29 November 2024

ASX Market Announcements
Via e-lodgment

High Purity Manganese Sulphate Monohydrate Project Update

- Designed, constructed, commissioned a Micro Plant to process Ant Hill manganese ore to produce HPMSM.
- Following the initial successful operation of the Micro Plant, entered into an Optimisation stage.
- Successfully produced HPMSM in the Micro Plant.
- Ongoing positive discussions with multiple potential Off-take Partners.
- Continued positive interactions with Northern Australia Infrastructure Facility (NAIF).
- Changed the company name from Comcen to Mn Battery Minerals to align with the Company's objectives.
- Project life likely to be in excess of 30 years.

Resource Development Group Limited (**ASX: RDG**) (**RDG** or the **Company**) is pleased to provide the following project update. Subsequent to the announcement made on 15th November 2023, and in line with the Company's objective of becoming a Battery Minerals producer, RDG have successfully produced High Purity Manganese Sulphate Monohydrate (**HPMSM**) at its own Micro Plant using its proprietary technology to process ore from the Company's 100% owned Ant Hill deposit.

Battery Minerals *refers to various minerals used in rechargeable batteries including manganese.*

Overview

- RDG have produced High Purity Manganese Sulphate Monohydrate, a Battery Mineral using unbeneficiated ore from its 100% owned Ant Hill deposit.
- Ant Hill and Sunday Hill deposits are located 360km by road from Port Hedland, in the Pilbara Region of Western Australia, a well-established and excellent mining jurisdiction.
- Market analysts continue to forecast exceptional growth in the demand for HPMSM, leading to periods of potential supply deficit.
- RDG is aiming to initially construct and operate a HPMSM process plant capable of producing 50,000tpa of HPMSM (Train 1), and should demand support it, have the ability to increase capacity by an additional 50,000tpa (Train 2) taking the total annual production capacity to 100,000tpa.
- Engaged Carnac Project Delivery Services Pty Ltd, a multi-disciplinary engineering and design company, who have delivered a SysCAD Production Scale Model (Train 1 – 50,000tpa)
- The Company continues to have positive discussions and feedback from vehicle and battery manufacturers interested in the supply of HPMSM from the proposed Boodarie process plant.
- Ongoing collaborative dialogue with Traditional Owners.
- Significant project life.
- Tremendous synergy with the federal government's Critical Minerals Strategy and National Battery Strategy and the Western Australian government Future Battery Industry Strategy. Ongoing positive discussions with the Northern Australia Infrastructure Facility (NAIF[1]).

[1] NAIF is an Australian Government financier, providing loans for the development of infrastructure projects in Northern Australia and the Australian Indian Ocean Territories.

The Ant Hill mining lease is a remnant basinal outlier of mid-Proterozoic sediments comprising the Manganese Group, the Pinjian Chert Breccia and the Hamersley Group. The sediments form a broad NW-plunging syncline and unconformably overlie the Fortescue Group, which is locally dominated by the volcanics of the Nymerina Basalt.

The manganese deposit occurs as a number of discrete podiform bodies of various sizes on the Ant Hill mesa. The mesa is a fault-bounded elongate feature, approximately 1.4km long and 400m wide, with a maximum topographic relief of 50m.

The Sunday Hill mining lease, which is located close to Ant Hill, is also a remnant mesa formation that rises 20 to 30 meters above the surrounding plain and has moderate to gentle slopes. The mesa is largely devoid of trees and generally covered by spinifex. The surface consists of skeletal soils to outcrop with some scree slopes and areas covered by colluvium. The geology of Sunday Hill is very similar to that of Ant Hill.

Sunday Hill is an outlier of late Precambrian Manganese and Hamersley Group sediments and covers an area of 5 x 5 square kilometres. The sediments form a broad NW plunging syncline and overlie Fortescue Group banded iron and shale units.

