Robust Resources Limited

Manganese Scoping Study

Romang Island, Indonesia

May 2014

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1. EXECUTIVE SUMMARY

This scoping level study was completed on manganese (Mn) mineralisation located at the Lakuwahi project on Romang Island, Indonesia ("Romang Mn Project"). The main objectives of the scoping study ("Study") were to:

a) Establish the commercial viability of producing and exporting Mn ore products,
b) Identify key risks and any "fatal flaws" to Mn ore production and sales,
c) Assess marketing options and market entry strategy.

This Study concludes that the Romang Mn Project, despite being small-scale and short production life (~2-3 years), is commercially attractive with strong financial returns and no fatal flaws.

However, the manganese ores at Romang have "unique technical and marketing challenges" due to high levels of metal contaminants. The key risks are Environmental Risks due to metal contamination (both at Romang site and in customer applications) and Political Risks due to restrictions on Mn ore export by Government laws and regulations.

These risks are considered to be manageable by Robust Resources, though will need a simple, compelling Mn project development plan and clear, frequent and honest communications with all stakeholders. The key to success will be based on strong support and participation by the local communities on Romang Island and the Provincial Government in Ambon, Maluku.

Key Conclusions and Risks

Commercial: Summary of Financial Estimates for the Romang Mn project

CAPITAL COST	DESCRIPTION	VALUE US$ Million
Equipment	Dozer /excavators / trucks etc, crushing & screening plant, water treatment plant/s, QC laboratory	5.5 to 6.5
Mobilisation & Construction (working capital)	Barging equipment, ~8km road, loading jetties x 2, camp, mine site & plant, water storage & treatment	2.5 to 3.5
TOTAL		**8.0 to 10.0**
OPERATING COST	**DESCRIPTION**	**VALUE US$/t Mn Product**
Mining	Grade control, dozer ripping (if possible) with limited drill & blast, excavator & truck	4.00 to 6.00
Processing & QC/QA	Crushing & screening plant, production QA/QC	4.50 to 5.00
Truck Haulage & Loading	~8km mine to barge port stockpile	0.50 to 1.00
Barging	Tug, barges, floating crane or direct load containers	3.00 to 4.00
Shipping (SE. Asia or China)	Minimum 10,000 dwt & maximum 50,000 dwt	23.00 to 25.00
General & Office Admin	Salaries, Government Fees, Marketing etc	5.00 to 6.00
Contingency		2.00 to 3.00
TOTAL		**$42.00 to 50.00**
REVENUE	**DESCRIPTION (Production @ 200,000 tonne / year for 2 years)**	**VALUE US$/t Million**
Manganese Price >42% Mn	US$3.50-4.50 / dmtu cif (~$150-190/t @ 20% discount)	Negotiable
Gross Margin	~US$100 /t to $140/t Mn product	$20M to $28M / yr
Returns & Gross Revenue	**Payback <6 months, NPV/IRR not applicable**	**~$40-60 Million**

Cost estimates were obtained from mining industry sources, Indonesian-based engineering groups and current industrial mineral producers, including coal, nickel laterite, bauxite, sand & aggregate. The cost structures are largely dependent on production scale, configuration and schedule of Mn ore production eg. Contract mining v's owner operated, vessel size / type and loading rates (self-loading v's floating cranes). Financial estimates in this Study are +/- 30% (typical error), though have included a "foreign investment factor" of higher cost structure (mainly due to high administrative costs spread over the small production scale and due to project remoteness). No corporate tax or Government "royalties" (export taxes) have been included in estimates of gross revenue.

The Romang Mn Project has low commercial risk due to its low capital and operating cost structures, while enjoying relatively stable and high forecast Mn ore prices based on strong demand by the Chinese steel industry and limited supply options.

Key commercial risks relate to Mn product marketing, where production of poor &/or variable quality Mn products (compared to contract specification) would likely result in low Mn product sales price (discounts >20-50%) and limited acceptance or rejection of Mn product/s ie. revenue risk. ***Further, recent changes to Government export tax on mineral concentrate products represents a significant commercial risk (increased cost), whereas possible future revised / reduced tax rates are beyond Robust's control.***

Commercial returns for the Romang manganese project have been based solely on the indicated resource classification of the current manganese resource estimated by Mining Associates 6th May 2014 (Manganese Valley = 413,000 tonnes @ 41.6% Mn)

Deposit	Resource Category	Material (tonnes)	Mn Grade (%)	Mn metal (t)
Manganese Valley	Indicated	413,000	41.6	172,000
	Inferred	274,000	39.5	108,000
Batu Hitam West	Inferred	51,000	45.7	23,000
Total Resources		738,000	41.1	304,000

Importantly, the current inferred manganese resource will likely be increased and / or converted to indicated resource classification by ongoing exploration and evaluation studies, thereby may extend the mine-life for >2 years and increase commercial returns.

Further, additional high-grade >40% manganese mineralisation is likely to be discovered by ongoing exploration, while the commercial potential for beneficiation of low-grade 10-30% manganese mineralisation warrants evaluation.

Technical & Environmental:

Characterisation test work established an indicative Mn product specification (nominal +8mm lump product) as:

Major Elements:	Mn ~46%, Fe ~4%, Al_2O_3 <3%, SiO_2 <5%, P ~0.05%, S ~0.05, LOI ~11%
Minor Elements:	K_20 ~3%, CaO <2%, MgO <0.7%, Na_2O <0.3%, C <0.3%, Ba ~1.2%, Sr <0.3%, Pb ~0.8%, Zn ~0.7%, Cu <0.1%,
Trace Elements:	As ~0.7%, Sb ~0.08%, Tl ~0.07%, Cl < 0.02%
Others (~ppm)	Mo 90, Cr 23, Ni 30, V 38, Co 18, Cd 10, Hg 0.5, F 180, Li 6, B <50

Mn fines product (nom. -8mm) will have lower quality specification with higher contaminants

Estimate:	Mn 40-42%, Fe 5-8%, Al_2O_3 <3-5%, SiO_2 5-8%, P 0.05-0.08%, S ~0.05%, LOI ~11%

The indicative >40% Mn ore products from Romang are considered suitable for all ferroalloy applications due to their relatively high Mn content and relatively low content of major contaminants (iron, alumina, silica, phosphorus and sulphur). Minor contaminants (Pb, Zn, Ba, As, Tl, Cd etc) are most likely manageable by the customer (ferroalloy producers), especially upon blending of various Mn ore sources / types.

Characterisation test work on indicative Mn product/s (lump & fines) and preliminary market enquiries has identified that ***high levels of metal contaminants pose significant Environmental Risk and may limit the marketability of Mn products from Romang Island.***

Accordingly, this Study increased its focus on technical test work to better define the chemical and physical characteristics of indicative Mn products. The aim was to qualify the Environmental Risks and Market Risks of metal contaminants and provide options to mitigate such risks.

Key Environmental Risks include:

a) Arsenic (As) contamination of surface and groundwater related to Mn mining and processing on Romang Island
b) Thallium (Th) and "heavy metal contamination" (Pb, Cd, As etc) of flue dust wastes in ferroalloy applications (ie. air & water pollution)
(**Note: thallium is highly toxic, while heavy metals have residual long-term toxicity)

However, the environmental and market risk of metal contamination of Mn products is considered manageable with "best practice" production methods (including treatment of mining & process water) and "duty of care" regarding market customers.

Marketing:

China is the largest global market for Mn ore products with 2012 imports ~12.3Mtpy @ average $177/t (~$90-150/t for 15-30% Mn products up to ~$210/t for Australian >42% Mn products). Strong Mn demand is based on rapid growth in the Chinese steel industry, which uses Mn ferroalloys in production of carbon steels and electrolytic manganese metal (EMM) in production of stainless steel.

As such, China is considered to be the key target market for Romang Mn products due to its large size and flexibility (customer diversity), whereas traditional Mn ore markets such as Japan & Korea are conservative, slow and more difficult to enter for new suppliers (especially for an unusual, niche material).

A preliminary market survey of Chinese Mn ore customers was conducted by the Penfold Group (Shanghai) as input to this Scoping Study. The market study confirmed the suitability and firm interest from all market applications for indicative Mn products from Romang Island. Key target customers, representing ~30% of the Chinese Mn market, considered the indicative Mn products to be premium quality (ie. >40% Mn with low major contaminants), while the general consensus among customers was that minor contaminants were manageable in their production processes.

Indonesia has a very poor reputation in China as a supplier of Mn ore products due to a chequered recent history of highly variable product quality and unreliable delivery of ore shipments. Accordingly, as a small and new potential supplier, it is considered essential that Robust engage an experienced marketing agent for customer development, contract negotiations and to organize export / import administration of Mn ore shipments and/or domestic sales in Indonesia.

Chinese smelters are able to take low grade ores (Mn ~25%), though pricing paid is roughly 50% of that of premium ores. India and Malaysia are selling such material to China and end-users are always happy to take difficult materials if a discount justifies the business. This may open the opportunity for a lower grade Mn material or beneficiated Mn product from Romang Island.

Shipment sizes, or more specifically, single sales lots to ferroalloy customers, are normally in the range of 5,000wmt to 20,000wmt and Robust should focus on this range to limit risk.

To be clear, the Chinese Mn industry is suffering from production overcapacity that often leads to payment risk. As such, Robust should concentrate both their domestic and export sales of Mn ore products to larger, reputable customers rather than smaller customers or trading companies.

The Indonesian ferroalloy industry is relatively small and undercapitalised, though represents an opportunity for domestic sales of manganese ore products from Romang Island, especially in respect of emerging Indonesian Government policy of export bans, increased taxes and requirements for domestic processing and refining (smelting)..

In recognition of these Government policies, Robust Resources, (via its Indonesian operating company PT. Gemala Borneo Utama), has entered a Memorandum of Understanding with PT. Asia Mangan Grup (AMC) to work collaboratively on sales and purchase of manganese ore products relative to AMC’s smelting project in West Timor.

Logistics & Infrastructure:

Barging and transshipment of bulk mineral commodities is commonplace in Indonesia & SE. Asia, especially with rapid growth in the thermal coal sector in Kalimantan (exports >400Mtpy) and lateritic nickel exported to China for production of nickel pig iron (effectively a ferroalloy).

Several barging and shipping companies confirmed that no issues or risks are envisaged in export or domestic shipment of Mn ore products from Romang Island and provided indicative costs.

Government Policy:

A key risk to successful development of the Romang Mn Project relates to Indonesian Government Policy and Regulations that ban the export of mineral concentrates from 1st January 2014 and require domestic sales of concentrates or investment in "value-added domestic processing and refining".

With DPR and Presidential Elections in 2014, the Government does not want to do anything to alienate the voters who are generally anti mining and anti foreign investment. The Government is clearly struggling to find a face saving formula which both allows unprocessed metal and mineral exports to continue and does not completely undermine the Government's credibility in terms of its often stated unshakeable commitment to domestic processing and refining.

The Indonesian Government recently made its decision on how the export ban on unprocessed mineral products would be applied and enforced as of 12 January 2014.

Manganese has been assigned as a Category 1 Mineral and requires to be a 49% Mn concentrate to allow its export during 2014-2017. Further, that export taxes have been applied on Category 1 Minerals whereby the export tax on manganese concentrate (≥ 49% Mn) is H1'14 20%, H2'14 20%, H1'15 30%, H2'15 40%, H1'16 50%, H2'16 60%.

However, the view of both the Indonesian mining industry (legal & policy experts) and the author of this Scoping Study is of a likely scenario that the Government will progressively relax these onerous new conditions of the export ban during late 2014 or early-mid 2015 ie. post presidential election and due to pragmatic response to sensible, reasoned lobbying by industry stakeholders and international investment community, including:

- ***a) Reduced export tax rates (10-15%),***
- ***b) Reduced ore grade (~45% Mn) or apply quotas on amount (tonnage) that can be exported,***
- ***c) Regularly evidence that companies are taking towards domestic processing and refining,***
- ***d) Extend the deadline for start of domestic processing & refining (~2020) or reduce the level of domestic processing & refining.***

Recommendations

- **Conduct a Feasibility Study on Mn ore production at Romang Island including:**

a) **Exploration & Resource –** infill & metallurgy drilling (planned & proposed August'13)
b) **Metallurgy –** sighter melt tests @ CSIRO Melbourne to determine deportment of metals
c) **Characterisation Tests –** QXRD, product solubility & physical properties eg. breakage etc
d) **Environmental ("key") –** qualify risks of As, Tl and heavy metal contamination
e) **Mining, Processing & Production Plan –** engineering design, scale & production schedule
f) **Logistics, Infrastructure & Shipping –** options study and cost / benefits analysis
g) **Marketing –** assess Indonesian market, conduct customer trials, obtain indicative sale terms
h) **Government Policy, Regulations and Community Relations ("key")**
i) **Commercial & Financial Model**

Estimated completion by end 2014 (or ~8 months from study commencement)
Estimated Total Cost of Feasibility Study = ~$1.2 million to maximum $1.5 million
(Note: Attributable Cost is ~$800,000 to $1.0 million if ~$400-500K is re-allocated for exploration, environmental & secondment of PT. GBU personnel from ROL's Romang overall base / precious metal exploration budget)

Main cost components (estimated range):

- Resource drilling & assay (nom. ~$250-300,000 & cost re-allocation),
- Resource estimate (~$40-60,000),
- Characterisation Tests (~$50-70,000) & Metallurgy (~$50-65,000)
- Environment (~$70-80,000 & cost re-allocation = baseline water / soil surveys & research re water treatment as part of overall EIS),
- Production plan** (~$340-430,000 consulting engineers – civil, mining, processing),
- Logistics & transport** (~$30-50,000 marine survey),
- Marketing (~$40-50,000 domestic sales or ~$50-90,000 export via agency agreement),
- ROL personnel (~$100-120,000 & cost re-allocation = technical, admin. / commercial),
- Feasibility study manager (~$230-250,000 consultant ~8 months incl. expenses)

(Production plan & logistics possibly @ pre-feasibility study level that may require additional ~$250K expenditure to achieve feasibility study level, especially for seasonal hydrology surveys)**

- **As above & to reinforce, a detailed Environmental baseline study needs to be conducted as an essential part of the Mn Feasibility Study and to mitigate against Environmental Risk and potential related Legal Risk.**

- **Overall Project Risk needs to be managed by formulating a simple, compelling Mn project development plan and by clear, frequent and honest communications with all stakeholders. The key to success will be based on strong support and participation by the local communities on Romang Island and the Provincial Government in Ambon, Maluku.**

- **Consider conducting beneficiation test work on 10-30% low grade Mn mineralisation in order to increase the Mn resource base, with potential to significantly improve commercial outcomes of the Romang Mn Project.**
  Estimated Cost = $30-50,000

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2. INTRODUCTION

This is an independent report on newly defined manganese mineralisation of the Lakuwahi Project located on Romang Island, Maluku Province, Indonesia.
Romang Island is located in the Maluku Province of East Indonesia, 2,350 km east of Jakarta and 435 km south of the provincial capital of Ambon, and 500km north east from Kupang, West Timor.

