EARBA PUMPED STORAGE HYDRO SCHEME

About Gilkes

Gilkes Energy Ltd (GEL) specialises in the development of hydro power projects in the UK. Over the last 14 years we have developed 17 hydro projects in the range 500kW to 5MW. In 2018 we moved our focus to Pumped Storage Hydro (PSH), reflecting the fact that the UK needs very significant amounts of electricity storage to reach the Government's Net Zero targets.

This is the first of a number of consultation events proposed prior to submitting a planning application.

Purpose of Exhibition

This preliminary public exhibition has been arranged to:

- Introduce the Earba Pumped Storage Hydro Scheme
- Provide details of the proposed project and how it would work
- Explain some of the environmental effects of the scheme and their mitigation
- To provide details of the project timeline

EARBA PUMPED STORAGE HYDRO SCHEME

The Site

The Proposed Development is located on Ardverikie Estate, approximately midway between Newtonmore and Spean Bridge, and would operate by transferring water between a lower reservoir, Lochan na h-Earba and an upper reservoir, Loch a'Bhealaich Leamhain.

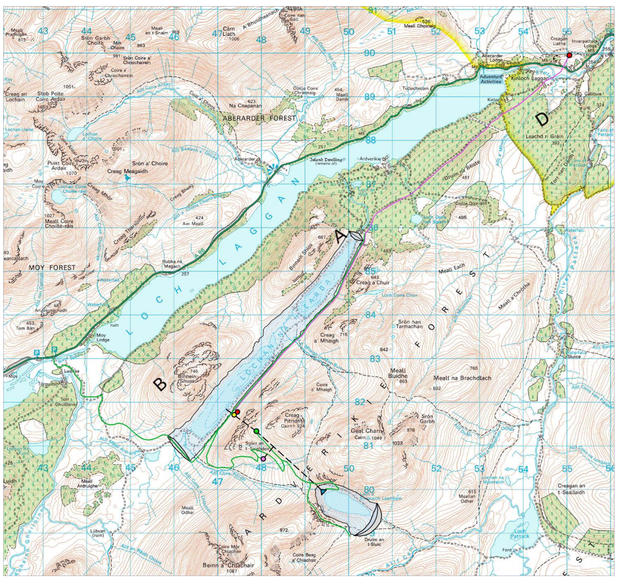
Lochan na h-Earba sits within a narrow glen, and currently consists of two lochs which are joined by a small watercourse. This loch is already a modified hydro reservoir, controlled by a weir / dam and hydro intake at the northern end. The 1MW hydro it feeds is operated by Ardverikie Estate, with an overhead line from the hydro powerhouse near the Ardverikie House to Dalwhinnie. Pattack Hydro, operated by Gilkes Energy, is located to the east and shares this export line to Dalwhinnie. A number of other existing hydro developments can also be found in the area.

Loch a' Bhealaich Leamhain is a smaller lochan located south-east of Lochan na h-Earba within an area of upland moorland, just south of the summit of Geal Charn.

The upper reservoir area at Loch a' Bhealaich Leamhain

Lochan na h'Earba

Powerhouse Area



EARBA PUMPED STORAGE HYDRO SCHEME

The Proposed Development

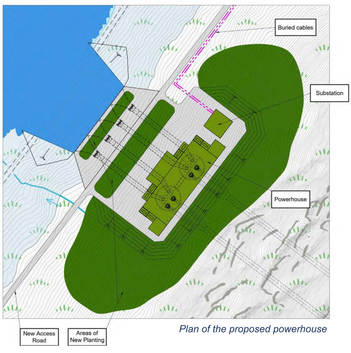
The scheme would operate by transferring water between a lower reservoir, Lochan na h-Earba and an upper reservoir, Loch a' Bhealaich Leamhain. The maximum water level of these existing lochs would be raised by constructing dams to increase their natural storage capacity. The reservoirs would be connected by an underground waterway system including two headrace tunnels.

A powerhouse will be constructed on the shore of Loch Earba which will extend deep underground. The turbines will be located at the bottom of the powerhouse shaft and will generate electricity in times of national demand or pump water for energy storage in times when there is surplus electricity on the national grid.

