

**Environmental Permit granted for Port Moresby lime project –  
PNG's first vertically integrated lime and cement project**

**HIGHLIGHTS:**

- **Environmental approval granted for Mayur's vertically integrated lime and cement project in PNG**
- **Permit encompasses the 382 Mt JORC limestone Resource<sup>1</sup> located on the coast 25km from Port Moresby and the downstream development of Quicklime and Clinker/Cement businesses enabling dispatch to PNG's domestic market and to nearby international markets**
- **Key contributing milestone into the definitive feasibility study currently underway that provides a resource base to accommodate 50 years+ production**
- **Advancing PNG's Nation Building capacity to produce its own Quicklime and Clinker/Cement and remove reliance on imports while developing an export-based industry that will generate significant 'revenue inflows' into PNG as well as create large scale employment in Central Province**

**Mayur Resources Ltd (ASX:MRL)** is pleased to announce that it has been granted an Environmental Permit by the Conservation and Environmental Protection Authority (CEPA) for the development of its Port Moresby vertically integrated lime and cement project in PNG. The project is owned by the Company's subsidiary in PNG (Mayur Iron Ltd) and is located on EL2303 situated in Central Province, approximately 25km north of the capital Port Moresby and 7km from the ExxonMobil PNG LNG plant and export terminal.

---

<sup>1</sup> Port Moresby Limestone Project JORC Resource as disclosed in the ASX Announcement dated 12 January 2018. The Company is not aware of any new information or data that materially affects the information contained in that announcement.



Figure 1 – Location of Mayurs limestone JORC Resources north of Port Moresby, proposed site for the lime and cement project

The permit has been issued for quarrying of limestone and processing into quicklime, clinker and cement. The permit conditions and associated environmental management documents shall guide the project development activities that include the extraction (i.e. conventional quarrying) of limestone, processing of this material and the manufacture of quicklime, clinker and cement, together with the associated transport, utilities and other infrastructure<sup>2</sup>.

### Key input into the Feasibility study

Following the delineation of the maiden JORC Resource in early 2018 and a subsequent capital raise on the ASX by the Company in April 2018, a definitive feasibility study commenced on the commercialisation of the lime resource to initially produce 250,000 tonnes of quicklime and 1,500,000 of clinker/cement<sup>3</sup>. This will be PNGs first quicklime and cement / project and will help provide a key piece of industrial ‘nation building’ infrastructure adjacent to the US\$19 Billion PNG LNG facility. The definitive feasibility study is due for completion in final quarter of 2018. An indicative project site layout is shown below in figure 2.

<sup>2</sup> Refer to ASX announcement dated 30 May 2018 titled MRL Lime and Cement presentation

<sup>3</sup> Subject to completion of the DFS currently underway as detailed in MRL Lime and Cement Presentation released to ASX on 30 May 2018