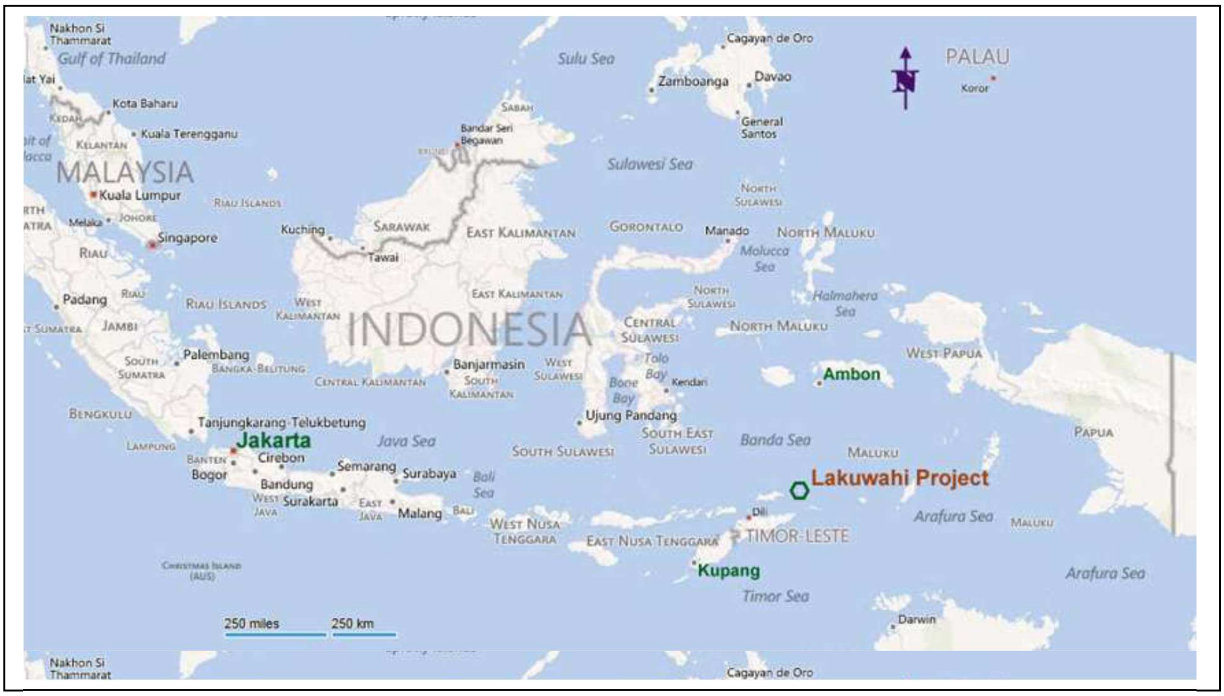

Figure 1: Regional Location: Lakuwahi Project on Romang Island, Indonesia (Source after Bing Maps 2013)

2.1. Scope of Work and Objectives

At the request of Mr Gordon Lewis, Director and Chief Operating Officer of Robust Resources Limited **(“Robust”)**, Equant Resources Limited **(“Equant”)** was commissioned in May 2013 to conduct an independent review and complete a scoping study **(“Scoping Study”)** on manganese mineralisation **(“Mn”)** located on southern Romang Island, Indonesia. The aim of this scoping study is to assist Robust with their evaluation of development options for export of manganese-rich products.

Equant has provided consulting services and prepared this Scoping Study report including:

a) Review of the internal project information, site visit, periodic progress updates and recommendations.
b) Preliminary test work on material characterisation and indicative product specifications,
c) Technical marketing and preliminary market surveys ***(key focus)***, logistics & export / import policies, environmental & community, cost structures and commercial evaluation.

Key objectives of this Scoping Study were:

a) Establish the commercial viability of producing and exporting manganese-rich materials.
b) Qualify the technical aspects of the manganese mineralisation and production methods.
c) Identify marketing options, key customers and propose a market entry strategy ***(key focus).***
d) Conduct the manganese study in conjunction and complementary to other project studies.
e) Advise on manganese project development options, value drivers, risks & opportunities.

Work on the Scoping Study was conducted by David Turvey, for and on behalf of Equant, in association with Penfold Limited **(Penfold)**, a Hong Kong registered company involved in marketing of mineral concentrates and smelter co-products, and trading and investment in minerals and metals industries. Penfold has expertise in Asian markets with a head office in Shanghai, China and representation in Tokyo and Seoul.

Based on input and guidance of Equant, parts of the Scoping Study report have been prepared or arranged by third party contributors, as detailed in the document. The contents of those parts have been generally reviewed by Equant for inclusion into the Report, though they have not been fully audited or verified.

2.2. Information Used & Competent Person

This report is based on technical data provided by Robust to Equant. Robust provided open access to all the necessary records and relevant personnel, in the opinion of Equant, to enable a proper initial assessment of the manganese mineralisation at the Lakuwahi project, Romang Island, Indonesia.

Additional relevant information was acquired independently by Equant from a variety of sources, including Intertek Laboratories (Jakarta, Indonesia & Perth, Australia). The Intertek Laboratory (Jakarta) has been used by Robust Resources for all routine chemical analytical work on samples of manganese mineralisation and host rocks from the Lakuwahi project, Romang Island.
This information was used to expand on the information provided by Robust and, where appropriate, confirm or provide alternative assumptions to those made by Robust.

The Scoping Study was conducted and supervised by Mr David Turvey, who is a Director and principal consultant of Equant Resources Pty Ltd (ABN: 78 109 269 105) and based in Adelaide, Australia. Mr Turvey visited Romang Island to inspect the manganese mineralisation from the 15th to 22nd May 2013, followed by a visit to Robust's Jakarta office to discuss and obtain information on logistics and mining regulations from 22nd to 25th May 2013.

Mr Turvey has experience relevant to evaluation and development of industrial mineral deposits under consideration (ferrous metal ores) and to the activity which he is undertaking to qualify as a Competent Person as defined in the 2012 Edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Turvey consents to the inclusion in the report of the matters based on his information, data interpretation and opinions in the form and context in which it appears. Mr Turvey holds a Bachelor of Science with Honours in Geology and is a Member of the Australasian Institute of Mining and Metallurgy.

3. ROMANG SITE VISIT and PRELIMINARY DATA REVIEW

The Lakuwahi project site on southern Romang Island was visited from the 15th to 22nd May 2013 in order to:

a) inspect the manganese mineralisation (Mn) at the Manganese Valley / Batu Hitam East prospect (main Mn mineralisation) and the Batu Hitam West prospect - both surface outcrops and diamond drill core,
b) conduct preliminary assessment of the manganese assay database and related geological and assay data,
c) meet the geology team on Romang Island and give overview presentations on the proposed Scoping Study, including technical evaluation of manganese "direct shipping ores" ("DSO") and global manganese markets (applications & customers).

The site visit was organized and accompanied by Mr Joseph Ogierman – Exploration Manager, Reliance Resources & Robust Resources with assistance from Jakarta and site-based administration personnel, especially Ibu Vika Ilinda.

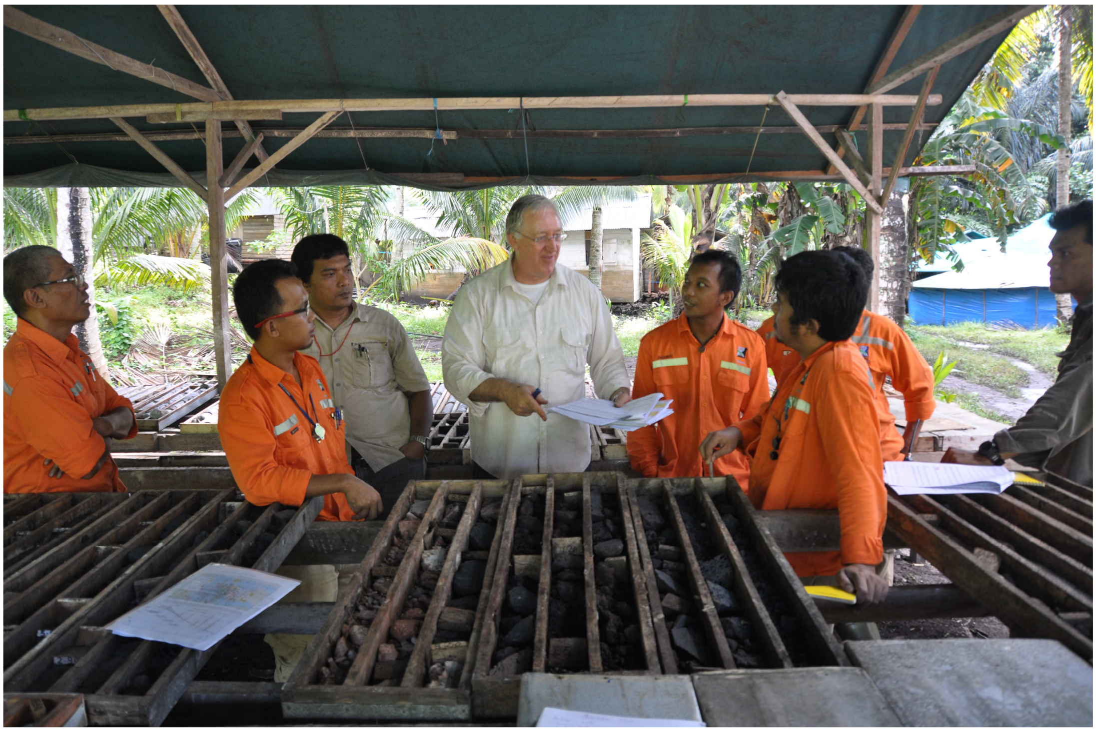

Figure 2: Manganese Technical Presentation to Indonesian Geology Team, Romang Island

3.1. Manganese Mineralisation, Exploration and Resource Potential

The majority of surficial manganese oxide mineralisation at the Manganese Valley / Batu Hitam East and Batu Hitam West prospects occurs as hydrothermal replacement within limestone and to a much lesser extent in intermediate volcanic rocks.
Recent geological observations and interpretation by Joseph Ogierman, Adriaan van Herk and the Indonesian geological team forms the basis of current understanding of the geological controls and distribution of manganese mineralisation on Romang Island. – refer Appendix 1.1 & 1.2.

Hydrothermal systems associated with volcanogenic massive sulphide deposits (“VMS”) are commonly characterised by multistage mineralisation events which can form economic concentrations of lead (Pb), zinc (Zn) and copper (Cu). Various commodities including manganese (Mn) and barite (Ba) are often related to VMS deposits and have on occasion been mined as commercially viable deposits in their own right.

Ogierman (2013) proposed that manganese-rich mineralisation at Lakuwahi is representative of the final stages of the hydrothermal system. It is likely all mineralisation events at Lakuwahi formed at the seafloor interface or in the sub seafloor environment, triggered by mixing of rising hydrothermal fluids and cooler seawater. High-grade Au – Ag + base metals associated with a barite-rich horizon at the top of the Lakuwahi Volcanics appear to be the peak of the main mineralising event.

Forty-four diamond drill holes at the Manganese Valley / Batu Hitam East and Batu Hitam West prospects have intersected manganese mineralisation containing greater than 30 % Mn. Many of the drill holes have dual exploration targets, the surficial Mn mineralisation and the deeper polymetallic mineralisation (Pb, Zn, Cu +/- gold & silver). The HQ and NQ core is cut in half using a diamond saw (100% of core recovered) and half of the core is submitted for analysis at a recognised independent laboratory. Maximum core sample interval is 2 m and the minimum sample interval is 0.5 m. A photographic record of the original whole core is taken immediately the core is transferred from the drilling rig to the core shed.

Initial field observations and evaluation of the manganese mineralisation database and drill core indicated that ~400,000-500,000 tonnes containing >40% Mn occurs at Manganese Valley / Batu Hitam East and Batu Hitam West prospects. The size, distribution (surficial) and % Mn grade of the manganese mineralisation was considered to have sufficient potential to warrant detailed evaluation of a mining and processing operation for production of Manganese “Direct Shipping Ore” (DSO) ie. High quality with relatively low contaminants.

An updated manganese resource estimate was conducted by Mining Associates Pty Ltd (Brisbane) and reported on 6th May 2014 – refer Appendix 1.3 (Robust ASX announcement 13/05/2014). The manganese mineral resource was reported in accordance with JORC 2012 guidelines as follows:

Deposit	Resource Category	Material (tonnes)	Mn Grade (%)	Mn metal (t)
Manganese Valley	Indicated	413,000	41.6	172,000
	Inferred	274,000	39.5	108,000
Batu Hitam West	Inferred	51,000	45.7	23,000
Total Resources		**738,000**	**41.1**	**304,000**

The exploration drilling and surface geological mapping at Manganese Valley / Batu Hitam East and Batu Hitam West prospects show that manganese mineralisation extends beyond the current JORC resource area. Further exploration drilling is likely to increase the Mn resource base with a potential target of up to 1 million tonnes @ >40% Mn, which is considered to be the minimum quality for a saleable / export Mn product.

In addition, significant quantities of manganese mineralisation containing 10-40% Mn has been identified in exploration drilling at both Batu Hitam (East & West) and other prospect areas at the Lakuwahi project, Romang Island eg. Batu Mas prospect. This “low grade” manganese contains relatively high levels of contaminants (eg. soil, limestone, weathered volcanics / clay) that would require processing (beneficiation) in order to reduce these contaminants and produce a saleable Mn product (ie. nominally >40% Mn).

Additional exploration drilling, geological modeling, resource estimates and beneficiation / metallurgical test work is required to determine the economic potential of the low-grade Mn mineralisation at the Lakuwahi project. An exploration target for low-grade Mn mineralisation is suggested to be 1-3 million tonnes @ 10-30% Mn, which upon beneficiation may produce an additional 0.5-1.5 million tonnes of saleable >40% Mn product

3.2. Re-assay of Pulps & Sampling ¼ HQ Diamond Drill Core

Based on initial assessment of the Mn database and observations on drill core, sample intervals of manganese mineralisation containing >30% Mn were selected for characterisation test work in the Scoping Study as follows:

d) Re-assay of Pulps @ Intertek Jakarta to determine indicative Mn product specification

e) Re-sampling ¼ HQ drill core for Characterisation Tests @ Intertek (Perth)**

Sample lists were compiled and the Indonesian geology team prepared documentation and conducted sampling as instructed where sufficient remaining samples were available. Sample submission sheets and background instructions are attached in Appendix 2.

**** Note: the representivity of these samples is somewhat questionable because the core had previously been sampled for assay test work (ie. ½ core remained).**

This previous sampling may have introduced some sampling bias by collection of greater volume of hard, competent materials compared to fine materials. Also, the original core recovery was quite variable due to frequent voids and competency contrasts.
However, on comparison with photographs of original whole core, the original sampling appears to have been conducted in a quite professional, systematic and adequate way.
The samples are the “best available” and are considered to be relatively representative of the manganese mineralisation.

