

ASX Release
29 February 2024

Mackay Potash Project Process Engineering Update

Highlights

- Testwork conducted in partnership with Veolia Water Technologies has resulted in significant increase in knowledge with positive impacts on process design and process control during pond commissioning
- Identification of a unique mineralogy in startup feed salts in Western Australian SOP projects caused by local climatic conditions
- Excellent test work results with Veolia Water Technologies determines optimal temperature to manage startup feed salt composition
- Mackay Potash Project will be the first SOP development in Western Australia to use a cooling crystalliser for temperature-controlled feed salt conversion
- Flotation test work being undertaken to further derisk the process flowsheet

Agrimin Limited (ASX: AMN) (“Agrimin” or “the Company”) is pleased to provide an update in relation to ongoing process test work for the Mackay Potash Project (“the Project”).

Process Engineering Update

The Company, as part of front end engineering design (“FEED”), has been progressing thorough process test work using samples harvested from the Mackay Potash Project. In conjunction with recent industry learnings, and with the support of leading equipment vendors, the results produced are being used to finalise the process design and equipment selection.

Technical review following the Definitive Feasibility Study (“DFS”) uncovered a mineralisation anomaly whereby Leonite ($K_2SO_4 \cdot MgSO_4 \cdot 4H_2O$) occurs with Schoenite ($K_2SO_4 \cdot MgSO_4 \cdot 6H_2O$) in the harvested salts during startup. This anomaly was discovered during bulk testing by Veolia Water Technologies Inc. (USA) (“Veolia Water Technologies”) in 2022, while smaller scale testing prior had not differentiated the minerals. It was initially understood that the minerals would respond in the same manner when processed given their similar chemical composition.

Global investigation and local learnings suggest that the presence of Leonite in the precipitated harvest salts is unique to Western Australian salt lake projects and arises due to climatic conditions, namely the heat experienced in the ponds and on the run of mine stockpile. The formation of Leonite is exacerbated during startup until brine recirculation develops higher Magnesium (Mg) levels in the ponds and plant.

Continued process test work during 2022 sought to validate the flotation step in the process flowsheet as designed in the DFS. However, this testing resulted in unexpected, sub-optimal recovery rates of ~60% which

was subsequently attributed to the occurrence of Leonite as it did not readily float; a behaviour which is contrary to Schoenite in the same conditions.

Once it was established that Leonite behaves differently to Schoenite and does not readily float, collaborative test work continued with Veolia Water Technologies (USA) in 2023 with the focus being to successfully identify the conditions required to convert Leonite to Schoenite (refer to Figure 1).

Test work results for the conversion stage have repeatably demonstrated that the occurrence of Leonite can be managed through temperature control and sufficient residence time in a cooling crystalliser. A cooling crystalliser, rather than heat exchanger vessel, was incorporated into the DFS design and remains the preferred equipment as it provides uniform temperature control throughout the vessel ensuring conversion to Schoenite. The optimal temperature required in the conversion stage to resolve Leonite is ~15 degrees celsius, which is lower than the 28 degrees celsius assumed during the DFS, prior to understanding the occurrence of Leonite in the startup feed salts.

With the Leonite issue now resolved by temperature-controlled conversion, further technical de-risking will occur through a suite of flotation tests. Using converted feed salts from Lake Mackay, FLSmidth will undertake this scope of work which aims to demonstrate acceptable recovery rates in the flotation stage of the flowsheet. This testing will be undertaken in the 1H 2024.

Graeme Ditri, Process Manager at Agrimin commented: *"Discovering the occurrence of Leonite in the Mackay feed salts has had a profound impact on our understanding of the required process flowsheet. While Schoenite and Leonite are very similar, the difference in waters of hydration (H₂O) affects how the salts respond in flotation.*

"By understanding industry learnings and working in collaboration with Veolia Water Technologies, the test plan we created has tested a range of scenarios and sensitivities to narrow down the key design parameters required in conversion, the first stage of the process.

