The residue storage area is for temporary use as QPM works to identify a sustainable end use for the residue. This work is forming the basis of a future application beneath the End of Waste framework.
Queensland Pacific Metals and EMM Consulting acknowledge the Traditional Custodians, the Bindal People of the land on which the Project is proposed. We pay our respect to their Elders past and present. We acknowledge and respect their continuing culture and contribution they make to the Townsville region.
**Fast facts**

- **800 jobs in construction**
- **At least 300 jobs in operation**
- **Active support for local and indigenous employment opportunities and business**
- **Riparian vegetation and waterways are protected and enhanced through no-go zones**
- **Significant opportunities during construction and operation for local industries to participate**
- **Zero process liquid discharge and zero run off to Ross River catchment and Lansdowne Creek**
- **Noise levels below 43 decibels at sensitive receivers, less than a quiet suburban area**
- **Ongoing and active stakeholder engagement**
- **Underpinning the renewable energy and electric vehicle industry**
- **Zero groundwater impact – no access, no contaminants and no use of groundwater**
- **Air quality levels are better than all the criteria at all sensitive receivers**
Queensland Pacific Metals (QPM) proposes to design, construct and operate the Townsville Energy Chemicals Hub (the Project). The Project is a sustainable, high-purity battery materials refinery. It has been developed in response to the growing demand for battery materials for electric vehicles and renewable energy projects.

The Project will process 1.5 million wet metric tonnes per year of high-grade nickel laterite ore imported from New Caledonia using the Direct Nickel Process (DNI Process™). These mines meet globally recognised and high (French and EU) standards. This process will produce high purity battery materials, including nickel sulfate, cobalt sulfate and other related products such as magnesia, high-purity alumina (HPA) and hematite (iron oxide).

The Project will be constructed in the Lansdown Eco-Industrial Precinct, approximately 40 kilometres (km) south of Townsville, near the town of Woodstock.
QPM will use a trademarked, processing technology, called the Direct Nickel Process (DNi Process™), to refine nickel-cobalt laterite ore. The DNi Process™ has many advantages over traditional refinery processes.

More than 98% of the leaching reagent used will be recycled and the waste produced is a dry, inert filter cake residue. There will be no requirement for a tailings dam or ponds.

The imported limonite ore is processed in three stages to deliver products to meet increasing demands in existing and emerging markets. The three production stages are:

- the ore processing plant that produces an intermediate nickel/cobalt product;
- a sulfate refinery that takes the intermediate product and refines it to nickel and cobalt sulfate; and
- a high purity alumina refinery that takes an aluminium hydroxide by-product and refines it to high purity alumina (HPA).

Stage 1 of the process produces an intermediate product, it is the output of Stages 2 and 3 that produces the saleable sulfates for the battery market and HPA for export. Leach residue from the process (predominantly consisting of silica) will be filtered and washed. The final residue following product extraction will be a semi-dry (34% moisture) filter cake, comprising a silica rich sand material. QPM has been working with James Cook University to identify a sustainable end use for the residue. This work is forming the basis of a future application beneath the End of Waste framework.
Project benefits

The Project will be a significant development for Townsville, supporting the city’s growing industrial diversification and offering significant employment opportunities for individuals and local businesses.

The Project is anticipated to deliver socio-economic benefits to the Townsville region which will likely extend to other Queensland population centres, including:

- the creation of skilled employment opportunities
  - 800 jobs during construction
  - at least 300 jobs during operations
- retention of jobs in the Townsville region
- economic stimulation of local industry
- opportunities for Indigenous employment, apprenticeships and training
- creating additional local jobs in the manufacturing and maintenance industry
- establishing a new environmentally friendly sustainable industry, supporting the growing renewable energy sector.

As Traditional Owners and Custodians of the land, we are pleased that the Bindal People have welcomed us to the Lansdown TECH Project site. We are committed to ensuring that cultural heritage is respected and preserved by QPM and its contractors. We are also committed to creating and maximising Project employment opportunities for the Bindal People.
Stakeholder engagement

QPM is committed to the ongoing engagement with local community and other stakeholders.

