

# Mardie Salt & Potash Project

# Feasibility Study Confirms World Class Opportunity

July 2020

ASX:BCI

www.bciminerals.com.au

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#### Summary Information Only; Material Assumptions Continue to Apply

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This document contains forward-looking statements. These forward-looking statements are based on BCI's current expectations and beliefs concerning future events at the date of this document, and are expressed in good faith. BCI believes it has reasonable grounds for making the forward-looking statements. However, forward-looking statements are subject to risks, uncertainties and other factors, many of which are outside the control of BCI, which could cause actual results to differ materially from future results expressed or implied by such forward-looking statements. Consequently, forward-looking statements should not be relied on as a guarantee of future performance. Other than as required by law, including the ASX Listing Rules, BCI does not undertake or assume any obligation to update or revise any forward-looking statement contained in this document.

BCI has reasonable grounds to believe the required levels of equity and debt can be secured to fund the Project's development, however there are no certainties this will be achieved.

#### JORC Code

The Mardie Salt and Potash Project aims to produce salt and SOP from a seawater resource, which is abundant, inexhaustible, readily accessible and has a known and consistent chemical composition. The Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves 2012 Edition ("JORC Code") does not apply to a project of this nature and, accordingly, JORC Ore Reserves and Mineral Resources are not reported.

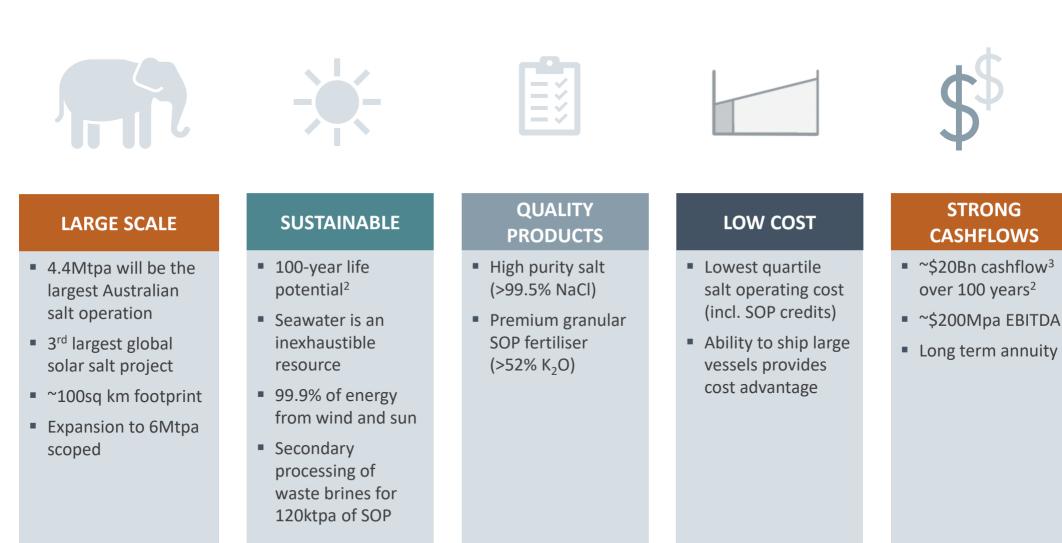
#### Acceptance

By attending an investor presentation or briefing, or accepting, accessing or viewing this document you acknowledge and agree to the "Important Notices" as set out above.

## **Mardie Project DFS<sup>1</sup> Summary**



### Tier 1 scale, cost and operating life



#### The DFS Summary and the DFS presentation are available on the BCI website (www.bciminerals.com.au)



#### **Strong growth in BCI's target markets**

#### Salt Market<sup>1</sup>

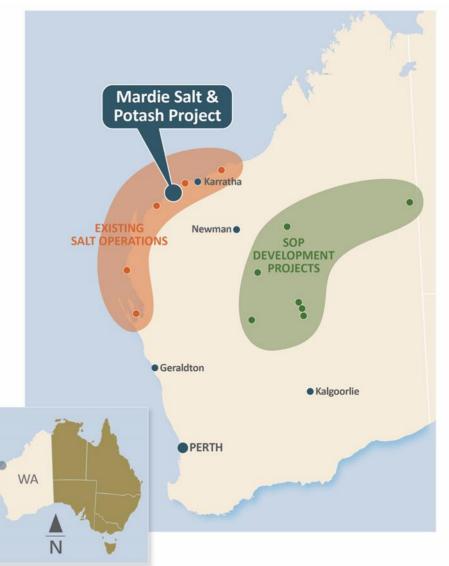


## Australian Salt & SOP Landscape



### Mardie: ideal location to produce high-purity salt and SOP

- Pilbara has ideal climate to produce high purity salt
  - High temperature, high wind, low rainfall, low humidity
  - Proven salt production region since the 1960's
- Five large WA Solar Salt Operations (12-13Mtpa)
  - Controlled by Rio Tinto and Mitsui
  - No new large Australian salt project in 20 years
- No current **SOP** production in Australia:
  - Other development projects all based on inland lake brines and >800km road transport to third party ports
- Mardie Salt and SOP Project:
  - Largest solar salt project in Australia
  - Only Australian project with commercial salt and SOP from seawater



