



Welcome

Drax Hydro Limited is pleased to share the advancing plans for the expansion of Cruachan Power Station. In July 2021 as part of the first public consultation, we introduced the concept of the scheme and the broad parameters of the project. We received valuable input from interested parties and have sought to answer some of the questions raised in this second consultation.

Since July, the plans have been developing, in particular with the engineering design being refined, but also with having submitted a request for an EIA scoping opinion and received the opinion from the Energy Consents Unit on behalf of Scottish Ministers.

Information in this Second Consultation:

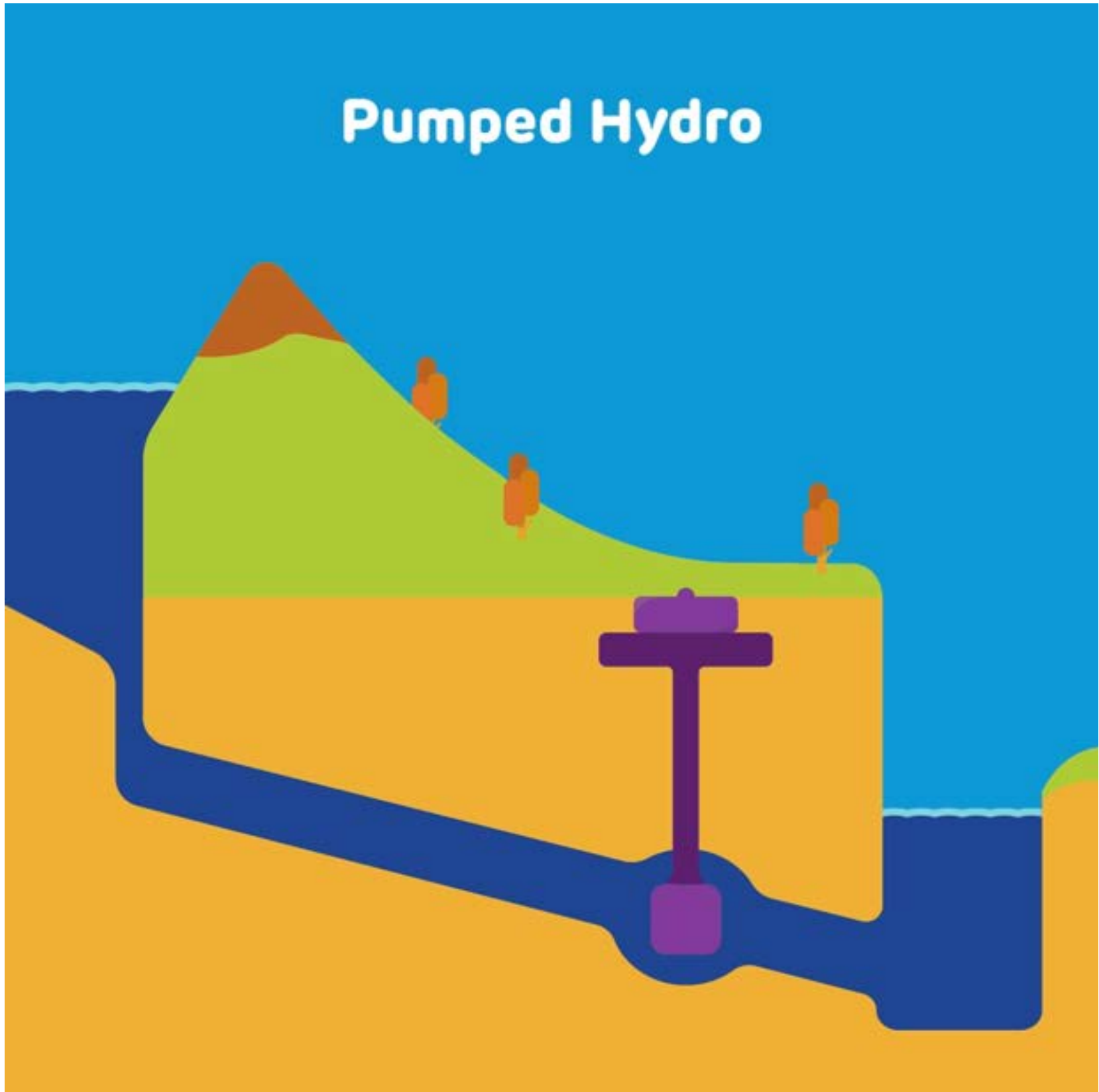
Engineering design

Revised designs for the following areas:

- A85 temporary diversion
- Lower Control works in Loch Awe
- Upper Control works in Cruachan Reservoir
- Underground works
- Temporary works

Environmental Understanding and Project Rationale

- Improved Environmental understanding and summary information on aspects of the environment being considered
- Summary of the EIA Scoping Opinion from Scottish Ministers
- Clarity on the rationale for the development and its importance to the decarbonisation of electricity supply in Scotland and the UK.



How does Pumped Storage work?

Water released from the upper reservoir (Cruachan), flows through a turbine and into the lower reservoir (Loch Awe). The flow of water rotates the turbine which in turn rotates a generator to produce electricity. For pumping, the process is reversed, with the turbines operating as pumps. Water is drawn from Loch Awe, which is then pumped up to the upper reservoir and stored for later use.

Why Cruachan?

