh Shielings
- Possible Shieling/Area of Agricultural Activity; and
- Inveraray Garden and Designed Landscape (setting impacts).

Negligible (**Not Significant**) residual effects are considered likely on:

- Dumarton-Tarbet-Inveraray-Tyndrum Military Road
- Drove Road, Balliemeanoch, Allt Beochlich; and
- Inveraray Garden and Designed Landscape (physical impacts).

As noted above, the potential for both physical and setting impacts on Inveraray Castle Garden and Designed Landscape were considered. The temporary construction compound / laydown area and the jetty are both located near the southern limits of the designated landscape. This area of the parkland has been degraded more than other areas, with the construction of a golf course, water treatment works, and an area of houses and industrial units all encroaching on the parkland in the second half of the 20<sup>th</sup> century landscape. While the temporary compound / laydown area and jetty will represent a new addition to the landscape in this area, the works will only be used for limited deliveries during the construction period. Furthermore, the works here will be removed after construction.

#### **5.10.1.2 During Operation**

No significant effects on setting are anticipated on any assets during operation, with minor adverse effects (**Not Significant**) on:

- Balliemeanoch Chapel Scheduled Monument;
- Carn Dubh Crannog Scheduled Monument; and
- Keppochan Cup Marked Stone Scheduled Monument.

There will be no further physical effects on any archaeological assets during the operational phase of the Development as these would only occur during construction.

#### **5.10.1.3 Decommissioning**

The archaeological assets recorded within the footprint of the permanent works, as well as any features that are identified within the temporary works areas, will have been removed during the construction phase, with mitigation undertaken. Therefore there will be no effects on archaeological assets during the decommissioning phase.

Any assets that are avoided and protected by fencing etc during construction will also need to be protected during decommissioning, although the limited information currently available for decommissioning means it is not possible to assess the potential for other physical impacts.

No further effects on the setting of heritage assets will take place during the decommissioning of the Development as the decommissioning works will be temporary.

### **5.10.2 Conclusions – Cultural Heritage**

Following mitigation including archaeological survey, excavation, and publication significant effects are only identified at the Possible Standing Stone, however it should be noted that this is a worst-case scenario based on the asset being a prehistoric standing stone, and further investigations may find this not to be the case.

## **5.11 Access, Traffic & Transport (See Chapter 14)**

This section summarises the potential for environmental effects of transport and movement resulting from the pre-construction and construction phase of the Development.

Traffic surveys were undertaken in June 2023 on the A85, A83, A819, B840 and A815 roads, in the vicinity of the Development Site. A 2023 baseline was obtained from these 2023 traffic surveys. The significance of environmental effects for the Development are identified against a 2027 baseline derived from this 2023 traffic data with a growth factor applied to assess the peak year of construction traffic.

The Development has been assessed by forecasting the level of construction traffic likely to be generated by the Development and comparing the predicted increases against the baseline. A cumulative assessment considering other relevant development has been undertaken and the residual effects of cumulative development considered once mitigation has been implemented.

Mitigation measures for the Development encompass the construction of bypass routes to ensure there will be no construction traffic required to route through the town of Inveraray and a Construction Traffic Management Plan.



### 5.11.1 Residual Effects

The assessment of residual effects below assumes that the embedded mitigation is implemented. Mitigation focuses primarily on HGV construction traffic and includes the implementation of a HGV construction traffic bypass route between the A83 east of Inveraray and the A819 to the north of Inveraray. This utilises a combination of existing construction access track and new access tracks to the north of Inveraray Castle.

- An AIL route, utilising Upper Avenue, between the A83 south of Inveraray and the A819 north of Inveraray to facilitate the movement of AIL deliveries from the proposed jetty.
- HGV construction traffic will avoid the B840. It is unlikely that this route would be required for construction traffic as a route will be available directly from access tracks from the A819 at Craig nan Sasanach to the Development Site.
- The proposed HGV construction traffic routes would avoid Inveraray Town Centre as well as the historic Aray Bridge on the A83.
- A Construction Traffic Management Plan (CTMP) would operate throughout the duration of the construction programme and will include the following. A detailed CTMP is expected to be conditioned and would be provided once a Construction Contractor is appointed.
  - Site and the entry/exit arrangements from public roads;
  - Traffic routing plans – defining the routes to be taken by hgv's to the Development Site. For example, prioritising the use of A and B-roads as far as possible and avoidance of sensitive locations;
  - Construction hours and delivery times;
  - Strategy for traffic management and measures for informing construction traffic of local access routes, road restrictions, timing restrictions and where access is prohibited;
  - Measures to protect the public highway (e.g. Wheel wash facilities);
  - Measures for the monitoring of the CTMP to ensure compliance from drivers and appropriate actions in the event of non-compliance;
  - Mechanism for responding to traffic management issues arising during the works (including concerns raised from the public) including a joint consultation approach with relevant highways authorities;
  - Details of traffic management requirements; and
  - Strategy for traffic management and measures for informing construction traffic of local access routes, road restrictions (statutory limits: width, height, axle loading and gross weight), timing restrictions (if applicable) and where access is prohibited.

There were considered to be minor adverse (**Not Significant**) effects on:

- Severance of Communities: The sensitivity of receptors on Study Area roads will be unchanged. Mitigation will reinforce the previously reported magnitude of change. Therefore, the effect on severance following mitigation will remain Not Significant.
- Road User and Pedestrian Safety : The sensitivity of receptors on Study Area roads will be unchanged. Mitigation will reinforce the previously reported magnitude of change. Therefore, the effect on road users and pedestrian safety following mitigation will remain Not Significant.
- Non-motorised User Amenity: The sensitivity of receptors on Study Area roads will be unchanged. Mitigation will reinforce the previously reported magnitude of change. Therefore, the effect on non-motorised user amenity following mitigation will remain Not Significant.
- Non-motorised User Delay: The sensitivity of receptors on Study Area roads will be unchanged. Mitigation will reinforce the previously reported magnitude of change. Therefore, the effect on non-motorised user delay following mitigation will remain Not Significant.
- Driver Delay: The sensitivity of receptors on Study Area roads will be unchanged. Mitigation will reinforce the previously reported magnitude of change. Therefore, the effect on driver delay following mitigation will remain Not Significant.

There were considered to be negligible (**Not Significant**) effects on:

- Fear and Intimidation on and by Road Users: The sensitivity of receptors on Study Area roads will be unchanged. Mitigation will reinforce the previously reported magnitude of change. Therefore, the effect on fear and intimidation following mitigation will remain Not Significant.

### 5.11.2 Conclusions – Access, Traffic and Transport

In summary, with mitigation measures in place including the CTMP and construction traffic haul routes, there are not considered to be any significant residual effects. All effects, in terms of Access, Traffic & Transport, are therefore considered not significant.

## 5.12 Noise and Vibration (See Chapter 15)

This section summarises the potential noise and vibration effects during the construction and operational and decommissioning phases of the Development. Based on this a structure for the assessment methodology for the Development is as follows:

- Construction Phase Impacts at noise sensitive receptors (NSRs) from:
  - Airborne and ground borne noise and vibration from activities within the site boundary.
  - Changes in airborne traffic noise levels from the surrounding road network.
- Operational Phase Impacts at NSRs from:
  - Airborne and ground borne noise and ground borne vibration from activities within the site boundary.
- Decommissioning Phase Impacts at NSRs from:
  - Activities within the site boundary.
  - Changes in airborne traffic noise levels from the surrounding road network.

Long-term and short-term baseline sound monitoring has been completed at eight locations which were considered representative of the closest identified sensitive receptors (with reference to Figures 15.1 and 15.2 (*Volume 3: Figures*)).

The worst affected NSRs are as follows:

- NSR90 - This receptor is located approximately 43 m from the planned B840 diversion road
- NSR220, NSR424 & NS-216 - These receptors are located approximately 45 m, 83 m and 106 m from the existing track at Inveraray Castle respectively.
- NSR278 – As this receptor is located 17 m from the existing access track (Upper Avenue) near the temporary Marine Facility
- NSR376 – This receptor is located approximately 35 m from the boundary of the northernmost temporary compound at the Lower Reservoir (Loch Awe)
- NSR378 – This receptor is located approximately 81 m from the B840 diversion road
- NSR041 & NSR440 – These receptors are approximately 260 m and 120 m from the closest part of the temporary Marine Facility respectively

### 5.12.1 Residual Effects

The assessment of residual effects below assumes that the embedded mitigation is implemented, including but not limited to: establishing good community relations, adherence to standard working hours, use of quiet and low vibration equipment and methodologies, following legislation and good practice guidelines on noise and vibration methods and limits, monitoring and maintenance. Additional mitigation is also included, including but not limited to:

- Specific construction site activity mitigation measures to achieve the 65 dBA 12 hour equivalent noise level (based on BS 5228-1 Category A Day-time Threshold Value)
- Communication – prior warning and explanation as per British Standard BS5228-2

- Design of the blasting requirements undertaken by specialist blasting contractor
- Divide traffic over north and south routes to site.
- Selecting a quieter diesel hammer piling rig
- Roadside acoustic screen, location, height and length to be determined as part of CEMP preparation to provide minimum of 5 dB attenuation at 45 m at Inveraray Castle.
- Further details on all mitigation can be found within *Chapter 15: Noise and Vibration (Volume 2 Main Report)*.