Western Australia – Salt and SOP Projects



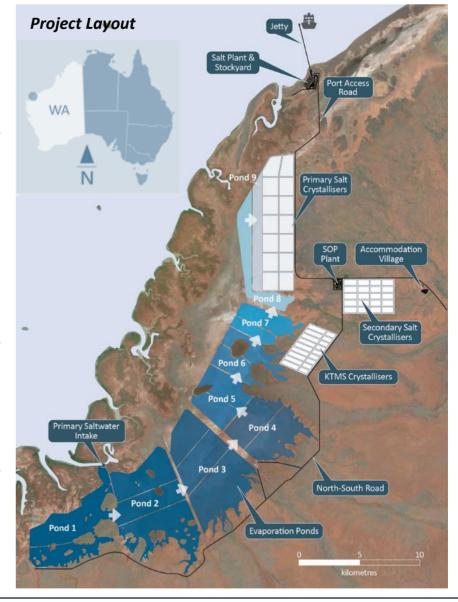
## **PROJECT OVERVIEW**

## **Mardie Project Overview**

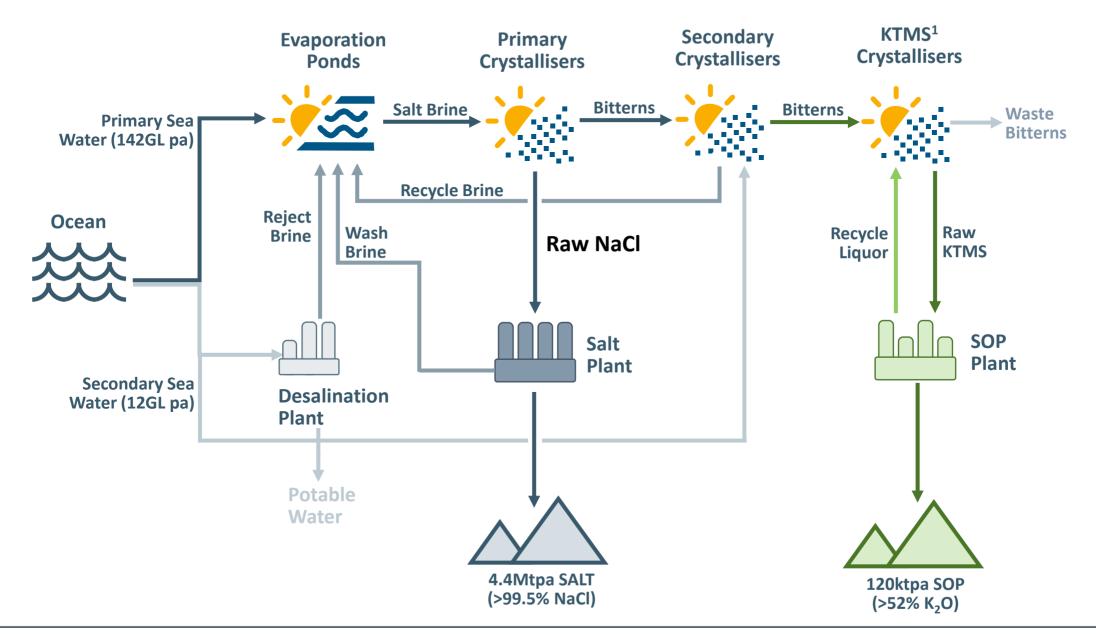


#### 100% owned salt and SOP development opportunity

	<ul> <li>100km<sup>2</sup> clay soils – ideal to retain water</li> <li>High net evaporation rates (~10mm/day)</li> </ul>
PRODUCTION	<ul> <li>9 evaporation ponds</li> <li>24 colt and 18 SOD emotallise me</li> </ul>
	<ul> <li>34 salt and 18 SOP crystallisers</li> </ul>
	<ul> <li>Salt wash plant producing 4.4Mtpa salt</li> <li>&gt;99.5% NaCl</li> </ul>
	<ul> <li>SOP process plant producing 120ktpa SOP &gt;52% K<sub>2</sub>O (granular)</li> </ul>
PORT	<ul> <li>2.3km steel trestle jetty with conveyor</li> </ul>
T	<ul> <li>Ship loader to transfer salt and SOP</li> </ul>
	<ul> <li>4.5km dredged channel</li> </ul>
SHIPPING	<ul> <li>10,000t transhipment vessel</li> </ul>
¥_===-	<ul> <li>Handymax, Panamax and Capesize vessels</li> <li>28km offshore</li> </ul>





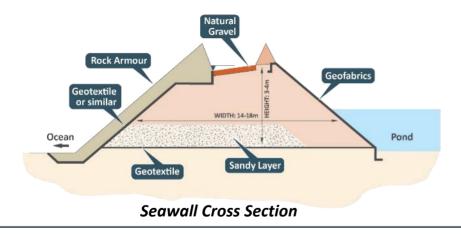


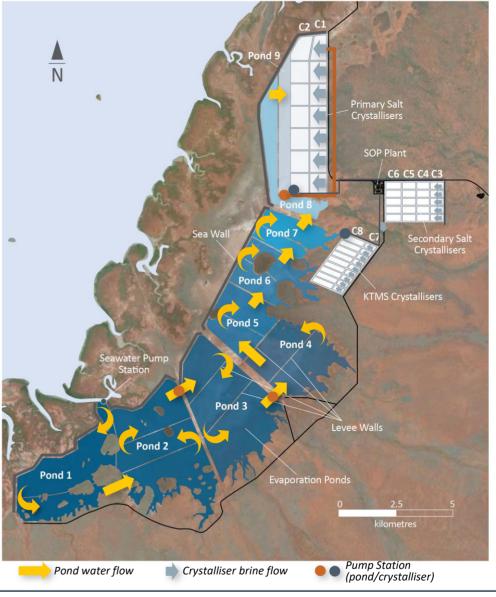
## **Ponds and Crystallisers**



#### Walls designed for a 1 in 100 year weather event

- Pond and crystalliser area ~90km<sup>2</sup> (25km x 3.5km)
- 26km sea wall to protect against adverse weather events
- Pond internal levee walls optimise brine flow and protect pond walls
- Seawater flows through 9 ponds over a 21-month period (combination of gravity flow and pump stations)
- Concentrated brine flows through crystallisers (C1 to C9)
  - Salt is harvested from C1 and C2
  - Salt from C3 to C5 is recycled to the evaporation ponds
  - Magnesium is removed in C6
  - KTMS is harvested from C7 and C8



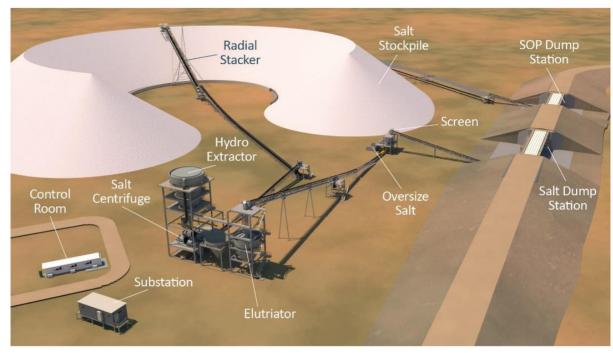


## Salt Wash Plant



### High yield purification process to produce high purity salt (>99.5% NaCl)

- 700tph salt wash plant using industry leading salt purification technology
- Two-stage counter-current washing technology:
  - first stage removes gypsum and dust particles via elutriation
  - second stage purifies salt by dissolving potassium and magnesium impurities via contact with pure seawater brine in the hydroextractor
- Purified salt is centrifuged to remove excess moisture and then conveyed to a 0.6Mt salt stockyard using a 100m radial stacker for storage prior to export

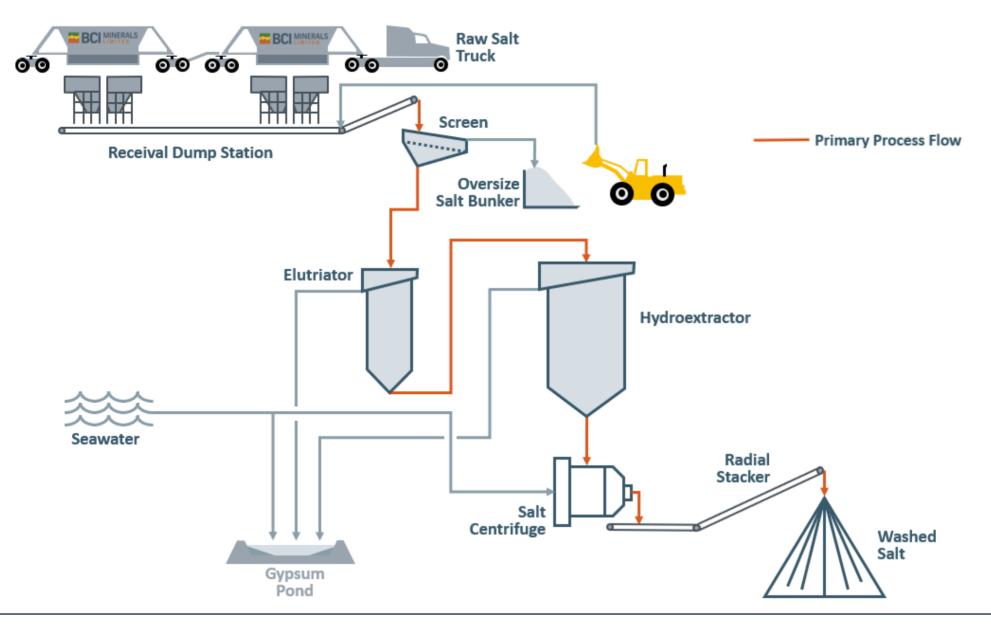


Salt Wash Plant and Stockyard

## Salt Wash Plant Flowsheet



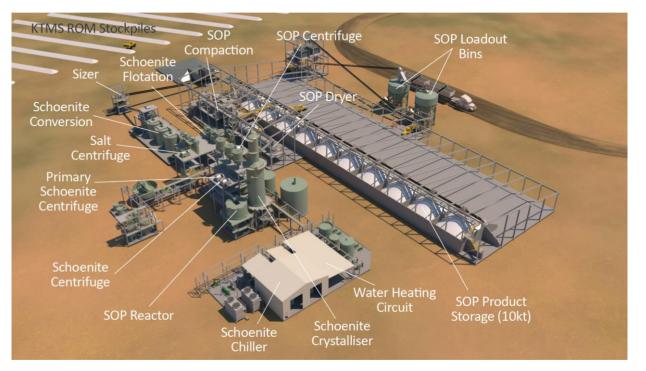
### High yield purification process to produce high purity salt (>99.5% NaCl)



