

ASX Release
10 July 2024

Mackay Potash Project Process Engineering Update

Highlights

- Flotation testwork successfully achieved greater than 90% potassium recovery at greater than 90% schoenite grade, focusing on lower grade feed salts that are expected during initial ramp-up of operations
- This represents a significant milestone as flotation is the primary separation step within the proposed process flowsheet and can significantly impact process plant performance
- Testwork was conducted in partnership with leading equipment vendors FLSmidth and Veolia
- Planned testwork for the remainder of 2024 includes optimising the leach and SOP crystallisation stages

Agrimin Limited (ASX: AMN) (“Agrimin” or “the Company”) is pleased to report successful flotation results and provide an update in relation to ongoing process testwork for the Mackay Potash Project (“the Project”). The results reported in this announcement relate to flotation testwork that was completed in partnership with FLSmidth Inc. (“FLSmidth”) and Veolia Water Technologies Inc. (USA) (“Veolia”).

Flotation testwork was performed at Veolia’s facility in Plainfield, USA and utilised FLSmidth’s flotation test unit and expertise. The testwork aimed to evaluate a range of flotation variables including collector selection, collector dose rate, collector application, collector conditioning time, mixing dynamics (conditioning and flotation), chemical behaviour, process temperature and flotation kinetics.

Debbie Morrow, Managing Director & CEO of Agrimin commented: “Successful flotation results at a range of operating conditions are an excellent result as flotation has been a key challenge for the SOP industry in Western Australia.

“Our findings have demonstrated that the conversion step of the process is critical for producing the suitable salts for successful flotation.

“The next phase of testwork will challenge these results further to better understand the bounds of the flotation unit.

“In the second half of the year we will continue to work with leading equipment vendors Veolia and FLSmidth to finalise testwork and then move to focus on the downstream schoenite leach and SOP crystallisation stages of the flowsheet.”

Graeme Ditri, Process Manager, Agrimin commented: *“We are pleased with the flotation results achieved in collaboration with Veolia and FLSmidth undertaken at the Veolia test facility in the USA. Collaboration with leading equipment vendors to co-design and undertake the laboratory work strengthen the results and our understanding of the range of conditions required to advance the plant design for commercial scale.*

“The repeatability of both the recent conversion results and now flotation results is highly encouraging.

“We look forward to finalising the float testwork and progressing efforts to refine schoenite leach and SOP crystallisation stages.”

Flotation Testwork Discussion

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

Flotation is a critical step required to separate the potassium bearing minerals from the waste salts that are harvested from the evaporation ponds (refer Figure 1).

In previous conversion testwork (announced to the ASX on 1 March 2024) it was found that temperature control to approximately 15 degrees celsius was required to ensure that schoenite was produced in the conversion stage. Without temperature control, it is probable that harvest salts will convert to leonite which is not amenable to direct flotation. Having successfully tested the paramaters required for conversion stage, ongoing testwork has focussed on flotation.

Utilising potash harvest salts from the Lake Mackay trench and pond trial, schoenite feed material was produced by conversion with Veolia. The focus being on lower potassium grades which are expected to occur during the initial ramp-up phase of operations.

A total of 23 open cycle tests were conducted which considered a range of conditions for flotation. Repeatable results were achieved under preferred conditions, consistent with the Definitive Feasibility Study (announced to the ASX on 21 July 2020) with design values of 90% potassium recovery and 90% schoenite grade.

A selection of test results are presented in Table 1 and Figure 2, which show repeatable recoveries and grades above 90%. These results provide high confidence in reaching a commercial solution for SOP production. Further testwork is planned to optimise the operating ranges and limits for the Leach and SOP Crystallisation stages, including the influence of recycle streams and feed variation.