#### 5.12.1.1 During Construction

Negligible residual effects (**Not Significant**) on:

- All NSRs from surface plant vibration
- Two traffic links<sup>6</sup> from haul road traffic noise at northern track “two-way” and “entry” respectively

Negligible to minor residual effects (**Not Significant**) on:

- NSR041 and NSR440 from temporary jetty impact piling noise
- NSRs near nine traffic links from Road Traffic Noise
- NSRs near one traffic link from haul road traffic noise using southern track “exit” only

Minor residual effects (**Not Significant**) on:

- NSR376 and NSR378 from surface plant noise
- NSR216, NSR424, NSR090 and NSR220 from access track upgrade and construction
- NSR440 from temporary jetty impact piling vibration
- All NSRs from cofferdam piling
- All NSRs from blasting
- NSRs near four traffic links from road traffic noise on northern and southern routes to site
- NSRs (except NSR220) near one traffic link from haul road traffic noise
- NSR220 from haul road traffic noise on one traffic link after additional mitigation

Moderate residual effects (Significant) at worst for a short temporary period, but minor (Not Significant) at worst for the majority of the time at NSR278 from access track upgrades and construction. This effect is overall considered to be **Not Significant** in EIA terms.

As all residual effects during construction range from negligible to minor these are considered **Not Significant** in EIA terms.

#### 5.12.1.2 During Operation

The residual effects to all NSRs during operation from turbine hall groundborne noise and vibration, surface plant airborne noise at upper reservoir and operational road traffic noise are considered negligible are therefore **Not Significant**.

#### 5.12.1.3 Decommissioning

Decommissioning, if required, would involve the drainage of water from the Headpond, the removal of equipment, blocking of Waterways and Tunnel entrances and the removal of above ground structures. No blasting, tunnelling or crushing will be required and it is considered that the effects in terms of noise will be negligible.

## 5.12.2 Conclusions – Noise and Vibration

After additional mitigation, in particular the use of acoustic screens, traffic routing and specific construction mitigation measures, there are considered to be no significant residual effects at any noise sensitive receptors, with significant effects avoided at properties along the southern access if the northern access is used for entry and exit to site.

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<sup>6</sup> Traffic links are identified within Chapter 14: Access, Traffic and Transport (Volume 2 Main Report)

## 5.13 Socio-Economics, Recreation & Tourism (See Chapter 16)

This section summarises potential effects on the following:

- Socio-economics – the local communities and associated economies in the vicinity of the Development; and
- Tourism and Recreation – tourist / visitor attractions as well as recreational land uses or resources such as visitor centres and walking or cycling routes.

The assessment considers the effects of the construction and operation of the Development on the local communities and associated economies in the vicinity of the proposed Development. Additionally, tourist and visitor attractions and recreational land uses such as walking or cycling routes will also be assessed. The study area extends to 5 km from the proposed Development Site in order to ensure consideration of the local area not just the immediate Development location.

Baseline information has been collated from a variety of publicly available sources as well as through consultation with ABC.

### 5.13.1 Residual Effects

A number of embedded mitigation measures, including those set out in the landscape and visual assessment to provide offsite screen planting will help to reduce the impact of any adverse visual amenity impacts which could deter visitors. Additional mitigation measures include:

- A Community Liaison Group (CLG) to be established during the pre-construction phase will remain throughout construction facilitating direct, two-way discussion between the Applicant and the local community including businesses, tourist / recreational operators;
- The preparation of an Outline Access Management Plan to minimise impacts upon local access and ensure public health and safety during construction works;
- A CTMP to mitigate against delays and amenity loss associated with peak or abnormal construction traffic;
- The provision of benches, signage and additional forestry paths to improve accessibility of the area.

#### 5.13.1.1 During Construction

Engagement with the CLG prior to the commencement of works will reduce negative impacts arising during the pre-construction phase on the local community and therefore are **Not Significant**.

- **Significant beneficial** effect on the local economy resulting from job creation and local expenditure by the developer and contractors within the study area throughout construction period.
- Creation of jobs within study area during construction phase will result in a **Not Significant** impact on the local job market.
- Construction activities causing changes to setting of certain visitor attractions and local amenity impacts will result in a **Not Significant** impact on tourism and tourist services.
- Tourist accommodation will not be significantly adversely impacted during construction through implementation of the Housing Strategy and therefore is **Not Significant**.
- Impacts to drivers on the local road network within the study area are reduced from Minor Adverse to Negligible through the preparation and implementation of a CTMP and therefore **Not Significant**.
- Recreational users of Loch Awe and Loch Fyne will not be significantly affected by construction due to the limited land take required and engagement of the CLG with Inspire Inveraray, Clydeport and local community, and therefore impacts are **Not Significant**.
- National Cycle Route 78 has been given a sensitivity of high as it is nationally important. The magnitude of change is the same as the other long distance routes and core paths within the area and is rated as Low. Following the assessment framework set out in *Chapter 4: Approach to EIA (Volume 2: Main Report)*, this would be a significant effect. However, using professional judgment it is not considered that the effects during construction will be significant on account of the limited extent of the impacted area on

Route 78. As a result, it is predicted that the impact will be reduced to Minor and therefore **Not Significant**.

- Core paths and forestry paths within the study area will largely remain open and accessible to all users during construction. To maintain public health and safety, diversions to certain forestry paths, such as the SA128, may be necessary. Through the implementation of signage, active travel users will be informed of any diversions currently in place and, where necessary, alternative routes will be suggested. The residual impact upon recreational route users is therefore **Not Significant**.

#### 5.13.1.2 During Operation

- An Outline Access Management Plan has been included in *Appendix 16.1 (Volume 5: Appendices)* and sets out where access will be restricted and general mitigation measures, such as diversions, which will be in place during operation of the Development. The implementation of this plan is expected to reduce any adverse impacts associated with the operation of the Development. A finalised Access Management Plan will be prepared post consent, providing greater detail on the specific diversions which will be in place. The residual effect is therefore **Not Significant**
- Core paths and forestry paths within the study area are expected to remain open and accessible to all users during operation. Through the implementation of signage, active travel users will be informed of any diversions currently in place and where necessary, alternative routes will be suggested. The residual impact upon recreational route users is therefore **Not Significant**.
- Without mitigation, there would be a minor adverse impact upon tourist services within the study area during operation. However as set out in *Chapter 5: Landscape and Visual Assessment (Volume 2: Main Report)*, embedded mitigation measures have been considered and will effectively reduce the impact of any adverse visual amenity impacts over time. In addition, measures such as offsite planting will be implemented, screening the development from view from nearby receptors. As such, the quality of the visitor experience in the local area is expected to be maintained throughout the operational phase. Any residual effects are thus considered to be **Not Significant**.
- Access to Loch Fyne and Loch Awe will be maintained during operation. The Marine Facility will be removed with only the piles remaining in-situ. However, for health and safety reasons, access to the Tailpond inlet / outlet will be restricted during operation. Although this accounts for only a small area of Loch Awe, an Outline Access Management Plan has been prepared (*Appendix 16.1 Outline Access Management Plan (Volume 5: Appendices)*). This plan sets out where restrictions may be necessary, the mitigation measures which will be implemented to reduce any impacts and the preferred approach for informing loch users of such access restrictions. A finalised Access Management Plan will be prepared post consent providing greater detail on the access arrangements in Loch Awe. As a result, a **Not Significant** residual effect is expected on loch users during operation of the Development.

### 5.13.2 Conclusions – Socio-Economics, Recreation and Tourism

The Socio-Economics, Recreation & Tourism assessment has identified most effects as **Not Significant**. The assessment has identified a **Significant Beneficial** residual effect during the construction period on the local economy as a result of job creation and increased local expenditure by the developer and contractors.

## 5.14 Climate – (See Chapter 17)

This section summarises the potential impacts and effects of the Development on the climate as well as the impacts and effects of climate change on the Development.

The following assessments were carried out:

- Lifecycle GHG Impact Assessment: covers all direct greenhouse gas (GHG) emissions arising from activities undertaken at the Development Site during the pre-construction, construction and operation (including maintenance). It also includes indirect emissions outside of the site boundary, including emissions embedded within the construction products and materials arising as a result of the energy used for their production, and emissions arising from the transportation of products and materials, waste and construction workers.
- Climate Change Risk Assessment: covers the construction and operation (including maintenance) of all assets and infrastructure which constitute the Development and within the area of the Development Site.



- In-combination Climate Change Impact (ICCI) Assessment – covers the existing and projected future climate conditions for the geographical location and assessment timeframe to identify climate hazards. It then identifies the extent to which receptors in the surrounding environment are potentially vulnerable to, and affected by, these climate impacts. The ICCI assessment also covers the ways in which projected climate change will influence the significance of the impact of the Development on receptors in the surrounding environment.
- Climate Change Resilience Assessment: The EIA Regulations require the inclusion of information on the vulnerability of the Development to climate change. The Climate Change Resilience Assessment covers resilience against both gradual climate change, and the risks associated with an increased frequency of extreme weather events. The review of potential impacts and the Development's vulnerability considers the embedded mitigation measures that have been designed into the Development, discussed in the Embedded Mitigation Section of *Chapter 17: Climate (Volume 2: Main Report)*.

#### 5.14.1 Residual Effects:

Embedded mitigation measures include (but are not limited to) the monitoring of weather forecasts and receipt of SEPA flood alerts by contractors to allow works to be planned and carried out accordingly to manage extreme weather conditions, such as storms and flooding, infrastructure design, and flood resilience measures.

An Outline CEMP identified various GHG mitigation measures to be embedded within the Development to reduce the GHG impact including but not limited to a Peat Management Plan and a Construction Traffic Management Plan (see *Section 17.11.1 Chapter 17: Climate (Volume 2: Main Report)*). Additional mitigation measures are only required where significant effects are identified following the application of embedded mitigation measures. No significant adverse effects have been identified in this assessment therefore no additional mitigation or enhancement measures are proposed.

##### 5.14.1.1 During Construction:

Minor adverse effects – **Not Significant** effects as a result of the impact of GHG emissions arising during construction of the Development on the climate.

Low to medium - **Not Significant** Impact of projected future climate change on the Development.

Negligible to–Low - **Not Significant** on combined impact of future climate conditions and the Development.