As such, future QC/QA checks are highly recommended by drilling ~10% twin HQ holes for comparison of physical & chemical properties of the manganese mineralisation.

Several drill holes containing strong Mn mineralisation were not re-sampled for characterisation tests as only limited core remained following several previous sampling campaigns for assay and metallurgical test work. The remaining ¼ core in these holes was considered “too precious” and was therefore retained on site for future record / use.

4. TECHNICAL CHARACTERISATION TEST WORK

The aim of the technical characterisation test work was to:

a) Establish key physical and chemical properties of "Direct Shipping Ore" Manganese products / material (DSO), nominally >40% Mn
b) Determine any "fatal flaws" in properties of >40% Mn DSO material, particularly regarding heavy metals contaminants (base metals Pb + Zn + Cu, Ba, As, Cd, Tl etc)
c) Provide preliminary information for marketing of Mn product/s ex Romang Island

Characterisation test work included:

- Re-assay of Pulps @ Intertek Laboratory, Jakarta

- Assay & physical tests on ¼ HQ drill core @ Intertek Laboratory, Perth including:

  - Size Distribution & Assay Deportment
  - Solubility
  - Volatiles
  - Mineralogy

All splits, residues and pulps of ¼ core Mn samples remain at Intertek Laboratory in Perth, where the principal contact is Mr. John Flynn – General Manager & Business Development Manager (Mobile Phone: +61 419 985 516, Email: john.flynn@intertek.com).

It is important that these Mn samples be retained for use in later characterisation tests or compiled as bulk samples for sighter metallurgy test work (melt tests) &/or application trials at potential customers as part of Mn marketing strategy.

Background information, assay data, characterisation test results and interpretations are included in Appendix 2.

4.1. Indicative Manganese Product Specification

The aim of this characterization test work was to determine the indicative specification of >40% Mn "Direct Shipping Ore" product/s @ nominal 30% cutoff grade and identify any contaminants that would limit the marketability of Mn product/s.

Test work included multi-element assay of existing Mn pulps (Jakarta) and volatile element assay on selected ¼ Mn core samples (Perth).

The indicative specification was calculated by averaging the chemical assay results for selected composite sample intervals for the existing Mn pulps and the weighted average assay results for volatile elements on equivalent sample intervals of ¼ core samples (that had not undergone heat treatment).
Assay data, test results and interpretations are included in Appendix 2.2 Characterisation Tests: Indicative Specification @ 30% Mn cutoff.

Conclusions & Comments:

a) **Indicative Mn Product Specification** **(estimate for Mn lump product @ nom. +8-80mm)

Major Elements: Mn ~46%, Fe ~4%, Al_2O_3 <3%, SiO_2 <5%, P ~0.05%, S ~0.05, LOI ~11%

Minor Elements: K_2O ~3%, CaO <2%, MgO <0.7%, Na_2O <0.3%, C <0.3%, Ba ~1.2%, Sr <0.3%, Pb ~0.8%, Zn ~0.7%, Cu <0.1%,

Trace Elements: As ~0.7%, Sb ~0.08%, Tl ~0.07%, Cl < 0.02%

Others (~ppm) Mo 90, Cr 23, Ni 30, V 38, Co 18, Cd 10, Hg 0.5, F 180, Li 6, B <50

** Note: Mn fines product (nom. -8mm) will have lower quality specification with higher contaminants (yet to be determined)
Estimate: Mn 40-42%, Fe 5-8%, Al_2O_3 <3-5%, SiO_2 5-8%, P 0.05-0.08%, S ~0.05%, LOI ~11%

"An indicative manganese product specification of >40% Mn is considered suitable for all market applications" due to relatively low major contaminants, while minor and trace metal contaminants are likely manageable by the customer (though may incur a price penalty and pose unacceptable environmental and legal risk).

b) High Manganese material (Mn >45%) contains very low major contaminants, whereas 40-45% Mn has variable distribution, content and type of major, minor & trace element contaminants.

c) The Iron content (Fe 0.2-10%, average 4%) is relatively low and suitable for all ferroalloy market applications ie. Mn : Fe ratio >4:1 However, high iron material (Fe >5% up to 10-15% Fe) has a moderate to strong correlation with high levels of **As, Sb and Tl which may represent a significant environmental issue and risk.** High and variable iron content (Fe >10% +/-5%) is considered to be a major contaminant in the Mn ore product and an issue in ferroalloy market applications, so Fe distribution and variability is important to monitor in production QA/QC in order to deliver a consistent Mn product to customers.

d) Major contaminants are CaO (limestone), Fe (iron oxides, clay, jarosite / alunite) and Al_2O_3 + SiO_2 (soil, weathered volcanics / clay) = key elements for mining grade control, processing quality control (QC), and product QA/QC

The Alumina (Al_2O_3 0.2-5% average ~2.0%) and Silica (SiO_2 0.4-10%, average 3.6%) are considered to be low and suitable (desirable) for all Mn market applications, though require to be monitored and controlled in production QA/QC to ensure consistency of Mn ore product/s.

e) Phosphorus (P) and Sulphur (S) contents are low, relatively consistent and suitable for all major market applications / customers. They remain key elements for product QA/QC, so variability and content must be monitored during production.

f) Loss on Ignition (LOI) varies with limestone (CaO) content, while high and variable CaO could be an issue in certain market applications eg. high off-gas generation in ferroalloy production may "blow the top out of furnaces"

g) The Potassium content (K_2O ~3%) indicates >50% cryptomelane as the dominant Mn mineral phase. Lower K_2O : Mn & LOI ratios occur at depth, which suggests some surface weathering of manganese rich material to Mn oxides > mixed oxide / hydroxide.

h) The Calcium content (CaO 0.2-15%, average 1.2%) is highly variable due to contamination by limestone ie. manganese mineralisation @ <40% Mn includes only partial replacement of limestone. The CaO content would not represent an issue in ferroalloy production as it commonly occurs in manganese ores and is often added as a fluxing and slaging agent. However, CaO is potentially a major contaminant in the Mn product, so variability of CaO is important to monitor in production QA/QC in order for production of a consistent Mn product.

i) The Magnesium (MgO ~0.64%), Strontium (Sr ~0.27%) and Carbon (C ~0.23%) contents are related to CaO content and limestone contamination of Mn mineralisation. There appears to be variable dolomitisation of the limestone (CaO : MgO ratios) as part of the Mn mineralisation process and there is a moderate correlation between MgO and Na_2O.

j) Barium (B) and Sulphur (S) have a poor correlation when Ba <1%, indicating virtually all of the Ba occurs in the mineral phase - hollandite ($BaMn_8O_{16}$) and in lattice substitution in cryptomelane (~5% Ba in KMn_8O_{16}). Whereas a moderate correlation occurs between Ba & S when Ba >1% indicating the presence of barite (BaSO4).

k) The base metal content Lead + Zinc + Copper (Pb + Zn + Cu ~1.6%) is very high compared to most export quality Mn ores, including BHP Billiton's Mn products from Australia (Groote Eylandt) and Africa (Wessels & Mamatwan).

These base metal contaminants can cause significant issues for ferroalloy producers (Mn ore customers) as they will predominantly report to flue dusts as a waste material and may cause pollution + environmental issues. However, they are typical (albeit at lower concentrations) and manageable in the ferroalloy production process. They may be viewed and negotiated by ferroalloy customers as a price penalty, especially in soft or weak markets. As such, they will require significant marketing input in order to minimize their commercial impact.

l) Zinc (Zn) is commonly depleted in near surface Mn mineralisation (0-3m) relative to deeper mineralisation. Zn and Cadmium (Cd) are strongly correlated, while lead (Pb) and Thallium (Tl) correlate moderately - strongly. Both Cd & Tl may represent environmental issues for ferroalloy producers, though this will depend on their extraction efficiency and management of flue dust wastes.

m) **The Arsenic content (As ~0.7%) is very high compared to most export quality Mn ores and may represent a significant environmental issue and risk.** Therefore, the behavior of As in Mn ore production and in market applications must be better / clearly understood and warrants detailed investigation.

Arsenic is expected to be relatively soluble, especially when associated with jarosite $KFe_3(SO_4)_2(OH)_6$ and related mineral phases such as alunite (K, Na)$Al_3(SO_4)_2(OH)_6$ and akrochordite $Mn_5(AsO_4)_2(OH)_4(H_2O)_4$. There is a significant risk of contamination of the environment from arsenic during mining and processing operations, including contamination of drinking water in aquifers and surface sources.

Logically, arsenic will predominantly report to flue gas in the production of ferroalloy, though a proportion may behave like phosphorous and report to the metal / product. If so, this would be an issue for ferroalloy and may impact on the marketability of Mn ore products from Romang.

n) The Antimony content (Sb ~0.08% or 800ppm) has a moderate correlation with arsenic and iron, especially at the Batu Hitam West prospect.

o) The Thallium content (Tl ~0.07% or 700ppm) of the manganese mineralisation is very high relative to global ore deposits and compared to all export quality Mn ores. **"The high thallium content may represent a significant environmental issue and risk".** Therefore, the behavior of Tl in manganese ore production and in market applications must be better / clearly understood and warrants detailed investigation.

p) The Cadmium content (Cd 2-90 ppm, average ~10ppm) and Mercury (Hg 0.06-5.7ppm, average ~0.45ppm) are considered to represent low to moderate environmental risk in ore production and market applications. However, distribution of elevated Cd and Hg should be identified and monitored during Mn ore production (QA/QC checks).

q) The Fluorine content (F 97-327ppm, average 182ppm) is considered suitable for ferroalloy market applications and is similar to BHP Billiton's Australian Mn ores (specification @ F<0.02%).

r) Other contaminant elements are relatively low and suitable for all market applications eg. Mo 90, Cr 23, Ni 30, V 38, Co 18, Li 6, B <50 ppm

"Opportunity"

- The indicative manganese product specification >40% Mn is considered suitable for all market applications and represents a significant commercial opportunity, subject to mining approvals and mitigation of environmental risks.

- Thallium is a highly valuable material @ price ~$6.8/g Tl metal and may be recoverable from waste streams of market applications. Nominally the thallium value of Mn ore = **$4,760/tonne** ie. ~700g/t Tl @ $6.8/g, despite a small / tiny global market ~10-15tpy or US$70-100M/year.

"Key Risks"

- **Quality and consistency of Mn ore product/s specification is essential to enable effective marketing and to maximise commercial returns = "Market Risk".**

- **Environmental Risk & possible Legal Risk are considered to be high related to arsenic (As) contamination of groundwater and drinking water (Romang site & local community) and heavy metals contamination (especially Pb, As, Tl, Cd) in flue dust waste streams in ferroalloy market applications.**

Recommendations:

a) Conduct detailed infill drilling and resource estimates on manganese mineralisation at Manganese Valley / Batu Hitam East and Batu Hitam West, including geochemical domaining to understand the distribution and content of major, minor and trace contaminants. This information as input to ongoing project evaluation and development studies, especially mining and production QA/QC to provide Mn product consistency, minimize environmental risks and maximise commercial outcomes.

   Complete twin HQ drilling (~10% or 8-10 holes) for Mn resource and reserve QC/QA and complete PQ drill holes (~10 holes) for metallurgy test work on physical & chemical properties and to provide bulk composite samples for possible customer trials.

   Note: Details of these recommendations were made in Periodic Reports to Gordon Lewis and Robust's Board – refer to Appendix 5.
   This work program was proposed and initiated in late September – early October 2013 with completion scheduled by ~end March 2014 depending on exploration priorities.

b) Conduct preliminary metallurgy sighter tests (melt tests @ CSIRO Melbourne) to provide information for marketing and environmental studies, especially the deportment of heavy metals and volatile elements (Pb, As, Tl, Cd etc).

c) Conduct detailed test work and environmental studies on heavy metals and volatile elements (especially Pb, As, Tl, Cd and Hg) including solubility and remediation of arsenic (As) from the Mn production process and understanding of waste streams from market applications (eg. potential recovery & marketing ferroalloy flue dusts, EMM residues).

d) Continue and increase marketing of indicative Mn product/s = essential for new Mn producer, successful entry of new niche Mn product/s and commercial success.

e) Complete a feasibility study on production of Mn ore product/s from Romang Island, possible by end September 2014 (or ~8 months after commencement).

4.2. Size Distribution & Assay Deportment

The aim of this characterization test work was to determine the size distribution and assay deportment at nominal 3.35mm crush size for >40% Mn "Direct Shipping Ore" product/s @ nominal 30% cutoff grade.

Results may identify contaminants that would limit marketability of Mn product/s and provide background information for future Mn project development studies, especially regarding environmental risks, production (mining, processing, transport) and Mn product/s marketing (eg. requirement / benefits of lump &/or fines products and any price differential).

Test work involved sample preparation and assay on selected ¼ Mn core samples at Intertek Laboratory, Perth. Samples were split to retain ~100g in quarantine storage, while the remainder was oven dried @ ~150^{o} C prior to jaw crushing to minimize generation of fines. Samples were then wet screened at 3.35mm, followed by weighing and assay of +/- 3.35mm size fractions.

Assay data, test results and interpretations are included in Appendix 2.3: Characterisation Tests: Screen Assays & Deportment +/- 3.35mm

Conclusions & Comments:

a) Wet screen results @ 3.35mm indicate ~48% material reports to +3.35mm size fraction (nominal lump product), whereas ~52% reports to -3.35mm size fraction (nominal fines product). Due to the questionable representivity of ¼ core samples (bias introduced by previous sampling), it is anticipated that a slightly higher lump : fines ratio (nom.60:40) will be achieved in mining & processing operations.

   Generally, the main manganese ores producers and exporters have both lump & fines products. Mn lump ore products tend to be higher grade than Mn fines products (high Mn% and lower major contaminants), though do not necessarily command a higher relative price depending on specific customer applications / technologies and type of contaminants. Production of lump & fines products is more to ensure production quality control, in order to normalize product consistency and optimize product marketability.
   As such, further market studies in conjunction with production studies (metallurgy & process design) are required to determine the optimal lump & fines size fractions for manganese mineralisation at Romang Island.

b) Generally, manganese shows a strong 5-10% deportment to +3.35mm size fraction, which indicates that a lump Mn product will contain higher % Mn than a fines product (perhaps 3-4% higher) and consequently lower major contaminants. This deportment ratio is reversed where Mn mineralisation contains a high % CaO (limestone = hard) and/ or exhibits a high lump ratio (Mn mineralogy or hard, botryoidal habit).

   This may have implications on beneficiation of lower grade Mn materials (especially where Mn mineralisation has high clay contamination), though is not considered important in producing very high grade lump products (ie. >45% Mn) as they are unlikely to attract a market price premium.

Results for size distribution and assay deportment of major, minor and trace contaminants indicate a strong potential for beneficiation of low-grade 10-30% Mn mineralisation by screening and low cost gravity processing methods to produce a marketable Mn product @ nominally >40% Mn eg. Spirals &/or jigs.

