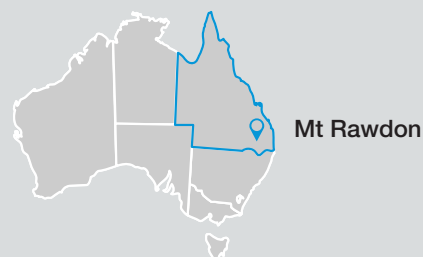


Mount Rawdon Pumped Hydro Project

Newsletter 1 - October 2021

The project involves the creation of a pumped hydro electricity generation plant through the repurposing of the Mt Rawdon gold mine open-cut pit



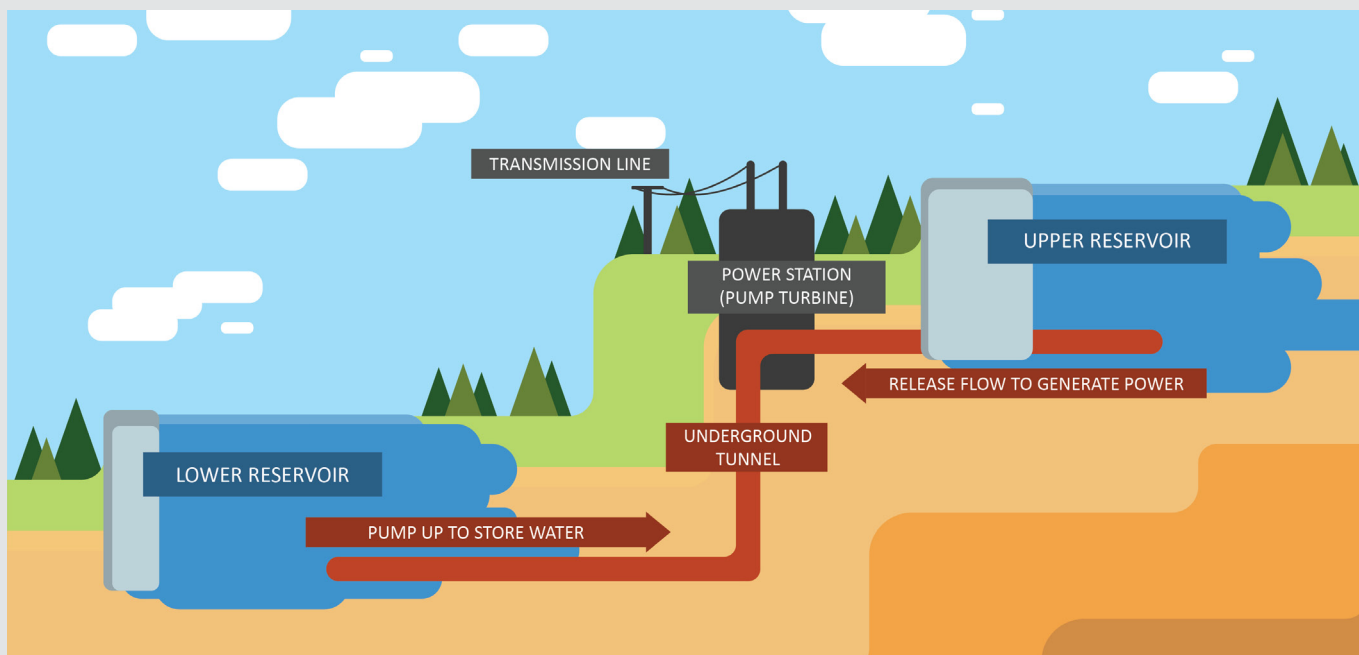
Evolution Mining along with ICA Partners are currently undertaking a feasibility study into the potential for a Pumped Hydro facility within and adjacent to the Mt Rawdon gold mine, located in Southeast Queensland. The Mt Rawdon Pumped Hydro Project (the Project) aims to store renewable energy generated during daylight hours for use during peak morning and evening hours. The project would likely comprise the following components:

- A purpose-built upper water reservoir created on land adjacent to the existing gold mine, capable of storing water required to generate 20,000 MWh of renewable energy.
- A lower water reservoir created by re-purposing the Mt Rawdon gold mine open-cut pit once mining of the pit is complete.
- Waterway tunnels and pumping stations connecting the upper and lower reservoirs.
- An underground powerhouse that will initially generate 500 MW/hr of reliable electricity for up to 40 continuous hours. The powerhouse has the potential to expand to up to 2,000 MW/hr electricity generation in the future.