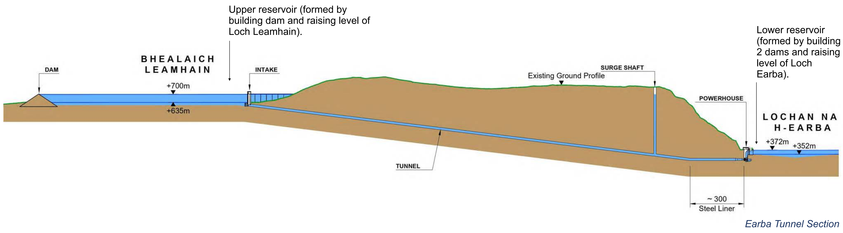
Key details

- 900MW Capacity
- Storage of up to 33,000MWh
- 3 Dam structures
- 2.6km tunnel length

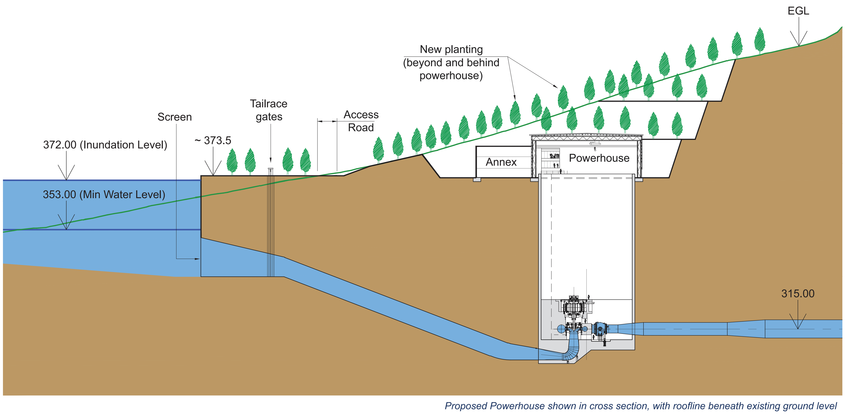
This is Marchyln Mawr dam in Wales which is similar to the dams proposed at Earba



Plan of the proposed powerhouse



Earba Tunnel Section



Proposed Powerhouse shown in cross section, with roofline beneath existing ground level

GILKES energy

EARBA PUMPED STORAGE HYDRO SCHEME

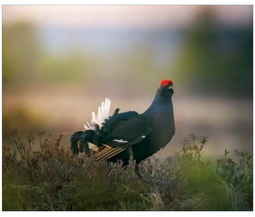
Environmental Impact Assessment

An Environmental Impact Assessment (EIA) will be undertaken to understand the potential impacts the Proposed Development could have on the environment and to identify appropriate mitigation measures to avoid, reduce or offset any adverse effects identified.

The EIA will comprise a series of targeted specialist environmental studies. Preliminary surveys and research commenced in 2021, including Phase 1 habitat and protected species surveys, ornithology surveys, aquatic ecology surveys and peat probing, as well as an initial review of potential landscape and visual and cultural heritage constraints.

The findings of the EIA will be reported in an EIA Report, which will be submitted as part of the Section 36 Application. The following topics will be incuded:

- Hydrology and Water Management
- Landscape and Visual
- Land Use and Recreation
- Terrestrial Ecology
- Ornithology
- Aquatic Ecology
- Geology, Soils and Water
- Cultural Heritage
- Traffic and Transport
- Noise and Vibration
- Air Quality
- Socioeconomics and Tourism

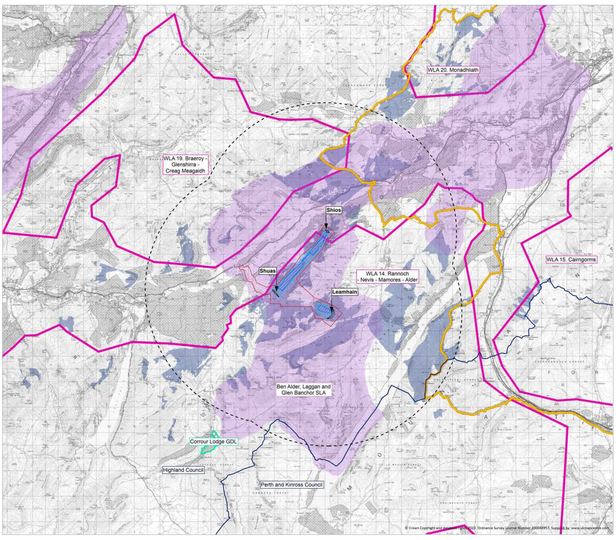


EARBA PUMPED STORAGE HYDRO SCHEME

Landscape and Visual

A Landscape and Visual Impact Assessment (LVIA) will be undertaken as part of the EIA, and will include the consideration of potential effects to the fabric and character of the landscape resource and the visual amenity of residents, travellers and visitors. Initial research has been undertaken to identify potential visual receptors and landscape designations within the area. As part of this exercise a preliminary Zone of Theoretical Visibility (ZTV) was produced to determine the potential extent of visibilty of the dams.