Figure 1: Mn Battery Minerals Micro Plant

Metallurgical test work

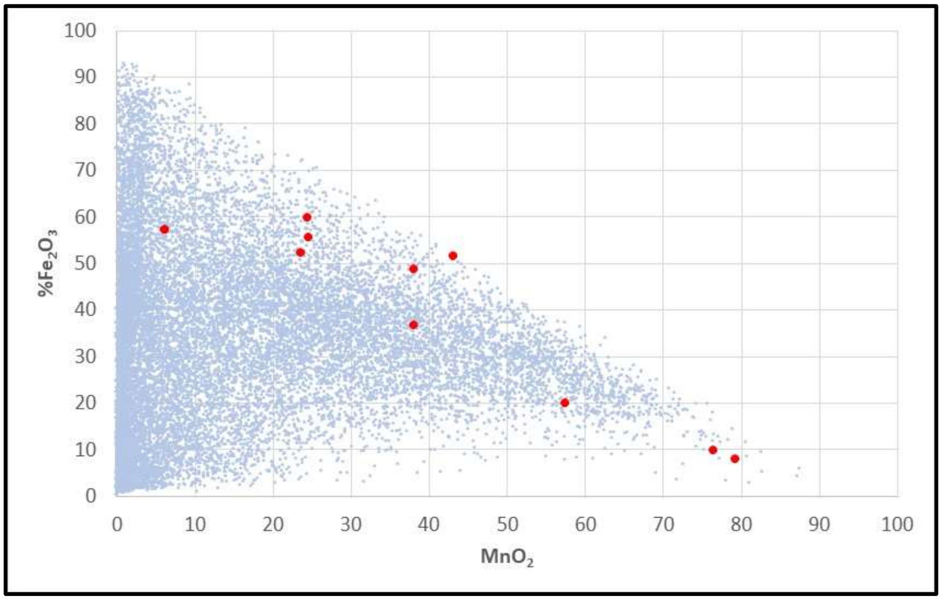
The initial Micro Plant runs used ore from the same diamond drill holes as used in the previously reported testwork. No new geological data was collected, nor were any new drill holes required. The assorted samples remaining after the previous testwork were blended to give a series of samples of different feed composition which partially covered the anticipated variability in composition across the Ant Hill deposit.

Once these materials had been consumed, approximately 100kg of ore were obtained from stockpiles to the south of the deposit and at the former site of the beneficiation plant developed prior to RDG taking ownership of the project. Consequently, the exact source of the material within these areas is unknown but seems most probably to have been from the area previously mined. One of these stockpiles appears to have been intended for use as blasthole stemming as it was crushed below the typical size for direct shipping ore. The samples were collected from several locations within each stockpile and transported to Perth.

Figure 2 Ant Hill Ore Stockpile

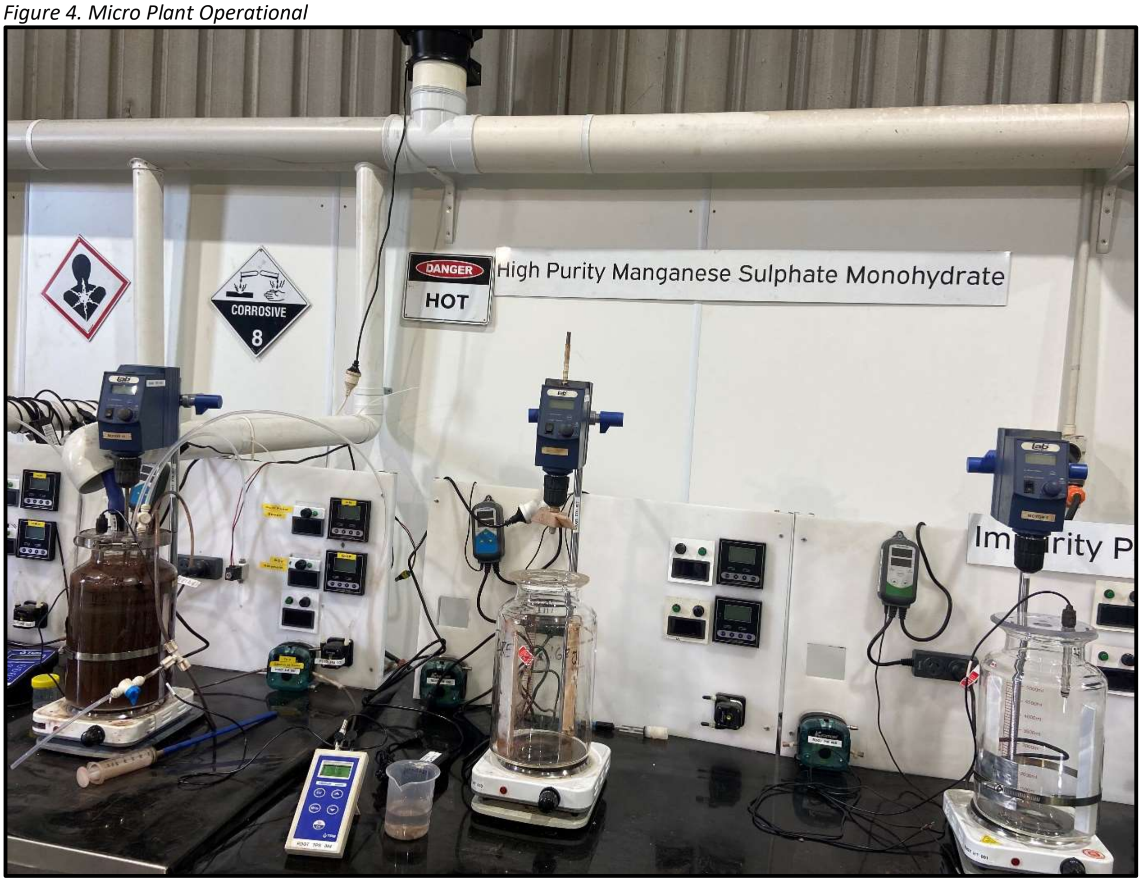
On arrival, the samples were analysed to confirm the major element composition, the samples were crushed and blended to give two different feedstocks.