### **SOP Process Plant**



- SOP processing plant with 110tph KTMS throughput capacity
- Standard conversion flowsheet consists of:
  - crushing of KTMS to < 2mm</li>
  - conversion of KTMS to schoenite<sup>1</sup>
  - removal of sodium chloride impurities via rougher-scavenger flotation circuit
  - conversion of purified schoenite to SOP powder using water from the desalination plant (heated to 75°C)
  - drying and compaction of SOP powder to final granular product
- Final SOP product stored in enclosed storage shed and transported by haul trucks to the Mardie Port Facility 10km from plant

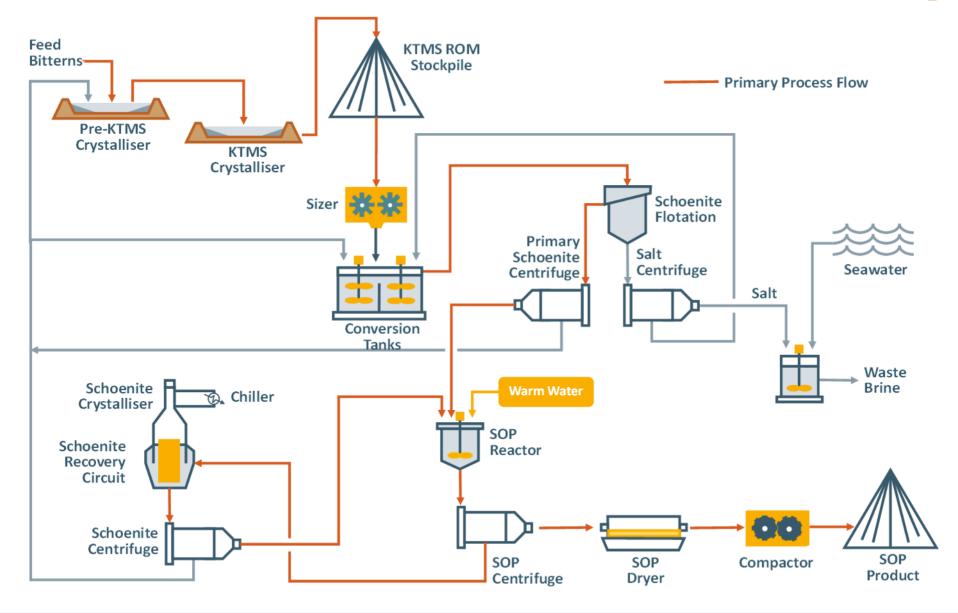


SOP Process Plant

### **SOP Process Plant Flowsheet**



#### Standard SOP conversion to produce 120ktpa of granular SOP (52% K<sub>2</sub>O)



## **Mardie Port Facilities**

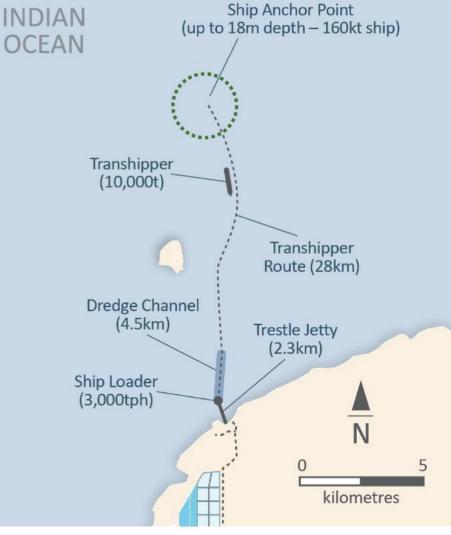


### Mardie salt and SOP product transhipped to large bulk carriers

- 2.3km steel trestle jetty with conveyor and vehicle access
- 3,000tph ship loader at end of jetty; berthing pocket of
   6.7m water depth and channel of 3.9m depth
- 10,000t self-propelled self-unloading transhipper delivers product to bulk carrier ships anchored 28km offshore
- Ships up to 160,000t can be loaded major competitive advantage
- Transhipper can load a 70,000t ship in ~5 days ~55 salt and 12 SOP shipments per year.



Self-propelled Transhipper at Berth



Transhipment System Layout

### **Positive Small-Scale Trial**



#### **Salt Samples Distributed to Customers**



1. Trial Evaporation Ponds

- Small scale trial has been operating for 15 months (and is continuing)
- Flowsheet parameters and product quality being verified
- Salt samples distributed to customers in Jun-20
- Salt quality similar to other Australian salt producers and qualifies for chlor-alkali industry
- KTMS (SOP feedstock) expected to be produced in Q3 2020



2. Final Salt Crystallisation

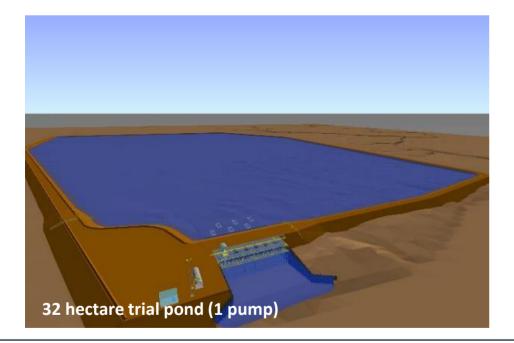


3. Mardie Salt for Customer Testwork

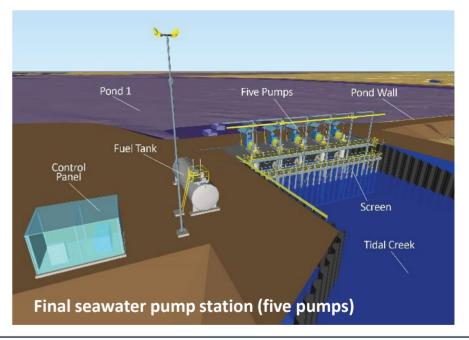
## Large Scale Trial Pond Planned

### Early Works to de-risk pond construction

- Large trial pond construction planned in 2H 2020
- Determine optimum construction methodology and materials
- Trial pond capacity >250 Olympic pools