Beneficiation will be dependent on rock / material type of contamination, with limestone being likely to be more difficult to remove compared to clay.

c) Iron (Fe) shows a strong 10-50% deportment to -3.35mm fines with a strong correlation to Al_2O_3, SiO_2, P, S, Ba, As and Pb + Zn. This strong deportment is considered to be due to the Mn mineralisation containing soil &/or weathered volcanic (clay) and friable iron oxides at surface (weathering +/- laterisation) or a subsurface oxidation front (ie. water table or supergene enrichment zone after weathered sulphide minerals).

These are all key contaminants in a Mn product specification and their distribution & content are important for mining grade control, processing quality control (QC), and product QA/QC. Crushing and screening (wet) will reduce these contaminants from a Mn lump product (thereby upgrading the quality) and increase these contaminants in a fines product.

If the fines product (nom. -8mm all in) contains too high contaminant levels for market acceptance, then additional wet screening @ nom. 2mm to waste material may be required – especially to reduce content & variability of Fe, Al_2O_3 and SiO_2.

d) As expected for surficial Mn mineralisation, Alumina (Al_2O_3) and Silica (SiO_2) shows a strong 10-50% deportment to -3.35mm fines except where there is a low lump : fines ratio ie. Friable Mn mineralisation. There is a strong correlation to Fe, P, S, Ba, As and Pb + Zn, which reflects the Mn mineralisation containing soil &/or weathered volcanic (clay) and friable iron oxides at surface (weathering +/- laterisation).

e) Phosphorus (P) generally shows 10-30% deportment to -3.35mm fines along with clays, except where high % CaO (limestone) occurs.

f) Sulphur (S) generally shows 10-50% deportment to -3.35mm fines along with clays and barite, except where alunite ($KAl_3(SO_4)_2(OH)_6$) &/or jarosite ($KFe_3(SO_4)_2(OH)_6$) occurs eg. LWD169 0-4.2m.

g) Loss on Ignition (LOI) shows minimal <2% deportment, generally to +3.35mm size fraction with a weak correlation with % CaO (limestone).

h) Potash (K_2O) generally shows 5-10% deportment to +3.35mm size fraction, except where high % CaO (limestone) and high lump : fines ratio. Mn has a strong correlation to K_2O indicating that cryptomelane reports to +3.35mm size fraction ((KMn_8O_{16} with a hard, botryoidal & massive habit), whereas hollandite ($(Ba, Pb, Fe)Mn_8O_{16}$) and pyrolusite (MnO_2) report preferentially to the -3.35mm size fraction (fine grained, radiating needle-like &/or granular habit)

i) CaO (limestone) generally shows 5-10% deportment to +3.35mm size fraction, especially where Mn mineralisation contains >3-20% limestone ie. Limestone is hard / tough and crushes to coarse aggregates, rather than fines.

There is a moderate to strong correlation between CaO : C : MgO ratios and deportment due to limestone ($CaCO_3$), dolomitised limestone and/or dolomite ($CaMg(CO_3)_2$) mineralogy.

j) Soda (Na_2O) generally shows 5-10% deportment to +3.35mm size fraction and a moderate correlation to Na_2O and Mn, possibly indicating partial substitution in cryptomelane.

k) Barium (Ba) generally shows 10-50% deportment to -3.35mm fine size fraction along with clays. Ba has strong correlation with S, Pb & Zn indicating barite association with base metal mineralisation.

l) Lead (Pb), Zinc (Zn) and Copper (Cu) generally show 10-30% deportment to -3.35mm fine size fraction along with clays, except where alunite &/or jarosite occurs eg. LWD169 0-4.2m

m) Arsenic (As) generally shows 5-30% deportment to -3.35mm fine size fraction with clays. Arsenic has strong correlation with Fe, antimony (Sb) and thallium (Tl).

n) Antimony (Sb) shows strong 5-30% deportment to -3.35mm fine size fraction with clays. Moderate correlation with Fe, As, Pb, Cu, Ba.

o) Thallium (Tl) P shows strong 10-20% deportment to +3.35mm lump size fraction with a strong correlation to Mn. This indicates that Tl occurs as lattice substitution in manganese minerals, cryptomelane ($K(Tl)Mn_8O_{16}$) or possibly hollandite ($(Ba, Pb, Tl, Fe)Mn_8O_{16}$)

As such, the high thallium content in the Mn mineralisation (~700ppm Tl) cannot be removed or reduced by simple, cost-effective beneficiation or processing. Thallium, as a low temperature & relatively volatile metal, is likely to follow lead in reporting to flue dust in ferroalloy production.

p) Cadmium (Cd) generally shows 10-20% deportment to -3.35mm fine size fraction with strong correlation with Zinc (Zn) and Lead (Pb) and moderate correlation to Ba, S (barite)

"Opportunity"

- Results for size distribution and assay deportment test work confirm the potential for beneficiation by screening of lump & fine Mn products, with possible mitigation of environmental risks.

  Further, it confirms the potential for beneficiation of low-grade Mn mineralisaton by screening and low cost gravity processing methods to reduce the content of major contaminants (Fe, Al_2O_3 and SiO_2 = "clays > limestone") and produce a marketable Mn product @ nominally >40% Mn eg. Spirals &/or jig.

Any additional Mn "beneficiation" products would likely improve the commercial returns by "increasing the economies of scale" in spreading cost structures over greater production and life of operations.

- Environmental risk of heavy metal contaminants (Pb, As, Cd etc) may be reduced and mitigated by removal of fine fraction (<2mm) to controlled waste disposal and by treatment of process water.

"Key Risks"

- **"Market and Commercial Risk" due to variable product quality and contaminant content leading to price discounting or rejected shipments.**

- **Environmental Risk & possible Legal Risk are considered to be high related to arsenic (As) contamination of groundwater (Romang site & local community) and heavy metals contamination (especially Tl, Cd) in ferroalloy flue dust waste streams (customer).**

Recommendations:

As per section 4.1, complete Mn resource & metallurgy drilling, additional characterization tests (eg. solubility on Mn products, key physical properties), metallurgy sighter tests, revised resource estimate, production planning and detailed environmental studies as part of a feasibility study during 2014.

Additional characterization tests on representative PQ metallurgy drill core should more accurately determine the key physical properties of Mn mineralisation and Mn product/s eg. Hardness / strength & work index, assay deportment on crushing & screening, bulk density, abrasion, handling properties etc).

Details of these recommendations were made in Periodic Reports to Gordon Lewis and Robust's Board – refer to Appendix 5

4.3. Solubility

The aim of the solubility test work was to determine the potential environmental risks and water contamination risks from heavy metals and toxic elements by Mn ore production at Romang, the transport /export of Mn ore products and in market applications.

Results identify contaminants that may create environmental issues and limit the marketability of Mn ore product/s. This background information should be used for future Mn project development studies.

Test work involved sample preparation and assay on selected ¼ Mn core samples at Intertek Laboratory, Perth (organized by Chief Chemist (Environmental) = Ann Evers).

Selected samples were taken of +/- 3.35mm sample splits for pulverizing to nominal 50 micron D50 particle size in order to maximize surface area and extraction of soluble elements. Samples for solubility test work were selected based on a spread of location (surface, mid & deeper subsurface at both Manganese Valley / Batu Hitam East and Batu Hitam West prospects) and indicative specification (low-high % Mn and major, minor and trace contaminants). These same samples were also used for XRD mineralogy in an attempt to identify major and minor contaminant mineral species.

Sample preparation and assay procedures reflect guidelines of USA and Australian Environmental Protection Authorities (EPA), which are industry standard practice for evaluation of water contamination at mining operations and processing facilities.
Solubility of Mn mineralisation was tested in:

a) Double Distilled Water (DDW)
b) Acidic Water @ ph5.0
c) Alkaline Water @ pH9.2

Solubility results were compared to USA EPA Drinking Water Standards (2004 & current) and Australian Drinking Water Standards to identify any potential environmental issues as a "worst case scenario" **(Note: Solubility test work was conducted on pulverized samples in order to maximize solubility & create a "worst case". The solubility of Mn mineralisation in the natural environment and normal ore production will likely be lower)**

Assay data, test results and interpretations are included in Appendix 2.4: Characterisation Tests: Solubility Tests (25% core @ Intertek Perth)

Conclusions & Comments:

a) Arsenic (As) content of solutes significantly exceeds maximum contaminant levels (MCL) for drinking water quality standards under USA EPA 2004 in all solubility tests ie. Distilled Water (DDW), Acidic Water (pH5.0) and Alkali Water (pH9.2).

   Arsenic represents a significant environmental risk in contamination of groundwater aquifers and surface water sources from mining of Mn mineralisation and production of Mn ore products.

   Arsenic concentrations in DDW averaged 26ug/l, which is ~2.6 times maximum contaminant level (MCL) of USA EPA 2004 (10ug/l & recommended 7ug/l).
   Arsenic concentrations were higher in pH5.0 solutes with average 37ug/l being ~ 4 times MCL, while concentrations were very high in ph9.2 solutes with average 7661ug/l (~7ppm) being ~800 times MCL.

   These results indicate that As solubility is quite sensitive to pH in being highly soluble under alkaline conditions. This suggests that the main Arsenic minerals are probably sulphates or chloride species or more likely as loosely bound suface phases or crystal lattice substitution in FeMn sulphate (jarosite) or iron-rich clays &/or Mn oxide/hydroxide species. The soluble arsenic mineral species are interpreted to be at equilibrium with their surface environment as solubility results are similar in neutral (DDW) and acidic (ph5.0) water, which is expected in tropical environments such as Romang.

Arsenic (As) shows a strong 2-3 times deportment to -3.35mm fines with a moderate to strong correlation to Sb, Ba, Ca and Mg. This strong deportment is interpreted to be due to the Mn mineralisation containing soil &/or weathered volcanic (clay) and friable iron oxides at surface (weathering +/- laterisation) or at a subsurface oxidation front (water table or supergene enrichment zone after weathered sulphide minerals).

There will likely be lower arsenic solubility from Mn products (lump & fines) compared to the pulverized test samples (due to lower surface area and contact / residence time). However, arsenic levels in mine & process waters are still likely to exceed EPA minimum standards (i.e. contaminated) and require remediation or treatment.

b) **All elements, except Arsenic (As), have lower contaminant levels in Double Distilled Water solutes than specified in USA EPA Minimum Contaminant Levels for Drinking Water.**

Most contaminant levels are significantly lower than US EPA Standards and do not represent an Environmental Risk.
This implies a relatively low solubility for most contaminant elements and that mining and processing using neutral pH water is unlikely to cause environmental issues for contamination of drinking water, other than for Arsenic.

c) **All contaminant elements show a strong deportment to -3.35mm fine size fraction.**
This indicates that wet processing (washing & wet screening) may significantly improve Mn product specification and mitigate environmental risks ie. Concentration & containment by treatment of process waste streams (process water & slime tailings).

d) Zinc (Zn) and Cadmium (Cd) concentrations in acidic water (pH5.0) solutes both averaged ~7mg/l, which is 2-3 times maximum contaminant level (MCL) of USA EPA 2004 (3ug/l & 2mg/l respectively). There is a strong correlation between Zn & Cd.

Zinc & Cadmium may represent an environmental risk in contamination of groundwater if acidic water is generated from mining of Mn mineralisation and production of Mn ore products ie. Acid mine drainage.
This risk is considered to be small – moderate and manageable via water quality monitoring.

e) Iron (Fe) has low solubility under all conditions.

f) Manganese (Mn) shows low-moderate solubility in acidic water (pH5.0) solutes where concentrations averaged ~14mg/l (no EPA MCL). Mn shows moderate correlation to Ba, Ca, Mg and a strong correlation in solubility with K_2O in acidic water (pH5.0) solutes. This suggests that some elements are slightly soluble from the main Mn mineral phases, either hollandite ((Ba, Pb, Tl, Fe)Mn_8O_{16}) or cryptomelane (KMn_8O_{16}) – particularly in acidic water.

g) Thallium (Tl) concentrations in acidic water (pH5.0) solutes are elevated in the -3.35mm fine size fraction and average 0.27ug/l, which is lower than the maximum contaminant level (MCL) of USA EPA 2004 (0.5ug/l). **As such, Thallium does not appear to represent an Environmental Risk in contamination of groundwater from Mn mining and processing on Romang.**

h) Antimony (Sb) concentrations in alkaline water (pH9.2) solutes averaged 8ug/l, which is ~8 times maximum contaminant level (MCL) of USA EPA 2004 (6ug/l). Sb shows a moderate to strong correlation with the solubility of arsenic (~800 times MCL in alkaline water).

Antimony may represent an Environmental Risk but only where alkaline water is generated in Mn mining and processing operations eg. Limestone quarries, road and stockpile bases where limestone aggregates are used. This risk is considered to be small and manageable with water quality monitoring.

i) Lead (Pb) and Thallium (Tl) are relatively insoluble and are unlikely to represent an Environmental Risk from groundwater contamination.

j) Solubility of other elements tested were low (significantly less than USA EPA Regulations) and are most unlikely to represent an Environmental Risk.

However, the multi-element assay data identified that volatile elements including Mercury (Hg) occur sporadically in the Mn mineralisation (maximum 5.4 ppm, average 0.45 ppm original samples & 0.25ppm on re-assay). Mercury contamination of surface water and groundwater from Mn mining operations may represent an Environmental Risk.

Opportunity

- Water treatment to remove arsenic contamination from mining / process water and surface / groundwater at both the Romang Mn operation and for the local community would make a significant contribution to Robust's Corporate Social Responsibility and mitigate environmental risk.

  Cost effective water treatment options are available and based on >30 years R&D by organizations including the United Nations (UNESCO re high arsenic groundwater in Bangladesh), CSIRO and the University of New South Wales. Recent pilot plant trials were successfully completed on high arsenic mine water at several Sb-As-Au mines located near Townsville, North Queensland (Curtain Brothers). These small, modular & transportable water treatment plants were shown to be cost effective and readily up-scaled to commercial operations.

- Solubility test work results confirm earlier size deportment tests in indicating the potential for beneficiation by screening of lump & fine Mn products, with possible mitigation of environmental risks.

Risks:

- **Environmental Risks and Legal Risks are considered to be "Very High" related to likely arsenic (As) contamination of surface water and possibly groundwater (Romang site & local community) from manganese mining and processing operations.**

- **Corporate and Commercial Risk are considered to be high if current arsenic (As) contamination of surface and groundwater is not quantified in the Environmental Impact Study, then if any identified As contamination is not removed by subsequent water treatment.**

  The Mn project &/or Mn operation may be stopped or indefinitely delayed by activism and negative press by Non Government Organizations' (NGOs) and subsequent disruptions from the local community and reaction by Provincial &/or Central Government.

Recommendations:

a) As a matter of priority, conduct detailed baseline water sampling and soil sampling of the Lakuwahi prospect, Southern Romang and the local communities for input to an Environmental Impact Statement (EIS) and Operations Plan as part of a Manganese Feasibility Study.