"Here there is a minimum distance between the two water sources with a maximum drop," says Gordon Pirie, Civil Engineer at Cruachan Power Station, *"It is an ideal site for pumped storage."*



Overview and Rationale

Cruachan Power Station ('The Hollow Mountain')

Cruachan power station opened in 1965, and was acquired by Drax in 2018, it is one of only four pumped hydro storage stations in the UK and has a current capacity of 440 Megawatts (MW) – enough to power almost 500,000 homes.

Why Pumped Storage Hydro?

Pumped hydro storage stations have never been more important to the country's decarbonisation. Drax believe that flexible and responsive power generation and storage capacity from pumped hydro projects like Cruachan are essential for delivering the Scottish Government's **net zero by 2045** target.

Cruachan Expansion – A 'National Development'

The Proposed Development seeks to provide an expansion of the power generation capacity of up to an additional 600 Megawatts (MW) at the Cruachan pumped storage hydro electric generation station.

The project has been under consideration for a number of years and the plans have now been developed to a point where an application for consent is proposed. The expansion of Cruachan is identified in National Planning Framework 3 (NPF3) as a 'National Development' and this status is being carried forward in the draft NPF4 published in November 2021.

This national development will play a significant role in balancing and optimising electricity generation and maintaining the operability of the electricity system as part of our transition to net zero. This is necessary as we continue to move towards a decarbonised system with much more renewable generation, the output from which is defined by weather conditions.

Scottish Government, Draft NPF4, November 2021

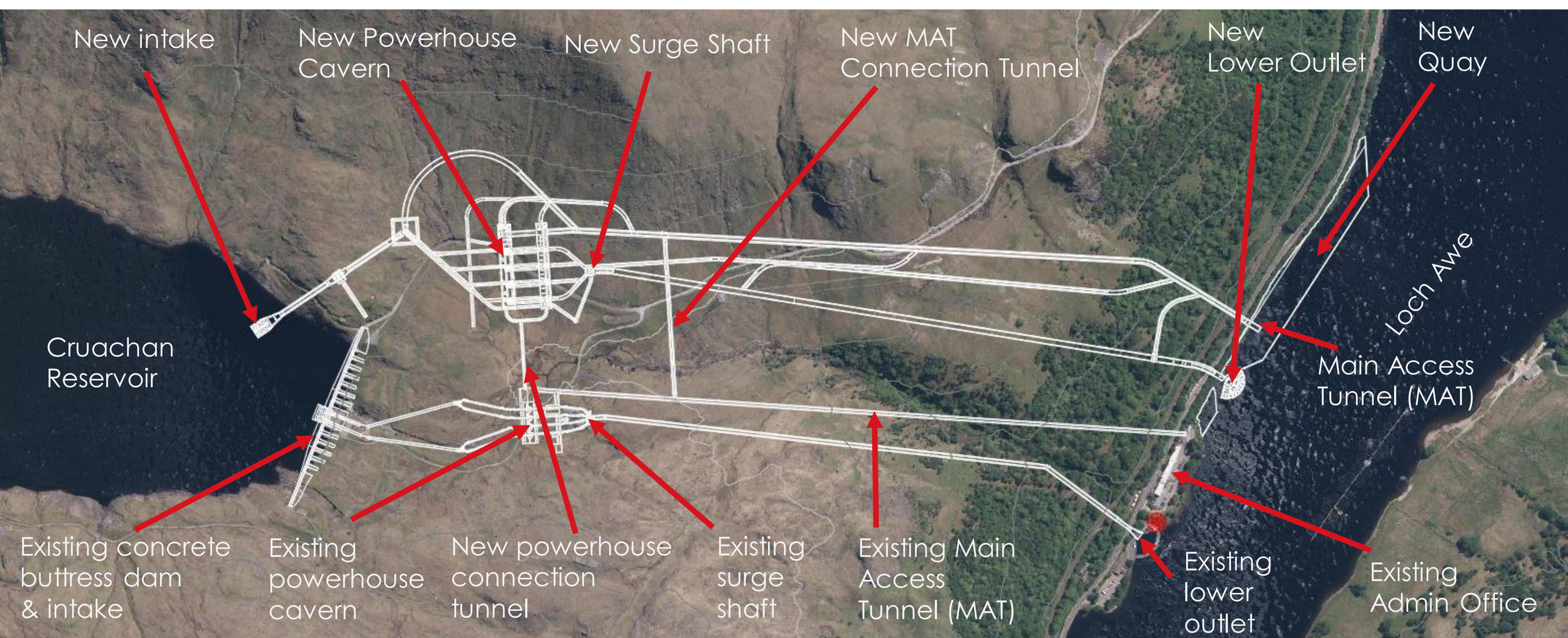
How does Pumped Storage work?

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Pumped storage provides extremely quick back-up during periods of excess demand by maintaining stability on the National Grid. For example, Cruachan can reach primary load (80MW) in around 10 seconds and full load in 30 seconds. It can also help solve intermittency issues with other forms of renewable power, that is, when the wind doesn't blow and the sun doesn't shine. Cruachan also plays a key role in maintaining the Grid's frequency and therefore preventing power cuts. For these reasons Cruachan recently won a six year contract to keep the electricity system stable.