##### 5.14.1.2 During Operation:

- During the operation of the Development, there will be unavoidable GHG emissions due to the use of materials, energy, fuel, and transportation. However, additional GHG savings are expected to be achieved by implementing the GHG mitigation measures within the Outline CEMP. The Development's operational phase results in a reduction of GHG emissions compared to the without-project baseline. As a result, the effect of GHG emissions are considered to have a beneficial effect which is **Significant Beneficial**.
- The impact of future climate change on the development is considered to be negligible to low and therefore **Not Significant**.
- The combined impact of future climate conditions and the Development to each technical chapter contained within the EIA is considered to be negligible and therefore **Not Significant**.

#### 5.14.2 Conclusions - Climate

There are not considered to be any residual effects of negative significance either on the climate or on the Development due to climate change. There is considered to be one **Significant Beneficial** effect to GHG emissions as a result of GHG savings that are expected to be achieved.

### 5.15 Marine Physical Environment & Coastal Processes (See Chapter 18)

This section summarises the assessment of the potential effects of the Marine Facility element of the Development on the marine physical environment and coastal processes. The temporary Jetty will consist of a 10 m wide elevated deck supported by an open-piled structure 7 m above the local Mean High Water Springs (MHWS) level. The jetty structure will extend up to 180 m into Loch Fyne from the shoreline.

Potential effects include consideration of hydrodynamic conditions and the sedimentary character across Loch Fyne and the wider area.

The extent of the Study Area is defined as the area of Loch Fyne below the elevation of Mean High Water Springs (MHWS) extending for a minimum distance equivalent to the flood and ebb tidal excursion on a spring tide from the location of the proposed Marine Facility.

A hydrodynamic tidal model (tidal modelling which considers sediment / partial transportation and morphological bed conditions) was used to provide a description of baseline conditions across the entire model domain which extends into the Irish Sea. The potential Zone of Influence (Zoi) for fine suspended sediments could potentially extend beyond the defined Study Area but will be fully contained within the defined model domain.

Baseline conditions were established by using:

- Multi-Beam Echo-Sounder (MBES) bathymetric survey covering an area of Loch Fyne approximately 1000m by 500m for the location of the proposed Marine Facility;
- LiDAR topographic survey data from the Scottish Remote Sensing Portal (Scottish Government);
- Numerical hydro-dynamic (HD) model of Loch Fyne and Approaches;
- C-Map digital bathymetry;
- Measured currents from the British Oceanographic Data Centre (BODC);
- Predicted tidal water levels and currents from the Admiralty's TotalTide software;
- Extreme water levels for the Environment Agency's Coastal Flood Boundary (CFB) database;
- Wind data from ERA5's global reanalysis atmospheric model; and
- Regional mapping of seabed geology (BGS, 1988).

The collation and analysis of baseline data, the potential effects of the Marine Facility have been assessed using a bespoke numerical model covering hydro-dynamic modelling of water surface elevations and current flows across the study area. Further details can be found within *Appendix 18.1: Tidal Model Calibration (Volume 5: Appendices)*.

### 5.15.1 Residual Effects

The embedded mitigation that reduces the impact of the Marine Facility includes the following:

- Piled foundations will be used to support the deck of the Marine Facility. This provides minimal blockage to tidal currents and wave propagation relative to alternative construction options. This will minimise the impact of the Marine Facility on the local flows during the operational phase.
- The avoidance of dredging means there will be minimal disturbance to sediments on the seabed during the construction phase. The potential requirement for maintenance dredging and spoil disposal is also avoided.

Due to the negligible effect that the Marine Facility is shown to have on the physical marine environment, no additional mitigation, compensation, or enhancement measures are presented.

Although the effects summarised are limited to having a **Minor** significance, a limited scope of post-construction monitoring is recommended as a precautionary measure, as outlined below:

- Visual inspection of outfalls to check for accretion of sediment (monthly)
- Visual inspection of coastline 500 m either side of the Marine Facility to check for any localised erosion or accretion (monthly for circa 5 years, longer if change is observed)

If after 5 years it is found from the monthly inspections that there is no change in local accretion and/or erosion, there would be no requirement for continued monitoring.

Due to the 'Negligible' classification of the various potential impacts identified, no requirement for additional mitigation has been identified in which case there are no residual effects to be considered.

#### 5.15.1.1 During Construction

**Not Significant** impacts are predicted during construction on:

- Intertidal habitats as a result of a direct loss of 6 m<sup>2</sup> of intertidal area due to the footprint of pile structures
- Subtidal habitats as a result of a direct loss of 22 m<sup>2</sup> of subtidal area due to the footprint of pile structures
- Water quality within Loch Fyne as a result of short-term disturbance of bed material due to the installation of piles.

#### 5.15.1.2 During Operation

**Not Significant** impacts are predicted during operation on:

- Hydrodynamic conditions as a result of changes in currents or water levels
- Sedimentary regime due to change in sediment transport
- Coastal morphology as a result of erosion or accretion of sediment unrelated to natural processes
- Coastal outfalls as a result of local sediment accumulation

#### 5.15.1.3 Decommissioning

The Marine Facility is proposed to be a temporary structure. However, given the steel piles are proposed to remain in-situ, in terms of impacts on the marine physical environment and coastal processes it is considered to be a permanent feature. As such, decommissioning effects do not need to be considered. If decommissioning were required, these effects would be very similar to those described in here which relate to construction effects and are **Not Significant**.

### 5.15.2 Conclusions – Marine Physical Environment and Coastal Processes

After embedded mitigation measures have been implemented, effects from the construction and operation phases of the Development relating to the marine physical environment and coastal processes are considered **Not Significant**.

## 5.16 Shipping & Navigation (See Chapter 19)

This section summarises the assessment prepared by Anatec Ltd on behalf of the Applicant and presents the assessment of likely significant effects of the Development on Shipping and Navigation. This section considers the potential impacts arising from the construction and operational phases of the offshore components of the Development.

The shipping and navigation EIA chapter (*Chapter 19: Shipping and Navigation (Volume 2: Main Report)*):

- Presents the existing Shipping and Navigation baseline established from desk studies and stakeholder consultation;
- Identifies any assumptions and limitations encountered in compiling the Shipping and Navigation information;
- Presents the likely significant environmental impacts on Shipping and Navigation arising from the Development and reaches a conclusion on the likely significant effects on Shipping and Navigation, based on the information gathered and the analysis and assessments undertaken; and
- Highlights any necessary monitoring and/or mitigation measures which are recommended to prevent, minimise, reduce or offset the likely significant adverse effects of the Development on Shipping and Navigation.

A desk based study and consultation exercise was undertaken to review vessel traffic, navigational features and historical incident data in proximity to the Marine Facility to establish a shipping and navigation baseline. In addition a future baseline scenario was considered to review factors that may lead to changes in vessel routing and the existing baseline environment. The Shipping and Navigation Study Area is defined as a 10 nm buffer on the deck footprint of the Marine Facility, constrained to the limits of Loch Fyne.

### 5.16.1 Residual Effects

As part of the design process for the Development, a number of embedded mitigation measures have been considered to minimise the adverse impacts of the Development. These measures typically include those that have been identified as good or standard practice and include actions that would be undertaken to meet existing legislation requirements. As there is a commitment to implementing these measures, and also to various standard sectoral practices and procedures, they are considered part of the design of the Development.

Embedded mitigation measures in relation to Shipping and Navigation include:

- Information will be distributed via means such as Notices to Mariners, Radio Navigational Warnings, NAVTEX and/or other navigation broadcast warnings as soon as reasonably practicable in advance of and during vessel activities.
- Use of advisory safe clearance distances during vessel activities
- Vessel traffic monitoring and marine coordination
- Compliance of all project vessels with international marine regulations as adopted by the Flag State
- The location, extent and nature of the Marine Facility will be communicated with the UK Hydrographic Office (UKHO) and any other relevant bodies to ensure awareness of the Development.
- Marking and lighting of Marine Facility and construction vessels as per the requirements of International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) guidance and in agreement with the Northern Lighthouse Board.
- Liaison with Clydeport and local harbours during the construction phase.
- Liaison with the Ministry of Defence (MoD) to ensure project activities do not interfere with military exercises.
- Review of feasibility of delivery of construction materials via Loch Fyne

No additional mitigation measures are considered necessary as all effects were assessed to be of broadly acceptable significance.

#### 5.16.1.1 During Construction and Operation

**Not Significant** effects on the following are anticipated during the construction and operational phases:

- Deviations to vessel routing resulting in increased vessel to vessel collision risk
- Increased vessel to vessel collision risk between a third-party vessel and a project vessel
- Increased risk of vessel grounding and restriction on vessel size navigating Loch Fyne to Inveraray
- Disruption to fishing and recreational activities
- Disruption to military exercises
- Allision risk (Allision refers to a moving vessel striking a stationary object) between third-party vessels and new structure
- Reduced access to local harbours

### 5.16.2 Conclusions – Shipping and Navigation

All potential effects identified during the construction and operation are considered to be broadly acceptable significance. Due to the 'Broadly Acceptable' significance of the various potential effects identified, no requirement for additional mitigation has been identified in which case there are **No Significant** residual effects.

## 5.17 Commercial Fisheries (See Chapter 20)

This section summarises the assessment produced by Brown and May Marine Ltd on behalf of the Applicant and considers the potential impacts from the construction and operation of the Marine Facility on commercial fishing activities.

A desk study was conducted to inform the commercial fisheries baseline and impact assessment. The assessment was further informed by consultation with key commercial fisheries stakeholders during scoping, an additional consultation exercise as well during visits to the local harbours at Inveraray, Tarbert and Strachur from 27/10/2023 – 28/10/2023.

### 5.17.1 Residual Effects

The likely effects of the Marine Facility on commercial fisheries receptors are not significant in EIA terms. As such, specific mitigation and monitoring in relation to commercial fisheries is not considered necessary.

The following sections summarises the potential effects on commercial fisheries during construction and operation as a result of the Development.