   All current sources of drinking water should be comprehensively tested to determine contamination levels relative to USA EPA Water Quality Standards (Drinking). Seasonal variation and routine monitoring of water quality should supplement the baseline water quality data.

b) Conduct solubility tests on indicative Mn lump and fines products for arsenic (+/- key potential contaminants including Pb, Cd, Tl, Hg etc) to determine possible water contamination from Mn mining / processing operations and for input to an Environmental Impact Study.
   Note: Results are likely to be lower than the original solubility tests, which were conducted on pulverized samples.
   These tests should also check if washing of Mn products (wet processing) significantly reduces arsenic & heavy metal content of Mn products.

c) Conduct desktop research to identify cost-effective water treatment options for removal of arsenic from mining / process water and groundwater / surface water in order to produce drinking quality water.

d) Conduct desktop research on potential Environmental Issues of Mn dust from mining / processing operations & consider options for dust mitigation.

4.4 Mineralogy

The aim of mineralogy test work was to identify the main manganese (Mn) mineral species and major contaminant minerals in >40% Mn mineralisation from the Lakuwahi prospect, Romang Island.

The test work was conducted using the Qualitative X-Ray Diffraction Method (XRD) at Intertek Laboratory, Perth (XRD Chemist = Sharon Ness).
The XRD test work was conducted on a selection of the ¼ Mn core samples that were used for solubility test work in order to compare and assist in interpretation of both test results. These samples were selected based on a spread of location (surface, mid & deeper subsurface at both Manganese Valley / Batu Hitam East and Batu Hitam West prospects) and indicative specification (low-high % Mn and major, minor and trace contaminants).

Results were expected to identify the main Mn mineral species along with major contaminant minerals (>10% volume) and minor contaminant minerals (<10%) and trace (<2%) contaminants. The results may provide direction for any additional test work required as input for future Mn project development studies and to help identify possible environmental issues and/or contaminants that may limit the marketability of Mn ore product/s.
It was recognized that XRD tests would only provide qualitative results due to the limited sensitivity and detection levels of the XRD method.

Earlier XRD mineralogy test work conducted as part of preliminary metallurgy studies in 2012 was reviewed, though original samples were not specific to >30% manganese mineralisation. As such, results of these Mn mineralogy tests were only indicative, though provided some guidance.

The XRD mineralogy report is included in Appendix 2.5: Characterisation Tests: XRD Mineralogy (25% core @ Intertek Perth)

Follow-up research was conducted on Quantitative X-Ray Diffraction Tests (QXRD) using CSIRO's QEMSCAN or equivalent methods. Preliminary discussions on procedures, likely outcomes and costs of QXRD were held with Dr David Tilley – Mineralogist, United Mineral Services, who is a recognized and recommended as an expert in the QXRD field with recent experience on Mn ores.

Conclusions & Comments:

a) The main Mn mineral species were identified as **Cryptomelane (KMn_8O_{16})** and importantly **Hollandite (Ba, Pb)Mn_8O_{16}** and **Pyrolusite MnO_2**

(Note: alternative mineral names that are commonly used in other literature for cryptomelane and hollandite are Psilomelene and Coronadite respectively).

b) In hydrothermal Mn mineralisaton (as per Romang), both cryptomelane and hollandite are reported in literature to contain quite high levels of base metal substitution in their mineral lattice structure (0.5-8% combined), including iron (Fe), lead (Pb), zinc (Zn) and likely Tl,

Cd, Mo etc in hollandite, whereas substitution of alkali elements is reported in cryptomelane (~1% Al_2O_3 + SiO_2 + Na_2O combined, likely in substitution for K_2O)
Note: these elements are bound within the manganese mineral structure and not as separate mineral phases ie. Not easily separated from the Mn minerals and therefore contained in the product chemical specification.

c) The major contaminant minerals are calcite ($CaCO_3$), barite ($BaSO_4$), hematite (Fe_2O_3) and Quartz (SiO_2 cf. clay Al_2O_3 + SiO_2)

Calcite is the main mineral phase in limestone. It is interpreted to be present either due to partial replacement of limestone by hydrothermal Mn mineralisation or by narrow, un-replaced limestone units in the sampled interval.

Hematite predominately reports to the -3.35mm fine size fraction and is interpreted to be associated with clay and secondary iron oxides +/- jarosite as a weathering product. In addition, hematite appears to occur as substitution in Mn oxide minerals or as a mixed, separate hematite phase where replacement mineralisation has occurred proximal to the hydrothermal vent (early stage, higher temperature replacement).

Barite was identified as a minor phase and reports predominately to the -3.35mm fine size fraction. As such, most barium in assay results of >40% Mn mineralisation is attributed to Ba substitution in hollandite, except where there is > 1.5% Ba.

Quartz was identified as both a major & minor contaminant mineral, though quartz is interpreted to more likely represent clay minerals as it reports predominately to -3.35mm fraction and the Al_2O_3 : SiO_2 assay ratios suggest that clays are present. Christobalite is tentatively recorded as a trace contaminant mineral in several samples and is recognised to commonly occur in volcanic related hydrothermal mineralisation systems.

d) Alunite ($(K, Na)Al_3(SO_4)_2(OH)_6$ and Akrochordite $Mn_5(AsO_4)_2(OH)_4(H_2O)_4$ were identified in drill hole LWD 169 located at Batu Hitam West prospect. This mineralogy correlates with high arsenic (As) and sulphur (S) in assay results for Mn mineralisation from Batu Hitam West.

Akrochordite was only tentatively identified by XRD, though may be present as a trace mineral in most Mn mineralisation at Romang. If so, this could explain the high arsenic content of Mn mineralisation (As ~0.7%) and the apparent high water solubility of arsenic. Alternatively, arsenic may substitute for barium in the hollandite structure and may be partially soluble.

e) Several "skarn" minerals were identified as trace contaminants in Mn mineralisation (<2% volume). They are considered typical of mineralisation related to hydrothermal replacement of limestone eg. merwinite ($Ca_3Mg(SiO_4)_2$), kutnahorite ($Ca (Mn, Fe, Mg)(CO_3)_2$), willemite ($ZnSiO_4$), hydrozincite ($Zn_5(CO_3)_2(OH)_2$, and lithiophorite $(Li, Al)MnO_2(OH)_2$

These trace mineral contaminants are considered not to represent any significant issues in product specification and marketability. However, they should be considered in future studies of processing options and beneficiation of Mn mineralisation.

f) Pyrolusite was generally identified to increase in the +3.35mm lump size fraction, which may explain some of the increase Mn content previously reported in section 4.2: Size Distribution and Assay Deportment. (Note: pyrolusite contains marginally higher Mn content @ 63% Mn compared to cryptomelane 59% Mn and hollandite nom. 42% Mn depending on lattice substitution)

g) Lithiophorite $(Li, Al)MnO_2(OH)_2$ was identified as a trace to minor mineral (2-10% volume) in several samples of >40% Mn mineralisation. Lithiophorite only contains ~1.47% Li in its chemical formula, which explains the relatively low lithium content in assay results for indicative Mn product specification (1ppm to maximum 13ppm Li, average 6 ppm Li) Lithium content is considered to represent no significant issue in product specification and marketability of Mn products from Romang.

Elevated fluorine contents (average F 182ppm) may represent minerals that were mistakenly identified or associated with lithiophorite. However, the elevated F contents are considered to represent no significant issues in Mn product specification and marketability of Mn products from Romang.
(Note: BHP Billiton's Australian Mn ores contain between 100-200ppm F).

h) The XRD mineralogy studies have identified several mineral species that indicate beneficiation by washing and wet screening may significantly improve Mn product specifications eg. Alunite $((K, Na)Al_3(SO_4)_2(OH)_6$, Lithiophorite $(Li, Al)MnO_2(OH)_2$ and particularly Akrochordite $Mn_5(AsO_4)_2(OH)_4(H_2O)_4$

Recommendations:

a) Conduct Quantitative XRD mineral identification (QXRD) on selected samples of >40% Mn mineralisation based on results of preliminary XRD and characterization tests.
This QXRD test work should focus on identifying the distribution of arsenic-bearing mineral species &/or degree of As substitution in Mn minerals. Further, to establish distribution of heavy metals in the main Mn minerals, including Pb, Tl, Cd etc.
Results of QXRD should be used to provide direction for processing / beneficiation studies and input to Environmental Studies (EIS) and Operations Plan as part of a Manganese Feasibility Study.

Estimated cost of QXRD tests = ~$15-20,000 depending on number of samples and the need for sample preparation.

5. REVIEWS and INDEPENDENT TECHNICAL STUDIES

Several reviews and independent technical studies were conducted during the term of this Mn Scoping Study and based on its interim recommendations including:

a) Metallurgy
b) Manganese Resource Estimate
c) Production Methods for Mn Ore Products

5.1 Metallurgy

A preliminary review of previous metallurgy studies on manganese mineralisation at Romang was completed in May-June 2013. This established guidelines for future metallurgical test work that could possibly be done on composite ¼ core samples of >40% Mn mineralisation in conjunction with characterization test work at Intertek Laboratory, Perth.

Desktop research on manganese metallurgy relative to market applications was conducted prior to discussions with several highly experienced Australian metallurgists. These discussions concluded that pyro-metallurgy expertise was quite limited in Australia, particularly regarding R&D test work on new and unusual Mn ores. Further, that limited bench-scale laboratory equipment existed in Australia to conduct sighter pyro-metallurgical tests (melt tests) and that results would most likely be indicative at best and totally misleading at worst. Eventually, it was concluded that Mintek Laboratories, South Africa was the best laboratory to conduct bench-scale melt tests to simulate ferroalloy production.

However, after discussion with the Chief Scientist at Mintek, it was decided that insufficient Mn samples were available in Perth or remaining at Romang to be used in a "sensible scale" pyro-metallurgical test work program. Further, that ¼ core Mn samples in Perth were initially required for characterization tests and were both insufficient and too valuable (rare) to be used for metallurgy trials. As such, it was decided to identify Australia's pre-eminent, "practical" pyro-metallurgist to complete a desktop review of metallurgy on Romang Mn mineralisation and to make recommendations on the scope, requirements and costs of future metallurgical test work.

During July 2013, Perth was visited to meet with consultant metallurgists and metallurgical laboratories to decide if the Mn samples at Intertek Perth were of sufficient size and if capabilities were available to conduct sighter metallurgical tests in Perth or elsewhere in Australia. It was decided that Perth metallurgical laboratories were insufficiently equipped to conduct meaningful metallurgical tests (melt tests) as they were more geared towards gold & base metal test work via hydrometallurgical methods. The Perth visit was in conjunction with a detailed briefing of Intertek Laboratories and finalizing the scope of characterization test work.

Eventually, Mr. Bob Howard – Metallurgist @ Case Consulting Pty Ltd was identified and commissioned to conduct a desktop review of the metallurgy of Romang Mn mineralisation. He completed a report in October 2013 titled "Romang Island Manganese Resource: A Provisional Assessment of Processing Options" - refer Appendix 3

Subsequently, Brisbane was visited in early October 2013 to meet several metallurgy consulting engineering groups that were either Brisbane-based or were attending the International GeoMet 2013 conference. The objectives of these meetings was to introduce the Romang Mn project and obtain information on the latest QA/QC methods applied to mining and processing of industrial minerals. These meetings included Julius Kruttschnitt Mineral Research Centre – University of Queensland (JK Centre), Metso Minerals (Suzi Lynch-Watson), AMEC (Dean David), Unimin (Peter Collins), Core Consulting (Peter Rohner & Jon Loraine) and Dr David Tilley–Mineralogist, United Mineral Services regarding Qualitative XRD test work.
These metallurgy meetings were coordinated in conjunction with a briefing of Mining Associates (MA) on their scope of work for the initial Mn resource estimate, Lakuwahi Project. Further to update MA on results of the Mn characterisation test work and discuss key parameters for resource drilling and follow-up resource estimates in early 2014.

A final review of all metallurgy studies to date on Romang Mn mineralisation was completed in late October 2013. This review was reported to Gordon Lewis – Director (Robust Resources) for consideration and discussion with Robust's Board – refer Appendix 3.

Conclusions & Comments:

a) >40% Mn ore products from Romang are suitable for all ferroalloy applications due to their relatively high Mn content and low content of major contaminants (iron, alumina, silica, phosphorus and sulphur).

b) Minor contaminants (Pb, Zn, Ba, As, Tl, Cd etc) are most likely manageable by the customer (ferroalloy producers), especially with blending of various Mn ore sources / types.

c) Melt tests are required to determine deportment of major & minor contaminants to ferroalloy (product), slag and flue dust. Partial deportment of As, Ba to ferroalloy products may cause technical and commercial issues (possibly resulting in ore price discounts), while volatile contaminants are expected to largely deport to flue dust.

   Results of melt tests would assist in marketing of Romang Mn products (ie. strengthened negotiation position & better commercial outcome) and to mitigate environmental & legal risk for Robust.

   Contrary to previous beliefs, CSIRO Laboratory (Melbourne) was identified as having suitable experience and facilities to conduct sighter melt tests on Romang Mn ores (estimated cost $60,000 and 2-3 months completion). Adequate samples of Mn mineralisation for sighter melt tests remain from the characterisaton test work at Intertek Perth. Composite samples would be required to be prepared from these remaining samples.

d) Potential for cost-effective beneficiation of low grade Mn mineralisation (10-30% Mn) to produce a marketable >40% Mn ore product was proposed by using wet gravity processing methods eg. Spirals &/or jigs.

Risks

- **Significant risk exists in Robust "not knowing" where and how contaminants in Romang Mn ore products would end up in customer applications, especially production of ferroalloys.**

  Environmental Risks are high if ferroalloy customers are closed down due to "pollution" from heavy metals, especially Pb, Cd and Tl in flue dust emissions or water contamination. (Note: several Chinese ferroalloy smelters have recently been closed due to Cd pollution and the Government is tightening regulations and penalties).

  Such scenarios could lead to significant Legal & Commercial Risks for Robust Resources.

Recommendations

a) Conduct sighter melt tests @ CSIRO Melbourne on composite Mn samples in Q1 2013 in order to determine deportment of major and minor contaminants in ferroalloy applications. Estimated cost $60,000 and 2-3 months completion.

   Results of melt tests should be input to a feasibility study of the Romang Mn project and used in marketing of Mn products and importantly, to mitigate environmental risks (ferroalloy customers) and associated legal + commercial risks (Robust).

b) Conduct representative sampling of low grade 10-30% Mn mineralisation from exploration and infill resource drilling based on "ore typing" ie. Limestone contamination or volcanic / clay contamination. Then conduct beneficiation tests by wet gravity methods to produce >40% Mn product/s or a consistent Mn specification with a benign major contaminant eg. 30-40% Mn + 5-10% limestone.
   Estimated Cost = ~$30,000 & timetable dependent on outcomes and recommendations of Mn feasibility study

5.2 Manganese Resource Estimate

A "back of the envelope" estimate of Mn mineralisation was calculated during the Romang site visit and preliminary Mn data review in May 2013. This identified ~300,000 to 500,000 tonnes of Mn mineralisation @ >40% Mn at Manganese Valley / Batu Hitam East and Batu Hitam West (based on nominal 30% Mn cutoff @ 1.8 -2.5 bulk density & ~40m drill spacing).