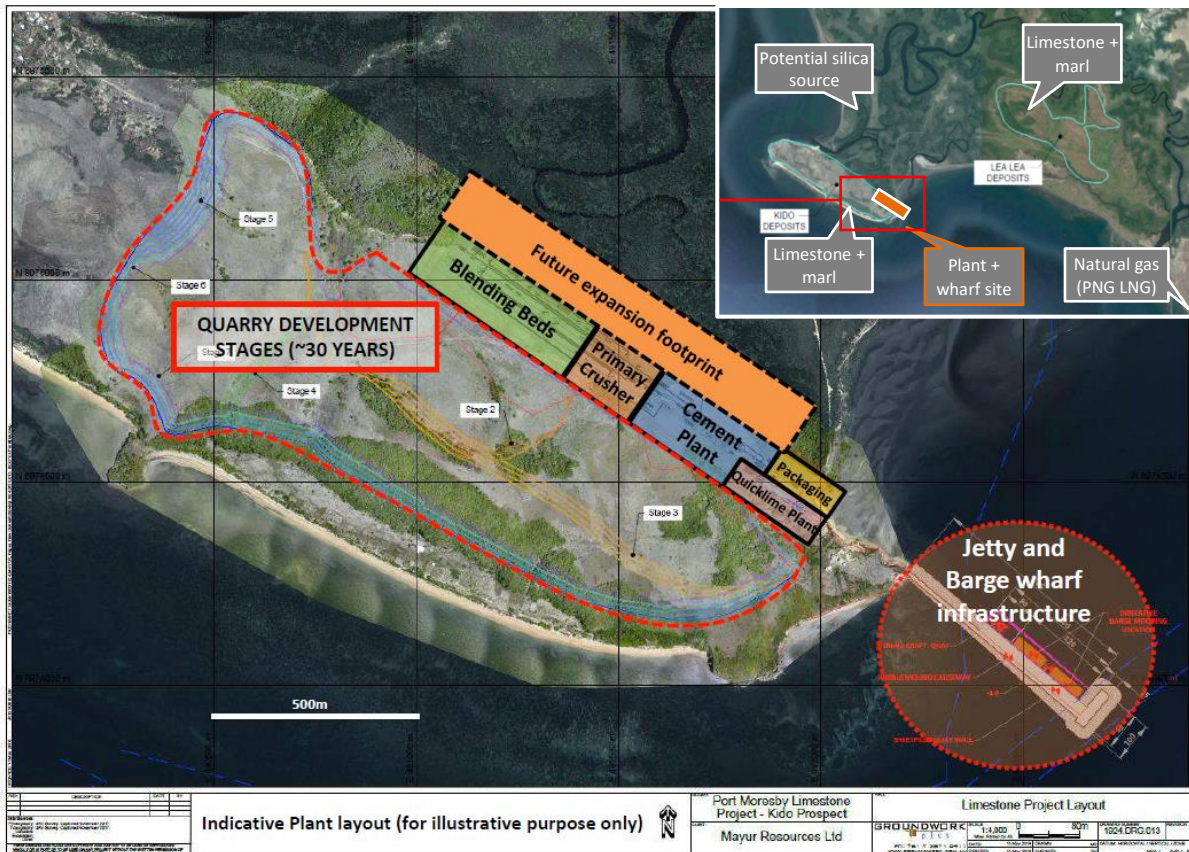


Figure 2 – indicative project layout on Kido coastline

### Nation Building and Sustainability Impact

MRL MD, Paul Mulder stated “this is yet another significant development for Mayur’s nation building project portfolio in PNG, with our strategy of import replacement, vertical integration and establishing new and competitive export industries to build wealth inflows into PNG. Following on from the maiden 382 Million tonne JORC resource released earlier this year and the commencement of the definitive feasibility study, this permit grant is a key project enabling development milestone and shows the progressive attitude being shown by the PNG regulatory authorities and their commitment to diversifying and adding in country value to PNG’s mineral wealth and promoting the industrialisation of PNG”.

Mayur’s facility design proposes an integrated clinker/cement, quick lime and power facility so as to employ modern waste heat recovery technology to increase energy efficiency and reduce emissions. With the plants proximal location to Port Moresby the plant also brings new options to bring in waste material from Port Moresby and its near surrounds and more effectively utilise such material by deploying proven European and Asian waste management technologies.

### Cement Consumption and Demand

As shown in figure 3 below, PNG’s cement consumption is very low at just 60kg per capita, placing PNG at the bottom of the global consumption curve. The link between GDP growth and high cement consumption has been well documented and as PNG’s economy grows, just to keep pace with cement consumption patterns on a per capita basis of other similar ‘low to middle income’ South East Asian countries, PNG would need to increase cement consumption by 5 to 10 times current levels.