"Flexible and responsive power generation and storage capacity from pumped hydro projects like Cruachan are essential for delivering the UK Government's net zero by 2050 target. With the right support framework from Government a new generation of pumped hydro storage power stations can be built, supporting new jobs and helping the country decarbonise faster."

Will Gardiner, CEO, Drax, March 2021



The proposed scheme

The component parts of the development are best thought of in two distinct phases: the **construction phase** and the **operational phase**. At this point in the process, design of both aspects is ongoing, this means there have been changes since we last consulted with you in July. The purpose of this consultation is to present those changes and share more detailed design proposals.

Changes since July Consultation

- Works to the dam access road from St. Conan's Road will focus on localised strengthening and widening and the creation of passing places.
- The A85 will no longer be diverted onto a new quayside in Loch Awe, instead there will be a temporary diversion close to the Falls of Cruachan Railway Station
- The lower control works are currently being reconfigured to relocate the location of the access tunnel under the A85 and the water intake / tail race. This work is in progress and more information will be available in the 3rd public consultation in Q1 2022 ahead of application lodgement
- It is not-proposed to remove spoil from the upper reservoir and dam area via St Conan's Road.

Construction Phase

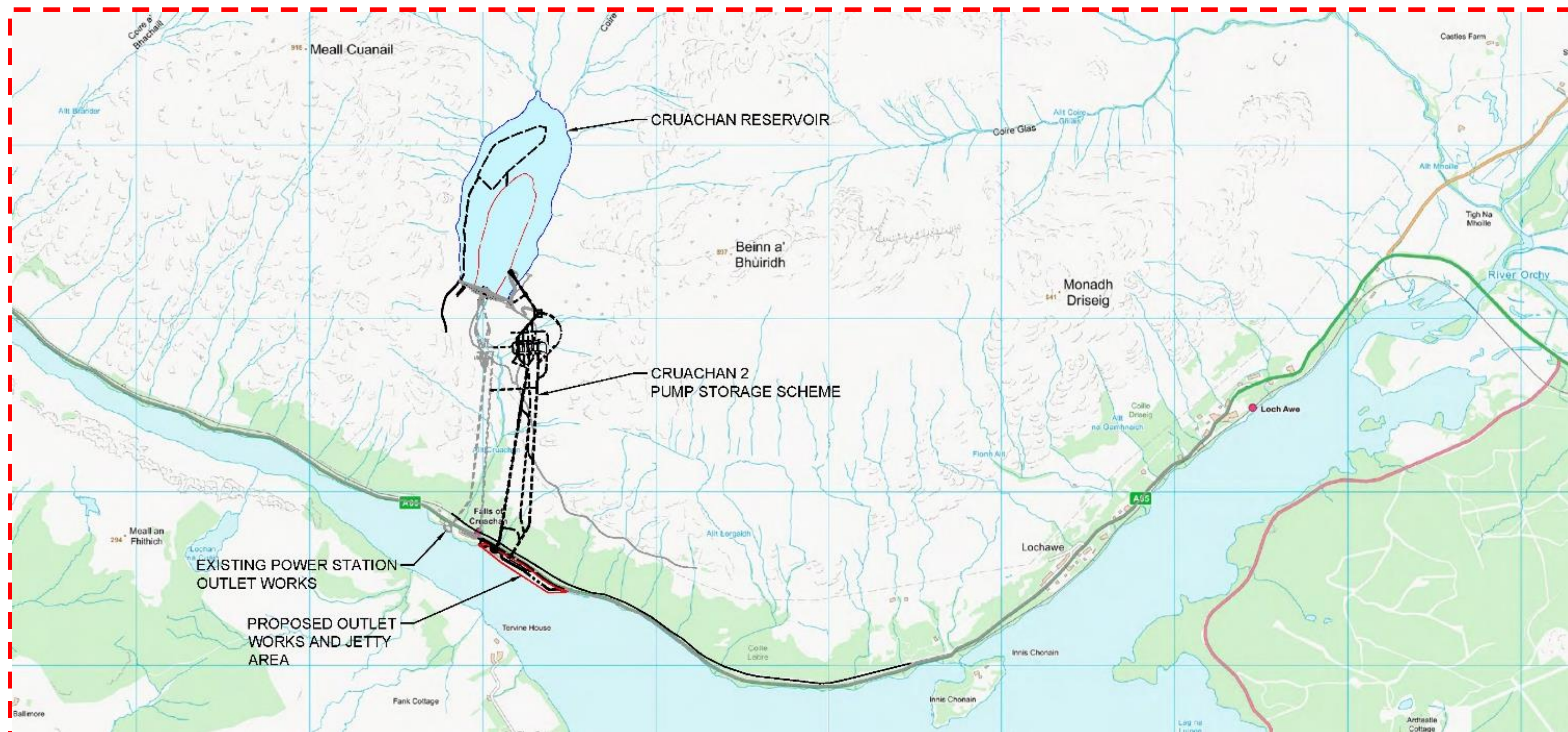
- Upper construction compound in the vicinity of the Cruachan Dam
- Localised widening works to the existing dam access road
- New quayside in Loch Awe – part temporary to facilitate construction works
- Temporary diversion of the A85 as necessary
- Establishment of lower site compound and construction workers accommodation
- Tunnelling and excavation works
- Delivery of specialist equipment and abnormal loads