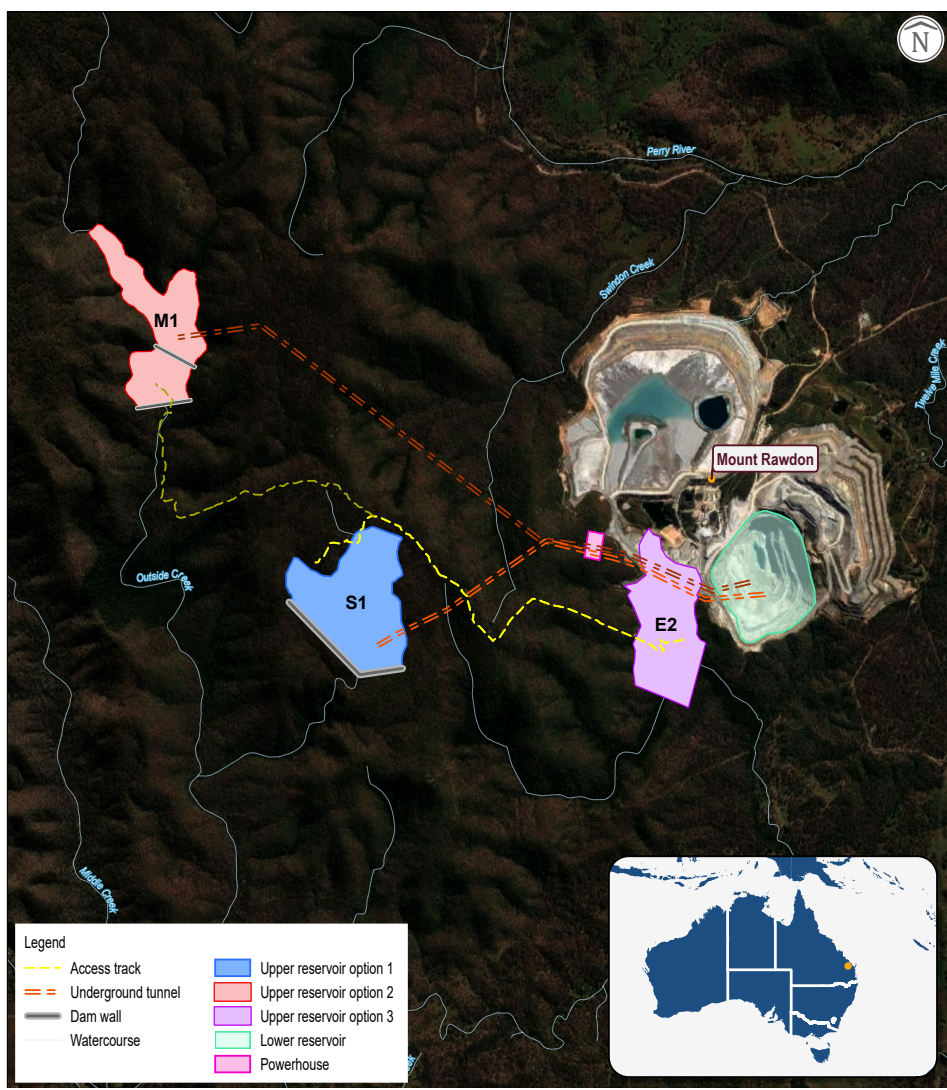
What is Pumped Hydro?

- Pumped hydro uses two water storages (reservoirs) at different elevations that are connected via tunnels to generate electricity. When water is released from the upper reservoir it travels via an underground tunnel through hydroelectric turbines to generate electricity and the water discharges into the lower reservoir (Mt Rawdon open pit).
- When excess solar and wind electricity is being produced the water is then pumped from the lower reservoir to the upper reservoir, thereby effectively storing renewable solar and wind electricity until it is required. During times of high electricity demand or low renewable electricity generation, water will be released from the upper reservoir, through the powerhouse and into the lower storage to generate hydroelectricity.

Queensland has a target to have 50% of its energy generation coming from renewable sources by 2030



Schematic of how pumped hydro works



Project layout indicating options for upper storage reservoir and key design features

When mining of the Mt Rawdon gold mine open-cut pit is complete, the project will seek to repurpose the pit as the lower reservoir. The upper reservoir will be a purpose-built valley fill dam. The upper and lower reservoirs will be connected by an underground waterway tunnel, pumping stations and powerhouse. There are currently three potential locations for the upper reservoir (M1, E2 & S1), environmental, geotechnical and hydrological surveys will determine which option is preferred.

The proposed facility is likely to have an energy storage capacity of **20,000 MWh**, allowing for **500 MW** of renewable electricity to be generated for up to **40** continuous hours, this is enough power to supply over **3,250 homes** with renewable energy. The project will create flexible energy supply for the increasing amounts of variable renewable generation which are connecting to the grid in Queensland, shifting daytime solar electricity generation to the evening and night and supporting energy supply.

The project is currently undertaking a feasibility study with the aim of confirming the technical and economic viability of the proposed facility.



Upper storage reservoir option 2.

Who is the Proponent?