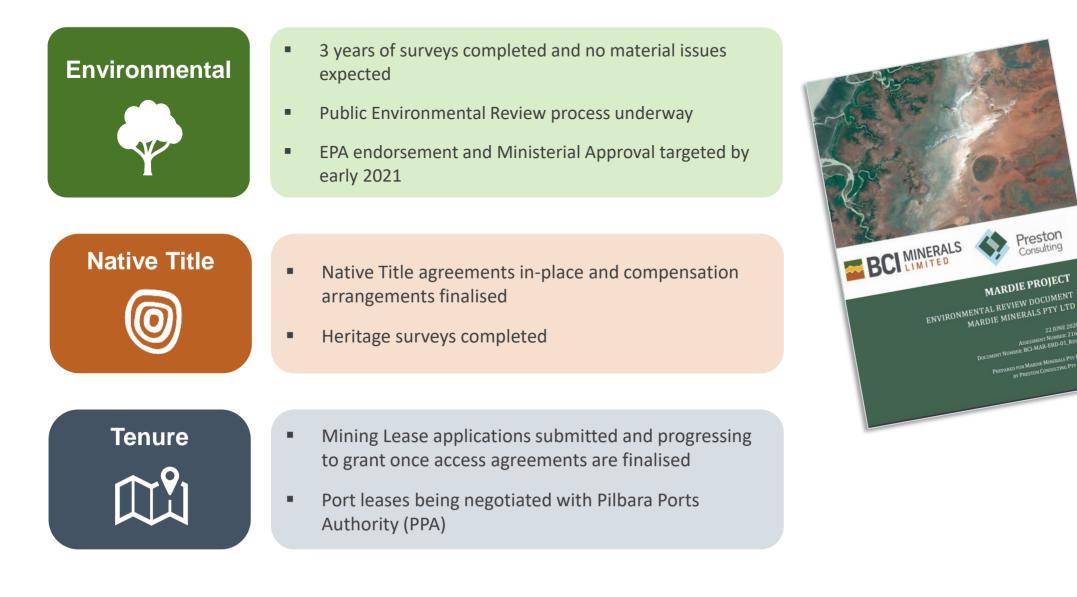




## **Approvals & Tenure Well Defined**



#### Native title arrangements in place, approvals and tenure on track for early 2021



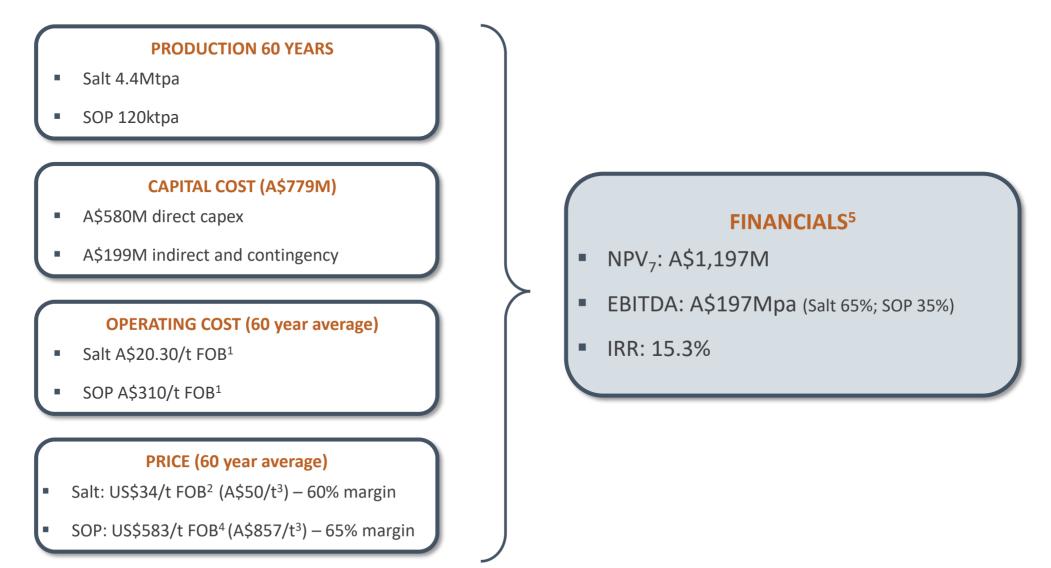


## **FINANCIALS**

### **Attractive Financials**



#### **DFS delivered strong outcomes for key financial metrics**



<sup>&</sup>lt;sup>1</sup>All-in sustaining opex <sup>2</sup>Roskill (April 2020) long term price forecast less Braemar (June 2020) long term freight forecast for Mardie shipments to target customers <sup>3</sup>FX: 0.68 <sup>4</sup>Argus Consulting (November 2019) long term NW Europe SOP price adjusted for Mardie quality and freight advantage <sup>5</sup>Pre-tax, ungeared, real

### **Exceptional Cashflow Generation**



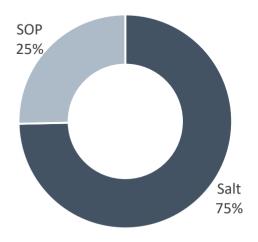
#### Long term annuity type cashflows

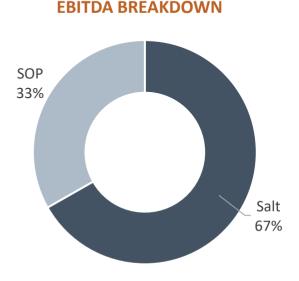
- Mardie forecast to deliver up to:
  - >\$10Bn in net cashflows over 60-years<sup>1</sup>
     (~\$20Bn, ungeared, pre-tax) over 100 years<sup>2</sup>
  - \$390Mpa in revenues (\$290M salt; \$100M SOP)
  - Average annual EBITDA of ~\$200M

#### **60 YEAR CUMULATIVE NET CASHFLOW<sup>1</sup> (A\$M)**

11.000 >\$10Bn 10,000 9.000 Cumulative Net Cash Flow (\$M) 8,000 7,000 6,000 5,000 4,000 3,000 2,000 1,000 (1,000)2020 2025 2030 2035 2040 2045 2050 2055 2060 2065 2070 2075 2080 2085

**REVENUE BREAKDOWN** 

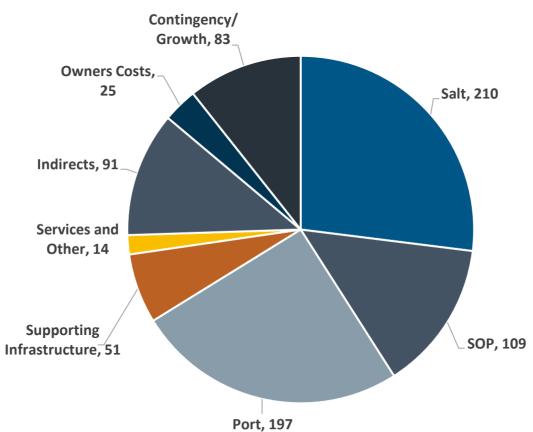




<sup>1</sup>pre-tax, ungeared, real <sup>2</sup>subject to Mining and Port Leases being extended



### **Direct costs A\$580M plus A\$199M indirect/contingency/growth allowances**



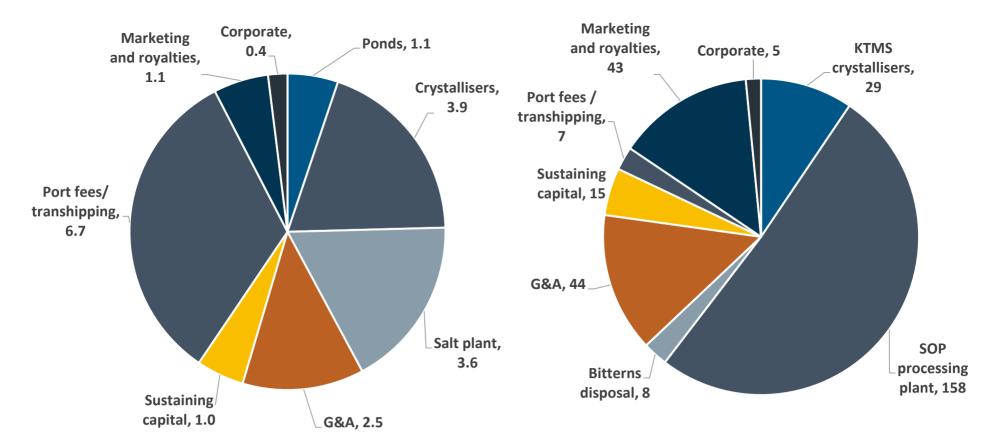
MARDIE CAPEX (A\$779M)

