

FEARNA PUMPED STORAGE HYDRO SCHEME

The Developer

Gilkes Energy Ltd (GEL) is leading the development of the Fearna Pumped Storage Hydro Project.

We specialise in the development of hydro power projects in the UK and our team, based in Glasgow, comprises civil & mechanical engineers, finance and development specialists and CAD draughting. Over the last 14 years GEL has developed 17 hydro projects in the range 500kW to 5MW around Scotland.

Our sister company, Gilbert Gilkes & Gordon has manufactured hydro turbines since 1856 and has service centres in Fort William, Invergordon and Callander.

We are therefore highly experienced in the development, construction and operation of hydro projects in remote, rural locations and have strong relationships with key stakeholders and local suppliers.

Purpose of Exhibition

This preliminary public exhibition has been arranged to:

- Set out the need for Pumped Storage Hydro.
- Introduce the Fearna Pumped Storage Hydro Project.
- Provide details of the proposed project and its construction and operation.
- Gather opinion from the local community on the various aspects of the project.
- Generate discussion on the form of Community Benefits which the project may provide.
- Identify some of the environmental impacts and mitigations.
- Provide details of the project timeline.

This is the first of a number of public consultation events proposed prior to submitting a planning application in 2024.



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The Site

The Proposed Development is situated approximately 1km west of the Quoich dam, at the west end of Glen Garry. The site is split between three land ownerships – West Glenquoich Estate, East Glenquoich Estate and SSE Generation.

The site is currently used for sporting activities and also for hydropower generation. Quoich hydro operates on the site and Loch Quoich will form the lower reservoir for the Fearna project. There is also a small run-of-river hydro station on the Allt Mheil burn within the site. Fearna will co-exist with both the existing hydro projects.

The site comprises predominantly wet heath, with some areas of blanket mire, upland blanket bog, purple moor grass pasture, acid and basic flushes, dry heath and grassland. No woodland exists within the footprint of the Proposed Development but the proposed access route does affect some small areas of existing commercial forestry and native (non-ancient) woodland, which will be compensated elsewhere.



Loch Fearna with Loch Quoich beyond



Quoich Dam



The upper reservoir area at Loch Fearna



Lower reservoir at Loch Quoich



Old quarry near powerhouse area

The Proposed Development

The scheme capacity would be up to 2000MW, which would be the largest of any UK project. The energy stored would be up to 37GWh, making it the second-largest project in the UK and providing a nationally significant energy balancing facility.

Dams would be required at Loch Fearna and Coire Dubh to create the upper reservoir. These would be constructed from rock which would be excavated from within the reservoir and would be of the same construction type as the existing Quoich Dam.

The powerhouse would be located next to the disused quarry which was used to build the Quoich Dam in the 1950s. The quarry is proposed to be re-used as the tunnel entrance, laydown area and possible electrical compound.

An access track would be required for the construction of the scheme between the lower and upper end of the site. Once completed, the access track would be narrowed to a 4x4 track.



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Access to the Site

The Fearna PSH site sits within a remote location, approximately 12 miles along the C1144 public road.

A new access route to the site is proposed for the construction of the project – named the Southern Access Route, which may comprise:

- A new junction off the A87 at White Bridge and new bridge across the River Garry.
- Existing Forest Road.
- Re-use of existing forest roads as far as possible up Glen Garry.
- Provision of a new bridge crossing of the Gearr Garry and re-joining the public road to the east of Quoich Dam via a new section of track.
- Widening of the C1144 around Quoich Dam to maintain separate public and construction access.

The main construction compound is proposed to be located along the Southern Access Route, which would provide accommodation, laydown/storage and offices during the construction phase.

Major maintenance works would use the Southern Access Route for the removal of heavy items of plant.

Once complete, it is proposed that daily operational traffic would use the C1144.