Operational Phase

- New generating facility could be 4 x 150MW or 2 x 300MW (or other configuration) and will be independent of the existing station
- Water will pass between Loch Awe (the lower reservoir) and Cruachan Reservoir, passing through the turbines in either direction depending on the operational mode
- Access tunnels would be independent of existing station during construction; then cross connected for operation
- No changes would be made to the upper reservoir other than new intake for Cruachan 2
- The proposed new plant would operate separately from the existing station

Construction elements being evaluated

- Tunnelling and excavation:
 - Tunnel boring machine
 - Drill and blast
- Spoil management options:
 - Reuse on site where possible
 - Movement by road
- Temporary workers village for accommodation during construction period



The Proposed Scheme

The proposed development will comprise the following main elements:

- **Upper Control Works** – An additional intake structure including tower, screens, gate and gate shaft located within or adjacent to Cruachan Reservoir to direct water to a new headrace tunnel and surge shaft underground waterway system
- **Underground Waterway System** – A series of underground shafts and tunnels carrying water between the upper reservoir and lower reservoir through the underground cavern powerhouse
- **Cavern Powerhouse** – A series of underground caverns containing reversible pump-turbines and motor-generators together with associated equipment such as transformers and switchgear. The construction process will require various interconnecting tunnels to allow construction
- **Grid Connection** – Cables will surface adjacent to the 275kV power lines that run from Cruachan to Dalmally. The electricity generated from the new power station will connect on to these circuits at or close to the existing electrical compound.
- **Ventilation Shaft** - A ventilation shaft will be required to circulate fresh air through the underground access tunnel and cavern power station complex.
- **Lower Control Works** – Comprising two screened inlet / outlet structures and stop logs positioned in Loch Awe at the end of the tailrace tunnel below minimum water level. These structures would channel water in and out of Loch Awe
- **Quayside** - Constructed on the shore of Loch Awe to facilitate the construction and operation of the development including heavy equipment and materials, and the temporary storage of tunnel spoil prior to its off-site removal
- **Administration Building** – above ground administration and workshop buildings required for day to day operational and maintenance tasks – located close to the lower reservoir
- **Access Tunnels** – A main access tunnel would be provided for accessing the underground power plant, close to the shore of Loch Awe. This will cross connect to the existing Cruachan 1 power plant to allow personnel to easily move between the plants and provide a further means of access and egress
- **Existing Service Roads** – these will be used as far as possible to facilitate the long term operation of the generation station. Some upgrades may be required to facilitate access by heavy machinery and the removal of spoil.