### **Operating Cost<sup>1</sup> Estimate**



#### Very competitive salt and SOP operating costs

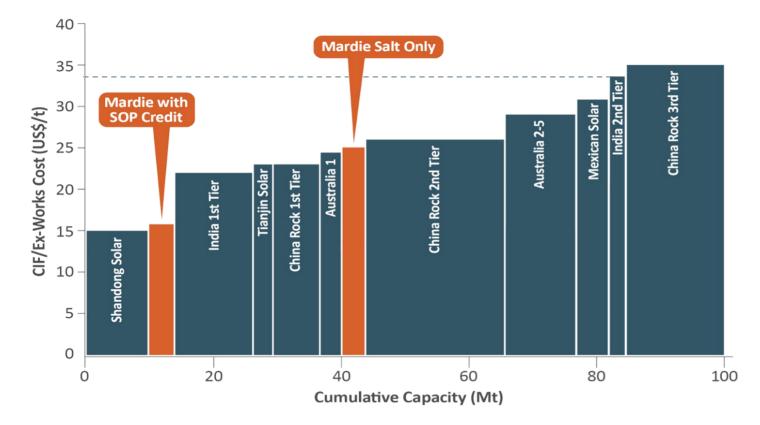
MARDIE SALT OPEX (A\$/t), A\$20.30/t MARDIE SOP OPEX (A\$/t), A\$310/t



### Salt Cost Curve<sup>1</sup> – Contestable Market<sup>2</sup>



### Mardie will be a low cost supplier of salt into Asia

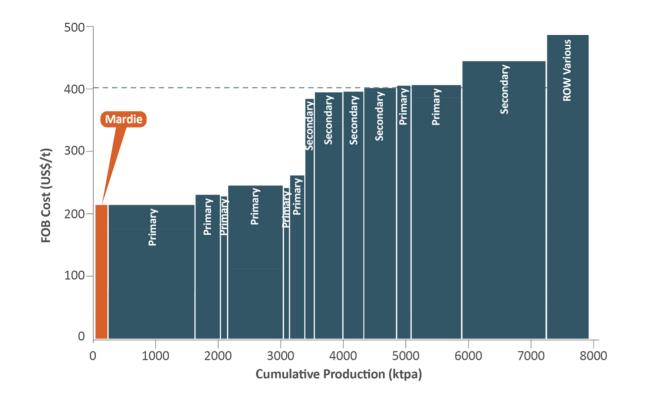


- Mexican solar salt and Chinese rock salt the marginal cost suppliers to most Asian markets (~US\$33/t)
- Mardie will be cost competitive with all Australian salt operations
- When SOP margin treated as a by-product credit, Mardie becomes one of the lowest cost salt producers

### **SOP Cost Curve<sup>1</sup>**



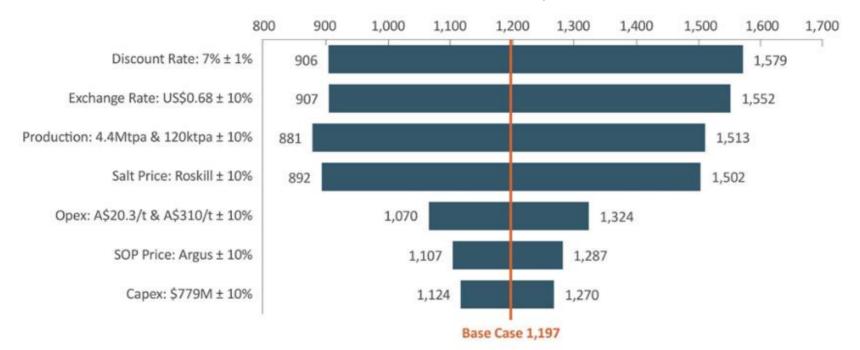
### Mardie one of the lowest cost SOP producers globally



- Mardie is expected to be one of the lowest cost SOP producers globally
- A large volume of SOP produced in China via the high-cost Mannheim production process which underpins SOP pricing above US\$400/t FOB
- Mardie has significant advantages over other SOP operators:
  - 1. primary producer
  - 2. SOP is a by-product with significant costs allocated to salt
  - 3. located on cost adjacent to an export facility



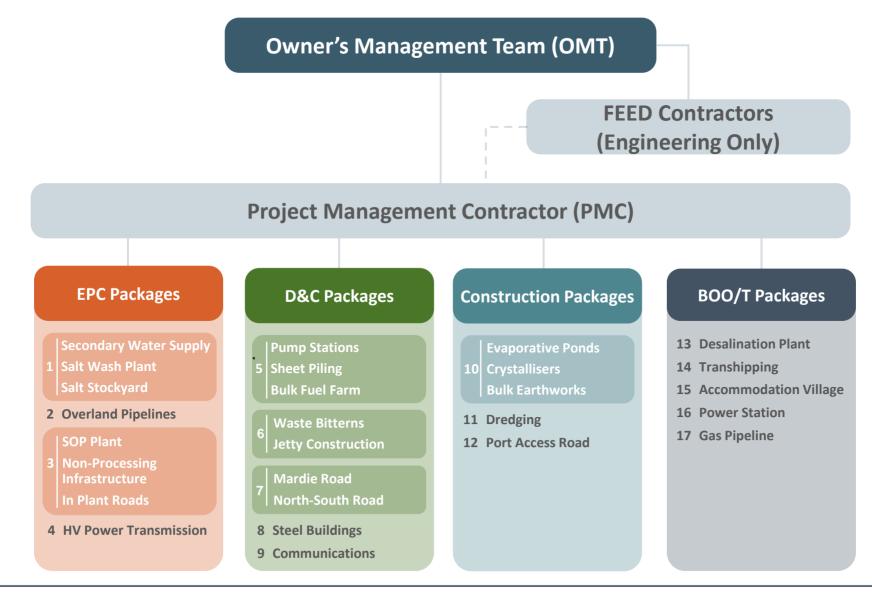
### Mardie most sensitive to discount rate, exchange rate and production



PRE-TAX NPV<sub>7</sub><sup>1</sup> (A\$M)



# BCI owner's team supported by Project Management Contractor (PMC) to implement the construction contracts

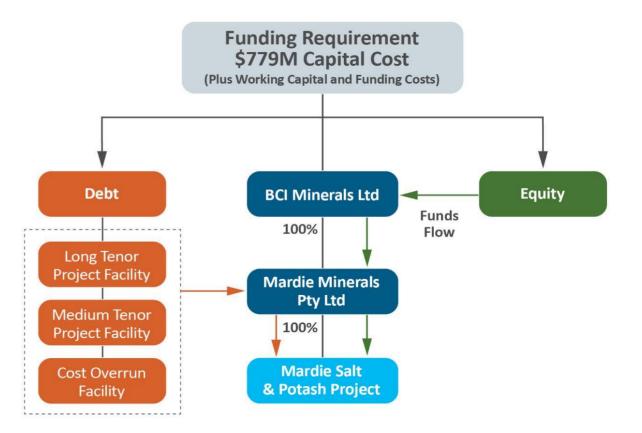


## **Funding Strategy Advanced**



### Positive engagement from NAIF and Banks on potential debt financing

- Base case is a conventional funding model of debt (65%) and equity (35%)
- Secure debt commitments by end 2020
- NAIF<sup>1</sup>: Formal DD phase; positive negotiations for potential long tenor facility
- Banks: Term sheet negotiations with multiple Australian and international banks
- Equity: Corporate level investment preferred; merits of project level investment to be considered