The >40% Mn mineralisation was observed to occur as a relatively continuous surficial sheet of 1-10 metre thickness, commonly with several layers of Mn mineralisation separated by narrow limestone layers (especially at depth to the east) – refer Study Section 3 & Appendix 1 for geological description of Mn mineralisation. The indicative tonnage and >40% Mn content of the Mn mineralisation was considered sufficient to warrant ongoing exploration and evaluation of development options for production of Mn ore products " Direct Shipping Ore" (DSO).

However, it was noted that major and minor contaminants in Mn mineralisation were highly variable in content and distribution, especially at the ~40m dill spacing eg. Fe, Al_2O_3, SiO_2, Ba, As, Pb etc. This variability in major contaminants was considered a likely issue for Mn product specification and future production planning. As such, it was recommended to conduct an initial Mn resource estimate @ 30% Mn cutoff to confirm the initial estimates of >40% Mn mineralisation and support the decision to proceed with evaluation of an Mn project at Romang Island.

Subsequently, an infill resource drilling program and metallurgical drilling program (including ~10% twin QA/QC drill holes) was proposed to better define the Mn mineralisation and its contaminants - refer Appendix 5.4.

Mining Associates Pty Ltd (MA), being specialist geoscience consultants based in Brisbane Australia, conducted an initial manganese resource estimate at Manganese Valley / Batu Hitam East and Batu Hitam West (Robust ASX announcement 7/11/2013: Inferred Mn Resource 566,000t @ 42.5% Mn). MA was visited in Brisbane in early October 2013 to update them on results of the Mn characterisation test work and discuss the initial Mn resource estimate and key parameters for the proposed infill resource drilling (refer Appendix 5.4) and follow-up resource estimates planned in early-mid 2014.

An updated manganese resource estimate was conducted by Mining Associates Pty Ltd (Brisbane) and reported on 6th May 2014 – refer Appendix 1.3 (Robust ASX announcement 13/05/2014). The manganese mineral resource was reported in accordance with JORC 2012 guidelines as follows:

Deposit	Resource Category	Material (tonnes)	Mn Grade (%)	Mn metal (t)
Manganese Valley	Indicated	413,000	41.6	172,000
	Inferred	274,000	39.5	108,000
Batu Hitam West	Inferred	51,000	45.7	23,000
Total Resources		**738,000**	**41.1**	**304,000**

Conclusions & Comments:

a) The initial and updated Mn resource estimate by Mining Associates confirms that sufficient >40% Mn mineralisation occurs on Romang Island to support production of Mn ore products and Robust's decision to proceed with evaluation of a mining & processing operation.

b) The "Inferred Classification" of the initial Mn resource estimate is mainly due to the wide spaced drilling, lack of twin QA/QC holes and scarcity of physical properties such as bulk density. Note: iron ore and manganese deposits are generally drilled at ~25m centres for resource estimates at indicated or above categories and often at 12.5m centres for reserve calculations, especially if major contaminants are highly variable at ~2m vertical scale.

c) The updated Mn resource (“Indicated Classification”) is sufficient for project evaluation and planning. However, infill resource drilling including QC twin holes and determination of detailed physical & chemical properties (multi- element assay, bulk density, breakage & handling properties etc) are required in order to improve resource classification and the understanding of content & distribution of major contaminants.

d) Understanding the distribution of contaminants is essential for production planning and production methods in order to achieve consistent Mn product/s specification required for effective marketing and optimal commercial outcomes ie. Product price, terms & conditions of Mn product sales agreements. Production QA / QC at an onsite laboratory, in order to ensure consistent product specification, is essential to mitigate market risk eg. Price discounts on contaminants (off spec Mn products), rejected shipments etc.

e) Mining Associates noted that >40% Mn mineralisation remains open, especially to the east & south at the Mn Valley prospect. As such, good potential exists to increase the current >40% Mn resource by additional exploration drilling.

Further, that 10-30% Mn mineralisation occurs adjacent to and within the currently known >40% Mn mineralisation. MA suggested that this low grade Mn mineralisation may be suitable for beneficiation to produce a marketable >40% Mn ore product. At this stage, insufficient drilling and/or incomplete assay data is available on distribution and type of contaminants within the 10-30% Mn mineralisation to allow for an initial resource estimate of low grade Mn mineralisation.

f) Geochemical domaining of % Mn and major contaminants (+/- selected minor contaminants) is required in future resource estimates, which should reflect an indicative product specification for the major elements. This information is critical for production planning.

Risks

- **As a potential new Mn ore producer & supplier, the Marketing Risk is very high from inconsistent product specification or delayed delivery schedules. This would most likely lead to significant price discounting (>20-50%) and possible rejection of shipments**.

Recommendations

a) Complete the HQ infill resource drilling, QC/QA twin hole drilling and PQ metallurgy drilling that was proposed in September 2013 – refer Appendix 5.4.

Results from characterization test work in this Scoping Study along with chemical and physical test work on samples from infill resource drilling should be used as input to production planning & feasibility study during Q2 & Q3 2014.

b) Additional exploration drilling should be conducted to extend current Mn resources and evaluate exploration targets– refer appendix 1.2 New Manganese Targets and Appendix 5.4

5.3 Production Methods for Mn Ore Products

Limited work was completed on production methods in the Study as they are considered relatively straight-forward and low risk and that the project is at an early stage.

The surficial distribution of the Mn mineralisaton and benign topography at Mn Valley / Batu Hitam East and Batu Hitam West prospect are expected to readily allow low cost open pit mining via “quarry-like” mining methods. Mining may be possible by simply ripping with a large bulldozer with limited requirement for drilling and blasting. However, the breakage properties of the Mn mineralisation are unknown and large boulders of Mn mineralisation are evident at surface that indicates a “rock breaker” would be required at very least.

An alternative mining method using continuous surface miners eg. Vermeer or Wirtgen, is being successfully used in iron ore and manganese mining in Australia. Key advantages include:
a) tight mining grade control @ 10-20cm cuts,
b) breaking during mining that reduces crushing requirements,
c) less generation of fines,
d) flexibility to change mining plan due to unforeseen contaminants,
e) reduced mining operating costs @ ~$1/t (no need for drill & blast).
Key disadvantage is the relatively high capital cost per unit continuous miner (~US$1.8M) relative to production scale.

Processing of Run of Mine (ROM) Mn ore is expected to use a mobile crushing and screening plant, similar to those used in aggregate quarries. Configuration and types of crushers will be determined by breakage and strength tests on bulk samples of Mn mineralisation, with key physical properties yet to be determined as a required part of future metallurgy & process engineering tests.

Dry (+/- wet) screening at nominal 8mm is expected to produce two Mn ore products = +8-80mm (lump Mn product) and a -8mm (fines Mn product). The fines product may require additional wet screening at 1mm or 2mm to reduce contaminants and provide a consistent product specification, dependent on product yields and loss of product to waste. Screening sizes are yet to be determined and are required as part of future metallurgy & process engineering tests.
Note: The processing plant is expected to initially be used to produce aggregate (basalt, limestone) for construction of roads, mine and jetty (port) infrastructure.

Risks

- **Mn dust may represent an Environmental Risk in mining, processing and handling / transport of Mn mineralisation and Mn products eg. Ingestion of high Arsenic & heavy metal materials. As such, wet / damp screening of lump Mn product is recommended along with wet screening of Mn Fines products.**

  Dust suppression will be required at the mine-site, processing plant and stockpiles / loading facilities.

- **Water treatment of mining and process water will be required to mitigate any Environmental Risk for arsenic (As) and heavy metal contamination of surface / groundwater.**

Recommendations

a) Conduct a desktop review then meet with Jakarta-based engineering groups in Q1'14 to obtain background information on mining and processing options and identify a group for future engineering studies.

Contromation Energy Services (www.contomationco.id) is recommended as a cost-effective and professional engineering group based on their recent design engineering work on small to mid scale industrial mineral projects in Indonesia, SE. Asia & Africa.

b) Commission a Jakarta-based consulting engineering group to conduct a design engineering & planning study for the infrastructure and Mn processing plant at Romang. This study should be conducted in conjunction and coordinated with a mine planning study by a specialist mining engineering consultant group.

Both the mining and processing / infrastructure engineering studies should be completed during Q1-Q2'14 and used as input to production planning and a feasibility study on the Robust Mn project during Q2 & Q3 2014.

5.4 Environmental Issues from Manganese Mining & Export

Characterisation test work on indicative Mn product/s (lump & fines) and preliminary market enquiries has identified that high levels of metal contaminants pose significant Environmental Risk and may limit the marketability of Mn products from Romang Island.

Accordingly, this Study increased its focus on technical test work to better define the chemical and physical characteristics of indicative Mn products. The aim was to qualify the Environmental Risks and Market Risks of metal contaminants and provide options to mitigate such risks.

Key Environmental Risks include:

a) Arsenic (As) contamination of surface and groundwater related to Mn mining and processing on Romang Island

b) Thallium (Th) and "heavy metal contamination" (Pb, Cd, As etc) of flue dust wastes in ferroalloy applications (ie. air & water pollution)
(**Note: thallium is highly toxic, while heavy metals have residual long-term toxicity)

The environmental and market risk of metal contamination of Mn products is considered to be manageable with "best practice" production methods (including treatment of mining & process water) and "duty of care" regarding market customers.

Conclusions & Comments: (compiled extracts from previous sections of this Study)

From Section 4.1: Indicative Product test work:

a) **The Arsenic content (As ~0.7%) is very high compared to most export quality Mn ores and may represent a significant environmental issue and risk.** Therefore, the behavior of As in Mn ore production and in market applications must be better / clearly understood and warrants detailed investigation.

Arsenic is expected to be relatively soluble, especially when associated with jarosite ($KFe_3(SO_4)_2(OH)_6$) and related mineral phases. There is significant risk of contamination to the environment from arsenic during mining and processing operations, including contamination of drinking water in aquifers and surface sources.

Logically, arsenic will predominantly report to flue dust in the production of ferroalloy, though a proportion may behave like phosphorous and report to the metal / product. If so, this may be an issue for ferroalloy producers and impact on the marketability of Mn ore products from Romang.

b) The Thallium content of the manganese mineralisation is very high (Tl ~0.07% or 700ppm) relative to global ore deposits and compared to all export quality Mn ores.
"The high thallium content may represent a significant environmental issue and risk".
Therefore, the behavior of Tl in manganese ore production and in market applications must be better / clearly understood and warrants detailed investigation.

c) The Cadmium content (Cd 2-90 ppm, average ~10ppm) and Mercury (Hg 0.06-5.7ppm, average ~0.45ppm) are considered to represent low to moderate environmental risk in ore production and market applications. However, distribution of elevated Cd and Hg should be identified and monitored during production (QA/QC checks).

From Section 4.3: Solubility test work:

a) All elements except Arsenic (As) report as lower than USA EPA Minimum Contaminant Levels for Drinking Water in Double Distilled Water solutes.

Most contaminant levels are significantly lower than EPA Standards and therefore do not represent a significant Environmental Risk.
This implies a relatively low solubility for most contaminant elements and that mining and processing using neutral pH water is unlikely to cause environmental issues for contaminants, other than for Arsenic.

b) Arsenic (As) significantly exceeds maximum contaminant levels (MCL) for drinking water quality standards under USA EPA 2004 in all solubility tests ie. Distilled Water (DDW), Acidic Water (pH5.0) and Alkali Water (pH9.2).

Arsenic represents a significant environmental risk to contamination of groundwater aquifers and surface water sources from mining of Mn mineralisation and production of Mn ore products.

Arsenic concentrations in DDW averaged 26ug/l, which is ~2.6 times maximum contaminant level (MCL) of USA EPA 2004 (10ug/l & recommended 7ug/l).
Arsenic concentrations were higher in pH5.0 with average 37ug/l being ~ 4 times MCL, while concentrations were very high in ph9.2 with average 7661ug/l (~7ppm) being ~800 times MCL. These results indicate that As solubility is quite sensitive to pH, being highly soluble under alkaline conditions.

Note: There will likely be lower arsenic solubility from Mn products (lump & fines) compared to the pulverized test samples (due to their lower surface area and contact / residence time). However, arsenic levels in mine & process waters are still likely to exceed EPA minimum standards (ie. contaminated) and require remediation or treatment.

c) Zinc (Zn) and Cadmium (Cd) concentrations in acidic water (pH5.0) both averaged ~7mg/l, which is 2-3 times maximum contaminant level (MCL) of USA EPA 2004 (3ug/l & 2mg/l respectively). There is a strong correlation between Zn & Cd.

Zinc & Cadmium may represent an environmental risk in contamination of groundwater if acidic water is generated from mining of Mn mineralisation and production of Mn ore products ie. Acid mine drainage.
This risk is considered to be small and manageable with water quality monitoring.

d) Thallium (Tl) concentrations in acidic water (pH5.0) are elevated in the -3.35mm fine size fraction and average 0.27ug/l, which is lower than the maximum contaminant level (MCL) of USA EPA 2004 (0.5ug/l). As such, Thallium does not represent an Environmental Risk in contamination of groundwater from Mn mining and processing on Romang.

e) Antimony (Sb) concentrations in alkaline water (pH9.2) averaged 8ug/l, which is ~8 times maximum contaminant level (MCL) of USA EPA 2004 (6ug/l). Sb shows a moderate to strong correlation with the solubility of arsenic (~800 times MCL in alkaline water).

Antimony may represent an Environmental Risk but only where alkaline water is generated in Mn mining and processing operations eg. Limestone quarries, road and stockpile bases where limestone aggregates are used. This risk is considered to be small and manageable with water quality monitoring.

f) Lead (Pb) and Thallium (Tl) are relatively insoluble and are unlikely to represent an Environmental Risk from groundwater contamination.

g) Solubility of other elements tested were low (significantly less than USA EPA Regulations) and are unlikely to represent an Environmental Risk.

However, multi-element assay data identified that volatile elements including Mercury (Hg) occur sporadically in the Mn mineralisation (maximum 5.4 ppm, average 0.45 ppm original samples & 0.25ppm on re-assay). Mercury contamination of surface water and groundwater from Mn mining operations may represent an Environmental Risk.

Opportunity (compiled extracts from previous sections of this Study)

- Water treatment to remove arsenic contamination from mining / process water and surface / groundwater at both the Romang Mn operation and for the local community would make a significant contribution to Robust's Corporate Social Responsibility and mitigate environmental risk.

  Cost effective water treatment options are readily available based on >30 years R&D by organizations including the United Nations (UNESCO re high arsenic groundwater in Bangladesh), CSIRO and the University of New South Wales. Recent pilot plant trials were successfully completed on high arsenic mine water at several Sb-As-Au mines located near Townsville, North Queensland (Curtain Brothers). These water treatment plants were shown to be cost effective and readily up-scaled to commercial operations.