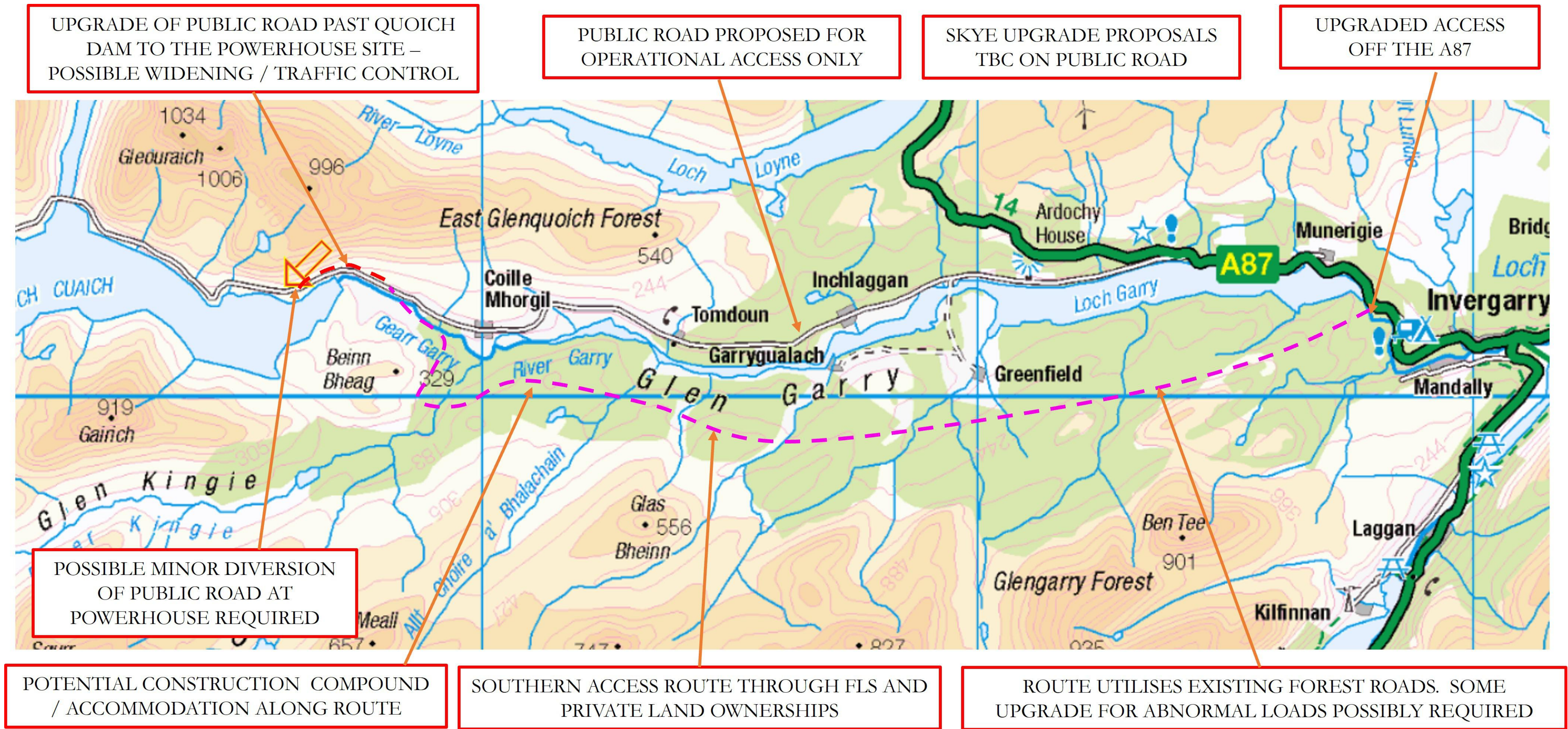
The use of the Southern Access Route is dependent on reaching agreement with landowners.



