



Bronte-Brady Mini-Hydro

Project Conceptual Description



Revision	Prepared by	Reviewed by	Approved	Date
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1 BRONTE-BRADY PROJECT CONCEPT

Enernet Global and Tamar Hydro are seeking to harness the potential to generate clean renewable energy from the flow of water from Bronte Lagoon through Woodward's Canal to Brady's Lake. The mini-hydro powerplant will take advantage of the existing water flows and infrastructure to deliver a low-impact development.

The Bronte-Brady Mini-Hydro project is in the Tasmanian highlands on the banks of Brady's Lake adjacent to an existing water release structure supplying water from Bronte Lagoon to Brady's Lake via Woodward's Canal, the water continues onward into the Derwent hydropower scheme. The location is shown in the figure below.

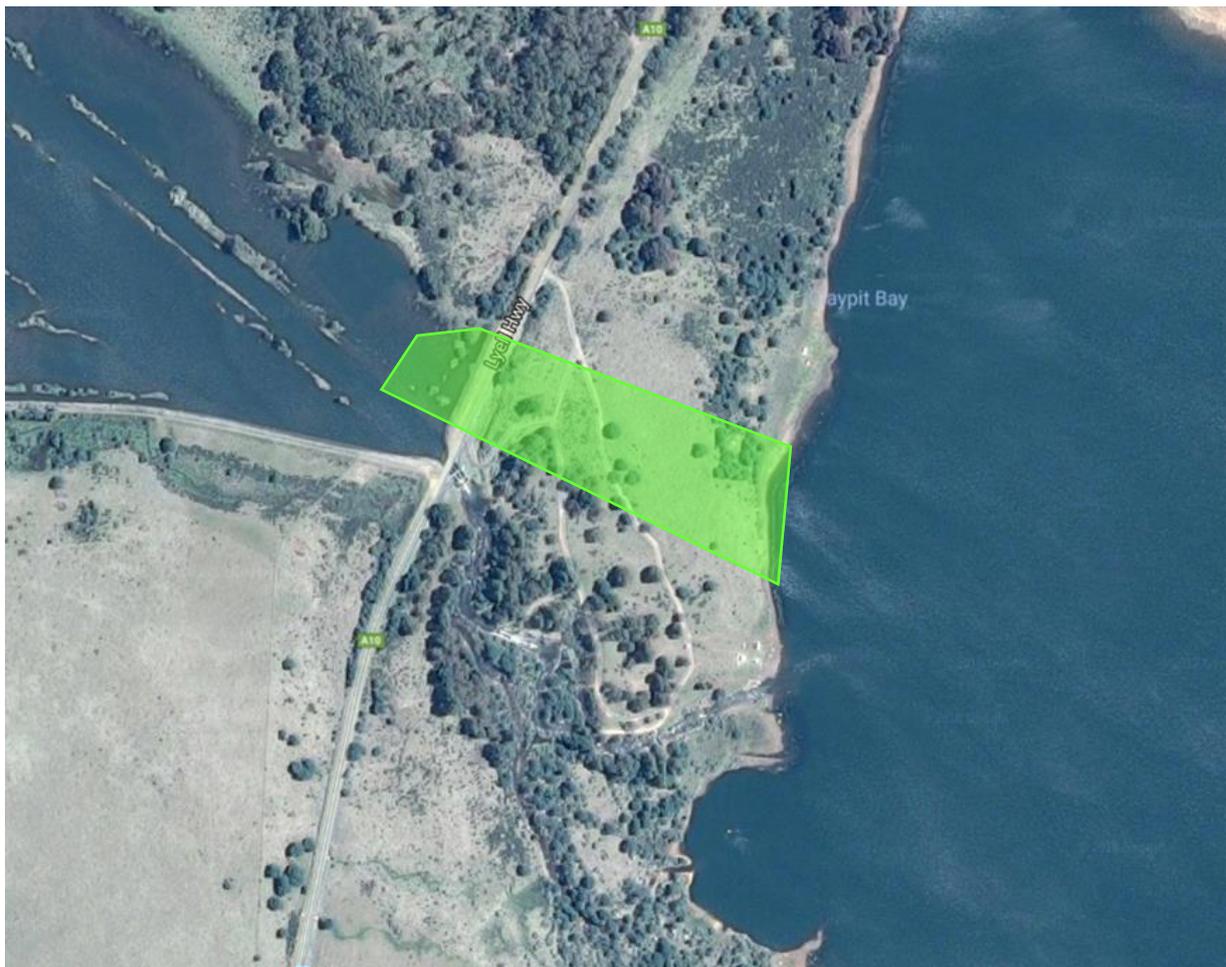


Figure 1 Project Location, approximate site indicated

1.1 CONTACT

For further information on the Bronte-Brady Mini Hydro Project, or to provide feedback, please contact the project manager, Nic Jacobson, on 1300 017 166 or at njacobson@enernetglobal.com.

2 PROJECT DESCRIPTION

2.1 PROJECT ARRANGEMENT

The Project will incorporate the construction of a mini-hydro powerplant on the shore of Brady's Lake to utilise water diverted from the existing Woodward's Canal that connects Bronte Lagoon to Brady's Lake.