#### 5.17.1.1 During Construction

The assessment identified the following 'likely significant effects' identified during the scope with all potential impacts considered to be **Not Significant**:

- Temporary loss or restricted access to commercial fishing grounds due to movement of vessels involved in construction;
- Displacement of commercial fishing activities;
- Obstruction of navigation / steaming routes to commercial fishing grounds; and
- Indirect effects on commercial fisheries due to impacts on the ecology of fish and shellfish species.

#### 5.17.1.2 During Operation

The assessment identified the following 'likely significant effects' identified during the scope with all potential impacts considered to be **Not Significant**:

- Long term loss or restricted access to commercial fishing grounds due to the placement of the Marine Facility;
- Long term displacement of commercial fishing activities;
- Obstruction of navigation / steaming routes to commercial fishing grounds; and
- Indirect effects on commercial fisheries as a result of impacts on the ecology of fish and shellfish species. These indirect effects are considered within *Chapter 8: Marine Ecology (Volume 2: Main Report)* and summarised in *Section 5.5: Marine Ecology* above.

### 5.17.2 Conclusions – Commercial Fisheries

All potential effects identified during the construction and operation are considered to be negligible which is **not significant** in EIA terms. Given the negligible significance of the various potential effects identified, no requirement for additional mitigation has been identified in which case there are no residual effects to be considered. There are no significant effects anticipated as a result of the Marine Facility on commercial fisheries receptors.



## 6. Cumulative Effects

### 6.1 Overview

In accordance with the EIA Regulations, the EIA has given consideration to 'cumulative effects'.

Two types of effect have been considered:

- Intra-project effects: These occur where a single receptor is affected by more than one source of effect arising from different aspects of the Development. This is also known as "in-combination effects". An example of an intra-project effect would be where a local resident is affected by dust, noise and traffic disruption during the construction of a scheme, with the result being a greater nuisance than each individual effect alone; and
- Inter-project effects: These effects occur as a result of a number of past (projects which have been granted planning permission), present (projects currently in the planning process but not yet granted permission) or reasonably foreseeable proposed developments, which individually might not be significant, but when considered together could create a significant cumulative effect on a shared receptor. Generally, it is not anticipated that any future development in the area would change the significance of the predicted residual effects associated with the Development.

### 6.2 Intra-Project Effects on Shared Receptors

Due to the application of embedded mitigation and additional mitigation measures (such as the avoidance of habitats, design of the Development, the CEMP and topic specific management plans) which ensure that potential significant effects on shared receptors are unlikely, or the absence of any in-combination effects on shared receptors, the following topics are scoped out from the intra-project cumulative assessment:

- Marine Ecology
- Ornithology
- Cultural Heritage
- Access Traffic and Transport
- Climate
- Marine Physical Environment and Coastal Processes
- Shipping and Navigation
- Commercial Fisheries

Intra-project effects have, however, been assessed for the following topics:

- Landscape and Visual – the topics where there is the potential for intra-relationship effects include the following:
  - Terrestrial Ecology – There would be combined effects on landscape habitats, including the craggy upland and plateau moor and forest landscapes, at construction and operation.
  - Cultural Heritage – There would be combined effects on the visual amenity experienced within the Inveraray Castle GDL, Ardkinglas and Strone GDL and Ardanaiseig House GDL and on the setting of the designations.
  - Access, Traffic and Transport – Combined effects would be experienced by users of the road network during the construction phase where the sense of activity would increase.
  - Noise and Vibration - Combined effects would be experienced by landscape and visual receptors in close proximity to construction activity through the construction phase where the sense of activity would increase.
  - Socio-Economic, Recreation and Tourism – Combined effects would be experienced by recreational users of the designated routes and core paths within the study area, where there would be intervisibility of the Development and where there are also diversions proposed.

- **Terrestrial Ecology** - It is concluded that for otter, the combination of loss of habitat and refuges to the Headpond, combined with disturbance, could theoretically result in a slightly greater cumulative effect, with the disturbance effect occurring over a prolonged period prior to eventual habitat loss. However, for the same reasons given individually for these effects on otter, the combined effects would remain only locally significant, primarily owing to the abundance of otter in the region and nationally (Scotland). This applies similarly to the other assessed species, for which no combination of effects is considered to result in a cumulative effect that exceeds the levels of significance stated for the individual effects (which are all locally significant only or negligible, or in some cases lack any effect at all). There are no intra-cumulative effects that would exceed in significance stated for the individual effects alone.
- **Aquatic Ecology** - There will be a requirement for lighting during construction, and operational external lighting at tunnel portals and along access roads and construction compounds. External lighting will also be required at the Headpond and Tailpond for access, although this will only be used occasionally. Lighting may also be fitted to the Marine Facility on Loch Awe. It is envisaged that embedded mitigation, including directional cowlings and restrictions to the hours of operation, will ensure that the potential effects of this lighting will be **Negligible** on all receptors.
- **Geology and Soils** - No potential direct combined effects on geology or ground conditions were identified. Potential indirect combined effects were identified from material management on the transport network, and on human receptors from nuisance such as reduced amenity, dust and noise. If excavated material were transported off-site, this would increase the required number of vehicle journeys to and from the Development Site and create a combined adverse effect of greater significance. However, as demonstrated in the MMA all excavated material can and will be reused within the Development Site, removing any potential intra-project transport effects. Amenity effects from noise and dust generation as a result of material excavation, transportation within the Development Site and storage could be compounded as a result of the overlapping construction programme for the different Development Components. The Outline CEMP provides mitigation in relation to generation of dust, noise and other emissions.
- **Water Environment** - There is the potential for intra-relationship effects between the assessment of effects of water quality, morphology and ecology. Firstly, it is important that the biological value of water features is carefully taken into account and that any physical modifications or river enhancements also consider the effects on ecological receptors. Generally, it is assumed that by improving water quality, hydraulic conditions and morphological diversity there would be associated biological benefits. Alternatively, on rare occasions, modified river morphology may support a sensitive ecological receptor or have heritage value, and these themselves may be important features that then restrict the type of hydromorphological improvements that can be made. There are also potential intra-relationship effects which occur between shallow superficial aquifers, GWDTs and geology/ground conditions. The removal of peat could impact the natural flow regime of rain-derived superficial aquifers and thus GWDTs.
- **Water Resources and Flood Risk** - There is a potential for intra-relationship effects between the assessment of water levels through the flood risk, water resource and the water environment assessments. The water resources and flood risk assessment identified unknowns at this stage in relation to which levels the fish lift (fish pass) of the Loch Awe Barrage is no longer able to operate. Therefore, careful consideration must be made alongside monitoring to agree upon an operating regime water level to ensure the vitality of the aquatic ecology and water environment around Loch Awe.
- **Noise and Vibration** - The intra-relationship effects of noise and vibration with other potential environmental effects have been considered at NSRs. Generally, the effects from the following sources have the potential to lead to significant effects when considered in combination: Noise and Vibration; Visual Impact; Dust; and Construction Traffic on Public Roads. The intra-cumulative effects are most likely to lead to significant effects when the receptor is in close proximity to the source of noise and vibration and the levels experienced are already leading to Minor or worse effects. However, it is difficult to quantify the intra-cumulative effects of noise and vibration with other potential effects. Nevertheless, given that only negligible effects of noise and vibration have been identified for the operational phase of the Development, any significant intra-cumulative effects that could occur would only be short term and temporary, during construction. Vibration is unlikely to contribute significantly to any intra-cumulative effects at receptors considered, due to the nature and distance of the groundborne vibration induced activities i.e. piling and blasting from the receptors.

- Socio-Economics, Recreation & Tourism: The potential emerges for combined effects to be experienced by recreational users of the designated routes and core paths and visitors to the tourism and recreational features present within the study area. The potential for intra-relationship effects emerges within the following topics:
  - Landscape and Visual Assessment – combined effects would be experienced by recreational users of the designated routes and core paths within the study area, where there would be intervisibility of the Development and where diversions are proposed.
  - Cultural Heritage – there would be combined effects on the visual amenity experienced at various cultural heritage sites within the study area which may impact upon the visitors' enjoyment of these features and the local area.
  - Access, Traffic and Transport – combined effects would be experienced by visitors to the area and users of the road network during the construction phase with increased construction traffic upon the local road network.
  - Noise and Vibration – combined effects would be experienced by visitors to the local area, particularly in close proximity to the construction area where the sense of activity would increase during the construction phase.

### 6.3 Inter-Project Cumulative Effects

The effects of the Development are assessed in combination with other projects that are either under construction or currently going through planning. Other projects have been identified through a search of ABC's online planning portal and confirmed with ABC's Planning Officers. The final planning portal check was concluded September 2023. A list of cumulative developments was sent to ABC for review on 12/09/2023. The inter-project cumulative assessment takes into account any existing environmental problems and any areas of particular environmental importance such as designated sites and landscapes.

Table 6.1 identifies the projects included within the inter-project cumulative effects.