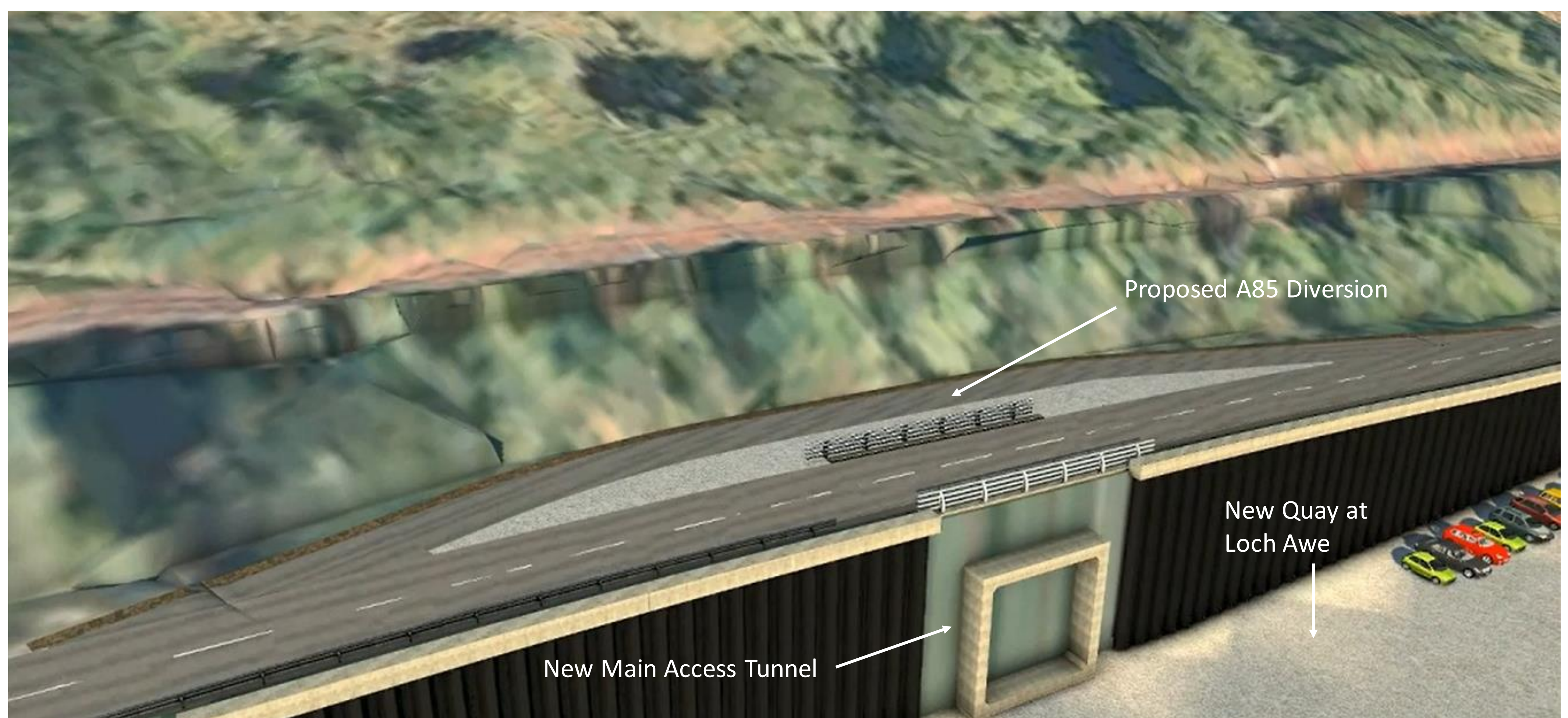


Lower Control Works

Existing lower control works at Cruachan for context

Cruachan 2 Development Proposals

- New Lower Outlet
- The lower works are proposed to be located to the east of the existing Cruachan access tunnel on the shores of Loch Awe
- To facilitate the construction of the new outlet structure in Loch Awe and the access tunnel it is proposed that a new quay is constructed along the shore to provide a working platform for the project
- Stantec has prepared high level concept designs to show how the infrastructure can be constructed within the constrained site whilst keeping impacts on the existing road and rail networks as low as possible
- Designs are progressing in this area beyond the concept sketch shown below and further design information will be presented in the 3rd public consultation in early 2022.



Road Works

A85 at Lower Control Works

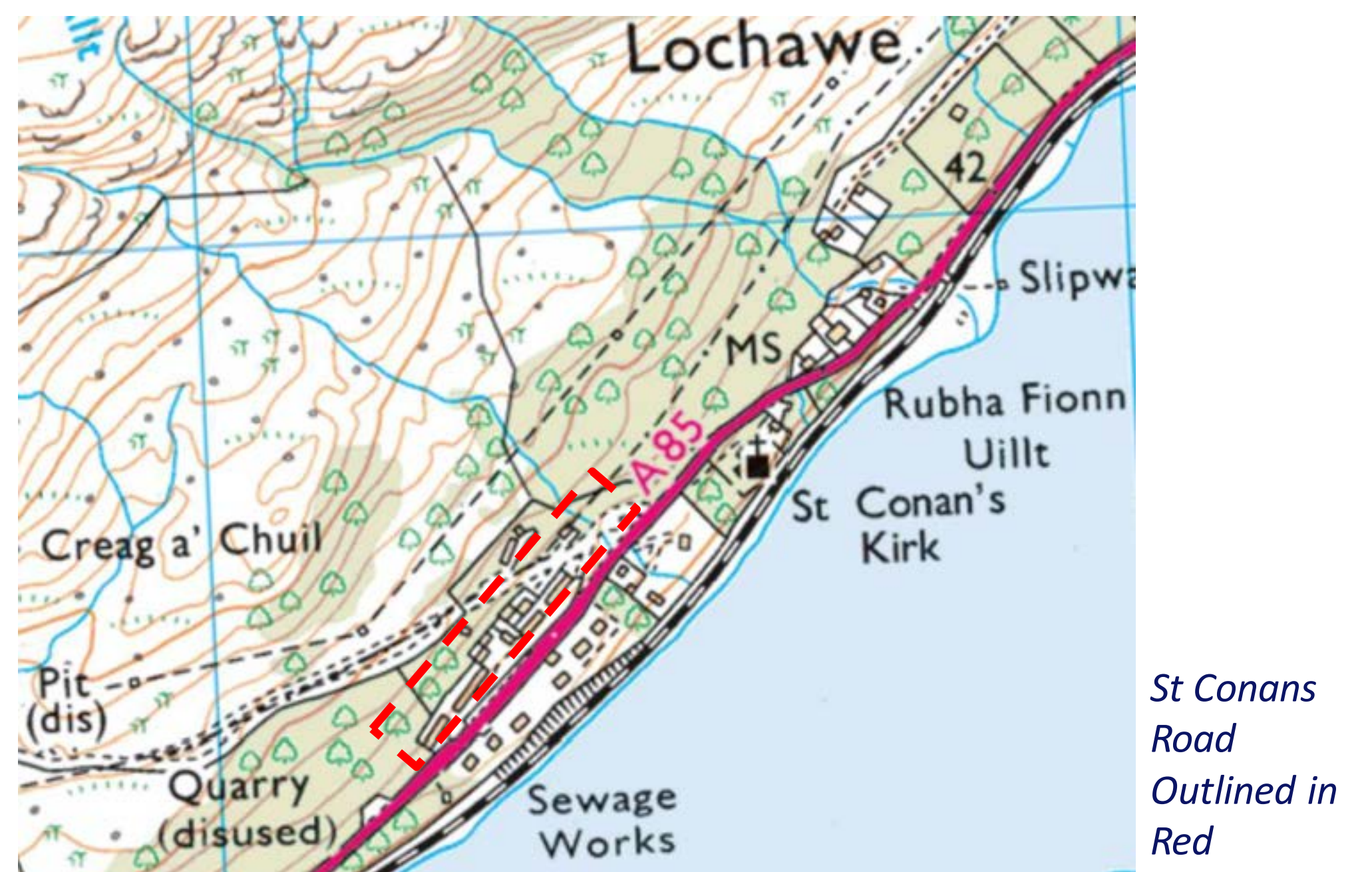


Proposed diversion of A85 into existing layby to facilitate construction of Main Access Tunnel