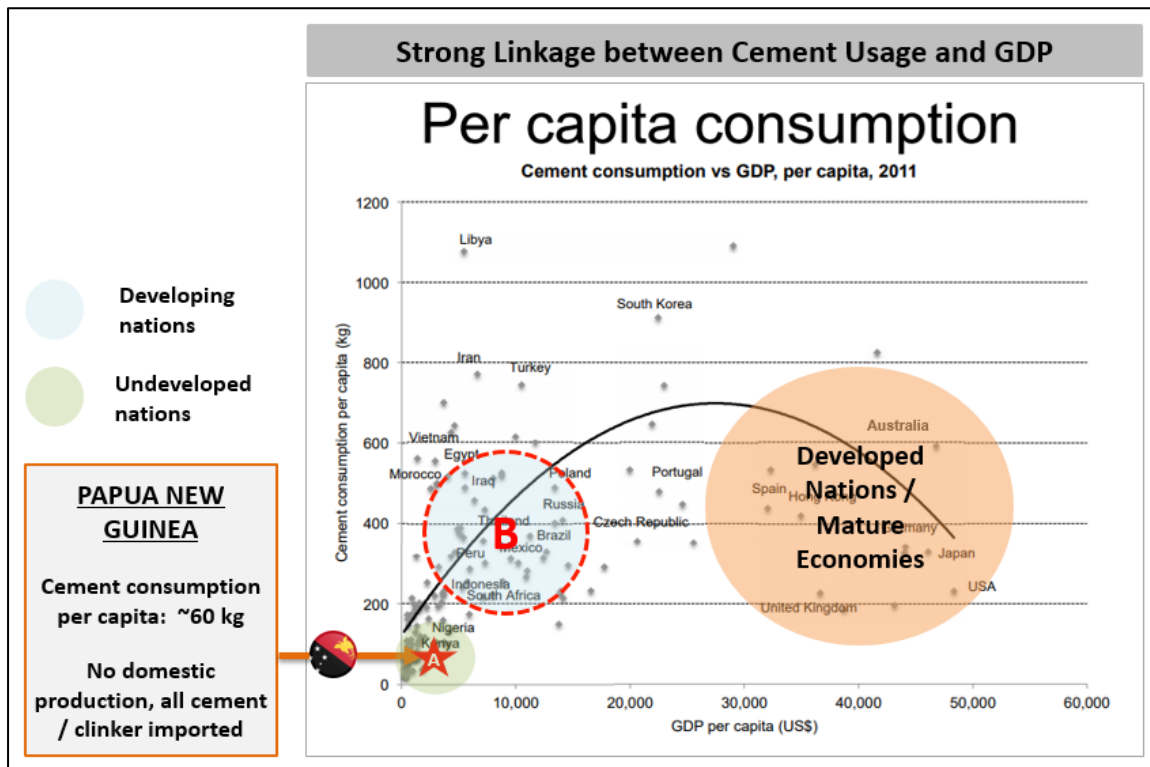


Figure 3 – Linkage between cement consumption per capita

Given the above, Mayur’s marketing strategy includes providing the domestic market with a low cost, viable supply option of quicklime, clinker/cement - *currently all quicklime, clinker/cement is imported from Asian countries such as Japan, China and Thailand*. Establishing a cost effective local PNG quick lime and clinker/cement industry and associated productive capacity will unlock suppressed demand, with massive potential for increased consumption as incomes inevitably start to increase from a low base.

In addition to helping PNG to become self-sufficient in quicklime and clinker/cement, Mayur in particular sees an opportunity to export such products to Australia by capitalising particularly on the trend in Australia of increasing imports of both clinker and cement as local cement capacity is shutdown or becomes too expensive to produce in Australia. Market opportunities also exist in the wider pacific region. Both domestic and export markets would provide a diverse customer base that would be sustainable in the long-term due to the unique factors as outlined below.