QPM has engaged and consulted with the Bindal People who are the registered Native Title claimants for subject site. A Cultural Heritage Management Agreement (CHMA) has been signed. To date, the Bindal People have been working with QPM to ensure they were present, ahead of the work crews, during the recent geotechnical investigation on site clearing the work areas. This would ensure any artefacts of cultural significance that were found were handled appropriately. Cultural survey of the site was completed by the Bindal People on 2 December 2021.

The first community information sessions were held on June 21 and June 22, 2021, in Woodstock and Townsville respectively. QPM has also been engaging extensively with local, State and Commonwealth governments since 2019.

Outcomes and feedback from stakeholder consultation have been addressed within the DA.
QPM is applying for a Development Permit for a Material Change of Use involving a nickel/cobalt refinery. Townsville City Council is the assessment manager. The DA considers potential environmental and social impacts and benefits of the Project, and describes measures identified to minimise and avoid impacts.

**APPROVALS BEING SOUGHT**
- Development permit for a material change of use (MCU) involving high impact industry (nickel/cobalt refinery)
- MCU involving clearing native vegetation
- MCU for a hazardous chemical facility
- State transport infrastructure generally
- MCU for an environmentally relevant activity

**APPLICATION DOCUMENTS INCLUDE**
- Volume 1 – Planning Assessment Report
- Volume 2 – Environmental Assessment Report
  - Matters of state environmental significance
  - Aquatic ecology
  - Geochemistry
  - Surface water
  - Groundwater
  - Conceptual site model
  - Erosion hazard
  - Air quality
  - Acoustics
  - Traffic

**APPLICATION IS ASSESSED BY**
- Townsville City Council (local government)
  The application is referred to the State Assessment Referral Agency and is distributed to various state (QLD) government for their input.

Separate to the Development Application, QPM is also required to obtain approval from the Commonwealth Department of Agriculture, Water and the Environment for potential impacts to matters of national environmental significance. A referral under the *Environment Protection and Biodiversity Conservation Act 1999* has been made. QPM is progressing through the Information Request stage of the Commonwealth assessment.

QPM lodged the Development Application to Townsville City Council on 2 December 2021. QPM is currently progressing through the Information Request stage.
Summary of technical studies
Terrestrial ecology

The ecology assessment (Volume 2, Appendix A) is supported by extensive desktop assessments, two seasonal field surveys, and impact assessments under the State guidelines.

The majority of the site has been previously cleared of native vegetation and cultivated. The cleared part of the site has an extremely high coverage of dense weeds.

Surveys of the site found the following protected species (mostly concentrated in the riparian corridors in the east and west, and the northern boundary):

- Squatter Pigeon
- Bare-rumped Sheathtail Bat
- Oriental Cuckoo
- Rufous Fantail
- Spectacled Monarch.

Vegetation in the north-west of the site protected by the no-go zone

Weed infestation towards east of site
At a glance

Potential impacts

- Potential direct impacts are mainly relating to vegetation and habitat clearance;
- Potential indirect impacts, which can include habitat fragmentation, erosion and sedimentation, bushfire risk, noise and lighting, reduced air quality, and weeds and pests.

The total estimated area of vegetation clearing is 4.2 ha of Least Concern remnant vegetation.

Proposed mitigation measures

- No-go areas were established around the riparian corridors of Lansdowne Creek and Gilligan Creek, where surveys identified remnant vegetation and threatened species habitat. QPM has committed to undertaking enhancement plantings and weed management to further improve the environmental values in these no-go areas.
- Bushfire Management Plan, Vegetation Management Plan, and a Weed and Pest Management Plan will be implemented.
The flood impact assessment identified that flood risks to the project from Lansdowne Creek are low, with flood flows for the probable maximum flood staying within main creek channel.

The Project will not cause any adverse impacts to existing flooding regimes.
Surface water

The surface water assessment (Volume 2, Appendix D) includes assessment of water quality, stormwater, geomorphology and flood impact.

Field investigations were undertaken to characterise the geomorphology of the site, and obtain water quality data. An existing flood model was updated to assess potential flood risk to the site.

QPM know and understand that water is precious to landholders and the community. QPM is committed to ensuring agricultural activities in the region are not just impacted by the Project but are enhanced by improving and re-establishing riparian vegetation.

The Project has no process liquid discharge. All aqueous streams are retained inside the process.