Figure 3. Fe and Mn composition of the ore blends used in the testwork to date compared to the entire Ant Hill drill hole database.



Production of manganese sulphate

Figure 4. Micro Plant Operational



A previous announcement outlined the process development. The present runs were made using the same flowsheet but at larger scale on a semi-continuous basis.

Completion of the design and construction of a Micro Plant facility was achieved in March 2024. The design was based on testwork carried out at ALS Metallurgy, as previously reported on 15 November 2023 (ASX Release). The scale was chosen to produce HPMSM in multi-kilogram quantities per run to allow the process to be further refined and provide 0.5-1.0kg samples of product to start qualification testing with potential off-takers / partners. The Micro Plant was designed to be able to run the complete flowsheet and operate two stages sequentially. Thus, leaching and major impurity removal were run simultaneously, the plant was then stopped, cleaned and reconfigured to run the minor element impurity removal and crystallisation stages.

The Micro Plant was commissioned in stages to ensure that each run provided technical data which could be used to develop a model of the process to be supplied to Carnac.

The samples blended from the samples remaining from the earlier work, were used to commission the Micro Plant, to provide some data on the effect of ore variability and to commence optimisation of the flowsheet.

Unlike the earlier testwork, the reagents used were of commercial grade and not of analytical grade, the level of impurities in the commercial reagents was higher than the analytical reagents and the reagent consumption was slightly higher. The early runs used lime which proved to have somewhat high magnesium (Mg) content which resulted in problems meeting the Mg specification in the final HPMSM product. This lime was replaced with lime with much lower magnesium content, from a different source resulting in a lower level in the crystals.

The leachate was processed through purification and crystallisation to give manganese sulphate crystals. Substantial process development occurred during these runs to gain a better understanding of the interrelationship between impurity removal, reagent type and addition and general operating conditions.

The reagent requirements, operating temperature, residence times, maximum impurity levels in solution and a range of other parameters were determined for each stage using the Pilot Plant.

The leaching stage was designed in order to achieve >90g/L Mn in the final solution; this was achieved with >90% Mn recovery in all runs. It was found that the leaching stage was largely unaffected by composition, although high iron, low manganese ores tended to have a slightly higher reductant consumption, high calcium ores tended to have a higher acid consumption. The impurity elements behaved as expected from the earlier work, elements associated with the Mn leached concomitantly. The levels of impurities in the leach solution varied between runs but could be correlated with their head grade. The apparent correlation between the impurity levels and mineralogy of the different feeds bodes well for the processing of ore from across the orebody as it implies a consistent mineralogy across the deposit. Further samples from across the orebody will be tested in due course to confirm this observation.

The potassium removal stage was highly effective with it being consistently >99% removed to well below the targeted level. Sodium removal was less effective, but 70-80% of the Na was typically removed from solution. Iron and aluminium were removed to <2ppm by raising the pH using lime. The base metals were consistently removed to <2ppm by formation of a sulphide containing Co, Cu and Zn as the major metals. The final elements removed were calcium and magnesium, these proved difficult to remove consistently, so a novel, proprietary, process had to be developed to reduce these to acceptable levels prior to crystallisation.