### Competitive advantage & access or ownership of key raw materials for cement manufacture

Mayur has a number of key competitive advantages for developing a new cement industry in PNG including:

- First mover advantage with direct access to the domestic market next to major infrastructure hub of Port Moresby
- Port access in the Australian market with a site secured in Port Botany
- Coastal location adjacent to ocean
- At surface deposition of the resource
- Access to gas via the gas supply MOU signed with State Owned Oil & Gas Company Kumul Petroleum<sup>4</sup>
- Low-cost labour jurisdiction
- Superior geographic location (sea freight distance advantage vs importing Asian competitors)

<sup>4</sup> MOU with Kumul as disclosed in the ASX Announcement dated 10 January 2018

- Direct access to key raw materials required for clinker/cement manufacture within MRL’s portfolio in PNG (as shown in table 1 this including marl, silica sands (either at Kido or alternatively from its Orokolo Bay Industrial Sands Project in Gulf Province) and coal (Depot Creek Coal project in Gulf Province) that would provide huge cost savings in the total cost of quicklime and clinker/cement production.

MATERIAL	PROXIMITY TO KIDO	OWNED BY MAYUR
LIMESTONE	0 km (located at / adjacent to site)	Yes
MARL	0 km (located at / adjacent to site)	Yes
SILICA SAND	<2 km	Yes
NATURAL GAS	7 km (from PNG LNG)	No (Gas supply MOU signed)
COAL	~350 km (by vessel from Gulf Province, PNG)	Yes
GYPSUM	Tbc (but low tonnages required)	No
WASTE MATERIALS (alternative fuels)	Available from Port Moresby industrial sector	N/A

Table 1 – Access to key raw materials / inputs for cement, quicklime manufacture

Mayur anticipates being very low on the 1<sup>ST</sup> quartile of the global cost curve and thus should be able to provide extremely competitively priced products into PNG and Australia compared to other Asian countries.

### Cement and economic growth multiplier

The cement and concrete industry is a key component for economic growth. Cement is the key ingredient in concrete, the most consumed material on earth after water. Over 70% of the world’s population live in structures containing cement improving living standards and quality of life for everyone.

It has long been known, as mentioned previously, that growth in demand for cement is closely linked to a nation’s economic growth, providing long term investment and employment stability. By way of examples, in Australia the quarry, cement and concrete industry contributed AUD\$12 billion to the country’s annual GDP, employing more than 18,000 people directly and more than 60,000 indirectly, much of which was in regional Australia as well as the suburban and industrial areas of its cities<sup>5</sup>.

Various studies have found the cement industry has a significant ‘multiplier effect’ on wages, employment and economic output that can be between 2.8 and 4 times in developed nations<sup>6</sup>. This effect can be even more magnified in developing nations, hence the establishment of a lime and cement industry in PNG should have a profound impact on the domestic economy. Providing domestically produced cement at the right pricing point will drive increased use and consumption of cement that in turn will also bring health and safety benefits for social infrastructure including improved housing, water and sanitation, roads, bridges, buildings and public services. These are all important and significant contributors to a country like PNG with aspirations to dramatically increase overall living standards and electrify 70% of the 8.4m people living in PNG.

<sup>5</sup> Cement Concrete and Aggregates Australia

<sup>6</sup> [https://www.theconcreteinitiative.eu/images/Newsroom/Concrete\\_Dialogue/3-\\_A\\_Shams.pdf](https://www.theconcreteinitiative.eu/images/Newsroom/Concrete_Dialogue/3-_A_Shams.pdf) and <http://www.phoenix-center.org/scorecards/AggregatesIndustry2017ScorecardFinal.pdf>