Any stormwater which may be required to be discharged in high rainfall events will be treated to relevant water quality objectives. This will be discharged to Gilligan Creek.

No runoff will be discharged to Lansdowne Creek, which forms part of the Ross River Dam catchment. There will be no impacts to the Ross River dam drinking water catchment.
Groundwater and geochemistry

A desktop assessment of the existing land resources was undertaken, complemented by field assessments for contaminated land, acid sulfate soils, sodic and dispersive clay soils. A contamination assessment of the proposed site was undertaken which included both visual and intrusive investigations of the site. Intrusive investigations included sampling of soils and groundwater for contaminants.

Soils
- Soils across the site are moderately acidic
- Low to medium soil salinity
- Potential susceptibility to low fertility or acidification
- Soils may be susceptible to dispersion
- Pre-existing polyfluoroalkyl substances (PFAS), hydrocarbons, metals and pesticides below the relevant assessment criteria

Groundwater
- The Australian Drinking Water Guidelines are generally met with the exception of slightly elevated total lead (at two groundwater bores) and total manganese (at one groundwater bore). These water quality levels are based on existing (pre-development) conditions.
- The Ross River water quality objectives are generally met for total and dissolved metals.
- At these two bores, slightly elevated levels of copper, nickel, nitrate, nitrite, phosphorus and zinc.

QPM will not be extracting any groundwater for the Project. Water used for construction will initially be trucked to site until connection to the Haughton pipeline is complete.

The plant is designed so that no process water or potential contaminants will discharge to groundwater or soils. All aqueous process streams remain within the process for re-use and recycling in the process.
The traffic assessment examined the existing traffic at the subject site and surrounds, and provides a baseline characterisation of the local road network, key intersections, existing traffic volumes and speed, level crossings, and public transport and parking, used to assess project-related impacts to traffic.

Access to the Lansdown Eco-Industrial Precinct will be facilitated by a 130 m long realignment of Glenn Road, as an extension to Jones Road which will provide a more direct connection to the Flinders Highway. The proposed realignment will also include decommissioning the existing railway crossing and part of Glenn Road. The proposed realignment of the Glenn Road and Finders Highway intersection servicing Jones Road is being delivered by TCC in accordance with the Lansdown Eco-Industrial Precinct Masterplan.

During the construction and commissioning phases, there will be 170 daily light vehicle movements and 220 daily heavy vehicle movements. During the operations phase, there will be 16 daily light vehicle movements and 147 daily heavy vehicle movements.
Emissions from the four main process stacks proposed for the project were estimated. Emission rates were calculated for the main pollutants expected to be emitted from the project process stacks.

Emissions modelled include: carbon monoxide (CO), oxides of nitrogen (NOx), PM\textsubscript{10}, PM\textsubscript{2.5}, sulfur dioxide (SO\textsubscript{2}) and volatile organic carbons (VOCs). All pollutants and averaging periods were far below the applicable assessment criteria at all assessment locations.

The main potential sources of pollutants are:

- process stacks:
  - boiler stack;
  - ore dryer stack;
  - thermal desorption stack;
  - hematite furnace stack; and

- fugitive dust-generated by on-site activities.

Proposed mitigation measures

QPM will be monitoring air quality throughout operations.

QPM operations will not exceed assessment criteria and/or conditions of approval.
Acoustics

Noise sources from the project include:

- Vehicles (workers, trucks, front end loaders, heavy vehicles)
- Plant and equipment (fixed)

A noise model was prepared for the site to determine potential levels of noise at surrounding sensitive receivers.

Predicted noise levels for all of the plant site complies with the noise objectives.

Examples of common noise levels are shown on the graphic to the right. At nearby sensitive receivers, the predicted noise levels was between 25 decibels (dB) and a maximum of 43 dB.
Conclusion

Financial, environmental, social, political drivers and justification:

- Project life of 30 years
- Leading-edge technologies developed in Australia
- Unique, modern, leading-edge technology
- 800 jobs for the construction phase
- At least 300 jobs for the operations phase
- Flow on economic benefits and jobs
- $150 million will be spent with local businesses and utilities
- Local and indigenous employment and supply chain opportunities
- Produce the necessary inputs for future energy and technological developments
- Critical materials for green electric vehicles industry and renewable energy projects
- State and local government support
- No tailings dam
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