Existing Forest Road at Whitebridge



Public Road at Quoich Dam



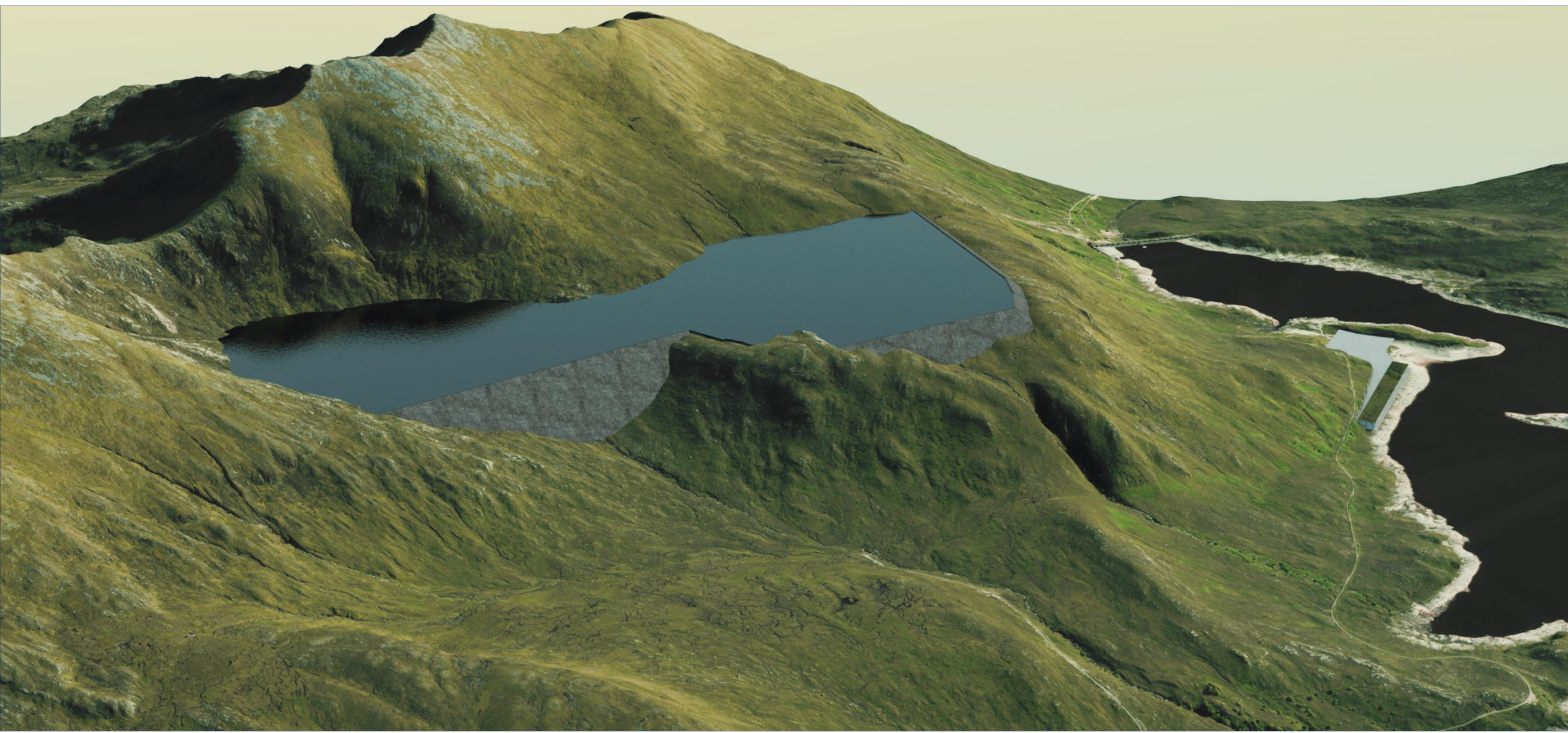
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Key Features of the Project

The main features of the project which would be visible are:

Upper Dams

The upper dams would create the storage reservoir within Loch Fearna and Coire Dubh. The dams would be of rockfill construction, similar to the existing Quoich Dam in form but larger.



Powerhouse

The powerhouse structure would be located on the shore of Loch Quoich and house the pump-turbine units. The proposal is to develop a design which reflects the surrounding landscape:

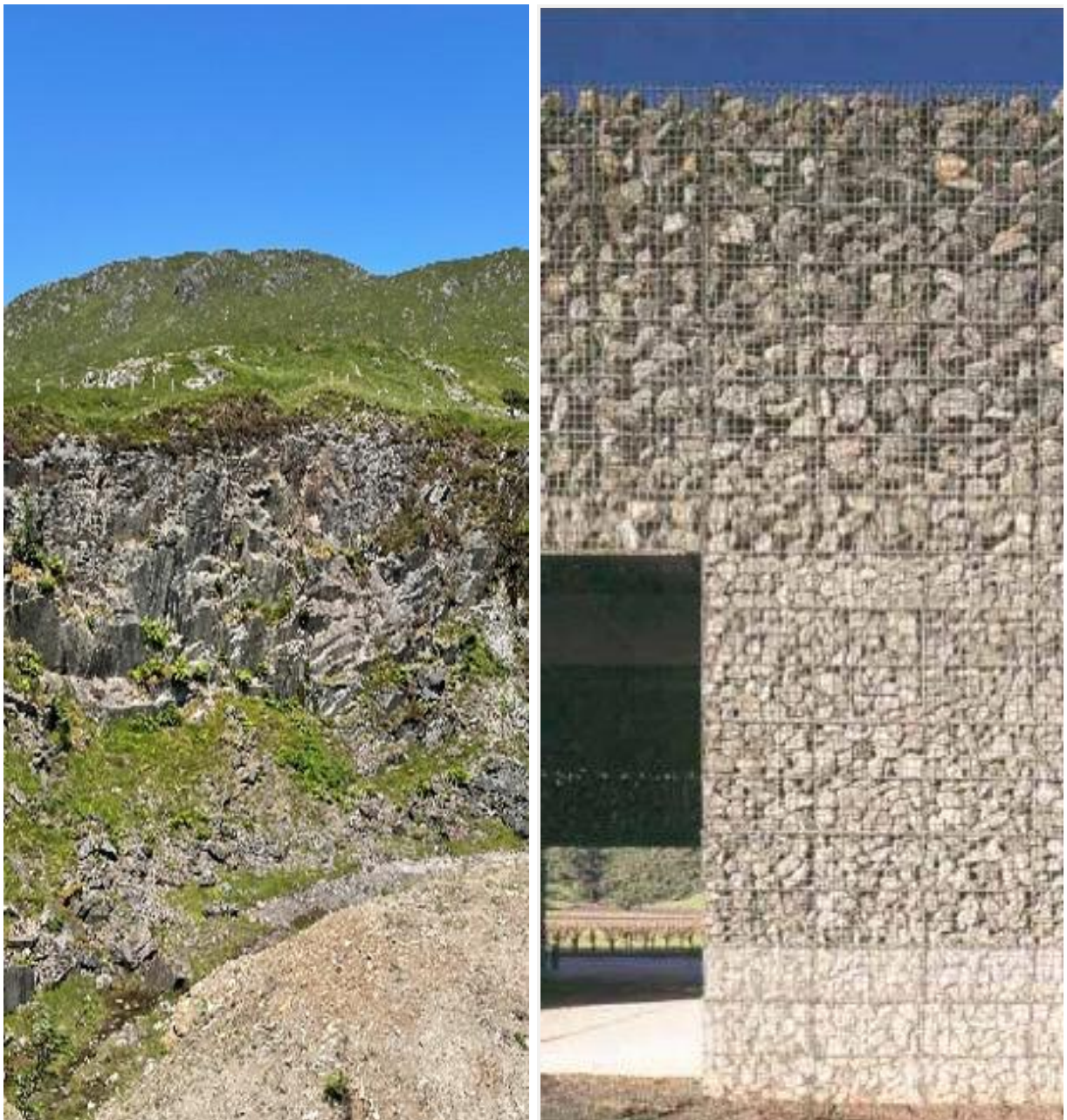
Topography



Geology



Materiality



Access Tracks

Access tracks would be constructed in the early stages. These tracks require to be robust for safety and practicality during construction, however would be as sensitively designed as possible to minimise earthworks and visual impact.

Where possible, access tracks would be shared with other projects in the area.

Best practice would be applied to use the excavated turf on the track edges during construction. On completion of the project the tracks would be reduced in with to 4x4 vehicle access only.

All waterways would be underground and therefore invisible.

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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.

Preliminary surveys and research commenced in 2022, 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 EIA will comprise a series of targeted specialist environmental studies.

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 included:

- 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



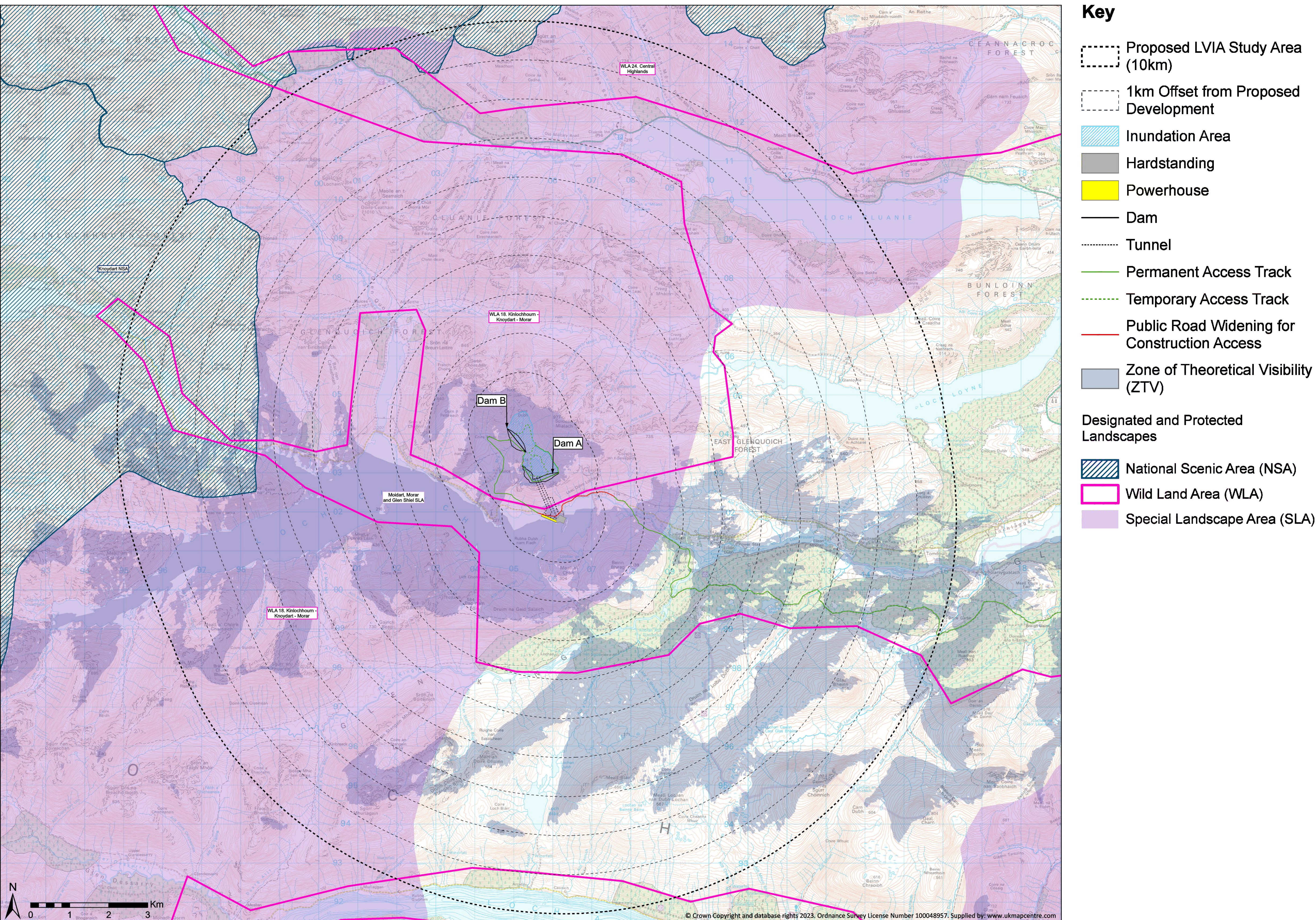
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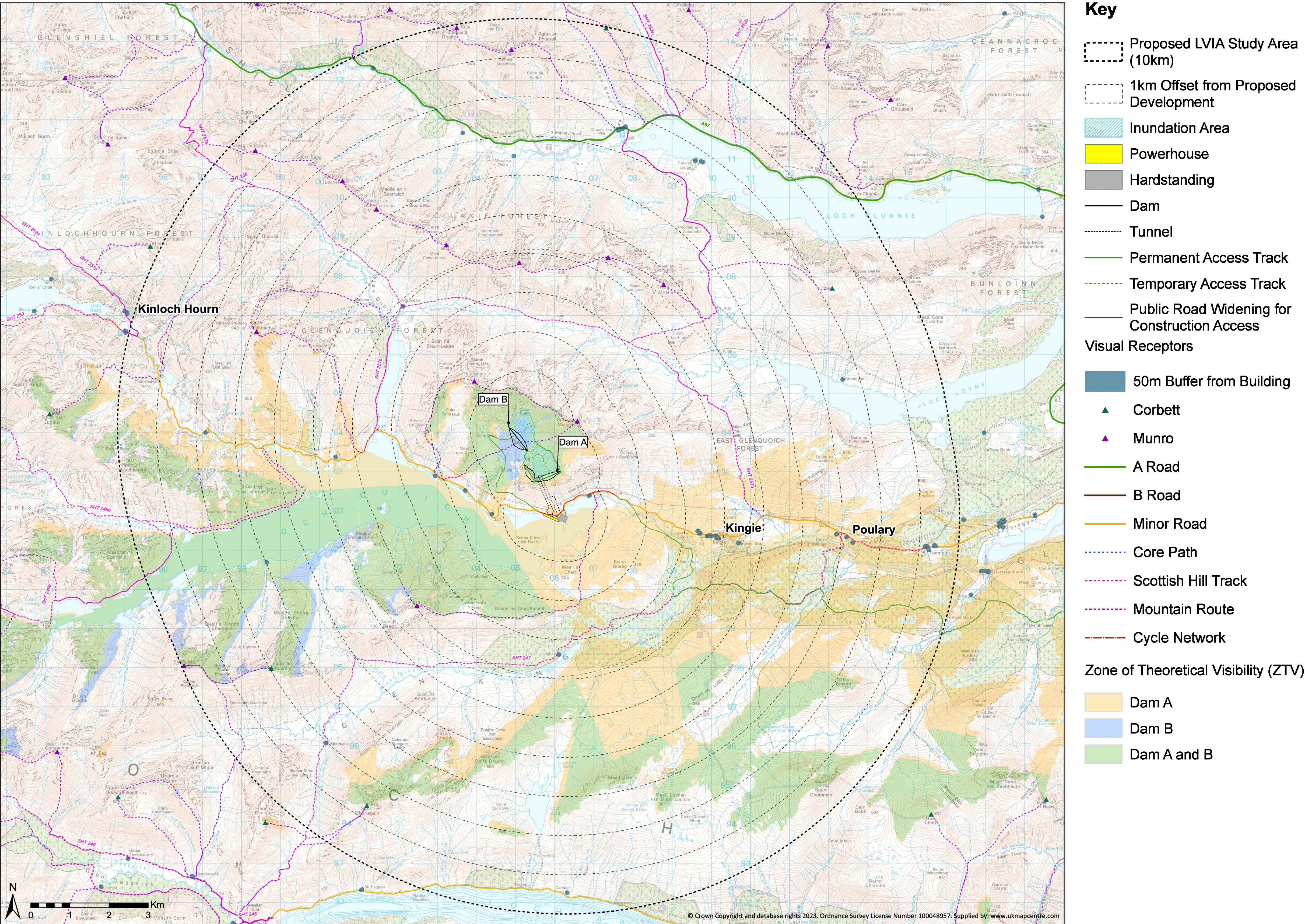
Landscape and Visual

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 visibility of the dams.