"Using a cooling crystalliser for conversion enables tight and uniform temperature control which results in the required conversion ahead of flotation, the second stage of the process.

"We look forward to our continued partnership with Veolia Water Technologies and commencing the flotation test work with FLSmidth."

Debbie Morrow, Managing Director & CEO of Agrimin commented: *"As we continue toward development of the Mackay Potash Project, I am pleased to share that our robust technical diligence has identified, corroborated and worked to resolve a mineralisation anomaly unique to salt lakes in Western Australia.*

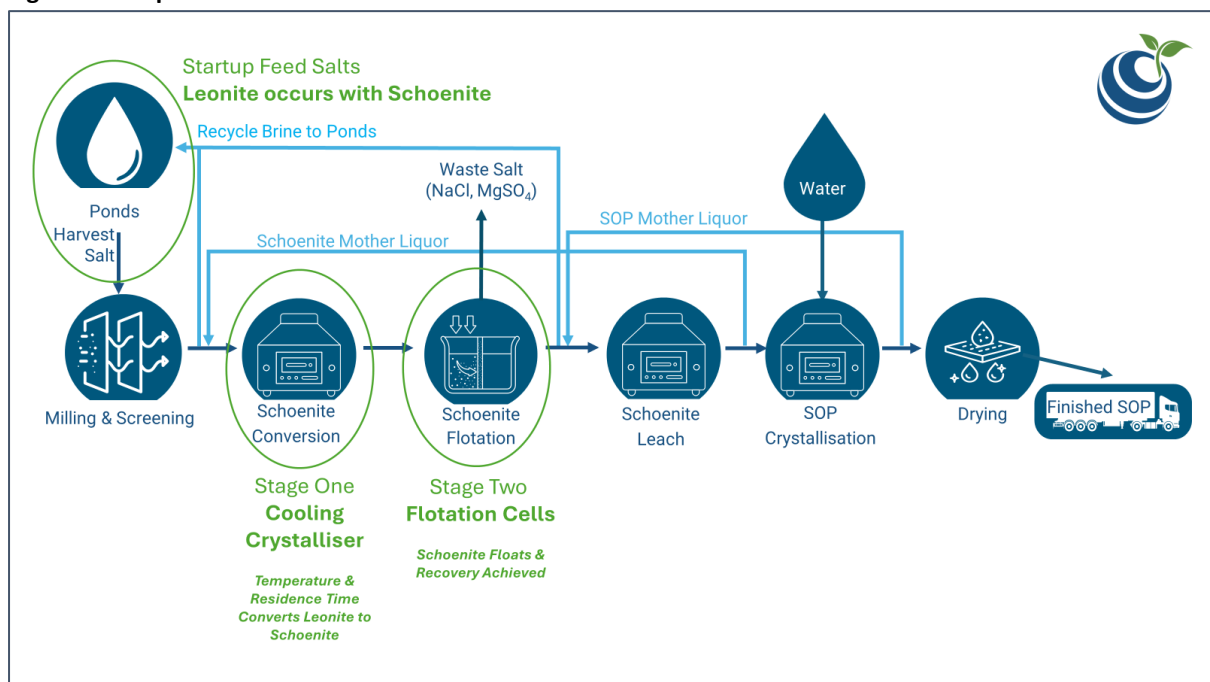
"As previously announced (refer to ASX announcement dated 26 July 2023) we have been undertaking extensive test work with Veolia Water Technologies which has successfully resolved Leonite in Lake Mackay harvest feed salts ensuring that conversion to Schoenite occurs before flotation.

"Conversion to Schoenite ahead of flotation, being the second stage in our process flow sheet is essential, and we now have a thorough understanding of the required cooling crystalliser conditions to resolve the occurrence of Leonite.

“Planning is well advanced for the next round of test work, which will focus on the second stage in the flow sheet, being flotation. Agrimin is partnering with FLSmidth on this scope which will focus on the mechanical design optimal for grade versus recovery and the impact of particle size distribution.