- Previous proposals for the A85 recommended a diversionary route of the road onto a jetty to facilitate the construction of the access tunnel under the carriageway.
- This option has been ruled out and an alternative access tunnel location has been considered at the section of the A85 adjacent to the existing layby. This greatly reduces the amount of time that the A85 would need to be under signal control.
- This wider section of the A85 is located at the existing parking lay-by adjacent to the pedestrian access to the Falls of Cruachan Railway Station. An alternative parking location will be provided during the construction period and the parking will be reinstated post construction.

St Conan's Road to Dam Access Road

- The existing track is approximately 4650m from the upper works access to the junction with the A85. Design work is ongoing at this time to identify a series of upgrades to strengthen the existing road, widen it to provide a minimum width of 4.8m (where practical) and where possible to form HGV passing places.



St Conans Road Outlined in Red

- Construction traffic movements at the junction of St Conan's Road and the A85 are expected to be well below the threshold that would necessitate an upgrade to the junction e.g. the installation of a right turning lane.
- Work is ongoing with respect to identifying abnormal loads at this junction. These will be identified in a Transport Assessment, however at this time it is not anticipated that upgrades to the junction will be required.



Upper Control Works & Grid Connection

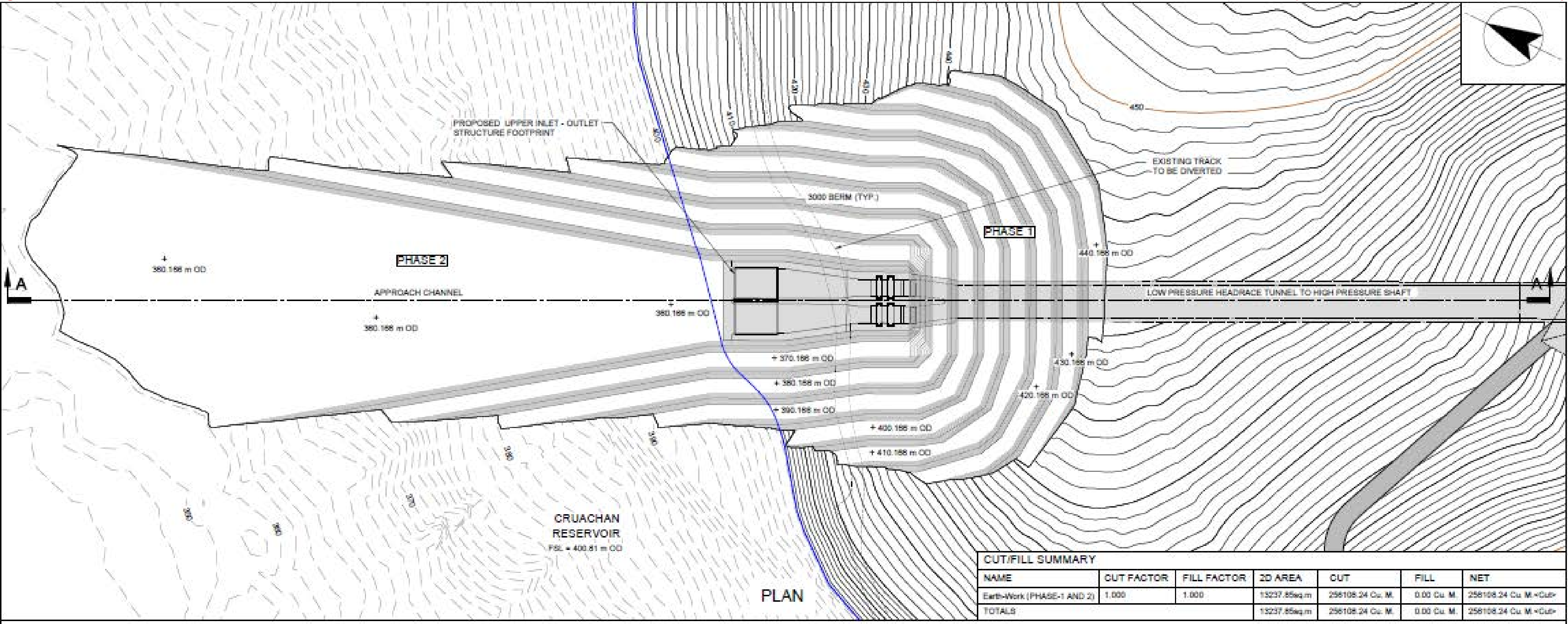
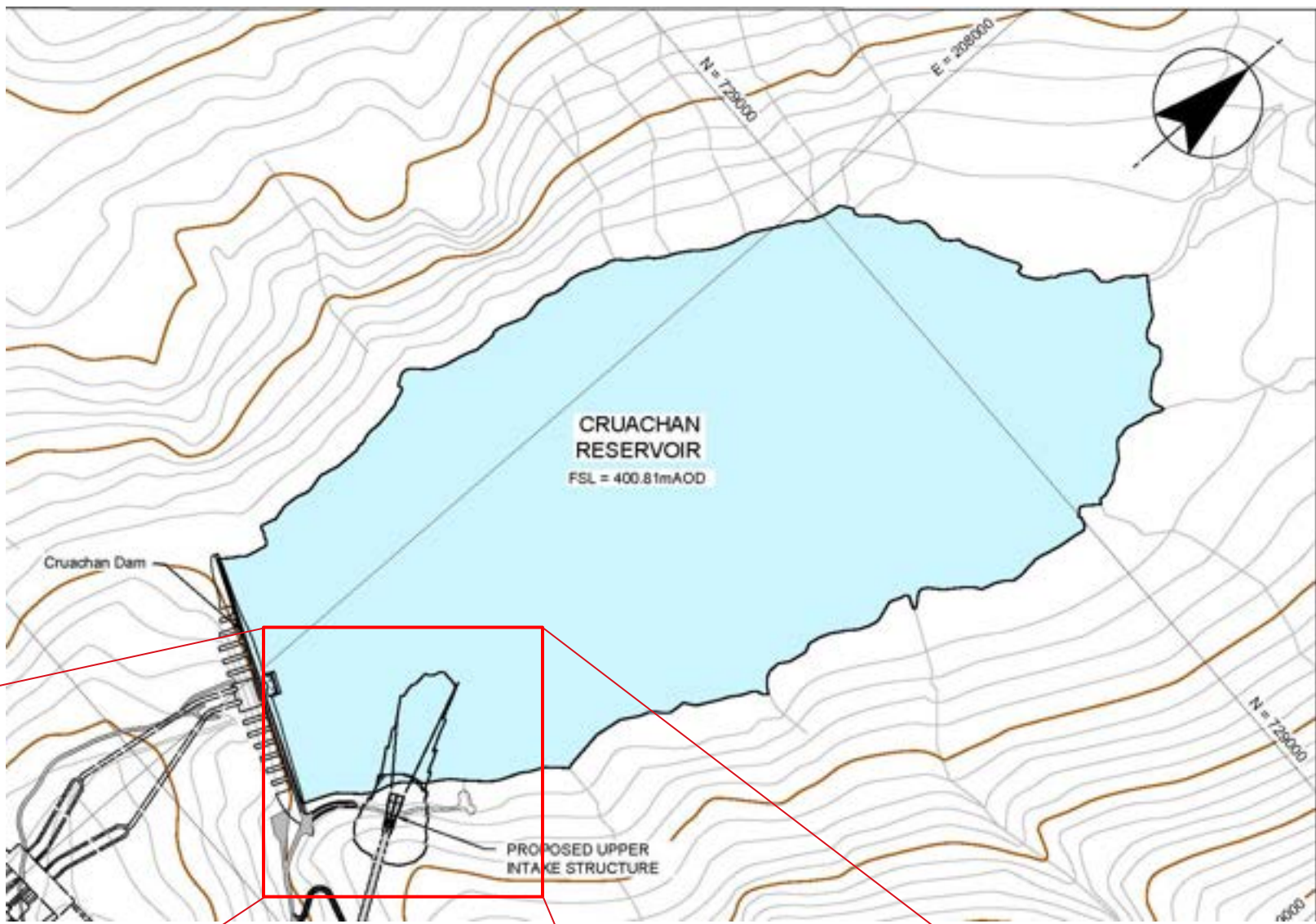
Existing dam and grid connection at Cruachan