Designated and Protected Landscapes



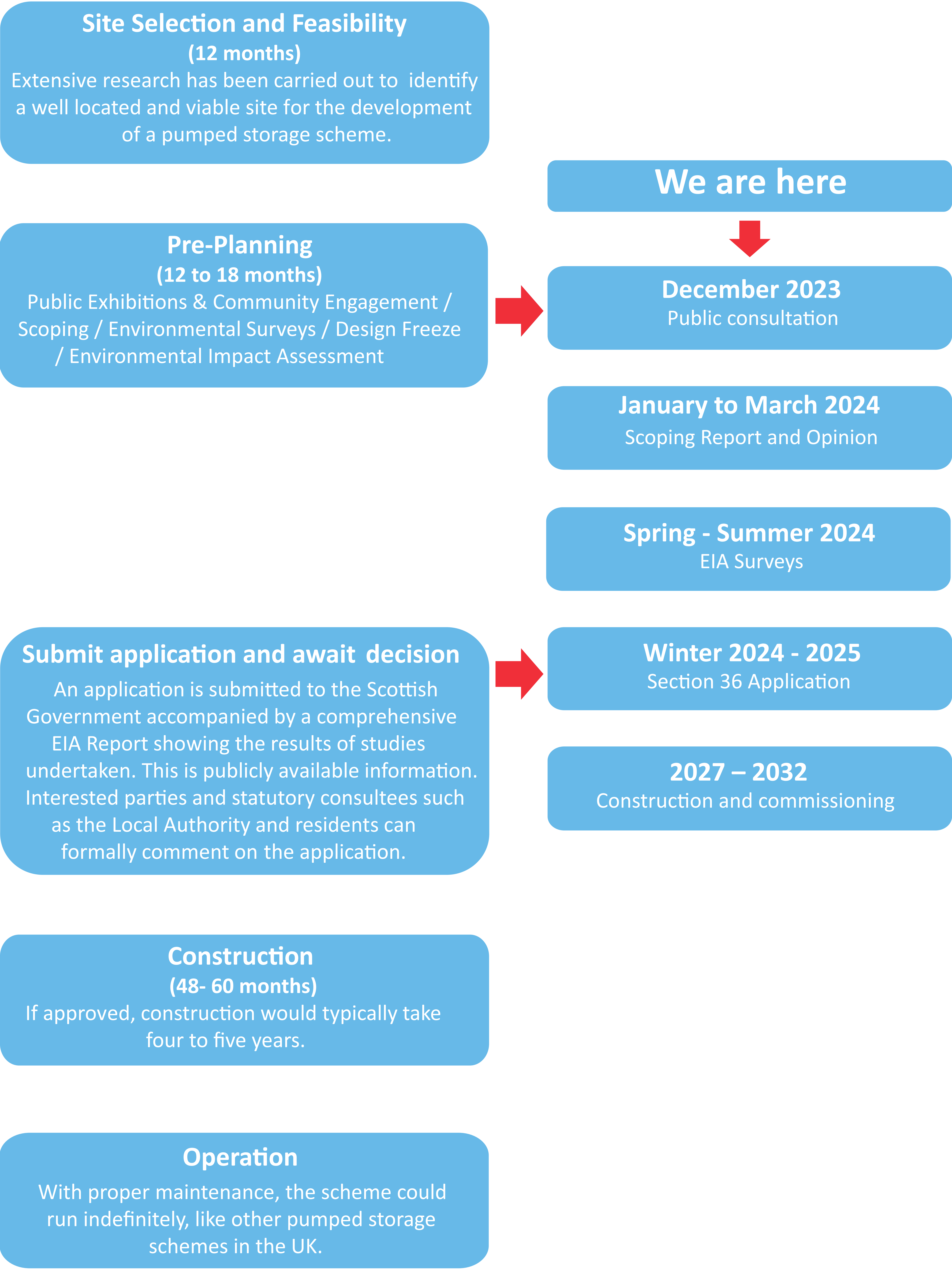
Potential Visual Receptors and Zone of Theoretical Visibility