**Table 6.1 Cumulative Projects**

Development	Description	Approx. distance to Headpond (km)	Status	Likely Shared Receptors
Beochlich Hydro Scheme	Small-scale 1MW hydropower scheme. Operational since 1998.	0.3	Operational	Water environment and resources, roads and amenity
Cruachan Hydro Scheme	440 MW pumped storage hydro scheme that uses Loch Awe as a tailpond. Operational since 1965	11	Operational	Water
Cruachan Expansion	Increasing the capacity of the existing PSH scheme by up to 600 MW.	11	Consented	Water, noise
Inverawe Hydro Scheme	25 MW hydro scheme on Loch Awe. Operational since 1963	16	Operational	Water
Nant Hydro Scheme	15 MW hydropower scheme that uses Loch Nant as its Headpond. Operational since 1963	8.8	Operational	Landscape, water
Lochan Shira (Reservoir)	Reservoir of the Clachan hydro scheme. Operational since 1950's	12.5	Operational	Landscape, water
Blarghour Wind Farm	Wind farm development comprising 17 turbines with a total installed capacity of 57.8 MW.	0.17	Consented	Landscape, noise
Blarghour Wind Farm variation	S36C scoping for increase in turbine tip height from 136.5m to 180m. Proposed Development still contains 17 turbines as per previous consented Development and will generate 85MW of electricity.	0.17	Scoping	Landscape, noise
Blarghour Wind Farm 132kV OHL Connection	Variation will vary consented s36 from 17 x 136.5m to s36c 14 x 180m.	2.01	Screening	Landscape
Beinn Ghlas Wind Farm	Construct and operate a 132 kV overhead line and Underground Cable to connect the proposed Blarghour	9.94	Operational	Landscape

Development	Description	Approx. distance to Headpond (km)	Status	Likely Shared Receptors
	Wind Farm to the proposed Creag Dhubh Substation. The technology options considered include OHL comprised predominantly of trident H wood pole supports, switching to trident H steel poles or steel lattice towers at altitudes over c. 300 m AOD, and a 500m section of UGC on approach to Creag Dhubh Substation.			
Beinn Ghlas Wind Farm Repowering	Wind farm development comprising 14 turbines with a total installed capacity of 8.4 MW. Operational since 1999.	9.90	Scoping	Landscape
An Suidhe Wind Farm	Wind farm development of up to 18 turbines of up to 180 m to tip, replacing the existing 14 operational turbines of 54.1 m to tip	7.06	Operational	Landscape
Carraig Gheal Wind Farm	Wind farm development comprising 20 turbines with a total installed capacity of 46 MW.	6.22	Operational	Landscape
Ladyfield Wind Farm	Wind farm development comprising 22 turbines, with a total capacity of between 50 and 100 MW.	4.12	Scoping	Landscape, noise & roads
Inveraray to Taynuilt (ITE/ITW) Tie-In to Creag Dhubh Substation	Construction and operation of a Tie-In connection to the proposed Creag Dhubh Substation from the existing 132 kV Taynuilt to Inveraray Overhead Line (OHL), as well as the temporary diversion of the existing 132 kV Taynuilt to Inveraray OHL to facilitate its connection to the substation and associated ancillary works.	3.67	Consented	Landscape & roads
An Suidhe Substation Overhead Line Connection	Install and keep installed approximately 1.34km of realigned 275 kV overhead line supported on six new steel towers to connect the proposed An Suidhe substation (via downleads) to the existing 275 kV Inveraray to Crossaig overhead line	9.76	Consented	Landscape
Creag Dhubh to Dalmally OHL	275kv OHL.	4.20	Consented.	Landscape & roads
Creag Dhubh – Inveraray OHL	Upgrade from existing 132kv to 275kv. (LT194 ref on map)	2.47	Consented	Landscape & roads
An Carr Dubh Wind Farm	Wind Farm (Generating station of >100 <200 MW Capacity) 13 turbines max turbine height 180m.	2.70	Application submitted	Landscape & roads
33kv Overhead Line - ETU 166 - Dalmally	New overhead 33kv line consisting of 1150m of Overhead EHV Conductor in order to connect to a new mast site. The new 33kv line will consist of 15 new poles and two spans of single phase, which will house our plant equipment and transformer. The new overhead line will be installed using poles of a wooden variety and these will be approximately 9.5 metres in height. The total length of the 33kv overhead line will be 1150 metres.	1.92	Consented	Landscape & roads
Barachander Wind Farm	Proposed wind farm and associated Battery Energy Storage System (BESS) facility. 11 turbines each with capacity c.6MW with max tip 180 m and BESS with capacity of 10MW.	7.90	Scoping	Landscape
Creag Dhubh substation	Substation with construction likely to commence 2024	4.04	Consented	Landscape & roads
Eredine Wind Farm	22 turbine wind farm with up to 120 MW generating capacity	10.04	Scoping	Landscape
Inveraray to Crossaig OHL	Construction of a new 275kV overhead line, initially operated at 132kV between Inveraray and Crossaig	5	Consented	Landscape & roads
An Suidhe Substation	Construction of a new 275kV substation and overhead line, which will connect into the recently completed 275kV overhead line between Inveraray and Crossaig.	9.93	Consented	Landscape & roads

All other developments are not on a like-for-like comparison basis or are scoped out due to there being limited or no shared receptors with the Development. It is also acknowledged that a grid connection will be required for the Development – it has been included as part of the cumulative assessment as Grid Connection OHL. This is not included as part of the Section 36 Application. The grid connection route is anticipated to be to Creag Dhubh

substation, which is located north east of the Development Site. The exact route of the grid connection from the Development Site to Creag Dhubh is currently unconfirmed, although it is anticipated that it will be via an underground line. A worst case approach of OHL has been considered within the assessment from a Landscape and Visual perspective, where no significant cumulative effects were found. A grid connection agreement has been made between the Development and SSE.

The approach taken for the Landscape and Visual cumulative assessment is set out in *Volume 5, Appendix 5.2 Landscape Assessment*. This approach deviates from other topics in that two cumulative scenarios have been defined for their potential to produce significant effects where the addition of the Development to the cumulative baseline would increase the prominence of energy infrastructure to the extent that they would potentially become either an influential characteristic or character-defining feature of a landscape and in views across the landscape.

- Cumulative Scenario 1: The cumulative baseline for this scenario includes schemes which have been consented and/or are under construction in addition to existing operational schemes; and
- Cumulative Scenario 2: The cumulative baseline for this scenario includes schemes at application stage in addition to existing operational schemes and those which have been consented and/or are under construction.

The following cumulative schemes have been excluded from the landscape and visual cumulative assessment. The schemes have been excluded due to reasons including a combination of the type of development proposed, distance, lack of intervisibility and a lack of shared landscape receptors. Therefore it is unlikely that there would be significant landscape or visual cumulative effects.

- Inverawe Hydro Scheme;
- Lochan Shira Reservoir;
- Clachan Flats Wind Farm;
- Coille Bhraghaid Mineral Exploitation Drilling;
- Corr Chnoc Wind Farm;
- Cruach Mhor Wind Farm;
- Crarae Substation; and
- Crarae Substation OHL Connection.

The cumulative landscape assessment takes a targeted approach, focusing on those landscape designations and LCTs where the potential for significant cumulative landscape effects is greatest:

- North Argyll LLA;
- LCT 34 Steep Ridges and Mountains;
- LCT 35 Rugged Mountains;
- LCT 40 Craggy Upland – Argyll; and
- LCT 53 Rocky Coastland – Argyll.

The significance of cumulative effect has been judged to be minor adverse (not significant) for all of the above landscape designations and LCTs for both Scenario 1 and 2.

The cumulative visual assessment focused on those representative viewpoints where the potential for significant cumulative visual effects is greatest:

- Viewpoint 4;
- Viewpoint 5;
- Viewpoint 6;
- Viewpoint 7;
- Viewpoint 8; and
- Viewpoint 17.



The significance of cumulative effect has been judged to be minor adverse (not significant) for all of the above representative viewpoints for both Scenario 1 and 2.

*Table 6.2* presents the results of the inter-project cumulative assessment on shared receptors by considering the contribution of the Development in combination with the effects of other projects identified in *Table 6.1*. The results are presented at a single project level and shows each project in combination with the effects of the Development –the total combined effects of all projects are considered and stated where relevant

**Table 6.2 Inter-Cumulative Effects on Shared Receptors**

Development	Cumulative Assessment on Shared Receptors
Cruachan Hydro Scheme and Cruachan Expansion	<p data-bbox="524 363 712 387"><u>Water Environment</u></p> <p data-bbox="524 395 2051 504">Cumulative impacts on water level within Loch Awe, which could influence water quality. Disturbance of the water column during seasonal thermal stratification could also lead to more widespread changes in Loch Awe. However, Cruachan Power Station is situated within the north basin over 17 km from the Proposed Development. Thus, there will unlikely be any interaction between the operation of the two pumped storage schemes and therefore cumulative effects in terms of water quality are unlikely.</p> <p data-bbox="524 539 736 563"><u>Landscape and Visual</u></p> <p data-bbox="524 571 2051 667">Both the Cruachan Hydro Scheme and the Cruachan Expansion have been included within the Landscape and Visual cumulative assessment Scenario 1 &amp; 2. The significance of cumulative effect has been judged to be minor adverse (<b>Not Significant</b>) for all of the above landscape designations and LCTs for both Scenario 1 and 2. The significance of cumulative effect has been judged to be minor adverse (<b>Not Significant</b>) for all of the above representative viewpoints for both Scenario 1 and 2.</p> <p data-bbox="524 702 703 726"><u>Terrestrial Ecology</u></p> <p data-bbox="524 734 1868 758">Cruachan Expansion does not involve expansion of its Headpond and thus there is unlikely to be any cumulative impact with the Development.</p> <p data-bbox="524 793 842 817"><u>Water Resources and Flood Risk</u></p> <p data-bbox="524 825 2051 952">The Cruachan PSH scheme utilises Loch Awe as its lower reservoir, with its own abstraction/generating cycle. The inter-cumulative effects were considered as part of the Flood Risk Assessment and Water Framework Directive Assessment. It is expected that if other developed schemes apply a similar robust and rigorous approach to mitigation and monitoring then the potential for significant adverse cumulative will be low. The assessment has considered the current operational arrangements for Loch Awe ensuring the need for minimum water levels and hence the pass forward environmental flows to the River Awe and operation of the Awe Barrage. It is assumed that all other developments must operate within these levels.</p> <p data-bbox="524 987 1003 1011"><u>Access, Traffic &amp; Transport (Cruachan Expansion)</u></p> <p data-bbox="524 1019 2051 1117">The assessment considered forecast construction traffic plus cumulative development traffic where the construction programme potentially coincides with that of the Development. This included the published construction traffic forecast for the Cruachan expansion with an anticipated peak construction year of 2026. Cumulative assessment mitigation measures will encompass the CTMP. In addition, it is expected that similar CTMPs will be in place for other cumulative developments.</p> <p data-bbox="524 1125 2051 1273">A key consideration for respective CTMPs should be that cumulative development sites explore options for coordinating construction traffic on public roads. The results of the cumulative assessment forecast found A819 Inveraray Town Centre was the only road link in the cumulative assessment forecast to potentially experience direct, temporary Major Adverse (<b>Significant</b>) effects. Consideration should also be given to the A83 Aray Bridge which the cumulative assessment forecasts to potentially experience direct, temporary Moderate Adverse (<b>Significant</b>) effects. Cumulative development mitigation could potentially examine the use of construction traffic routes associated with the Development that avoid Inveraray town centre, or scheduling of cumulative development to avoid peak construction traffic periods coinciding.</p> <p data-bbox="524 1308 931 1332"><u>Noise and Vibration (Cruachan Expansion)</u></p> <p data-bbox="524 1340 2051 1386">A cumulative assessment of construction traffic noise on local roads using the worst case period for relevant developments including Cruachan Expansion, Blarghour Wind Farm, Upper Sonachan Expansion, and Ladyfield Wind Farm was carried out. During construction the combined effects at road links are no worse than minor</p>