## **Expansion/Optimisation Potential**

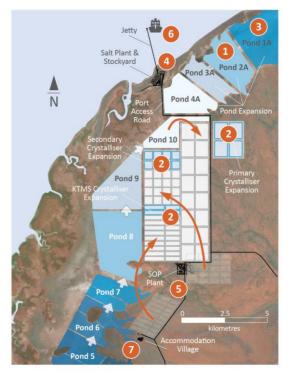
#### Adjacent tenement acquisition allows optimisation and future expansion

#### **PROJECT OPTIMISATION (2020/21)**



- Reconfigure ponds 8 and 9, add a new Pond 10, relocate and expand Primary, Secondary and KTMS crystallisers and expand salt washing capacity.
- Increase production by 0.3Mtpa Salt and 10ktpa SOP
- Lower operation cost

#### **PROJECT EXPANSION (2025/26)**

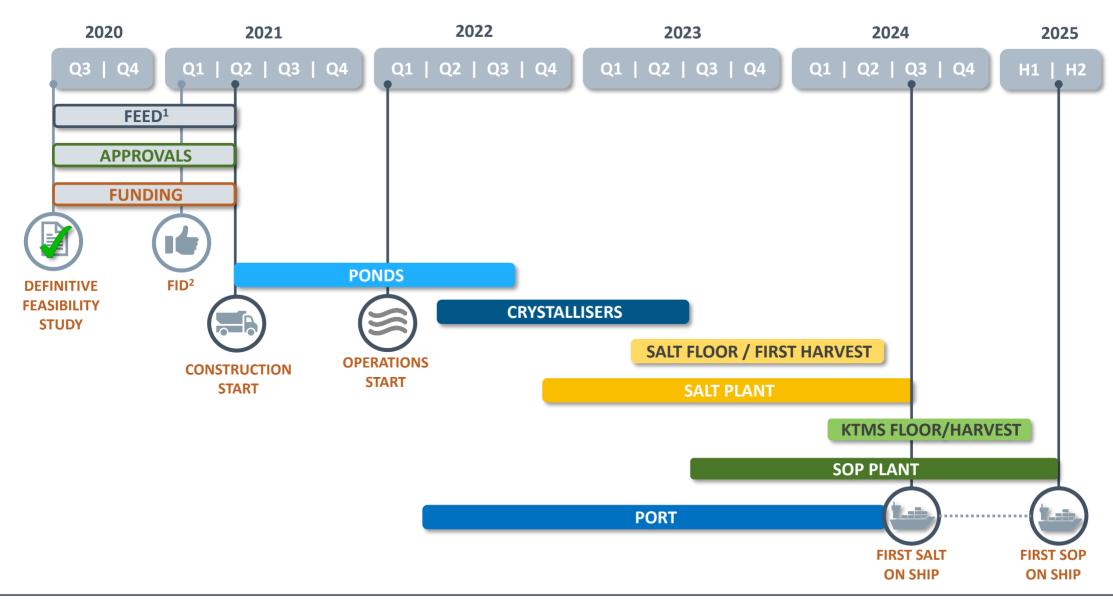


- New ponds and crystallisers, expand SOP processing/capacity expand transshipping capacity
- Increase production to 6Mtpa Salt and 160ktpa SOP
- >\$100M capex for significantly reduced OPEX

### **Indicative Project Schedule**



#### Next Steps: FEED, approvals, funding, ongoing site trials and early works





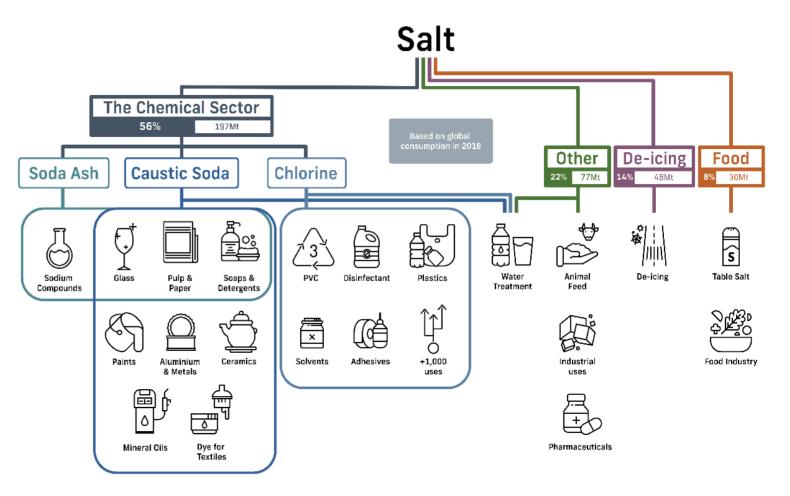
## **MARKETS AND OFFTAKE**

## Salt Uses<sup>1</sup>



### Salt has >10,000 direct and indirect uses across all markets

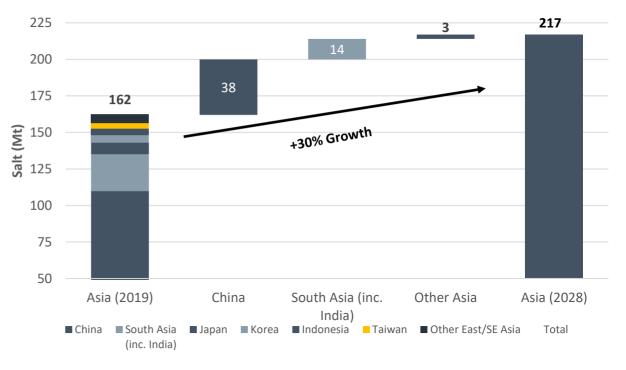
- Long established, large and deep market
- Demand is highly correlated with GDP, industrial activity and urbanisation rates
- Chemical sector is the largest consumer of salt (56% globally)
- Chemical sector converts salt into three primary intermediate products: soda ash, caustic soda and chlorine
- Key downstream products: PVC, glass, alumina, paper, paints, water purification etc.





### Strong growth market driven by the Asian chemical industry

- Asian salt demand of 162Mtpa
- Strong correlation (r<sup>2</sup>=0.98) between salt demand and industrial activity (measured as GDP)
- Asian post-Covid recovery and stimulus likely to boost industrial and consumer activity – positive for salt demand
- Forecast for 30% demand growth (55Mtpa) in Asia by end of this decade
- Growth primarily driven by the chemical industry (38Mtpa of 55Mtpa)



#### **30% DEMAND GROWTH OVER NEXT DECADE<sup>1</sup>**

## Salt Supply to Asia



#### Asian salt supply mainly from China, India, Australia and Mexico

- China (90Mt), India (30Mt), Australia (12Mt) and Mexico (5Mt)<sup>1</sup>
- Mardie will be competitive on cost and quality with Chinese domestic rock salt and with Australian/Mexican solar salt
- Large component of Indian salt of lower quality – this has captured Asian market share during the last 10 years impacting prices. However, higher and more consistent quality salt still sold at premium
- Mexico has a freight and logistics disadvantage to China