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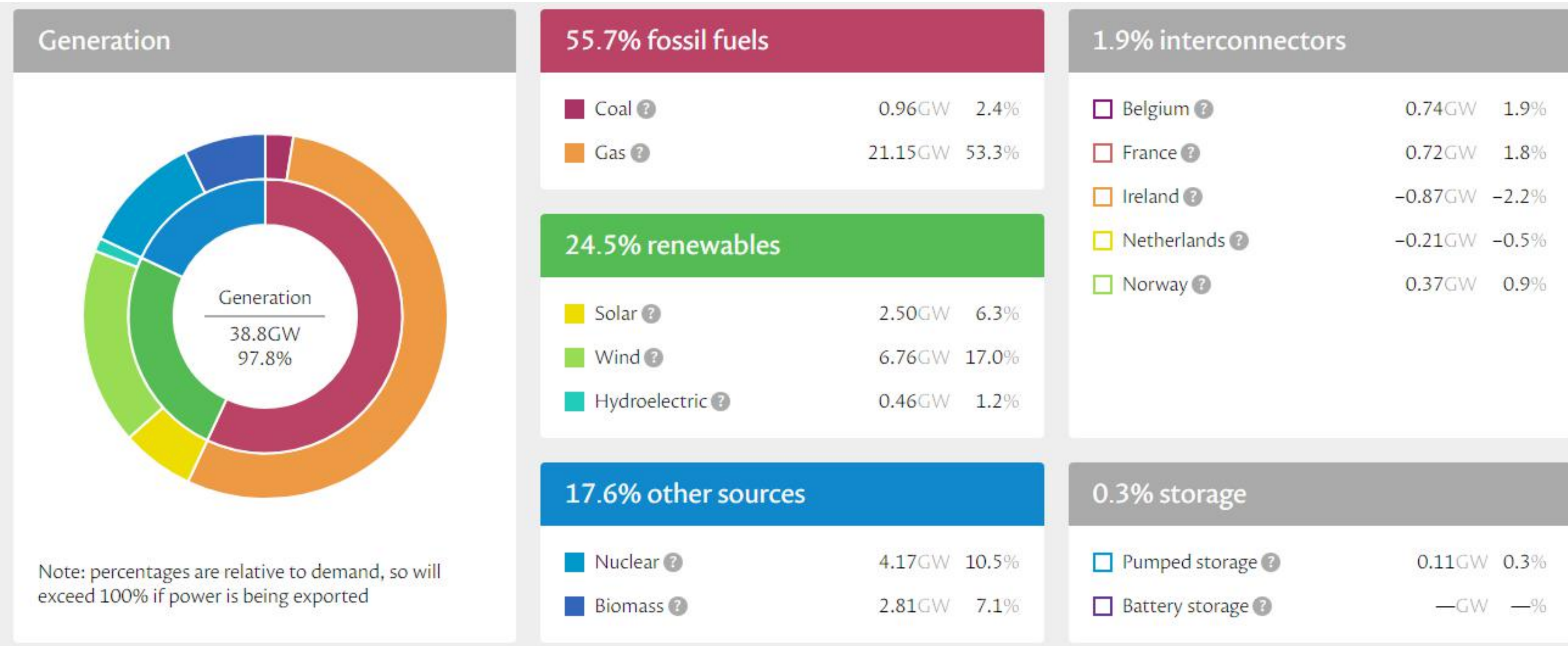
The Proposed Timeline