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## Cumulative Assessment on Shared Receptors

adverse (**Not Significant**) with the exception of Link 11 at A819 Inveraray (S) which is moderate adverse (**Significant**). However, it should be noted that without the contribution of other developments the Development has Negligible effect on the Magnitude of Impact outcome at Link 11; in other words the effect of construction traffic noise associated with the other developments is moderate adverse without the contribution of Development. Therefore, the overall effect of the Development on the cumulative effect of construction road traffic on all considered road links is Negligible (**Not Significant**). During operation the cumulative effects are considered Negligible (**Not Significant**).

Blarghour Wind Farm - Consented and  
Blarghour wind farm variation

### Water Environment

If built and once the necessary land rights are secured, the wind farm access track will also be used to access the Development Site. Therefore, there may be inter-cumulative effects with increased traffic flow which could generate suspended soils in wet weather and lead to potential contamination impacts at water crossings. However, appropriate mitigation measures, including runoff collection and SuDS will limit this.

Additionally, the Development vehicle's movements on the track will likely be very low, thus a very low impact.

### Landscape and Visual

Both included within the Landscape and Visual cumulative assessment. Consented has been included within Scenario 1, Variation within Scenario 2. The significance of cumulative effect has been judged to be minor adverse (**Not Significant**) for all of the above landscape designations and LCTs for both Scenario 1 and 2. The significance of cumulative effect has been judged to be minor adverse (**Not Significant**) for all of the above representative viewpoints for both Scenario 1 and 2.

### Terrestrial Ecology

There are no cumulative effects that would exceed in significance that stated for the effects of the Development alone, because cumulative contributions from Blarghour Wind Farm are either considerably less than those of the Development alone, or both are sufficiently negligible to remain so cumulatively. Therefore those cumulative effects on terrestrial ecological features assessed all remain **Not Significant** apart from Blanket Bog which remains as **Significant** as detailed below.

Blanket bog – a total of 9.8ha of blanket bog is stated in the Blarghour Wind Farm EIA Main Report to be permanently lost, nearly all considered unmodified (this excludes areas of flush and acid grassland within the bog areas). This is insignificant compared to the 165ha that would be lost to the Development (including all blanket bog whether or not considered sufficiently overgrazed and/or burnt to be classed as degraded bog). This small increase in overall loss of blanket bog would not increase the assessed (unmitigated) scale of effect for the Development to national level, and it remains as a Permanent Adverse Effect of Regional Significance, which is Significant. Limited hydrological impacts on retained blanket bog at Blarghour Wind Farm would not increase the slight degree of effect from the Development, which is minor in comparison to the loss;

### Ornithology:

Given proximity to the Development there is potential for combined impacts of habitat loss, disturbance and displacement to act on ornithological features:

- Waders: For curlew, golden plover and snipe, it was concluded that there could be Permanent Adverse effects of Regional Significance for curlew, and of Local Significance for golden plover and snipe, as a result of habitat loss from the Development. The combined loss of territories due to construction of Blarghour and An Carr Dubh Wind Farms would not increase this to being of National significance. The proposed LEMP as part of the Development will implement large-scale habitat enhancement which will benefit curlew and golden plover and other waders. Other developments, including Blarghour Wind Farm, have proposed similar measures which will further mitigate any cumulative effects.
- Golden eagles: Confidential Appendix 9.1 describes in detail the potential cumulative losses of golden eagle habitat which could arise from construction of the Development and the following nearby consented/proposed wind farms: Blarghour, Ladyfield, and An Carr Dubh. The increase in habitat loss from relevant golden eagle home ranges as a consequence of the construction of all of these projects combined would be minimal compared to that which will arise from the Development alone. It could not increase the significance of effect predicted on golden eagle from the Development in isolation from being Regionally significant to being Nationally significant cumulatively with other schemes.
- Black grouse: Loss of habitat used by breeding black grouse from the Development was assessed as likely having Negligible effect on the local population of this species. The LEMP will see the delivery of habitat creation / enhancement which will directly benefit black grouse, in particular the planting of native broadleaved trees which provide an important food source. Blarghour Wind Farm also proposes to implement habitat enhancement measures aimed at

## Development

### Cumulative Assessment on Shared Receptors

providing benefits for black grouse. There is consequently unlikely to be negative cumulative effect on this species, and it is quite likely that overall there could be a positive effect for the local black grouse population.

#### Cultural Heritage

Although Blarghour Wild Farm was identified as having the potential to result in inter-cumulative effects on heritage assets it was judged that there will be no cumulative effects when considering the Development against the identified schemes on heritage assets.

#### Access, Traffic & Transport

The assessment considered forecast construction traffic plus cumulative development traffic where the construction programme potentially coincides with that of the Development. This included the published construction traffic forecast for Blarghour Wind Farm with an anticipated peak construction year of 2026. Cumulative assessment mitigation measures will encompass the CTMP. In addition, it is expected that similar CTMPs will be in place for other cumulative developments.

A key consideration for respective CTMPs should be that cumulative development sites explore options for coordinating construction traffic on public roads. The results of the cumulative assessment forecast found consideration should be given in particular to the A819 Inveraray Town Centre was the only road link in the cumulative assessment forecast to potentially experience direct, temporary Major Adverse (**Significant**) effects. Consideration should also be given to the A83 Aray Bridge which the cumulative assessment forecasts to potentially experience direct, temporary Moderate Adverse (**Significant**) effects. Cumulative development mitigation could potentially examine the use of construction traffic routes associated with the Development that avoid Inveraray town centre, or scheduling of cumulative development to avoid peak construction traffic periods coinciding.

#### Noise and Vibration

A cumulative assessment of construction traffic noise on local roads using the worst case period for relevant developments including Cruachan Expansion, Blarghour Wind Farm, Upper Sonachan Expansion, and Ladyfield Wind Farm was carried out. During construction the combined effects at road links are no worse than minor adverse (**Not Significant**) with the exception of Link 11 at A819 Inveraray (S) which is moderate adverse (**Significant**). However, it should be noted that without the contribution of other developments the Development has Negligible effect on the Magnitude of Impact outcome at Link 11; in other words the effect of construction traffic noise associated with the other developments is moderate adverse without the contribution of Development. Therefore, the overall effect of the Development on the cumulative effect of construction road traffic on all considered road links is Negligible (**Not Significant**). During operation the cumulative effects are considered Negligible (**Not Significant**).

Beinn Ghlas Wind Farm  
Beinn Ghlas Wind Farm Repowering

#### Landscape and Visual

Beinn Ghlas Wind Farm has been included within Scenario 1, and Beinn Glass Wind Farm Repowering has been included within Scenario 2. The significance of cumulative effect has been judged to be minor adverse (**Not Significant**) for all of the above landscape designations and LCTs for both Scenario 1 and 2. The significance of cumulative effect has been judged to be minor adverse (**Not Significant**) for all of the above representative viewpoints for both Scenario 1 and 2.

#### Terrestrial Ecology

There are proposals in the planning system for upgrading Blarghour and Beinn Ghlas Wind Farms to install slightly fewer but larger turbines. If consented, and given the prior existence of these wind farms and that impacts on terrestrial ecology will have largely already occurred, these upgrades are likely to have negligible cumulative impact with the Development.

#### Ornithology:

The assessment for Beinn Ghlas Wind Farm predicted adverse effects on this species. However, despite there being evidence of avoidance of operational wind farms, there is little proof that this has a negative effect on breeding golden eagles. Moreover, there are at least seven wind farms at which golden eagles have established nests nearby following commencement of operation, including on Kintyre.

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### An Carr Dubh Wind Farms

#### Landscape and Visual

An Carr Dubh Wind Farm has been included within Cumulative Scenario 2. The significance of cumulative effect has been judged to be minor adverse (not significant) for all considered landscape designations and LCTs for both Scenario 1 and 2. The significance of cumulative effect has been judged to be minor adverse (**Not Significant**) for all representative viewpoints for both Scenario 1 and 2.

#### Ornithology

At approximately 2 km distance between this proposed wind farm and the Development, it is possible that habitat loss and/or displacement associated with both could act cumulatively to affect important bird species, including waders and golden eagles:

- Waders: For curlew, golden plover and snipe, it was concluded that there could be Permanent Adverse effects of Regional Significance for curlew, and of Local Significance for golden plover and snipe, as a result of habitat loss from the Development. The combined loss of territories due to construction of Blarghour and An Carr Dubh Wind Farms would not increase this to being of National significance. The proposed LEMP as part of the Development will implement large-scale habitat enhancement which will benefit curlew and golden plover and other waders.
- Golden Eagles: *Confidential Appendix 9.1* describes in detail the potential cumulative losses of golden eagle habitat which could arise from construction of the Development and the following nearby consented/proposed wind farms: Blarghour, Ladyfield, and An Carr Dubh. The increase in habitat loss from relevant golden eagle home ranges as a consequence of the construction of all of these projects combined would be minimal compared to that which will arise from the Development alone. It could not increase the significance of effect predicted on golden eagle from the Development in isolation from being Regionally significant to being Nationally significant cumulatively with other schemes.