Cruachan 2 Intake

- A new intake for the Cruachan Expansion project is proposed within the upper reservoir.
- Since July, the design of this area has been progressed to allow the works to be constructed with minimal outage time for the existing Cruachan Power Station.
- This has meant moving construction works eastwards to allow the construction to take place behind a coffer dam, rather than requiring the reservoir to be drained for the duration of these construction activities at the upper reservoir.
- The drawing below shows the current proposals in this area.

Cruachan 2 Grid connection

- The grid connection for Cruachan 2 is expected to use the same connection point as Cruachan 1 at the existing electrical compound in front of the Dam.
- No new overhead lines are proposed





Principal Environmental Effects

Due to the nature and scale of the Cruachan expansion, the project is subject to an Environmental Impact Assessment (EIA) which has been scoped with consultees to identify the likely environmental effects and make sure appropriate mitigation and protections are in place.

Construction Phase

Recreational Access

- Existing access routes will be maintained to protect local public rights of way. In limited circumstances, localised diversions may be put in place around construction working sites.

Noise

- In terms of construction at the lower works, noise surveys will be undertaken in early December to determine background noise levels and set appropriate construction noise limits to prevent significant impacts on local properties.

Ecology

- A significant number of surveys have been undertaken across the project site, including; golden eagle, otter, pine marten, red squirrel, bats and fish. We have also mapped the protected areas and ecological constraints across the site.
- We are working with NatureScot and Argyll & Bute Council to ensure the protection of species and habitats across the project site and wider surrounding area.

Traffic

- Removal and movement of spoil material will be achieved via the existing road network.
- St Conan’s Road and the existing access road to the dam will be upgraded for construction traffic (localised widening, strengthening and passing places only). This route will not be used for spoil removal.
- Options to mitigate traffic related impacts are being explored at present and include the timing of removals and re-using the spoil material at local sites.
- An appropriate location for a contractors village will be identified to allow workers to travel to and from the site sustainably throughout the construction of the project (e.g. mini buses to limit impacts on the local road network as far as possible).