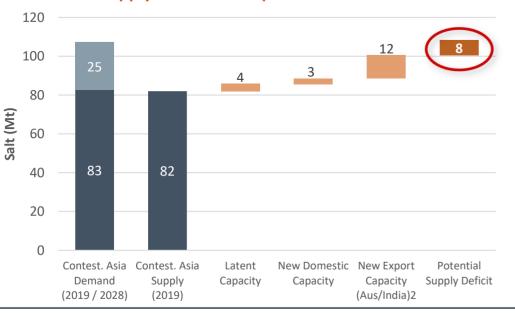


### Mardie Contestable Market in Asia

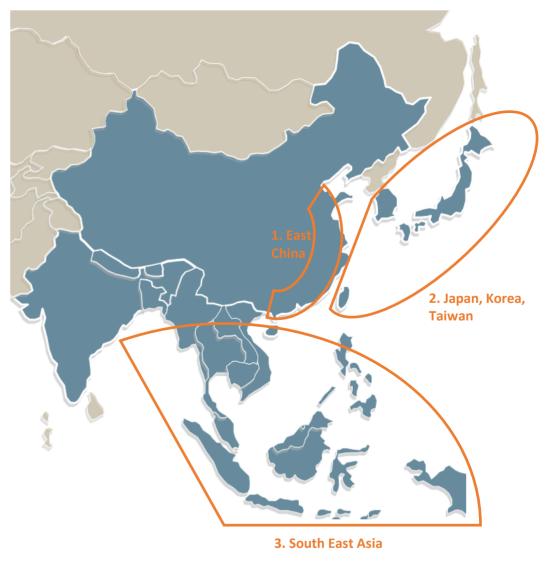


### 25Mtpa salt demand increase by 2028 with insufficient new supply

- Contestable market where Mardie can compete on delivered cost and quality at the specific buyer location (East China, Japan, Korea, Taiwan, SE Asia)
- BCI has identified >25 specific buyers where Mardie will be able to secure offtake support
- Potential supply shortage in the Mardie contestable market







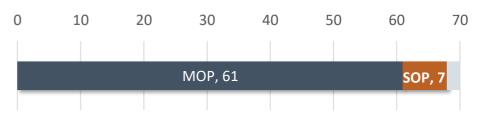
### **SOP Uses**

BCI MINERALS

#### **Premium potassium fertiliser**

- Global potassium fertiliser market of 70Mtpa
- Two main potassium fertilisers: Muriate of Potash (MOP, KCl) and Sulphate of Potash (SOP, K<sub>2</sub>SO<sub>4</sub>)
- MOP is a lower quality chloride containing fertiliser
- SOP is a high quality and soil friendly fertiliser that also contains another essential element of sulphur
- SOP is used on higher value crops (fruits, nuts, vegetables, flowers) to increase yield, quality
- SOP is used as a direct application fertiliser or as a feedstock for compounded fertilisers

#### GLOBAL POTASSIUM FERTILIZER MARKET (Mt)<sup>1</sup>



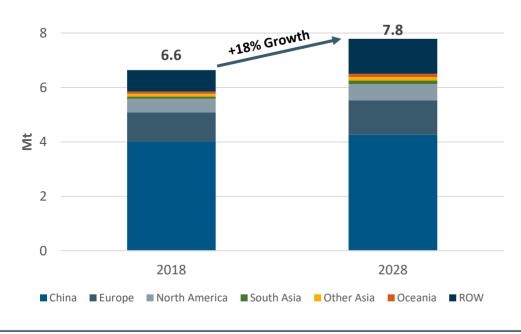


## **SOP Market**



### **Increasing demand for high quality fruits and vegetables**

- Strong long-term demand outlook driven by:
  - Population growth
  - Increasing preference for high quality food; and
  - Reducing arable land
- SOP demand is forecast to increase from 6.6Mtpa to 7.7Mtpa by 2028



#### **SOP DEMAND 2018-2028<sup>1</sup>**

- Mardie SOP placement is focused on Asian growth and displacement of existing high cost supply from Europe and Taiwan.
- Targeting a proportion of supply domestically (Oceania) and into North America

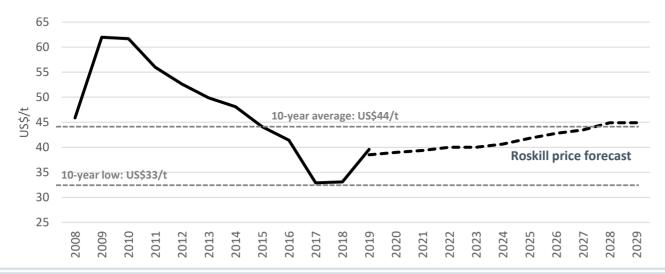




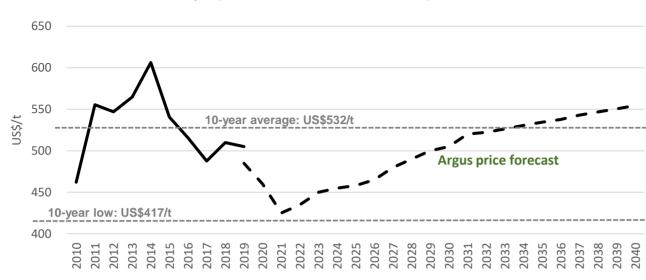
### Salt & SOP Pricing



#### Salt Prices – Australian Imports in Asia (US\$/t CIF, forecast in real)<sup>1</sup>



#### SOP Prices – NW Europe (US\$/t FOB, forecast in real)<sup>2</sup>



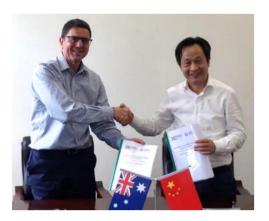
- 10-Year low of US\$33/t and average of US\$44/t (excluding peak pricing)
- Cyclical low in 2017/18 aligned with natural floor price, driven by multiple factors. Price increasing in 2019
- Roskill forecast price to increase to US\$45/t by 2028
- Mardie pricing equivalent to Roskill forecast
- 10-Year low of US\$417/t and average of US\$532/t
- Argus forecast price decline in next 2-3 years due to MOP price weakness and increase in China exports
- Thereafter, Argus forecast increase to US\$554/t by 2040
- Mardie to attract product quality and freight netback premium to Argus forecast

## **Strong Customer Support for Mardie**



### **MOUs covering a significant proportion of initial sales**

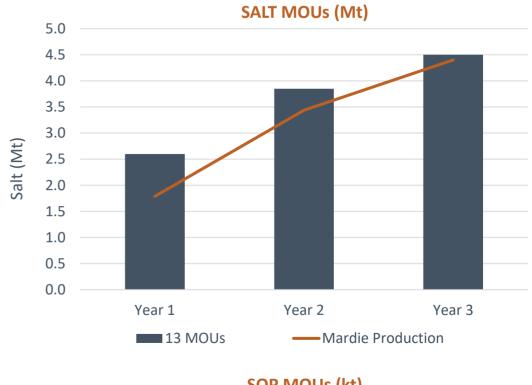
- 13 Salt non-binding MOUs signed throughout Asia covering >100% of first 3 years
- 2 SOP non-binding MOUs signed covering >75% of first 5 years
- Convert MOUs to binding offtake agreements during 2020/2021



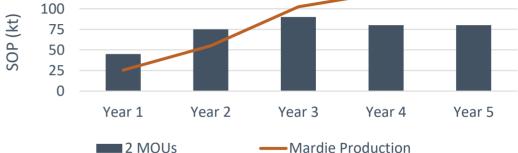
Support from Japan, China, Malaysia and others