#### Access, Traffic and Transport

An Carr Dubh Wind Farm was included in the cumulative assessment for Access, Traffic and Transport the details of which are included in *Section 9. Cumulative Development of Appendix 14.1 Transport Assessment Report (Volume 5: Appendices)*. The results of the cumulative assessment forecast found A819 Inveraray Town Centre was the only road link in the cumulative assessment forecast to potentially experience direct, temporary Major Adverse (**Significant**) effects. Consideration should also be given to the A83 Aray Bridge which the cumulative assessment forecasts to potentially experience direct, temporary Moderate Adverse (**Significant**) effects. Cumulative development mitigation could potentially examine the use of construction traffic routes associated with the Development that avoid Inveraray town centre, or scheduling of cumulative development to avoid peak construction traffic periods coinciding.

### Ladyfield Wind Farm

#### Landscape and Visual

Ladyfield Wind Farm has been included within Cumulative Scenario 2. The significance of cumulative effect has been judged to be minor adverse (**Not Significant**) for all considered landscape designations and LCTs for both Scenario 1 and 2. The significance of cumulative effect has been judged to be minor adverse (**Not Significant**) for all representative viewpoints for both Scenario 1 and 2.

#### Ornithology

This project is sited almost entirely in commercial conifer plantation which has low or no value to golden eagle. However, a relatively small proportion does include potentially suitable golden eagle habitat. At approximately 4km distant from the Development, there is very little possibility of combined impacts of construction-phase disturbance.

#### Access, Traffic & Transport

Ladyfield Wind Farm was included in the cumulative assessment for Access, Traffic and Transport the details of which are included in *Section 9. Cumulative Development of Appendix 14.1 Transport Assessment Report (Volume 5: Appendices)*. The results of the cumulative assessment forecast found A819 Inveraray Town Centre was the only road link in the cumulative assessment forecast to potentially experience direct, temporary Major Adverse (**Significant**) effects. Consideration should also be given to the A83 Aray Bridge which the cumulative assessment forecasts to potentially experience direct, temporary Moderate Adverse

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(**Significant**) effects. Cumulative development mitigation could potentially examine the use of construction traffic routes associated with the Development that avoid Inveraray town centre, or scheduling of cumulative development to avoid peak construction traffic periods coinciding.

#### Noise and Vibration

A cumulative assessment of construction traffic noise on local roads using the worst case period for relevant developments including Cruachan Expansion, Blarghour Wind Farm, Upper Sonachan Expansion, and Ladyfield Wind Farm was carried out. During construction the combined effects at road links are no worse than minor adverse (**Not Significant**) with the exception of Link 11 at A819 Inveraray (S) which is moderate adverse (Significant). However, it should be noted that without the contribution of other developments the Development has Negligible effect on the Magnitude of Impact outcome at Link 11; in other words the effect of construction traffic noise associated with the other developments is moderate adverse without the contribution of Development. Therefore, the overall effect of the Development on the cumulative effect of construction road traffic on all considered road links is Negligible (Not Significant). During operation the cumulative effects are considered Negligible (**Not Significant**).

33kv Overhead Line - ETU 166 -  
Dalmally

#### Landscape and Visual

Dalmally OHL has been included within both Cumulative Scenario 1 and 2. The significance of cumulative effect has been judged to be minor adverse (**Not Significant**) for all considered landscape designations and LCTs for both Scenario 1 and 2. The significance of cumulative effect has been judged to be minor adverse (**Not Significant**) for all representative viewpoints for both Scenario 1 and 2.

#### Ornithology

Habitat loss will be minimal for this project and so unlikely to be sufficient to have cumulative effects with this impact arising from the Development. However, if this scheme were under construction at the same time as the Development, disturbance caused by both could act cumulatively to significantly affect important ornithological features.

#### Cultural Heritage

While Dalmally OHL was identified as having the potential to result in inter-cumulative effects, it was judged that there will be no cumulative effects.

#### Access, Traffic and Transport

33kv Overhead Line – ETU 166 Dalmally was included in the cumulative assessment for Access, Traffic and Transport the details of which are included in *Section 9. Cumulative Development of Appendix 14.1 Transport Assessment Report (Volume 5: Appendices)*. The results of the cumulative assessment forecast found A819 Inveraray Town Centre was the only road link in the cumulative assessment forecast to potentially experience direct, temporary Major Adverse (Significant) effects. Consideration should also be given to the A83 Aray Bridge which the cumulative assessment forecasts to potentially experience direct, temporary Moderate Adverse (**Significant**) effects. Cumulative development mitigation could potentially examine the use of construction traffic routes associated with the Development that avoid Inveraray town centre, or scheduling of cumulative development to avoid peak construction traffic periods coinciding.

Beochlich Hydroelectric

#### Landscape and Visual

Beochlich Hydroelectric has been included within both Cumulative Scenario 1 and 2. The significance of cumulative effect has been judged to be minor adverse (**Not Significant**) for all considered landscape designations and LCTs for both Scenario 1 and 2. The significance of cumulative effect has been judged to be minor adverse (**Not Significant**) for all representative viewpoints for both Scenario 1 and 2.

#### Geology and Soils

Shared fault lines and geology between Beochlich hydroelectric site and the Development were considered. However, no effect was identified given the distance between the two sites and the safety standards and requirements incorporated into the design.



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### Cumulative Assessment on Shared Receptors

The potential for indirect combined effects on the transport network was also considered. Although the material management for Beochlich hydroelectric is unknown, no combined effect between the Development and Beochlich Hydroelectric was identified, due to the proposal to retain and re-use excavated material on the Development Site.

#### Inverawe Hydro Scheme

##### Landscape and Visual

Inverawe Hydro Scheme has been excluded from the Landscape and Visual cumulative assessment because a combination of the type of development proposed, distance, lack of intervisibility and a lack of shared landscape receptors means it is unlikely that there would be significant landscape or visual cumulative effects.

##### Water Resources and Flood Risk

There is a historic existing dam that feeds into the Inverawe hydropower station, located roughly 5 km from the barrage.

The inter-relationship cumulative effects have been assessed above that could have cumulative effects from the water bodies that will be affected by the Development, either during the periods of construction or operation. However, it is expected that if supplying the similar robust and rigorous approach to mitigating and monitoring as other developed schemes as this proposal, the potential for these significant adverse cumulative effects will be low.

The assessment has considered the current operational arrangements for Loch Awe ensuring the need for minimum water levels and hence the pass forward environmental flows to the River Awe and operation of the Awe Barrage. It is assumed that all other developments must operate within these levels.

#### Creag Dhubh Substation

##### Landscape and Visual

Creag Dhubh Substation has been included within both Cumulative Scenario 1 and 2. The significance of cumulative effect has been judged to be minor adverse (**Not Significant**) for all considered landscape designations and LCTs for both Scenario 1 and 2. The significance of cumulative effect has been judged to be minor adverse (**Not Significant**) for all representative viewpoints for both Scenario 1 and 2.

##### Cultural Heritage

Although Creag Dhubh Substation was identified as having the potential to result in inter-cumulative effects to heritage assets it was judged that there will be no cumulative effects.

##### Access, Traffic and Transport

Creag Dhubh substation was included in the cumulative assessment for Access, Traffic and Transport the details of which are included in *Section 9. Cumulative Development of Appendix 14.1 Transport Assessment Report (Volume 5: Appendices)*. The results of the cumulative assessment forecast found A819 Inveraray Town Centre was the only road link in the cumulative assessment forecast to potentially experience direct, temporary Major Adverse (**Significant**) effects. Consideration should also be given to the A83 Aray Bridge which the cumulative assessment forecasts to potentially experience direct, temporary Moderate Adverse (**Significant**) effects. Cumulative development mitigation could potentially examine the use of construction traffic routes associated with the Development that avoid Inveraray town centre, or scheduling of cumulative development to avoid peak construction traffic periods coinciding.

#### Creag Dhubh to Inveraray OHL

##### Landscape and Visual

Creag Dhubh to Inveraray OHL has been included within both Cumulative Scenario 1 and 2. The significance of cumulative effect has been judged to be minor adverse (not significant) for all considered landscape designations and LCTs for both Scenario 1 and 2. The significance of cumulative effect has been judged to be minor adverse (not significant) for all representative viewpoints for both Scenario 1 and 2.

##### Cultural Heritage

Although Creag Dhubh to Inveraray OHL was identified as having the potential to result in inter-cumulative effects to heritage assets it was judged that there will be no cumulative effects.

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#### Access, Traffic and Transport

Creag Dhubh to Inveraray OHL was included in the cumulative assessment for Access, Traffic and Transport the details of which are included in Section 9. Cumulative Development of *Appendix 14.1 Transport Assessment Report (Volume 5: Appendices)*. The results of the cumulative assessment forecast found A819 Inveraray Town Centre was the only road link in the cumulative assessment forecast to potentially experience direct, temporary Major Adverse (**Significant**) effects. Consideration should also be given to the A83 Aray Bridge which the cumulative assessment forecasts to potentially experience direct, temporary Moderate Adverse (**Significant**) effects. Cumulative development mitigation could potentially examine the use of construction traffic routes associated with the Development that avoid Inveraray town centre, or scheduling of cumulative development to avoid peak construction traffic periods coinciding.

Grid Connection OHL

#### Landscape and Visual

Grid Connection OHL has been included within Cumulative Scenario 2. The grid connection is expected to be via buried cable, but the OHL has been assessed to give a worst case scenario and no OHL forms part of these proposals. The significance of cumulative effect has been judged to be minor adverse (**Not Significant**) for all considered landscape designations and LCTs for both Scenario 1 and 2. The significance of cumulative effect has been judged to be minor adverse (**Not Significant**) for all representative viewpoints for both Scenario 1 and 2.