Designated and Protected Landscapes



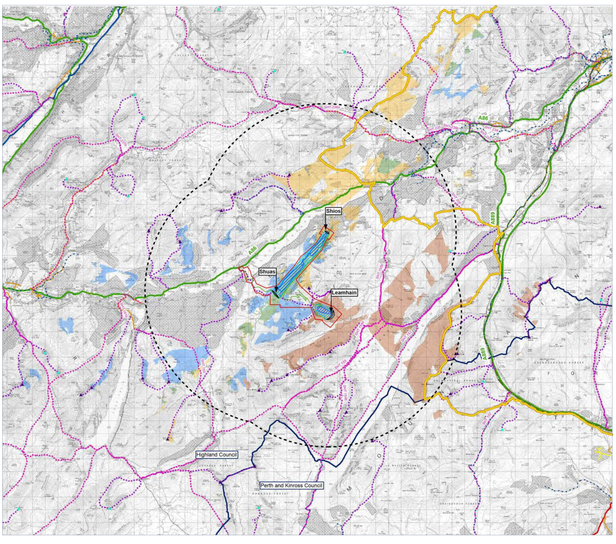
Key

- Red Line Boundary
- Low Water Level
- Maximum Inundation
- Dams
- Administrative boundary
- Cairngorms National Park (CNP)
- Proposed LVIA Study Area (10km)
- Zone of Theoretical Visibility (ZTV) Dams

Designated and Protected Landscapes

- Wild Land Area (WLA)
- Special Landscape Area (SLA)
- Site Included on the Inventory of Gardens and designed Landscapes (GDL)

Potential Visual Receptors and Zone of Theoretical Visibility



Key

- Red Line Boundary
- Low Water Level
- Maximum Inundation
- Dams
- Administrative boundary
- Cairngorms National Park (CNP)
- Proposed LVIA Study Area (10km)

Zone of Theoretical Visibility (ZTV)

- Shios Dam
- Shuas Dam
- Shios Dam and Shuas Dam
- Leamhain Dam

Visual Receptors

- Munro Summit
- Corbett Summit
- A Road
- B Road
- Minor Road
- Private Road Publicly Accessible
- Cycle Network
- Core Path
- Scottish Hill Track (SHT)
- Mountain Route

GILKES energy

EARBA PUMPED STORAGE HYDRO SCHEME

The Proposed Timeline

Throughout the process Gilkes will continuously engage with the local community and stakeholders about the emerging proposals

Site Selection and Feasibility
(12 months)
Extensive research has been carried out to identify a well located and viable site for the development of a pumped storage scheme.

Pre-Planning
(12 to 18 months)
Public Exhibitions & Community Engagement / Scoping / Environmental Surveys / Design Freeze / Environmental Impact Assessment

Submit application and await decision
An application is submitted to the Scottish Government accompanied by a comprehensive EIA Report showing the results of studies undertaken. This is publicly available information. Interested parties and statutory consultees such as the Local Authority and residents can formally comment on the application.

Construction
(36-48 months)
If approved, construction would typically take three to four years.

Operation
Whilst it is anticipated that the consented life of the scheme would be 100 years, with proper maintenance, the scheme could run indefinitely, like other pumped storage schemes in the UK.

We are here

January to March 2023
Scoping Report and Opinion

February 2023 onwards
Public consultation

February to July 2023
EIA Surveys

Autumn 2023
Section 36 Application

2026 – 2029
Construction and commissioning

GILKES energy

EARBA PUMPED STORAGE HYDRO SCHEME

Why pumped storage hydro is needed

- PSH uses electricity to pump water from a lower to an upper reservoir when there is excess renewable energy on the grid and uses that water to drive a turbine to generate electricity when there is inadequate renewable energy.
- In effect it is a giant battery.
- The Scottish Government recognises the need for large-scale, long-duration electricity storage provided by PSH to create the conditions for a net zero energy system by facilitating the development of more intermittent renewable energy.
- Earba PSH has a bigger electricity storage capacity than any others operating, consented or in planning in the UK.
- If built, Earba PSH would more than double the UK's current electricity storage capacity (all technologies)

Why Earba?

- Suitable topography to be able to create an upper and lower reservoir
- High elevation difference and short distance between the upper and lower reservoirs
- Large reservoir capacity to maximise electricity storage
- Large power capacity to deliver storage at scale
- Suitable geological conditions
- Practicable access to the electricity transmission network and road network
- No ecological designations within the site
- The opportunity for a shaft powerhouse rather than a cavern
- The opportunity to win and use materials within the site to minimise off-site transport
- Local Employment Opportunities

Contact details and website:

info@gilkesenergy.com

https://earbastorage.co.uk

GILKES energy