The Project is being jointly developed by Evolution Mining, the current owners and operators of the Mt Rawdon Gold Mine, and an investor group managed by ICA Partners



ICA Partners 

Project Benefits

The project will create a new use for the Mt Rawdon Gold Mine which is due to cease mining in FY24 (and cease ore processing in FY27). The project is likely to generate between 300 to 500 direct jobs during the construction phase and is likely to create 25 to 30 permanent jobs during the operational phase (with additional jobs created during any large service or maintenance work). The project is also likely to generate a significant number of indirect jobs, particularly during the construction phase.

In addition to creating a new use for the mine the project will facilitate increasing levels of renewable energy generation in Queensland, provide ancillary services to assist with grid stability and provide a significant portion of the 9 to 16 GW of electricity the Australian Energy Market Operator has forecast is likely to be needed by 2040. Scheduled to commence operations by 2029, the project will also help to smooth the transition of Queensland electricity generation away from non-renewable coal-fired generation to renewable energy generation.

The project will provide multiple environmental and economic benefits through providing emission-free electricity, an economically productive use for a former mine site and jobs in both the construction and the operational phases of the project; and will help to deliver on the state government policy objectives of achieving net zero emissions by 2050 and 50% renewable energy by 2030 ensuring there is clean energy available even when the sun doesn't shine and the wind doesn't blow.

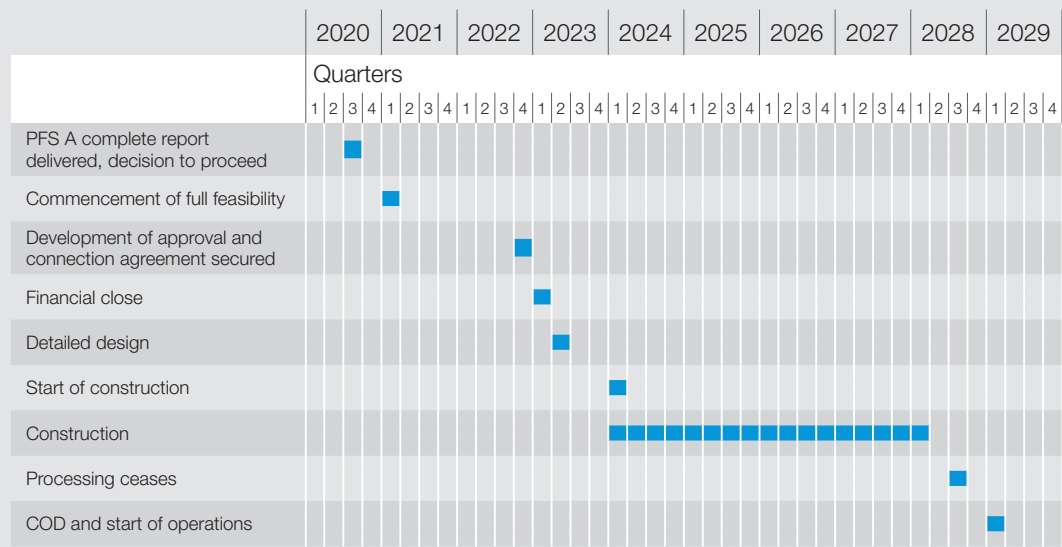


Upper storage reservoir option 1.

Transmission Line Project Schedule

The project is currently at the feasibility stage. Part of this stage involves studies to determine the most suitable transmission line alignment to connect the project to the electricity grid.

The transmission line corridor is currently under investigation and will consider a range of environmental, social, land use and engineering considerations to ensure the alignment minimises impacts and maximises benefits.



Benefits to Queensland

The project will both help to achieve the Queensland Government goal of net zero emissions by 2050 and will fulfill a need identified in the 2020 Integrated System Plan published by the Australian Energy Market Operator.

Australia is a signatory to the Paris Agreement which has the objective of holding the increase in global average temperature to 2°C and pursuing efforts to limit temperature increase to 1.5°C above pre-industrial levels.

One key part of achieving these objectives is through reduction of greenhouse gas emissions associated with non-renewable electricity generation. The project is consistent with and supports the Queensland Government target of a transition to 50% renewable energy by 2030.

Pumped hydro electricity generation has the advantage of being a lower cost form of renewable energy storage than batteries and is not subject to the fuel price volatility associated with gas-fired power generation.

Pumped hydro generation can also improve the electricity system strength and reliability by supplying additional inertia (necessary for frequency control) to the Queensland energy grid and can help to smooth out the price volatility caused by the increased renewable energy penetration in the Queensland grid, by buying power during periods of high generation and low demand and selling at peak periods when there is high demand and lower renewable energy generation, thereby putting downwards pressure on prices for end users.

The project is estimated to provide between 300 to 500 jobs during construction and approximately 25 long term jobs during operations.

Further Information

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