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ENVIRONMENTAL

KEY PROJECT FACTS

Julia Creek Vanadium Project



PROJECT SUMMARY

- The Julia Creek Vanadium Project (the Project) is a vanadium and oil shale mining opportunity located in the North-West Minerals Province being developed by QEM Limited (QEM).
- The Project holds one of the single largest vanadium deposits in the world with 2,760 million tonnes of vanadium, with an average vanadium content of 0.30%.
- The ore body also comprises oil-bearing shales and is measured at 783 million barrels of oil equivalent, in the 3C category of the SPE-PRMS Code.
- QEM plans to develop a shallow-cut mine, processing facilities and infrastructure to produce three primary commodities including high purity vanadium pentoxide, fuel and/or hydrocarbon products, and power from renewables QEM intends to construct solar and wind farms to power the Project's industrial processes and to produce green hydrogen through a water electrolysis process.
- Once operating, the Project is forecast to produce 10,000 metric tonnes of high purity vanadium pentoxide per year, 250 MW of renewable electricity installed capacity and approximately 6,000 barrels per day of transportation grade fuel.
- Hydrogen is a key element required to convert the oil into transport fuels.
- Excess renewable energy generated could be supplied to the National Electricity Market (NEM) via connection to the proposed CopperString 2.0 transmission line.
- Water supply options for mining and hydrogen production are currently under investigation with QEM and the QLD Government.
- The Project boundaries extend between approximately 6 km to 37 km east of Julia Creek, adjoining the Flinders Highway in north western Queensland.
- Julia Creek is situated 655 km by road to the west of the port of Townsville and 255 km east of the mining town of Mt Isa. The Project is adjacent to the Flinders Highway and the Great Northern Railway line.

CRITICAL MINERAL PROJECT IN THE NORTH WEST MINERALS PROVINCE

- The Project will produce high purity vanadium pentoxide, a critical component in redox flow batteries (safe, large scale grid level energy storage) and lightweight vanadium steel alloys, occurring in the resource-rich NWMP of Queensland. The Project's vanadium resource is one of the world's largest single deposits of this critical mineral.
- The Project is strategically important due to the role vanadium will play in achieving Australia's COP26 commitment to net zero emissions by 2050. It is consistent with the increasing global and regional focus on developing renewable energy sources, critical minerals and green hydrogen. These industries have all achieved strong State and Federal Government support.
- The demand for vanadium is forecasted to increase from 110kt to 580kt by 2040 creating a market growth of ~385%. Currently it is estimated that 90% of vanadium is used to make high-strength, low alloy steel. Additionally, there is rapidly growing demand for vanadium to supply Vanadium Redox Flow Batteries which can power large renewable energy sources such as wind and solar. The International Energy Agency anticipates wind and solar PV to make up at least 30% of the total installed power capacity by 2025.
- Although Australia has not yet commenced production of vanadium, Australia holds the third largest vanadium resource in the world and is perfectly positioned to capitalise on this growing demand.
- The project has been identified by the Queensland and Australian governments through inclusion in the Australia Critical Minerals Strategy and the Queensland Department of Resources New Economy Minerals initiative: There is an increasing global demand for critical minerals in the manufacture of renewables, technology, and infrastructure.
- The Project proposes to take advantage of the future supply deficit and future demands for vanadium required for a range of renewable technology, transport and infrastructure uses including construction of solar grid batteries, jet engines, car suspension, and building frames.

TRANSPORT FUELS TO MINIMISE NATIONAL SECURITY RISKS

- Australia's dependence on imported transportation fuels has also been highlighted as a national security risk. The proposed Project would provide opportunity to extract both oil shale and vanadium, while generating green energy for hydrogen production and potential sale to the market. This offers efficient and cost-effective processing technologies for production of oil, vanadium pentoxide, and green hydrogen while reducing Australian reliance on imported fuels.





PROVIDING EMPLOYMENT AND BUSINESS OPPORTUNITIES FOR REMOTE COMMUNITIES

- The Project will support the liveability of the NWMP by attracting skilled workers and their families.
- Up to 1,300 construction jobs and over 300 permanent operational jobs will be generated across its renewables, hydrogen, vanadium mining and fuel processing activities.
- These figures are early estimates and require validation as the Project progresses through the study phases. Unskilled jobs will be created by the Project in roles such as security personnel, heavy machinery operators, maintenance providers, IT technicians and bus drivers.
- A higher worker population in Julia Creek will boost long-term demand for local businesses and services, creating new employment opportunities for local workers. Given that the renewable energy infrastructure will operate past the life of the vanadium mine, the economic impact on Julia Creek is expected to be multigenerational.
- QEM is committed to supporting local community through social engagement, Indigenous relations, long-term jobs, and training. The Project will involve identifying goods and services, such as workforce, fuel, transport, and procurement that can be provided locally.

APPROVALS PROCESS

- QEM, with its environmental consulting partner Epic Environmental are working to seek the relevant Commonwealth and State Government approvals for the Project to enable its development.
- The permitting approval and development of the Project involves a number of steps that come together in the form of an Environmental Impact Statement (EIS).
- The first steps are submitting an Initial Advice Statement to the Queensland Government which outlines the Project's size and proposed infrastructure, a major project application, and a referral to the Commonwealth Government under the Environment Protection and Biodiversity Conservation Act 1999.
- Following this the Terms of Reference for the EIS will be developed, which details what the EIS must cover. The EIS is required to:
 - Identify the existing environment
 - Assess potential environmental impacts of the Project
 - Propose measures to avoid, minimise, mitigate and/or offset potential impacts
- QEM will then have up to two (2) years to prepare and lodge the EIS for assessment by the Queensland Government and the EIS will be placed on public exhibition for the community and other stakeholders to make comments. During this time a wide range of environment, social and economic studies are undertaken involving field work and consultation in local communities.
- Throughout the EIS process there will be opportunities for community members and stakeholders to be involved and provide input and feedback.
- Once approved, QEM will continue to monitor and manage a range of environmental matters through the life of the Project.