“This development validates our patient and diligent approach to delivering the Mackay Potash Project and we look forward to continued collaboration and testing with Veolia Water Technologies and FLSmidth to finalise our process design and progress equipment selection.”

Figure 1. Simplified Process Flowsheet



ENDS

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This ASX Release is authorised for market release by Agrimin’s Board.

About Agrimin

Based in Perth, Agrimin Limited is the leading fertiliser development company on the ASX (**ASX: AMN**) focused on development of its 100% owned Mackay Potash Project. The Project is situated on Lake Mackay in Western Australia, the largest undeveloped potash-bearing salt lake in the world. Agrimin's vision is sustainable food security for future generations by providing nutrition the world needs. The demand for SOP is underpinned by population growth, which the Food and Agriculture Organization of the United Nations predicts will drive an increase in global food demand by 50% by 2050¹.

Competent Persons Statement

The information in this announcement that relates to Exploration Results for the Mackay Potash Project is based on and fairly represents information compiled or reviewed by Mr Michael Hartley, who is a member of AusIMM and the Australian Institute of Geoscience (AIG). Mr Hartley is a full-time employee of Agrimin Limited. Mr Hartley has sufficient experience which is relevant to the style of mineralisation and type of deposit under consideration, and to the activity he is undertaking, to qualify as a Competent Person in terms of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (JORC Code 2012 Edition). Mr Hartley consents to the inclusion of such information in this announcement in the form and context in which it appears.

The information in this announcement that relates to the interpretation of process test work data and mineral processing for the Mackay Potash Project was first reported in the ASX Release titled "Agrimin to be the World's Lowest Cost SOP Producer" announced on 21 July 2020. The Company confirms that, other than as set out in this announcement, it is not aware of any new information or data that materially affects the information in the previous announcement and that, other than as set out in this announcement, all the material assumptions underpinning the interpretation in the previous announcement continue to apply and have not materially changed.

Forward-Looking Statements

This ASX Release may contain certain "forward-looking statements" which may be based on forward-looking information that are subject to a number of known and unknown risks, uncertainties, and other factors that may cause actual results to differ materially from those presented here. Where the Company expresses or implies an expectation or belief as to future events or results, such expectation or belief is expressed in good faith and believed to have a reasonable basis. Forward-looking information includes exchange rates; the proposed production plan; projected brine concentrations and recovery rates; uncertainties and risks regarding the estimated capital and operating costs; uncertainties and risks regarding the development timeline, including the need to obtain the necessary approvals. For a more detailed discussion of such risks and other factors, see the Company's Annual Reports, as well as the Company's other ASX Releases. Readers should not place undue reliance on forward-looking information. The Company does not undertake any obligation to release publicly any revisions to any forward-looking statement to reflect events or circumstances after the date of this ASX Release, or to reflect the occurrence of unanticipated events, except as may be required under applicable securities laws.

¹ Food and Agriculture Organization of the United Nations, The future of food and agriculture Trends and challenges, accessed 24 October 2023, page 136: <https://www.fao.org/3/i6583e/i6583e.pdf>

JORC Code, 2012 Edition – Table 1

Section 1 Sampling Techniques and Data

Criteria	JORC Code explanation	Commentary
Sampling techniques	<i>Nature and quality of sampling (eg cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling.</i>	Results reported in this announcement relate to chemical testwork conducted by Agrimin Limited (“Agrimin”) to advance its DFS flowsheet for recovery of Potassium Sulphate (“SOP”) from resource brines containing Potassium and Sulphate ions.
	<i>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</i>	The testwork was developed and scoped collaboratively with Veolia Water Technologies (“Veolia”) conducted at facility in Plainfield II, USA, overseen by local Veolia experts with over 30 years crystallisation experience using Veolia standard methods and experience for testwork execution and assay determination. Elemental assay was determined via Atomic Absorption Spectroscopy (AAS) for the positive ions (K, Na, Mg), Ion Chromatography for the negative ions (SO ₄ and Cl) per the Veolia standard procedures and practice. Mineral analysis was performed via X-ray Diffraction (“XRD”) at an independent laboratory at North Western University (“NWU”) at the J.B. Cohen X-ray Diffraction Facility. XRD sample preparation and analysis completed via a jointly developed method for schoenite/leonite hydrated salt analysis between Agrimin, NWU and Microanalysis Australia. XRD Quality Control Leonite reference material provided by Agrimin, certified by Microanalysis Australia.
	<i>Aspects of the determination of mineralisation that are Material to the public Report.</i>	Not applicable.
	<i>In cases where ‘industry standard’ work has been done this would be relatively simple (eg ‘reverse circulation drilling was used to obtain 1 m samples from which 3 kg was pulverised to produce a 30 g charge for fire assay’). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. Unusual commodities or mineralisation types (eg submarine nodules) may warrant disclosure of detailed information.</i>	Not applicable.
Drilling techniques	<i>Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or</i>	Not applicable.