- Solubility test work confirms earlier size deportment tests in indicating the potential for beneficiation of lump & fine Mn products by low cost washing & screening, with possible mitigation of environmental risks.

- Environmental risk of heavy metal contaminants (Pb, As, Cd etc) may be reduced and largely mitigated by removal of fine fraction (<1mm or <2mm) to a controlled waste disposal site and by treatment of all mining and process water.

Risks (compiled extracts from previous sections of this Study)

- **Environmental Risk & possible related Legal Risk are considered to be high related to arsenic (As) contamination of groundwater and drinking water (Romang site & local community) and heavy metals contamination (especially Pb, As, Tl, Cd) in waste streams in ferroalloy &/or EMM market applications.**

- **Environmental Risks and Legal Risks are considered to be "Very High" related to arsenic (As) contamination of surface water and possibly groundwater (Romang site & local community) from manganese mining and processing operations.**

- **Legal and Commercial Risks will be exacerbated if current, "natural" arsenic (As) contamination of surface and groundwater is not quantified in the Environmental Impact Study, then if any identified arsenic contamination is not removed or adequately reduced by subsequent water treatment.**

- **Thallium (Th) and "heavy metal contamination" (Pb, Cd, As etc) of flue dust wastes in ferroalloy applications and/or EMM waste streams are considered to represent a moderate-high "Indirect" Environmental Risk (ie. air & water pollution by customer) (**Note: thallium is highly toxic, while heavy metals have residual long-term toxicity)**

- **Based on Environmental issues, the Mn project &/or Mn operation may be stopped or indefinitely delayed by activism and negative press by Non Government Organizations' (NGOs) and subsequent disruptions from the local community and reaction by Provincial &/or Central Government.**

Recommendations: (compiled extracts from previous sections of this Study)

a) As a matter of priority, Robust should conduct detailed baseline water sampling and soil sampling of the Lakuwahi prospect, Southern Romang and the local communities for input to an Environmental Impact Statement (EIS) and Operations Plan as part of a Manganese Feasibility Study.

All current sources of drinking water should be comprehensively tested to determine contamination levels relative to USA EPA Water Quality Standards (Drinking). Seasonal variation and routine monitoring of water quality should supplement the baseline water quality data.

b) Conduct solubility tests on indicative Mn lump and fines products for arsenic (+/- key potential contaminants including Pb, Cd, Tl, Hg etc) to determine possible water contamination from Mn mining / processing operations and for input to EIS. Results are likely to be lower than the original solubility tests, which were conducted on pulverized samples.
These tests should also check if washing of Mn products (wet processing) significantly reduces arsenic & heavy metal content of Mn products ie. analyse the washed products.

c) Conduct desktop research to identify cost-effective water treatment options for removal of arsenic from mining / process water and groundwater / surface water in order to produce drinking quality water.
Conduct desktop research on potential Environmental Issues of Mn dust from mining / processing operations & consider options for dust mitigation.

d) Conduct preliminary metallurgy sighter tests (melt tests @ CSIRO Melbourne) to provide information for marketing and environmental studies, especially the deportment of heavy metals and volatile elements (Pb, As, Tl, Cd etc) in production of Mn ferroalloy and Mn sinter products.

- **Conduct a Feasibility Study on Mn ore production at Romang Island including results and action plans from all environmental studies and test work outlined above.**

- **As above & to reinforce, a detailed Environmental baseline studies needs to be conducted as an essential part of the Mn Feasibility Study and to mitigate against Environmental Risk and potential for related Legal Risk.**

6. MARKETING

Manganese mineralisation and indicative Mn products from Romang Island are “unusual & unique” due to their relatively high level of metal contaminants, especially Ba, Pb, Zn, As, Tl and Cd. While the indicative >40% Mn product/s have a high Mn content and low major element contaminants, potential customers would view them as “niche products for blending” due to their high level of minor metal contaminants.

In general, it is expected that potential Mn ore customers for Mn product/s from Romang would attempt to negotiate a price discount due to minor metal contaminants being considered as “penalty elements”.

As a potential new Mn ore producer & supplier, it is considered essential that Robust engage an experienced marketing agent for customer development, sales contract negotiations and to organize the export / import administration of Mn ore shipments. This is especially important as Indonesian Mn producers have a very bad reputation due to a chequered recent history of highly variable product quality and unreliable shipments delivery ie. Chinese customers expect to receive a discount ~20% at least until reliable supply is confirmed by several shipments.

Background Mn market information, an interim report to Robust on Mn markets, and the Penfold Group’s preliminary marketing report on the Chinese Mn Industry based on visits to potential Mn customers during August 2013 are included in Appendix 4.

The preliminary market survey of Chinese Mn ore customers conducted by Penfold Group (Shanghai) confirmed the suitability and firm interest from all market applications for indicative Mn products from Romang Island. Key target customers, representing ~30% of the Chinese Mn market, considered the indicative Mn products to be premium quality (ie. >40% Mn with low major contaminants), while the general consensus among customers was that minor contaminants were manageable in their production processes.

Main conclusions and recommendations from the marketing work on indicative Mn products from Romang are presented in the Executive Summary of this Study with additional comments below.

6.1 Technical Marketing and Issues re Contaminants

Characterisation test work was conducted to determine the indicative specification for Mn ore product/s from Romang Island (nominal lump & fines Mn products) – refer Section 4 & Appendix 2.2 of this Study.

The indicative specifications for Mn ore product/s from Romang Island compares favourably in manganese content (>40% Mn) and major contaminants with BHP Billiton’s product specifications for Mn ore products from Groote Eylandt, Australia and Wessels & Mamatwan, South Africa – refer background information in Appendix 4. However, Romang Mn products contain very high minor and trace element metal contents compared with BHP Billiton’s Mn ore products.

This indicative Romang Mn product specification (nominal lump) was used to guide the scope of characterization test work, particularly the content and physical / chemical properties of minor & trace element contaminants. The indicative Mn product specification was also used in summary presentations to potential customers in China & SE. Asia ie. initial communication of the Romang Mn project with the Mn industry & marketplace.

These initial market presentations summarized the major elements and minor contaminant elements (Pb, Ba & As) and were used for ‘technical marketing purposes with real customers” to establish any “fatal flaws” or key issues with the content and type of major and minor contaminants. Note: at this stage, no specific details were given on various trace metal contaminant elements, including thallium.

6.2 Primary Marketing Survey – Customer Visit, China

Key conclusions of the Mn ore pre-marketing offtake discussions with potential Mn ore customers in China conducted by the Penfold Group in August 2013 are summarized in the Executive Summary of this Study and the full detailed report is included in Appendix 4.

Conclusions & Comments: (based on extracts from Penfold’s China market report)

a) Romang Mn 46% DSO Product with low iron and silica would be viewed as a premium high grade product suitable for all applications and achieving manganese unit pricing at the higher range of mainstream seaborne ores, albeit with the initial ‘Indonesia discount’. FeMn production is likely the least suitable given the elevated lead levels but all other impurities are tolerable. Phosphorous should be capped at 0.1%.

b) Silico-Manganese ferroalloy (SiMn) would be the easiest market for the high-grade DSO as SiMn producer are accustomed to paying premiums for higher grade ore given electricity costs savings with higher grades. However EMM/EMD end-users only purchase non-carbonate ores as a last resort as an additional roasting step would be required and there are less efficiencies achieved with using higher grade in the leaching process. These users traditionally pay 7-20% less for carbonate ores on a Mn % unit basis.

c) One constraint with the Romang Mn products may relate to the lump product, as LOI of 12% would be somewhat higher than mainstream oxide ores and this would potentially restrict the use directly in the ferroalloy furnaces. EMM/EMD do not pay lump premiums as they need to grind material to a fine level. There may be pushback on achieving a full lump premium (~US40cents/dmtu) to ferroalloy makers

d) Shipment sizes, or more specifically, singe sales lots, are normally in the range of 5,000 to 20,000wmt and Robust should focus on this range to limit risk. There are takers for 50Kt shipments but there are only a few parties willing to take such large parcels, and then only for proven, stable supply. Main ports are either Tianjin or Lianyungang in the north, or Qinzhou or Fangchenggang in the south. Robust would be advised to sell to 2-3 regular/reliable customers during the year, with spot sales to 2-3 other customers to test the market and diversify risk during the year.

e) Benchmark" pricing is now set monthly with smaller producers settling prices once the mainstream BHP, South African and Vale prices are known. Long term contracts could be structured to reference these prices once Robust has established regular shipments with uniform quality. In truth, all sales will function as spot business as each shipment is subject to letter of credit opening subject to renegotiation of previously agreed terms if the market has moved substantially downward.

Recommendations

- Next steps in the preparing for offtake would be provision of larger samples amounts (5-10kg) to a half-dozen or so potential customers and continual updates on project and Indonesian regulatory / permitting process. Trial shipments should be arranged as early as possible, with the caveat that the shipments should be extremely uniform and representative of anticipated regular production.

- Subject to requirements of metallurgy sighter tests and additional characterization tests, Robust should prepare several composite "bulk" Mn samples from current Mn samples at Intertek Perth.
  Alternatively, wait for sampling and assay of infill Mn resource drilling in order to prepare bulk samples for customer trials and market development.
  The former alternative is the preferred, despite the samples being considered "precious".

6.3 "Reality Check on Market Viability"

China is the largest global market for Mn ore products with reported 2012 imports of ~12.3Mtpy @ average price $177/t cif (ranging from ~$90-150/t for 15-30% Mn products up to ~$210/t for Australian >42% Mn products). Strong demand for Mn ore products is based on rapid growth in the Chinese steel industry, which uses Mn ferroalloys in production of carbon steels and electrolytic manganese metal (EMM) in production of stainless steel.

As such, China is considered to be the key target market for Romang Mn products due to its large size and flexibility (customer diversity), whereas traditional Mn ore markets such as Japan & Korea are conservative, slow and more difficult to enter for new suppliers (especially for an unusual, niche ore material).

Based on the initial market survey in China, the indicative Mn ore products from Romang Island can "definitely find a home" in all market applications – it's just a matter of price.
The reality is that the Romang Mn ore products can be sold.

6.4 Potential Customers, Indicative Terms & Market Entry Strategy

A spreadsheet list of potential Chinese Mn ore customers in ferroalloy, electrolytic manganese metal (EMM) and electrolytic manganese dioxide (EMD) industries is included in Appendix 4. Further, refer to previous comments on potential customers and indicative terms in this Study section 6.2.

Opportunity

Chinese smelters are able to take low grade ores (Mn~25%), though pricing paid is roughly 50% of that of premium ores. India is selling such material to China and end-users are always happy to take difficult materials if a discount justifies the business. This may open the opportunity for a lower grade Mn materials or beneficiated Mn product from Romang Island.

Conversely, there would also be a market for value-added Mn products, specifically either calcined material (milled or unmilled) that could be introduced directly to the EMM/EMD hydro process or sinter that can be sold to SiMn producers with larger furnaces. OM Materials in Qinzhou and Sarawak are operating significant Mn oxide sinter facilities for external sales, such that this business model is proven.

Risks

- **Manganese production from Indonesia has an extremely poor reputation in China stemming from poor performance of suppliers and highly variable quality. China imports only 30-50Ktpa from Indonesia and, whilst high-grade, the issues impel a substantial discount for the material (>20%). Robust will need to overcome this scepticism and will only be able to overcome this Indonesia discount through 2-3 months of successful shipments.**

- **There is also substantial knowledge of Indonesian mining law and export issues, which means buyers of Mn ore products will push to only open letters of credit once material has been shipped (with copies of export permits) and independent assay results are available. A trial shipment of 500 to 1000wmt to China would be necessary given the Indonesian scepticism with respect to export permitting and product uniformity.**

Recommendations

- To be clear, the manganese industry in China is suffering. Rampant overcapacity and increased cost and environmental pressures continue to make it difficult for smelters to earn profits and capacity utilization across the industry ranges 20-60%.

- As such, many smelters are unable to finance imports directly or may be unable to perform contracts when the market moves. Accordingly, Robust would likely need to focus on only the larger, established importers to ensure smooth payment and execution.

Market entry in China for Robust's Mn ore products from Romang Island would likely need to include several (3-4) of the main ferroalloy producers, along with 2-3 largest EMM & EMD producers (both northern China and southern China) as key target customers. This would spread the commercial risk (poor payment) and provide valuable information on "who, what & why" certain market sectors will be better as short & medium-term customers. Customers with modern technology, well managed facilities and having accreditation or good environmental practices should be preferred customers. These criteria may / will exclude the Mn chemical manufacturers as potential customers due to Environmental Risk from their observed poor production practices ie. Filthy, dirty joints.

- Accordingly, as a small & new potential supplier, it is considered essential that Robust engage an experienced marketing agent for Mn market & customer development, contract negotiations and to organize the export / import administration of Mn ore shipments.

7. LOGISTICS, INFRASTRUCTURE and EXPORT/IMPORT POLICIES

Current assumptions for transport of Mn ore products from Romang Island to customers in SE. Asia and China involve:

a) stockpiling of lump & fines product/s adjacent to rock jetty/s on Romang Island (constructed & owned by Robust and depending on seasonal weather + sea conditions)
b) loading by truck of several contract "tugged" barges nom.1,000-2000 dwt
c) barging to a self-loading vessel nom.25,000-50,000 dwt capacity
d) alternatively, barging to a floating crane/s for loading via transshipment to smaller 20,000dwt to 30,000dwt vessel

Several barging, shipping and logistics companies were visited in Singapore and Jakarta during August 2013 to obtain background information and preliminary cost estimates on logistics options for the Romang Mn Project. These companies included:

a) IMC Group, Singapore
Mrs. Tai Sook Yee – Director

b) PT. Pelita Samudera Shipping (IMC Group), Jakarta
Hans Peter Glipman Jorgensen – Director and Mr Benaiah Soenarto

c) PT. Indo Tambangraya Mega TBK, Jakarta (Banpu Group)
Mr Sean Pellow – Director & SVP Operations

d) PT. (Pelayaraan Nasional) Tanjung Bahari
Julius Chandra – Director
An Indonesian company with barging and shipping operations for glass-grade silica sand and several private lateritic nickel producers.

These companies own and provide barging and shipping services to industrial mineral producers in Indonesia, including small lateritic nickel and bauxite mines, large and small coal mines in Kalimantan, and large silica sand mines in Belitung and Kalimantan. Mineral products are barged and shipped directly to industrial customers in Indonesia, SE. Asia and China. Alternatively, many products are trans-shipped using floating cranes to load vessels or larger self-loading vessels for shipment to customers in Asia.

Barging and trans-shipment of bulk mineral commodities is commonplace in Indonesia & SE. Asia, especially with the rapid growth in the thermal coal sector in Kalimantan (exports >400Mtpy) and lateritic nickel exported to China for production of nickel pig iron (effectively a ferroalloy and same/similar ports to potential Mn ferroalloy customers).

