



Pure Minerals Limited

29 November 2018

ASX Announcement

**QPM SUCCESSFULLY PRODUCES NICKEL AND COBALT SULPHATE
CONFIRMING CSIRO PROCESSING FLOWSHEET**

- **Queensland Pacific Metals Pty Ltd has successfully produced samples of nickel and cobalt sulphate from a nickel and cobalt mixed hydroxide precipitate generated by the Direct Nickel (DNi™) Process**
- **Milestone confirms the processing flowsheet proposed by CSIRO for the production of battery grade nickel and cobalt sulphate**
- **The combination of the DNi Process and the CSIRO processing flowsheet will allow QPM to process New Caledonia ore and deliver a final product for the growing lithium-ion battery industry**
- **Pure Minerals Limited has entered into a binding option agreement to acquire 100% of the issued capital of QPM as announced on 15 October 2018**

Pure Minerals Limited (“**PM1**” or the “**Company**”) is pleased to announce that Queensland Pacific Metals Pty Ltd (“**QPM**”), the privately owned entity which the Company has secured an option to acquire, has successfully produced samples of nickel and cobalt sulphate.

QPM plans to use the Direct Nickel (DNi™) to process high grade nickel and cobalt ore imported from New Caledonia under a binding ore supply agreement with its ore supply partners Société des Mines de la Tontouta and Société Minière Georges Montagnat S.A.R.L. The DNi™ Process produces an intermediate nickel and cobalt mixed hydroxide precipitate (“**MHP**”) which is commonly sold on the open market.

As announced to the Australian Securities Exchange on 9th November 2018, QPM engaged CSIRO Mineral Resources (“**CSIRO**”) to identify the most prospective processing flowsheet to upgrade nickel and cobalt MHP to produce battery grade nickel and cobalt sulphate (see Figure 1).

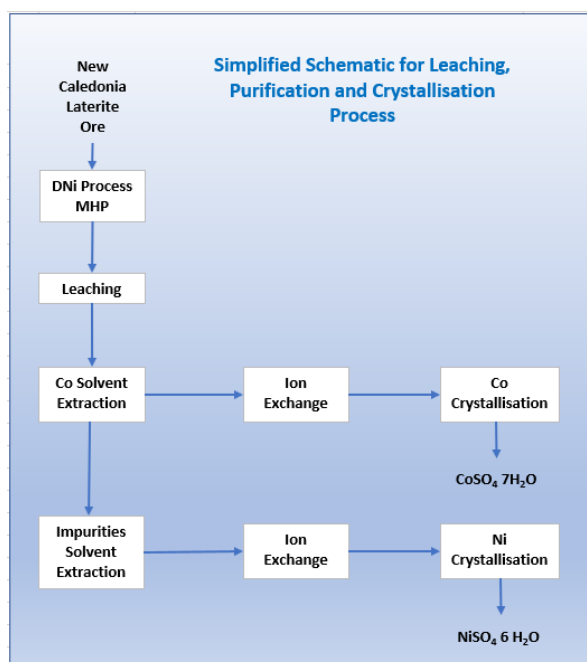


Figure 1: Processing flowsheet from New Caledonia Ore to Final Product

Under laboratory ‘proof-of-concept’ conditions, CSIRO started with a nickel and cobalt MHP produced by the DNi™ Process and employed selective dissolution to create a nickel and cobalt rich liquor. This liquor was then subjected to solvent extraction to separate the nickel and the cobalt and remove impurity elements. Further purification and crystallisation was then utilised to produce the final nickel sulphate and cobalt sulphate products. In addition, a raw manganese dioxide product (one of the potential co-products under the DNi™ Process) was also produced (see Figure 2).



Figure 2: Nickel-Cobalt MHP from DNi™ Process (green) upgraded to produce Nickel Sulphate (blue), Cobalt Sulphate (orange-pink) and Manganese Dioxide (black)

QPM Director John Downie commented,

“The success of this work program conducted by CSIRO means that QPM now has a complete processing flowsheet to take high grade nickel-cobalt ore from New Caledonia and produce battery grade nickel and cobalt sulphate products. These higher value products are key materials for the lithium ion battery industry. Importantly, the testwork has confirmed the DNi™ Process and the CSIRO processing flowsheet are compatible and can be combined into a single flowsheet.”

CSIRO Minerals Group Leader Hydrometallurgy Dr Keith Barnard commented,

“This initial effort has confirmed the potential of the current flowsheet to generate nickel and cobalt sulphate products. The battery metals market is charging ahead and QPM is working with CSIRO to secure its advantage through process innovation. As the market develops for electrical vehicles and energy storage, the awareness of ethical and environmentally friendly raw materials is becoming more prominent.”

QPM will continue to work with CSIRO to refine and optimise the flowsheet. In addition, with the processing flowsheet bedded down, QPM will undertake a Scoping Study to assess the economic viability of processing New Caledonia ore in a plant in Townsville to produce battery grade nickel and cobalt sulphate.

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