Criteria	JORC Code explanation	Commentary
	<i>standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).</i>	
Drill sample recovery	<p><i>Method of recording and assessing core and chip sample recoveries and results assessed.</i></p> <p><i>Measures taken to maximise sample recovery and ensure representative nature of the samples.</i></p> <p><i>Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material.</i></p>	Not applicable.
Logging	<p><i>Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies.</i></p> <p><i>Whether logging is qualitative or quantitative in nature. Core (or costean, channel, etc) photography.</i></p> <p><i>The total length and percentage of the relevant intersections logged.</i></p>	Not applicable.
Sub-sampling techniques and sample preparation	<p><i>If core, whether cut or sawn and whether quarter, half or all core taken.</i></p> <p><i>If non-core, whether riffled, tube sampled, rotary split, etc and whether sampled wet or dry.</i></p> <p><i>For all sample types, the nature, quality and appropriateness of the sample preparation technique.</i></p> <p><i>Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples.</i></p> <p><i>Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling.</i></p> <p><i>Whether sample sizes are appropriate to the grain size of the material being sampled.</i></p>	Refer to 'Sampling techniques' above.
Quality of assay data and laboratory tests	<i>The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total.</i>	Crystallisation tests were executed by trained Veolia technicians, overseen by Veolia research engineers with over 30 years relevant experience in crystallisation. Analytical methods determined to be appropriate with adequate oversight and considered total.

Criteria	JORC Code explanation	Commentary
	<i>For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation, etc.</i>	Not applicable.
	<i>Nature of quality control procedures adopted (eg standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (ie lack of bias) and precision have been established.</i>	Standard Veolia analytical procedure for the chemical assay, with blanks and duplicates as per the Veolia standards. Leonite reference material used in the XRD analysis (refer to summary included in 'Sampling techniques' above). Reference material certificate of analysis was provided by Microanalysis Australia.
Verification of sampling and assaying	<i>The verification of significant intersections by either independent or alternative company personnel.</i>	The results presented were not verified by any alternative analytical entity. However, XRD results were reviewed by Veolia, Graeme Ditri (Process Manager at Agrimin) and Microanalysis Australia for consistency and ionic balance when received.
	<i>The use of twinned holes.</i>	Not applicable.
	<i>Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols.</i>	All data stored at Veolia premises and duplicated in Agrimin office in Perth as native data and PDF reports.
	<i>Discuss any adjustment to assay data.</i>	Not applicable.
Location of data points	<i>Accuracy and quality of surveys used to locate drill holes (collar and down-hole surveys), trenches, mine workings and other locations used in Mineral Resource estimation.</i> <i>Specification of the grid system used.</i> <i>Quality and adequacy of topographic control.</i>	Not applicable.
Data spacing and distribution	<i>Data spacing for reporting of Exploration Results.</i> <i>Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied.</i> <i>Whether sample compositing has been applied.</i>	Not applicable.
Orientation of data in relation to geological structure	<i>Whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type.</i> <i>If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have</i>	Not applicable.