Spoil Management

- Work is ongoing to identify local sites to re-use spoil generated from the project. Spoil material will be stored at appropriate locations on the project site to allow a coordinated removal strategy and minimising traffic movements.
- A Construction Environment Management Plan (CEMP) will be prepared to mitigate and limit any run-off/sedimentation into Loch Awe.

Operational Phase

It is anticipated that there will be very limited environmental effects once operational. The project will operate in a similar way to Cruachan 1.

Water Levels

- Extensive studies have been conducted to predict how the operational phase will affect water levels in Loch Awe. Findings highlight that the proposed development would not have any likely significant effects on water levels or the hydrological regime of Loch Awe or Cruachan Reservoir.

Traffic

- As the proposed development will create an additional 5 to 10 operational staff above existing levels at Cruachan 1, any potential operational effects on traffic flow will be minimal.

Energy generation

- The expansion of Cruachan will add enough generation capacity to power nearly 1,000,000 homes.



What Happens Next?

Environmental Impact Assessment

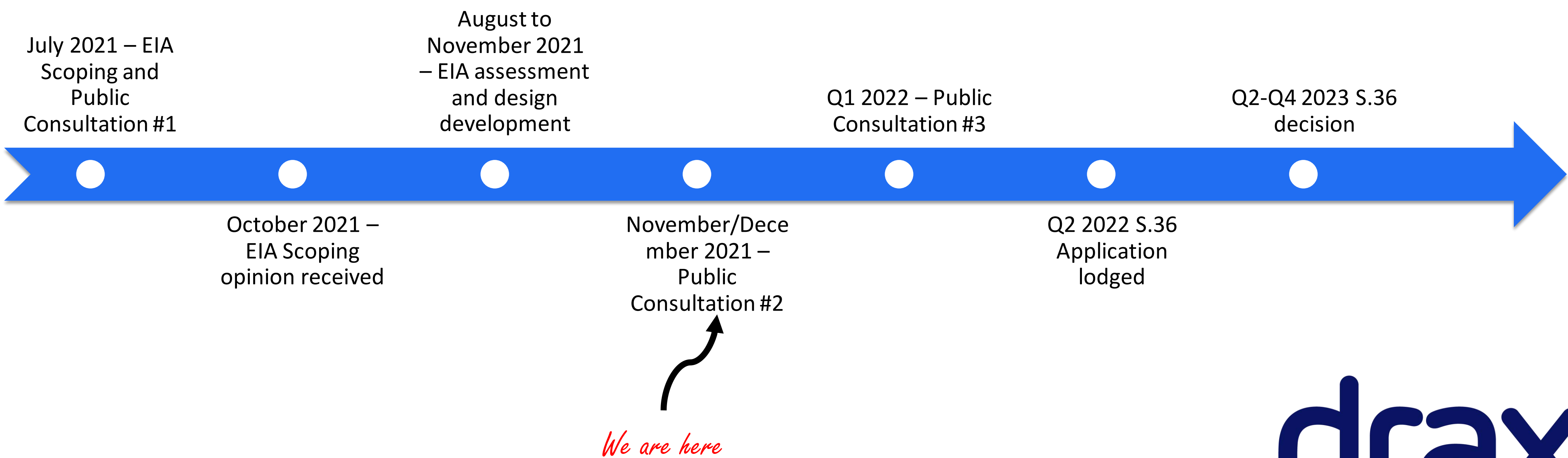
Drax submitted an EIA Scoping Report in July 2021. Following consultation with statutory and non-statutory consultees the Scottish Government provided their Scoping Opinion in October 2021 which confirms the scope and level of detail of information to be provided in the Environmental Impact Assessment (EIA) Report which will be submitted with the application for the development.

The EIA Report will detail the outcome of the surveys and impact assessments which are currently being undertaken by professionally qualified specialists. The following topics will be covered:

- Landscape Character and Visual Amenity;
- Terrestrial Ecology (Habitats and Animals);
- Ornithology;
- Fish and other Aquatic Ecology;
- Water Geology and Soils;
- Noise and Air Quality;
- Cultural Heritage;
- Land Use and Recreation; and
- Traffic and Transport.

On submission of the application, consultees and the wider public will be able to formally comment on the finalised proposals.

Planning Timeline





Feedback

Exhibitions such as this are an important part of the development process for us, helping us to engage with the local community and interested parties about our proposals and work we have undertaken so far and will be undertaking before an application is submitted to the Scottish Government in 2022.

The exhibition is a chance for us to share our plans and is an opportunity for people to raise questions, concerns, ideas or comments that can be considered as part of the development process. Now that you’ve seen the proposals, we’d be grateful if you can share your thoughts with us. You can do this in any of the following ways:

Complete a Feedback Form:
Available from the team today or at
<https://www.cruachanexpansion.com/>

Email:
getintouch@cruachanexpansion.com

Writing to:
Stantec, 5th Floor, Lomond House, 9 George
Square
Glasgow, G2 1DY

Comments should be submitted by:
17 December 2021

We will be returning in early 2022 to update you on further progress ahead of anticipated lodgement of the application in April 2022 progress. In the meantime, we will be sharing updated information on the project site: www.cruachanexpansion.com