The head available for the project is approximately 15 m, equivalent to the change in water level between Woodward's Canal on the west side of the Lyell Highway and Brady's Lake on the east. The water for the mini-hydro will be diverted from the canal through a new intake structure and underground pipeline.

The new intake structure is expected to include shut-off gates, trash racks and fish exclusion measures.

The pipeline will cross under the Lyell Highway to a belowground penstock that feeds into the turbine house located on the edge of Brady's Lake. The pipeline will be constructed from precast uni-culvert sections, the penstock may use steel pipe or uni-culvert sections.

The turbine house will hold the two 2.7 MW Kaplan turbines and generators. The tailwater will be discharged into the lake through a concrete lined tail race. The tail race will be constructed in the lake to provide enough tailwater pressure to the generator when Brady's lake is at its minimum normal operating level.

In addition, the existing Woodward's Canal control gates will be automated to allow remote operation of the gates in coordination with the operation of the mini-hydro powerplant.

Water level and flow monitoring equipment will be installed at the existing control gates and at the tailrace. The monitoring equipment will be used to inform automated operation of the powerplant and remote control of the gates on Woodward's Canal.

The access road to the site, comprising an existing rough vehicle track, will be up-graded for construction and on-going maintenance use.

The Bronte-Brady project will be connected to TasNetworks' 22kV distribution feeder adjacent the site via an overhead power line from the powerplant.

The location of the key elements of the project are indicated in Figure 2.

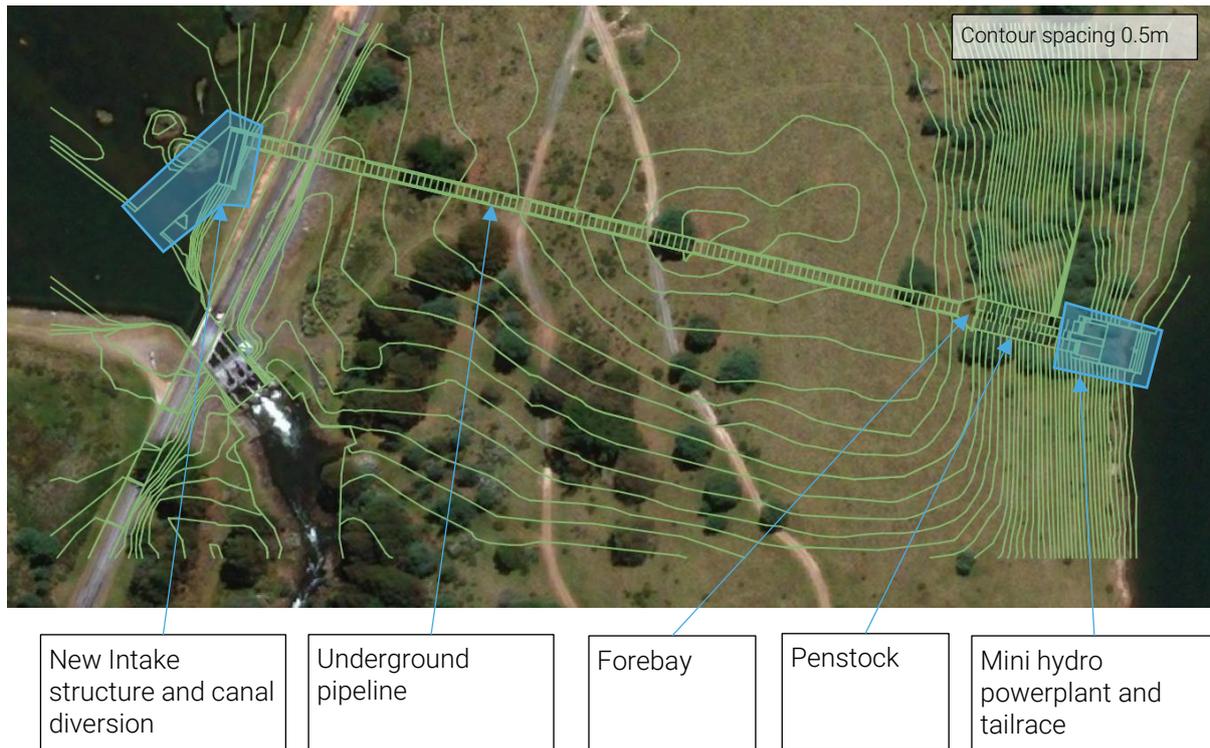


Figure 2 Indicative mini-hydro scheme arrangement

2.2 CONSTRUCTION

The project will be constructed to minimise impacts on the surrounding area. In addition to the areas required for the powerplant infrastructure, space will be required temporarily for site offices and facilities and a construction lay-down area. Public access to the construction site will be restricted using a site fence, and CCTV monitoring will be used outside working hours.

The pipeline will cross under the Lyell Highway. Construction of the crossing will require partial closure of the highway and traffic control. Due to the isolated location, traffic control warning signs will be placed at a suitable distance from the construction works.