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

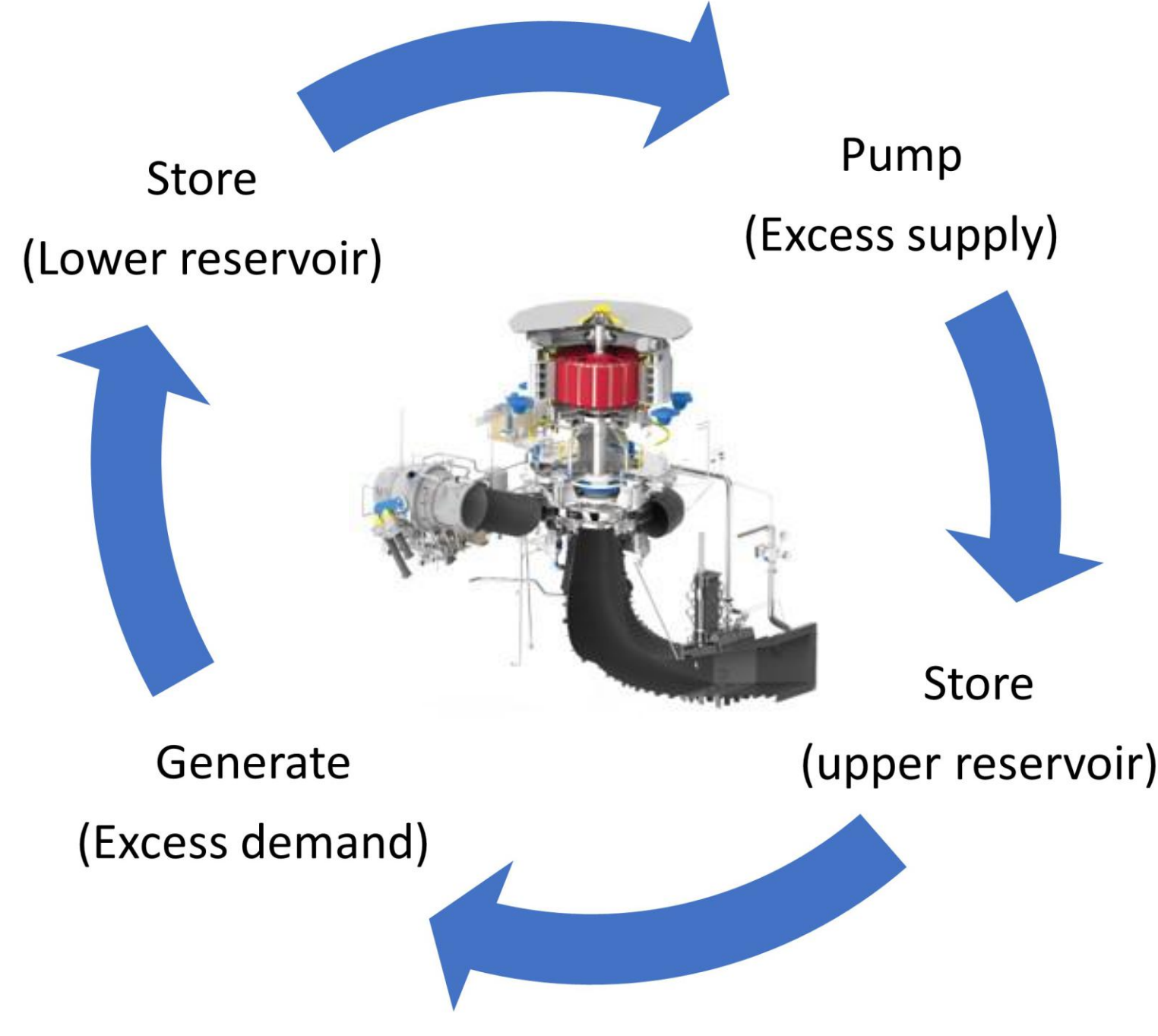


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Why pumped storage hydro is needed



Current UK energy mix (source: <https://grid.iamkate.com/>)



- In order to balance electricity supply and demand in the UK, fossil fuels (coal and gas) are currently used. These fuels need to be removed from the energy mix to achieve Net-Zero.
- Electricity demand is expected to double by 2050, due mainly to the increased use of electric vehicles and the way we heat our homes.
- 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.
- Pumped storage is recognised as the only mature technology which can effectively store large volumes of energy, which can be dispatched when it is required.
- Pumped storage acts like a giant battery, however, it is more sustainable, and works on a much larger scale. The energy stored at Fearna would be equivalent to over 500 x 50MW battery plants, will be able to charge / discharge over many hours or days, and will remain operational for over 100 years.
- The Scottish Government recognises the need for large-scale long-duration electricity storage provided by PSH, in order to create the conditions for a net zero energy system by facilitating the development of more intermittent renewable energy.
- Large-scale pumped storage projects are required to store energy from the huge rollout of wind and solar projects in the UK.
- Fearna would provide one of the largest pumped storage plants in the UK and Europe.

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Community Benefits

Pumped Storage Hydro projects can offer long term community benefits. With project lifespans of over 100 years, benefits will apply through future generations. We also know that every community is different, with specific needs and ideas and those within communities are best-placed to advise us on these.

At this stage, the type of community benefits that may be applied has not yet been finalised, as we need to gather more information. This consultation event is designed to generate feedback from the community on what type of benefits would suit best, so we welcome any thoughts that you have on this.

We do however wish to develop a programme of community benefits which align with the project values. These include:

- Tackling Climate Change
- Sustainable Development
- Creating equitable communities
- Promoting the rural economy
- Ending fuel poverty

In addition to a programme of community benefits, the project construction and operation could offer opportunities for the development of long term skills within the local area. The scale of the project and the development timeline will create opportunities for young people to begin careers which could potentially retain them in the area.

We look forward to hearing your views.



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Why Fearna?

- Re-use of an existing hydro asset to maximise its potential.
- 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.
- Favourable geological conditions.
- Practicable access to the electricity transmission network and road network.
- No ecological designations within the site.
- No export of materials from site.
- Local Employment Opportunities.
- Community Benefits.



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