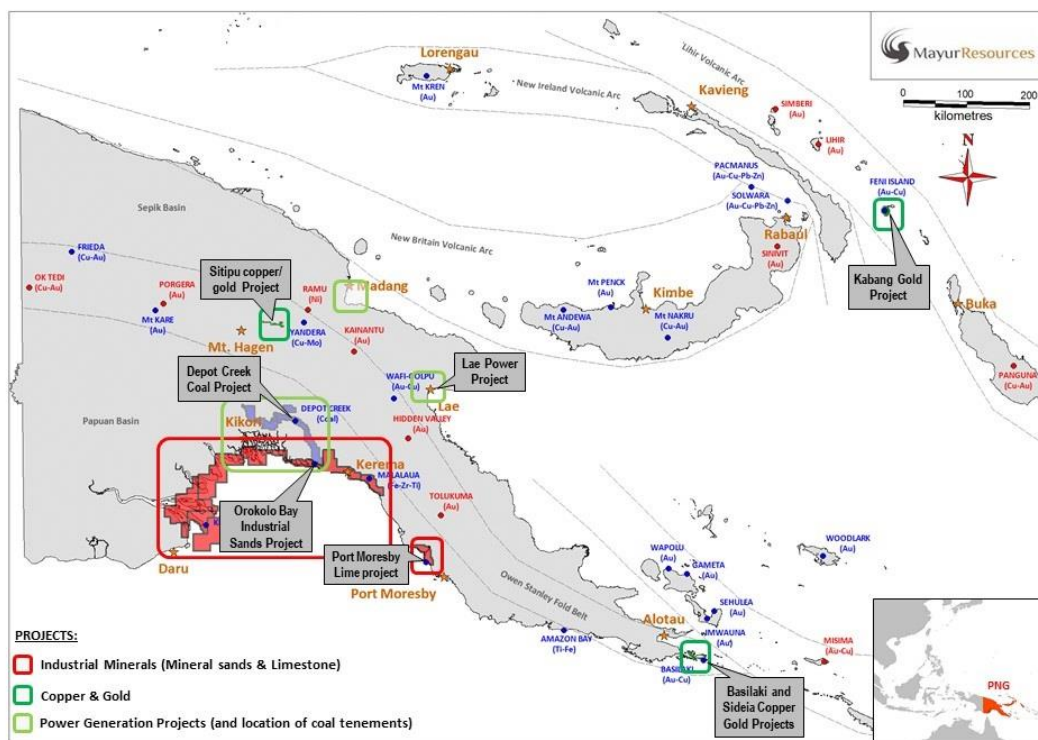
## About Mayur Resources

Mayur Resources is a diversified mineral exploration, development and energy company operating in Papua New Guinea (PNG) across three main divisions:

**(a) Industrial Minerals (construction sands, magnetite sands, heavy mineral sands and limestone)** The Company is advancing the Orokolo Bay Industrial Sands Project along the southern coast of PNG. A pre-feasibility study has been completed which identified an opportunity to establish a project producing fine grain construction sands, titanomagnetite (iron sands) and a zircon-rich Valuable Heavy Mineral Concentrate by-product. The next steps include preparation of a Definitive Feasibility Study and construction of a pilot demonstration plant. The other key project in this portfolio is the Port Moresby Limestone Project, located close to the national capital, which seeks to produce high grade limestone together with the development of a vertically integrated downstream processing quicklime and clinker / cement plant for domestic (import replacement) and export markets.

**(b) Copper and Gold.** The Company holds the Feni Island Project in New Ireland Province as well as the prospective Basilaki/ Sideia project in Milne Bay Province and the Sitipu project located in the Eastern Highlands region of the prolific Owen Stanley Fold Belt.

**(c) Power Generation.** The Company is developing a vertically integrated domestic power project at PNG's second largest city of Lae. A detailed Power Purchase Agreement has been submitted to PNG Power, the state-owned power entity, for a 52.5MW (net) power facility (with future scalability to 200MW). A definitive feasibility study has been completed for the Lae project that contemplates the use of multi fuels (Enviro Energy Park) including renewables and potentially coal from the Company's Depot Creek project in Gulf Province.



## Enquiries

Paul Mulder – Managing Director

[info@mayurresources.com](mailto:info@mayurresources.com)

+61 7 3157 4400