Public access to the Brady's Lake Whitewater course and to the waters' edge will be maintained during the construction and operation period. The access track is a loop track with one entry point from the Lyell Highway. During construction only one arm of the loop track will be closed at a time. Traffic control measures will be used to direct traffic and minimise inconvenience.

Areas disturbed during construction will be reinstated using endemic species.

2.3 OPERATIONS

The Bronte-Brady mini-hydro project will have a long operational life. Enernet expects to operate the project for 40-years, with possible extension.

The mini-hydro will be capable of fully automatic and remote operation. Operation will be monitored and controlled from both Tamar Hydro's Exeter operations centre and Enernet Global's operations centre in Adelaide.

Locally based operations and maintenance staff from Tamar Hydro will carry out routine checks and scheduled maintenance on the mini-hydro.

The mini-hydro will take water from the canal on the west side of the highway and the existing control gates. The Kaplan turbines will be normally be operated at full output, when each of the two turbines will use 15 cumecs¹ of water. When both are operating 30 cumecs will pass through the powerplant.

As a result, the mini-hydro will reduce the water flow in Woodward's Canal east of the highway by 15 cumecs when one turbine is operating or 30 cumecs when both are operating.

The mini-hydro will be operated consistent with Hydro Tasmania's water flow requirements for their own generation demands; the Inland Fisheries Service water levels for recreational fishing; and the use of Brady's Lake Whitewater course for canoe slalom events and training.

The mini-hydro will be operated to allow for the generation of power on a dispatchable basis by using the control gates to store water in Bronte Lagoon and Woodward's Canal consistent with Hydro Tasmania's and the Inland Fisheries Service level requirements.

2.3.1 BRADY'S LAKE WHITEWATER COURSE

The Brady's Lake Whitewater course, which currently receives all the flow, will have reduced flows once the min-hydro is operational. Enernet commits to maintaining the availability of water for canoe events during the operation of the mini-hydro.

Enernet has commenced engagement with the Derwent Canoe Club and PaddleTas to discuss the impacts

2.4 DECOMMISSIONING

At the end of the project operational life it will be decommissioned. This will involve removal of the key infrastructure of the mini-hydro power station and reinstatement of the area.

¹ 1 cumec = 1 cubic meter of water per second, 1 m³/s

3 PROJECT TIMELINE

The Bronte-Brady mini-hydro project has been granted an investigation license by Hydro Tasmania. Enernet has commenced investigations and planning to achieve development approval and construct the powerplant. The key project milestone dates are indicated in Table 1.

Table 1 Project Milestones

Project Milestone	Proposed Completion Date
1. On-site investigations completed	Q4 2019
2. Development Application submitted	Q1 2020
3. Network Connection approved	Q2 2020
4. Development Approval granted	Q2 2020
5. Long-lead time equipment orders placed	Q2 2020
6. On-site construction commences	Q1 2021
7. Bronte-Brady mini hydro powerplant operational	Q4 2021

4 PROJECT PROPONENTS

The project is being developed by Enernet Global in partnership with Tamar Hydro.

4.1 ENERNET GLOBAL

Enernet Global is an independent, technology neutral, distributed renewable power project developer, with operations in Australia/Pacific, the Philippines and Caribbean. Enernet builds, owns and operates (BOO) renewable and hybrid systems. As an Independent Power Producer, Enernet offers lower cost and improved energy services to local power networks and to end-users using long-term power purchase agreements.

Enernet's mission is to drive the global adoption of clean energy by developing mega-watt class distributed renewable systems which benefit local companies, communities and investors alike.

Enernet's global and regional teams are industry veterans with experience in financing, designing, building and operating over 500MW of renewable projects over their careers. Enernet's Australian team have lead some of the most high-profile hybrid renewable energy projects in the country.

Enernet's Australian Head Office is in South Australia with additional resources based in NSW, Western Australia and Queensland. Globally, Enernet has offices in the Philippines, America and Europe.

For further information about Enernet Global please visit <https://www.enernetglobal.com>.

4.2 TAMAR HYDRO

Tamar Hydro Pty Ltd, based in Exeter, is the largest manufacturer of hydro turbines in Australia and has built, installed and commissioned more than 200 turbines. Tamar Hydro has extensive experience with major project work gained over 40 years specialising in the design and manufacture of hydroelectric power generation plants.

Tamar Hydro has the local resources to carry out turnkey projects utilising in house design, in house or bought in manufacture, and installation/commissioning. Tamar Hydro have mechanical, electrical, automation and civil engineers experienced in the creation of equipment layouts, connection details, risk assessments, safety HAZOPs and other required project documentation. They also have specialists in High Voltage design and construction and in the development and commissioning of the major brands of PLC and SCADA systems.

Tamar Hydro has developed several mini-hydro projects of similar nature to the Bronte-Bray mini-hydro and is therefore well placed to partner with Enernet in offering a tried and tested solution.

Tamar Hydro are an excellent local partner for this project as they offer:

- Feasibility studies
- Project management
- Design & manufacture/integration of turbines, electrical systems, control systems and plant ancillary equipment
- Supply of generators, valves, switchgear and transformers
- Engineering & consultancy services
- Installation & commissioning services
- Maintenance, repairs and refurbishments
- Component manufacture and procurement