#### Cultural Heritage

Although Grid Connection OHL was identified as having the potential to result in inter-cumulative effects to heritage assets it was judged that there will be no cumulative effects.

Upper Sonachan Wind Farm

#### Access, Traffic & Transport

The assessment considered forecast construction traffic plus cumulative development traffic where the construction programme potentially coincides with that of the Development. This included the anticipated construction traffic forecast for Upper Sonachan Wind Farm with an anticipated peak construction year to be confirmed.

Cumulative assessment mitigation measures will encompass the CTMP. In addition, it is expected that similar CTMPs will be in place for other cumulative developments.

A key consideration for respective CTMPs should be that cumulative development sites explore options for coordinating construction traffic on public roads. The results of the cumulative assessment forecast found consideration should be given in particular to the A819 Inveraray Town Centre was the only road link in the cumulative assessment forecast to potentially experience direct, temporary Major Adverse (**Significant**) effects. Consideration should also be given to the A83 Aray Bridge which the cumulative assessment forecasts to potentially experience direct, temporary Moderate Adverse (**Significant**) effects. Cumulative development mitigation could potentially examine the use of construction traffic routes associated with the Development that avoid Inveraray town centre, or scheduling of cumulative development to avoid peak construction traffic periods coinciding.

#### Noise and Vibration

A cumulative assessment of construction traffic noise on local roads using the worst case period for relevant developments including Cruachan Expansion, Blarghour Wind Farm, Upper Sonachan Expansion, and Ladyfield Wind Farm was carried out. During construction the combined effects at road links are no worse than minor adverse (**Not Significant**) with the exception of Link 11 at A819 Inveraray (S) which is moderate adverse (**Significant**). However, it should be noted that without the contribution of other developments the Development has Negligible effect on the Magnitude of Impact outcome at Link 11; in other words the effect of construction traffic noise associated with the other developments is moderate adverse without the contribution of Development. Therefore, the overall effect of the Development on the cumulative effect of construction road traffic on all considered road links is Negligible (**Not Significant**). During operation the cumulative effects are considered Negligible (**Not Significant**).

Other wind farms

#### Landscape and Visual

**Development**

**Cumulative Assessment on Shared Receptors**

	<p>In addition to the wind farms included above An Suidhe Wind Farm, Carraig Gheal Wind Farm, Barachander Wind Farm and Eredine Wind Farm were also included as part of the Landscape &amp; Visual Assessment. The significance of cumulative effect has been judged to be minor adverse (<b>Not Significant</b>) for all considered landscape designations and LCTs, and minor adverse (<b>Not significant</b>) for all representative viewpoints for both Scenario 1 and 2.</p>
<p>Other overhead line schemes and substation schemes</p>	<p><u>Landscape and Visual</u></p> <p>In addition to the OHL schemes and substations above Blarghour Wind Farm OHL Connection, Creag Dhubh Substation OHL Connection, An Suidhe Substation OHL Connection, Creag Dhubh to Dalmally OHL and An Suidhe Substation were also included as part of the Landscape and Visual Assessment. The significance of cumulative effect has been judged to be minor adverse (<b>Not Significant</b>) for all considered landscape designations and LCTs, and minor adverse (not significant) for all representative viewpoints for both Scenario 1 and 2.</p> <p><u>Access Traffic and Transport</u></p> <p>Inveraray to Taynuilt (ITE/ITW) Tie-In to Creag Dhubh Substation, An Suidhe Substation Overhead Line Connection, Creag Dhubh to Dalmally OHL, Inveraray to Crossaig OHL and An Suidhe Substation were included in the cumulative assessment for Access, Traffic and Transport the details of which are included in <i>Section 9. Cumulative Development of Appendix 14.1 Transport Assessment Report (Volume 5: Appendices)</i>. The results of the cumulative assessment forecast found A819 Inveraray Town Centre was the only road link in the cumulative assessment forecast to potentially experience direct, temporary Major Adverse (<b>Significant</b>) effects. Consideration should also be given to the A83 Aray Bridge which the cumulative assessment forecasts to potentially experience direct, temporary Moderate Adverse (<b>Significant</b>) effects. Cumulative development mitigation could potentially examine the use of construction traffic routes associated with the Development that avoid Inveraray town centre, or scheduling of cumulative development to avoid peak construction traffic periods coinciding</p>
<p>Other hydro schemes</p>	<p><u>Landscape and Visual</u></p> <p>Nant Hydro Scheme – a 15 MW hydropower scheme that uses Loch Nant as its Headpond. Operational since 1963- was the only other hydro scheme - in addition to the hydro schemes included in this table- included as part of the Landscape and Visual cumulative assessment. As stated above the significance of cumulative effect has been judged to be minor adverse (<b>Not Significant</b>) for all considered landscape designations and LCTs, and minor adverse (not significant) for all representative viewpoints for both Scenario 1 and 2.</p> <p><u>Water Resources and Flood Risk</u></p> <p>Other operational hydro power schemes utilising Loch Awe and Rver Awe are considered historic uses of River Awe and their form part of the baseline scenario.</p>
<p><b>Conclusion</b></p>	<p>The inter-project cumulative assessment found that the majority of effects were considered minor adverse or negligible, or otherwise cumulatively did not exceed in significance the stated for the effects of the Development alone. Two <b>Significant</b> cumulative effects were found for Access, Traffic and Transport, one major adverse and one moderate adverse, both temporary during construction. This is based on a worst case scenario and in practice it is highly unlikely that peak construction traffic for all projects will coincide.</p>

## 7. Overall Conclusions

This Non-Technical Summary Outlines the findings of the EIA for the Balliemanoch PSH Scheme. The construction, operation and decommissioning of the Development have the potential to have effects on the natural environment and nearby human receptors.

The EIA concludes that the Development is likely to have mainly **Minor adverse** to **Negligible** effects (**Not Significant**) on the environment. **Moderate** and **Major adverse** effects (**Significant**) are likely to be limited to the following, with **Moderate Beneficial** effects also noted:

- The landscape and visual assessment concluded that during construction there are likely to be **Major adverse** effects (**Significant**) on landscape character for two landscape character types, and on visual amenity for seven viewpoints and **Moderate adverse** effects (**Significant**) on landscape character for four landscape features, on landscape character for one landscape character type, and on visual amenity for four viewpoints. This is reduced within Operation Year 1 to **Major Adverse** effects (**Significant**) on visual amenity for three viewpoints and **Moderate adverse** effects (**Significant**) on landscape character for two landscape character types and visual amenity for five viewpoints. This is further reduced within Operational Year 15 to **Moderate Adverse** effects (**Significant**) on visual amenity for one viewpoint.
- The terrestrial ecology assessment concluded that during construction there will be an initial medium-term temporary Adverse effect of regional significance (**Significant**) on blanket bog loss; ameliorating to permanent Adverse effect of local significance by the proposed rehabilitation of retained blanket bog, as set out in the oLEMP, in approximately 20 years (**Not Significant**).
- The aquatic ecology assessment concluded that during operation there would likely be a **Moderate Adverse** effect (**Significant**) on migratory fish species in Loch Awe and River Awe, including Atlantic salmon, brown/sea trout, European eel, and lamprey species.
- Two **Significant adverse** effects (adverse effects of Regional significance) are likely for Ornithology: one temporary during construction on displacement of golden eagle and one permanent due to the loss of golden eagle habitat. However it should be noted that with implementation of the Outline LEMP it is reasonable to assume that this permanent effect could in the medium term reduce to **Not Significant** or positive.
- The water environment assessment concluded a **Moderate Adverse** effect (**Significant**) on thermal stratification within Loch Awe during operation.
- The Cultural Heritage assessment concluded a **Moderate Adverse** effect (**Significant**) on potential physical impacts on a possible standing stone. However, it should be noted that this is a worst-case scenario based on the asset being a prehistoric standing stone, and further detailed investigations may find this not to be the case.
- **Moderate Beneficial (Significant Beneficial)** effects are predicted during the construction period, in terms of socio-economics and tourism from job creation and local expenditure by the developer and contractors within the study area throughout construction period.
- For climate there is considered to be a **Beneficial** effect (**Significant Beneficial**) to GHG emissions as a result of GHG savings that are expected to be achieved.
- The Access, Traffic and Transport cumulative assessment concluded that during construction there is considered to be a temporary **Major Adverse** effect (**Significant**) at A819 Inveraray Town Centre and a temporary **Moderate Adverse** effect (**Significant**) at A83 Aray Bridge. However this is based on a worst case scenario and in practice it is highly unlikely that peak construction traffic for all projects will coincide

The results of the EIA also ensure that decision makers, such as the ECU, ABC, SEPA and NatureScot amongst other statutory consultees and other interested parties including local communities, are aware of a proposed development's potential environmental impacts and whether these may be significant or not so that they may be considered in the determination of an application for consent.

A significant adverse effect is not necessarily one that would make the Development unacceptable, nor is a significant beneficial effect necessarily one that would make the Development acceptable. The purpose of identifying the significant effects (adverse and beneficial) is to ensure that all parties, in particular decision makers, are aware of the environmental impacts (in particular those which are likely to be significant) of the Development and consider these alongside other material considerations in determining this application.

### **Next Steps**

The results of the EIA will be considered as part of the decision to grant or refuse planning permission for the Development. One of the key aims of the EIA is to ensure that the environmental effects of the Development are known and understood so that these may be considered before deciding whether or not to proceed with the development.

In considering the application, the ECU will consult with a range of organisations such as ABC, SEPA, NatureScot and HES as well as invite comments from the local community. Further details of how to make a representation can be found in *Section 1.4.1* of this NTS. The responses to the Section 36 Application from all parties, including comments made in relation to results of the EIA, will be considered in determining the application for consent.