Criteria	JORC Code explanation	Commentary
	<i>introduced a sampling bias, this should be assessed and reported if material.</i>	
Sample security	<i>The measures taken to ensure sample security.</i>	<p>Samples for analyses were hand delivered to the assay laboratory from the crystallisation laboratory staff within the same building. Samples are discarded immediately upon advice from the Company that the data has been received. Reserve samples are held at the Company's laboratory for an adequate back-up period.</p> <p>Samples for XRD were shipped via secure tracked courier, with chain of custody documentation and sign off procedures.</p>
Audits or reviews	<i>The results of any audits or reviews of sampling techniques and data.</i>	<p>No external audits or reviews of sampling techniques or analytical data have been undertaken to date. A metallurgical balance model (SysCAD) has been undertaken by Agrimmin and Veolia to examine the Company's conceptual flowsheet/mass balance based on analytical results obtained and presented by Agrimmin. Results are preliminary and being subjected to further laboratory testwork for consistency.</p>

Section 2 Reporting of Exploration Results

Criteria	JORC Code explanation	Commentary
Mineral tenement and land tenure status	<p><i>Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings.</i></p> <p><i>The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area.</i></p>	Not applicable.
Exploration done by other parties	<i>Acknowledgment and appraisal of exploration by other parties.</i>	Not applicable.
Geology	<i>Deposit type, geological setting and style of mineralisation.</i>	Not applicable.
Drill hole Information	<p><i>A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes:</i></p> <ul style="list-style-type: none"> <i>easting and northing of the drill hole collar</i> <i>elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar</i> 	Not applicable.

Criteria	JORC Code explanation	Commentary
	<ul style="list-style-type: none"> dip and azimuth of the hole down hole length and interception depth hole length. <p>If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does not detract from the understanding of the report, the Competent Person should clearly explain why this is the case.</p>	
Data aggregation methods	<p>In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (eg cutting of high grades) and cut-off grades are usually Material and should be stated.</p> <p>Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of low grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail.</p> <p>The assumptions used for any reporting of metal equivalent values should be clearly stated.</p>	Not applicable.
Relationship between mineralisation widths and intercept lengths	<p>These relationships are particularly important in the reporting of Exploration Results.</p> <p>If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported.</p> <p>If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (eg 'down hole length, true width not known').</p>	Not applicable.
Diagrams	<p>Appropriate maps and sections (with scales) and tabulations of intercepts should be included for any significant discovery being reported. These should include, but not be limited to a plan view of drill hole collar locations and appropriate sectional views.</p>	Refer to page 12 of Agrimin's announcement titled 'Bell Potter Unearthed Presentation' dated 14 February 2024 which provided a conceptual process diagram. Data reported in this announcement provides further data on the process unit operations.
Balanced reporting	<p>Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and/or widths should be practiced to avoid misleading reporting of Exploration Results.</p>	Not applicable.
Other substantive exploration data	<p>Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples – size and method of treatment; metallurgical test results; bulk density,</p>	<p>Agrimin, as part of its front-end engineering design ("FEED"), has been progressing through process testwork using samples harvested from the Mackay Potash Project trial ponds. Metallurgical testwork has confirmed the presence of unique mineralogy in the Lake</p>

Criteria	JORC Code explanation	Commentary
	<i>groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.</i>	Mackay start-up feed salts due to climatic conditions. Namely, leonite mineralogy which has shown to behave differently to schoenite under the same process conditions, particularly in flotation. Leonite is different to schoenite by two hydration waters in its crystal structure, and previously was thought to behave similar to schoenite (i.e. it would float). However, testwork has shown that it does not readily float and needs to be converted to schoenite for traditional processing. The conversion conditions are highlighted in this ASX release.
Further work	<p><i>The nature and scale of planned further work (eg tests for lateral extensions or depth extensions or large-scale step-out drilling).</i></p> <p><i>Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive.</i></p>	Agrimin is continuing its testwork and development of its DFS flowsheet for SOP recovery. Additional data will be reported as it comes to hand and in accordance with Agrimin's continuous disclosure obligations under the ASX Listing Rules.