Follow-up meetings were held with Thoresen Shipping (Bangkok) during November 2013 to obtain background information on Handymax self-loading vessels, including availability and current rates. Thoresen Shipping own a fleet of >15 self loading vessels and also own/operate barges and floating cranes. Website = http://www.thoresenshipping.com/

All of the barging and shipping companies confirmed that operational issues or risks are envisaged in export of Mn ore products from Romang Island. Further, all companies were keen to learn more about the Romang Mn Project and provide indicative terms, conditions & costs as and when required.

7.2 Materials Handling, Mn Product Storage & Handling and Transport

Stockpile and jetty/s construction for barge loading of Mn ore products (lump & fines) on Romang Island is considered to present no issues to logistics, loading, barging and transhipment. Rock & aggregate quarry sites would be required to be identified and licensed, though plentiful quarry sites appear to be available.

Seawater depths close to the shoreline appear to be adequate for construction of short rock fill +/- concrete jetty/s and barge loading, nominally 4-6 metres. Suitable jetty sites and barging routes would be required to be identified and licensed, though this may require a marine survey and likely involvement of Provincial Government officers eg. Hila harbourmaster.

Moisture contents of Mn products (free water) will need to be managed to ensure product specifications, especially Mn fines products that will hold greater free water ie. Customers do not want to pay for water, while free water >10% can create loading and shipping issues. Mn product specifications are commonly < 2-3% free water in lump products and <5% or <7% in fines products – these moisture contents to be determined by future test work.

Saline water is considered a contaminant in Mn ore products. As such, product contamination by seawater in seasonal rough weather should be avoided / minimized or monitored.

Surface drainage from the Mn mine site, ROM ore stockpiles, processing plant, transport roads and Mn product stockpiles may contain Mn-rich fines that may pose an Environmental Issue. Further, Mn dust may be generated during stockpile residence, loading, barging & shipping, which may lead to Environmental Issues.
Both potential Environmental Issues are considered to be readily & adequately managed by standard industry practices eg. Mist sprayers for dust suppression, road watering.

Recommendations

a) Civil engineering, design & construction studies for roads, quarries and jetty/s etc should be conducted in conjunction with design & engineering studies on Mn production facilities by experienced Jakarta-based consulting engineering company/s during Q1-Q2'14 as input to a Mn Feasibility Study in Q2-3'14.

7.3 Mineral Concentrate Export Ban and Regulations on Domestic Sales & Processing

A key risk to successful development of the Romang Mn Project relates to Indonesian Government Policy and Regulations that ban the export of mineral concentrates from 1st January 2014 and require domestic sales of concentrates or investment in "value-added domestic processing and refining".

Several Jakarta-based lawyers and legal firms who are active in the Indonesian mining sector were visited during May 2013 to discuss and obtain information / opinion on Government Policy (Mining Law) and Regulations including:

a) Christian Teo Purwono & Partners
Mr Bill Sullivan

b) Hadiputranto, Hadinoto & Partners (affiliated with Baker McKenzie)
Mr Luke Devine

c) Soemadipradja & Taher
Mr Rahmat Soemadipradja - Partner

d) Several local lawyers advising small, private nickel laterite producers.

Follow-up discussions and correspondence was exchanged on several subsequent occasions in order to obtain updates on a rapidly evolving situation.
Robust's Mn project was not mentioned to any of the lawyers, while discussions were held on an anonymous basis as a mining industry consultant conducting mining project investment evaluations in Indonesia on behalf of foreign investors – "only the truth".

General legal opinion (to which I agree) was that due to the upcoming DPR and Presidential Elections in 2014, the Government does not want to do anything to alienate the voters who are generally anti mining and anti foreign investment. The Government is clearly struggling to find a face saving formula which both allows unprocessed metal mineral exports to continue and does not completely undermine the Government's credibility in terms of its often stated unshakeable commitment to domestic processing and refining.

The Indonesian Government recently made its decision on how the export ban on unprocessed mineral products would be applied and enforced as of 12 January 2014:

a) Government Regulation No. 1 of 2014 re Increase of Mineral Value Added Through Domestic Processing & Refining ("**GR 1/2014**") and
b) MoF Regulation No. 6 of 2014 re Determination of Export Goods that are subject to Export Duty and the Export Duty Tariff ("**MoFR 6/2014").**

The Government has sought to distinguish between metal minerals which are realistic to expect greater levels of domestic processing and refining than is already taking place (Category 1 Minerals) and those metal minerals which it is realistic to expect a greater level of domestic processing and refining (Category 2 Minerals).

Category 1 Minerals will be allowed to be exported from 2014-2017 (after 12 January 2014), in “concentrate form” so long as a specified minimum level of processing and refining has been carried out.

Manganese has been assigned as a Category 1 Mineral and requires to be a 49% Mn concentrate to allow its export. It will be difficult to achieve significant quantities of 49% Mn concentrates from production on Romang Island, including by selective mining or physical beneficiation.

Further, export taxes have been applied or increased on Category 1 Minerals whereby the export tax on manganese concentrate (≥ 49% Mn) is:
H1’14 20%, H2’14 20%, H1’15 30%, H2’15 40%, H1’16 50%, H2’16 60%.

However, the view of both the Indonesian mining industry (legal & policy experts) and the author of this Scoping Study is of a likely scenario that the Government will progressively relax these onerous new conditions of the export ban during late 2014 or early 2015 ie. post presidential election and due to pragmatic response to sensible, reasoned lobbying by industry stakeholders and international investment community, including:

a) Reduced export tax rates (10-15%),
b) Reduced ore grade (~45% Mn) or apply quotas on amount (tonnage) that can be exported,
c) Regularly evidence that companies are taking towards domestic processing and refining,
d) Extend the deadline for start of domestic processing & refining (~2020) or reduce the level of domestic processing & refining.

Recommendations

a) Expert legal advice / opinion should be sought on a periodic ongoing basis in order to closely monitor changes to Government Policy and Regulations related to Mining Law, especially the export ban on mineral concentrates and requirement for domestic sales and processing / refining.
This legal advice / opinion should be input to the Romang Mn Feasibility Study and guide the project development strategy and timetable.

In the interim and in parallel it is highly recommended that Robust:

b) Prepare a simple, compelling Mn project development plan and provide clear, frequent and honest communications with all stakeholders. In doing so, obtain strong support and participation in the Romang Mn project by the local communities and the Provincial Government in Ambon, Maluku ie. Need to take a “hearts & minds approach”.

A key question is “how & why is the Mn development plan linked or separated from the overall Romang base & precious metal development plan”?
I suggest that the development plans are linked, though the story must be simple to understand & simple to support it.

c) Negotiate terms & conditions for Mn ore production on Romang Island with the Central Government only with the formal support of the provincial Government and the local Romang community ie. "Have the locals fight on our side in our / any fight".

Any changes to current Government Policy and Regulations that are negotiated to allow Mn production should be geared to support the local community and the Provincial Government, including allocation of increased export taxes (if possible)

8. COMMERCIAL EVALUATION

This Study concludes that the Romang Mn Project, despite being small-scale and short production life (2-3 years), is commercially attractive with strong financial returns and no fatal flaws.

Cost estimates were obtained from industry sources, Indonesian-based engineering groups and current industrial mineral producers & exporters, including coal, nickel laterite, bauxite, sand & aggregate.

Capital and Operating cost structures are largely dependent on the scale, configuration and schedule of Mn ore production = "Mn Project Development Plan" (yet to be prepared or agreed) eg. contract mining v's owner operated, vessel size / type and loading rates (self loaders v's floating cranes).

Financial estimates in this Study are +/- 30% (typical error) based on owner operated mine & processing plant and contract barging and transshipment, though have included a "foreign investment factor" of higher cost structure, mainly due to high administrative costs spread over the small production scale and project remoteness. ***No corporate tax or Government "royalties" (export taxes) have been included in estimates of gross revenue.***

8.1 Estimated Costs, Revenues & Financial Model

CAPITAL COST	**DESCRIPTION**	**VALUE US$ Million**
Equipment	Dozer /excavators / trucks etc, crushing & screening plant, water treatment plant/s, QC laboratory	5.5 to 6.5
Mobilisation & Construction (working capital)	Barging equipment, ~8km road, loading jetties x 2, camp, mine site & plant, water storage & treatment	2.5 to 3.5
TOTAL		**8.0 to 10.0**
OPERATING COST	**DESCRIPTION**	**VALUE US$/t Mn Product**
Mining	Grade control, dozer ripping (if possible) with limited drill & blast, excavator & truck	4.00 to 6.00
Processing & QC/QA	Crushing & screening plant, production QA/QC	4.50 to 5.00
Truck Haulage & Loading	~8km mine to barge port stockpile	0.50 to 1.00
Barging	Tug, barges, floating crane or direct load containers	3.00 to 4.00
Shipping (SE. Asia or China)	Minimum 10,000 dwt & maximum 50,000 dwt	23.00 to 25.00
General & Office Admin	Salaries, Government Fees, Marketing etc	5.00 to 6.00
Contingency		2.00 to 3.00
TOTAL		**$42.00 to 50.00**
REVENUE	**DESCRIPTION (Production @ 200,000 tonne / year for 2 years)**	**VALUE US$/t Million**
Manganese Price >42% Mn	US$3.50-4.50 / dmtu cif (~$150-190/t @ 20% discount)	Negotiable
Gross Margin	~US$100 /t to $140/t Mn product	$20M to $28M / yr
Returns & Gross Revenue	**Payback <6 months, NPV/IRR not applicable**	**~$40-60 Million**

Commercial returns for the Romang manganese project have been based solely on the indicated resource classification of the current manganese resource estimated by Mining Associates 6th May 2014 (ie. Manganese Valley = 413,000 tonnes @ 41.6% Mn)

Importantly, the current inferred manganese resource will likely be increased and / or converted to indicated resource classification by ongoing exploration and evaluation studies, thereby may extend the mine-life for >2 years and increase commercial returns.

Further, additional high-grade >40% manganese mineralisation is likely to be discovered by ongoing exploration, while the commercial potential for beneficiation of low-grade 10-30% manganese mineralisation warrants evaluation.

8.2 Risks, Opportunities & Scenarios

The Romang Mn Project has low commercial risk due to its low capital and operating cost structures, while enjoying relatively stable and high forecast Mn ore prices based on strong demand by the Chinese steel industry and limited supply options. Mn ore prices used in this Study were based on recent / current market prices and price forecasts by independent industry market research groups such as CRU, which in turn are the basis for sales revenue estimates.

Operating cost estimates are considered to be realistic and somewhat conservative. Similar small scale industrial mineral operations in Indonesia, such as lateritic nickel producers, have total production costs of US$35-40/t cif China (includes ~US20-22/t shipping) and “close up shop” when the Ni ore price falls below $45/t.

The Mn ore price has been relatively stable during 2013 @ $4-5/dmtu for 42-45% Mn products, following highs of $5-7/dmtu during late 2000’s to 2011 due to the Chinese steel boom ie. Mn ore prices closely reflect iron ore price trends.
Historical Mn ore prices has been as low as $2-2.5.dmtu ie. ~$85-100/t ~42% Mn product, though prices are highly unlikely to retreat to these levels (1990’s). Most recognised commodity research houses have short-medium term price forecasts (1-3 year) for >42% Mn ore at $3.5-4.5/dmtu ($150-200/t Mn product). Supply remains tight and well controlled with no large new suppliers on the horizon. As such, the forecast Mn ore price risk is low.

Key commercial risks mainly relate to Mn product marketing issues, especially where production of poor &/or variable quality Mn products (compared to contracted specification) would likely result in low Mn product sales price (discounts >20-50%) and limited acceptance or rejection of Mn product/s ie. significant revenue risk. These circumstances are particularly common in a soft “oversupply” market where customers have many supply sources / options and price leverage, so tend to argue any inconsistencies in ore deliveries and product specification.

Importantly, recent Indonesian Government imposition of a 20-60% export tax on >49% Mn mineral concentrate products represents a significant commercial (cost) risk that is beyond Robust’s control. However, the general consensus of the mining industry in Indonesia is that the Indonesian Government will progressively relax these onerous new conditions of the export ban during late 2014 or early 2015 (refer Section 7.3)

Recommendations

a) Conduct a Feasibility Study on Mn ore production at Romang Island including:

- **Exploration & Resource –** infill & metallurgy drilling (planned & proposed August'13)
- **Metallurgy –** sighter melt tests @ CSIRO Melbourne to determine deportment of metals
- **Characterisation Tests –** QXRD, product solubility & physical properties eg. breakage etc
- **Environmental ("key") –** qualify risks of As, Tl and heavy metal contamination
- **Mining, Processing & Production Plan –** engineering design, scale & production schedule
- **Logistics, Infrastructure & Shipping –** options study and cost / benefits analysis
- **Marketing –** assess Indonesian market, conduct customer trials, obtain indicative sale terms
- **Government Policy, Regulations and Community Relations ("key")**
- **Commercial & Financial Model**

Estimated completion by end 2014 (or ~8 months from study commencement)
Estimated Total Cost of Feasibility Study = ~$1.2 million to maximum $1.5 million (Note: Attributable Cost is ~$800,000 to $1.0 million if ~$400-500K is re-allocated for exploration, environmental & secondment of PT. GBU personnel from ROL's Romang overall base / precious metal exploration budget)

Main cost components (estimated range):

- Resource drilling & assay (nom. ~$250-300,000 & cost re-allocation),
- Resource estimate (~$40-60,000),
- Characterisation Tests (~$50-70,000) & Metallurgy (~$50-65,000)
- Environment (~$70-80,000 & cost re-allocation = baseline water / soil surveys & research re water treatment as part of overall EIS),
- Production plan** (~$340-430,000 consulting engineers – civil, mining, processing),
- Logistics & transport** (~$30-50,000 marine survey),
- Marketing (~$40-50,000 domestic sales or ~$50-90,000 export via agency agreement),
- ROL personnel (~$100-120,000 & cost re-allocation = technical, admin. / commercial),
- Feasibility study manager (~$230-250,000 consultant ~8 months incl. expenses)

(Production plan & logistics possibly @ pre-feasibility study level that may require additional ~$250K expenditure to achieve feasibility study level, especially for seasonal hydrology surveys)**

b) Obtain firm cost estimates for all key components of the Mn project development plan from industry sources, Indonesian-based engineering groups and current industrial mineral producers & exporters.

Where possible, indicative quotes should be obtained for costs of all capital equipment and operating costs for barging, shipping, construction of infrastructure, construction and commissioning of mining and processing facilities, contract mining and processing etc.

c) Obtain Mn ore product price estimates from ongoing primary market research of Mn customers and indicative term sheets for sales contracts with key target customers.

In doing so, Robust is recommended to engage an experienced marketing agent to prepare a market entry strategy and conduct Mn market & customer development, negotiation of sales contracts, and to organize the export / import administration of Mn ore shipments.

These cost and revenue estimates should be input to the Romang Mn Feasibility Study for completion during Q4 2014 and to guide the Mn project development strategy and timetable.

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