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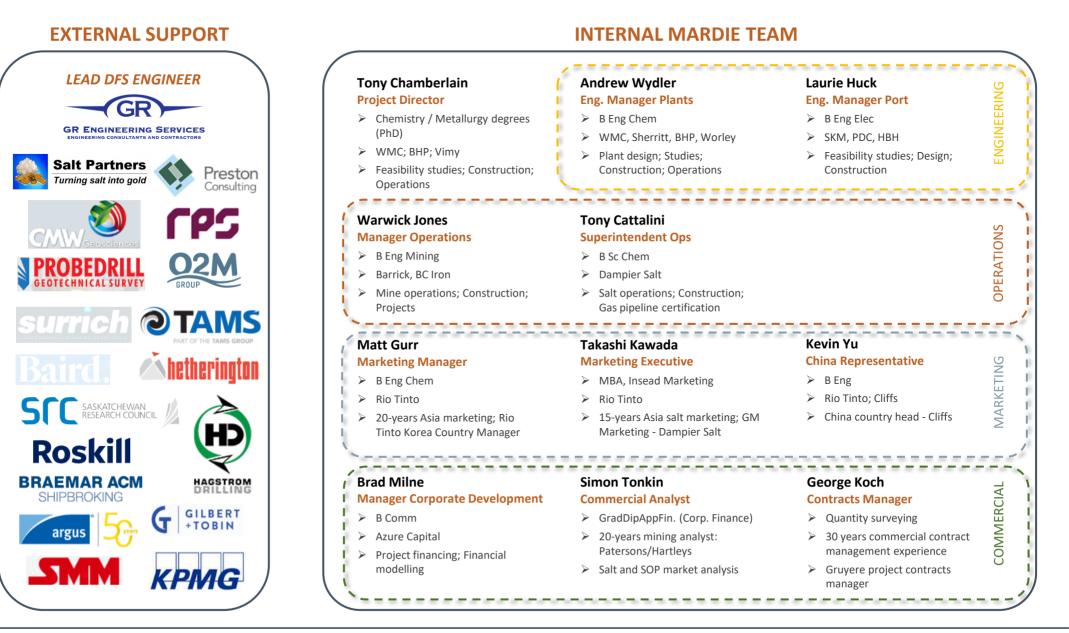
# SOP MOUs (kt)





## **MARDIE PROJECT TEAM**





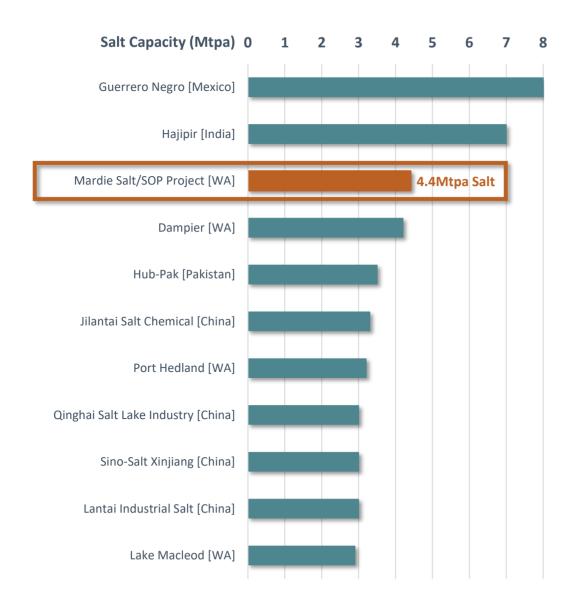


## **PEER COMPARISONS**

### Large Scale Salt Project



#### Top tier global solar salt project<sup>1</sup>



### **Project footprint vs Sydney/Perth**

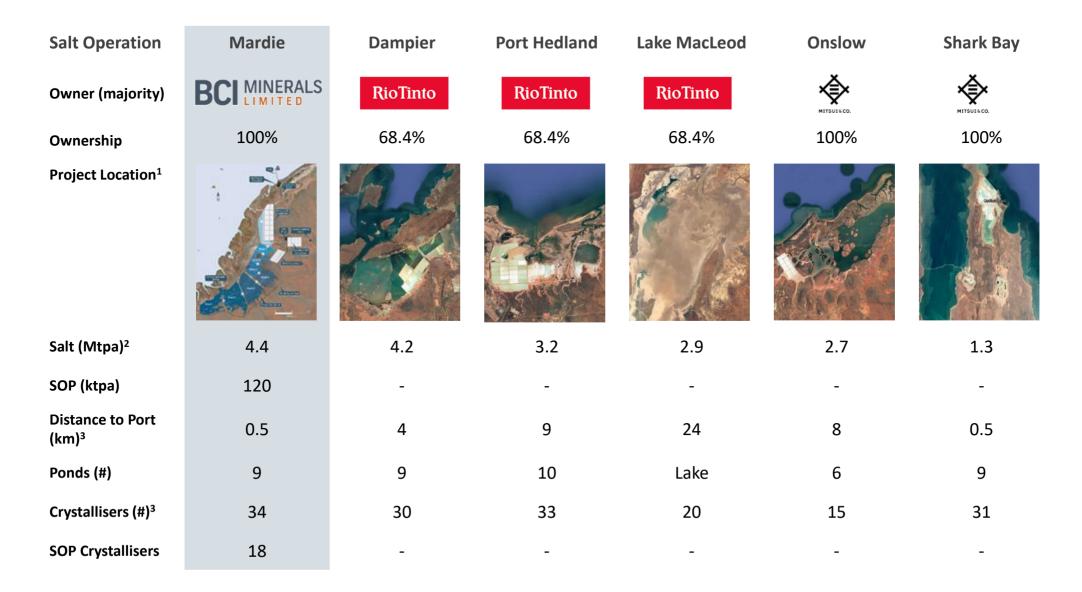




### **Australian Salt Peer Comparison**



#### Mardie will be the largest Australian solar salt operation



### **SOP Peer Comparison**



### Mardie compelling on several metrics (OPEX, EV/EBITDA and EV/prod)

	BCI MINERALS	SALT LAKE	KALIUM LAKES	<b>E</b> agrimin		REWARD MINERALS LTD
EV (\$M)1	34	230	117	109	33	31
Project	Mardie	Lake Way	Beyondie	Lake MacKay	Lake Wells	LD
Study Level	DFS	Construction	Construction	DFS	DFS	PFS
ASX Source Document	1 July 2020	11 October 2019	24 July 2019	21 July 2020	28 August 2019	13 July 2018 & 1 May 2018
Salt Sales(Mtpa)	4.4	-	-	-	-	-
SOP Sales (ktpa)	120 460ktpa SOP Eq.	245	90	450	150	407.5
Dis. to Port (km)	10	780	862	941	1003	850
Reported OPEX (A\$/t SOP)	310	355	291	273 <sup>2</sup>	385 <sup>2</sup>	376
Adjusted OPEX \$A/t AISC <sup>3</sup>	310	376	352	311 <sup>2</sup>	424 <sup>2</sup>	395
Reported EBITDA pa (\$M)	197	111	85	223	834	118
EV/EBITDA	0.17	2.07	1.37	0.49	0.40	0.26
EV/Production SOP Eq. \$/t	75	939	1,297	243	221	75

<sup>1</sup>As at 21 July 2020 <sup>2</sup>Converted at 0.68 FX <sup>3</sup>adjusted to be on a like-for-like basis with BCl's reporting basis, which includes marketing fees, all relevant royalties (state at 2.5% of revenue, native title and private) and sustaining capital <sup>4</sup>\$114M nominal (30 year average) converted to \$83M real basis



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