The purified solution was evaporated to crystallise high purity manganese sulphate which was then recovered and dried to produce a solid phase.

Table 2 shows the analyses of the most recent HPMSM product. After evaporation, the crystals were washed using high purity water, thermally dried at 105°C and sent for analysis at Source Certain International (SCI), a NATA accredited laboratory in Wangara, Western Australia.

Each batch of crystals was analysed in duplicate and the average value is reported. The Grade 1 and Grade 2 standards are from the recently updated Chinese standard HG/T 4823-2023 Manganese sulfate for battery materials. Analyses 001/004 were for crystals from the initial crystallisation, 002/005 for washed crystals and 003/006 after recrystallisation.

element	Grade 1	Grade 2	SC1307-001 / 004	SC1307-003 / 006	SC1307-002 / 005
Al	10	30	23.7	9.9	10.8
As			0.03	<0.01	<0.01
Ca	50	100	68.3	72.6	63.2
Cd	5	10	<0.02	<0.02	<0.02
Cl	100	200			
Co	50	-	3.0	2.9	2.9
Cr	10	15	0.2	0.2	0.1
Cu	10	20	1.5	1.6	1.3
F	negotiable	negotiable			
Fe	10	20	<0.5	<0.5	<0.5
Hg			<0.004	<0.004	<0.004
K	30	50	16.0	8.0	7.3
Mg	50	100	60.9	59.9	55.7
Mn	31.18	32			
Na	100	200	105.6	35.7	49.1
Ni	50	-	1.6	1.9	1.8
P			<5	<5	7.5
Pb	10	15	<0.05	<0.05	<0.05
Se			1.9	2.1	2.2
Si	negotiable	negotiable	324.7	58.6	75.1
Sn			<0.1	<0.1	<0.1
Zn	10	20	0.4	0.6	1.0

Notes:

1) *The ICP method used by SCI is unable to measure Cl or F and a method capable of providing suitable detection limits is being researched.*
2) *The Mn in the crystals is too high for the ICP to measure accurately. Internal analyses indicate that all crystals were >32% Mn.*

As is clear, all three sets of crystals achieved the Grade 2 HPMSM standard. Washing of the crystals reduced the Al, Na and Si significantly, recrystallisation of the washed crystals made relatively small changes, both positive and negative. It was subsequently found that the water used for washing and recrystallisation was not as pure as expected due to the near exhaustion of a stage of reverse osmosis, further runs will be made using higher purity water so that better purities can be reasonably expected.

Future work

Additional process improvements are underway to reduce the impurities further and to improve the physical processes during the production of HPMSM. Some laboratory test work is planned to assess the effect of adding seed crystals to stages where precipitation occurs. Seed crystals generally increase the rate of removal of elements and produce a coarser product thereby aiding filtration. Dewatering of the crystals has also been identified as an area where improvements can be made.

A larger Pilot Plant capable of producing 40-50kg per day of HPMSM is in the final stages of design using the data obtained from the test work programme. The Pilot Plant will allow the production of the much larger mass of HPMSM required by offtake partners in order to proceed to the second and subsequent stages of qualification with vehicle and battery manufacturers. It will also provide additional engineering data necessary for the design of the full-scale plant.

The Pilot Plant will be fed using ore from a number of locations within the Ant Hill orebody to ensure the process is sufficiently robust. Geometallurgical assessment of the orebodies is presently underway to identify the best locations for sampling the orebodies.

Resource Development Group Managing Director Andrew Ellison commented:

"As with many projects of this nature, we have encountered and overcome challenges, which makes the achievements all the more rewarding. We have the resource, the process, fantastic support and we have the drive to become a globally significant Battery Minerals producer."

This announcement dated 29 November 2024 is authorised for market release by the Board of Resource Development Group Ltd.

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COMPETENT PERSONS STATEMENT – Metallurgy

The information in this report relating to metallurgical test work results is based on and fairly reflects information reviewed by Dr Nicholas Welham. Dr Welham is a consultant to RDG Technologies Pty Ltd, a 100% owned subsidiary of Resource Development Group Limited. Dr Welham is involved in leading the development and optimisation of the process to produce HPMSM. Dr Welham is a Fellow of the Australian Institute of Mining and Metallurgy. Dr Welham is a qualified metallurgist and has sufficient experience which is relevant to the management and interpretation of test work activities undertaken 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". Dr Welham consents to the inclusion in the ASX release of the matters based on their information in the form and context in which it appears.