Figure 1. Simplified Process Flowsheet

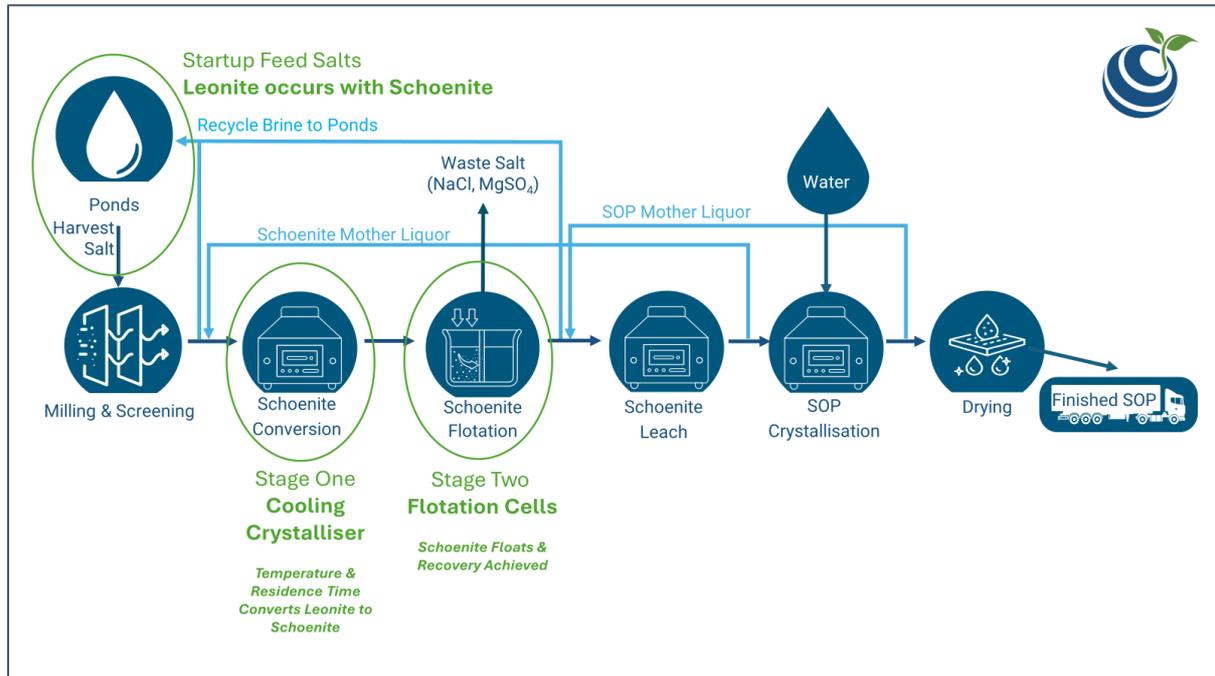
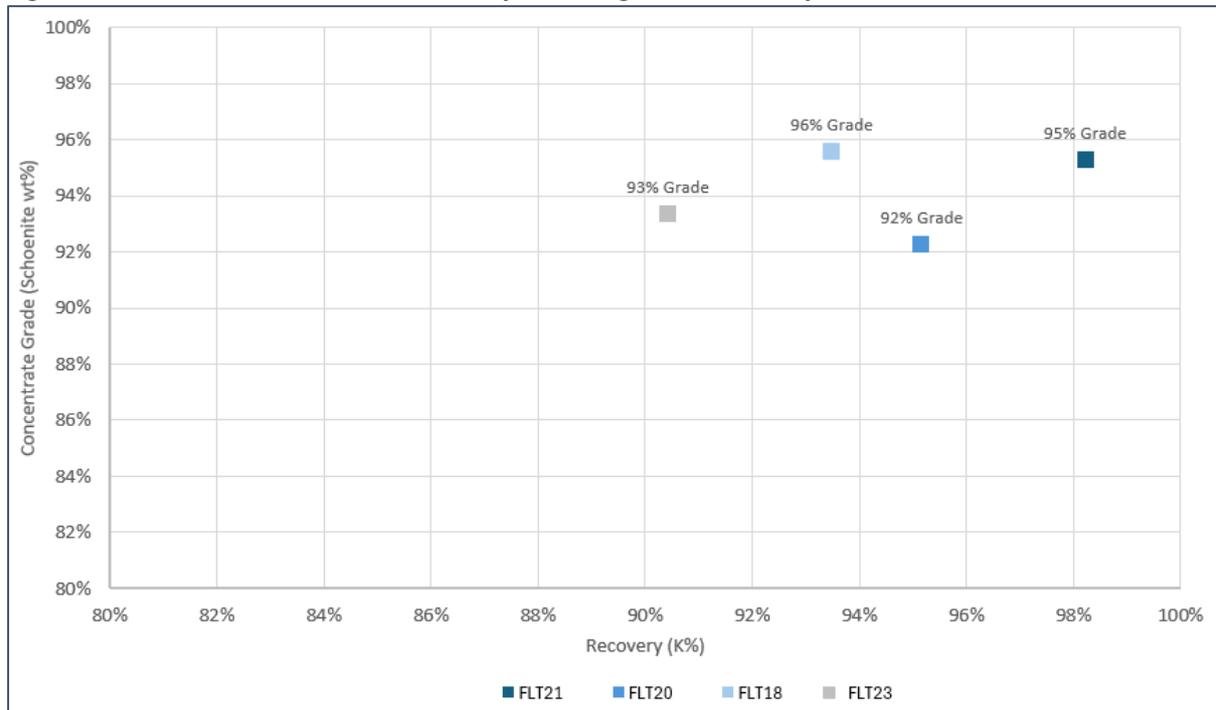


Table 1. Selection of Flotation Testwork Results

	Test ID:	FLT18	FLT20	FLT21	FLT23
Feed Grade	Schoenite	72%	72%	69%	69%
	Halite	16%	16%	20%	20%
	Bloedite & Epsomite	12%	12%	11%	11%
Concentrate Grade	Schoenite	96%	92%	95%	93%
	Halite	3%	4%	3%	4%
	Bloedite & Epsomite	1%	4%	2%	3%
Tails Grade	Schoenite	11%	8%	4%	16%
	Halite	50%	55%	50%	40%
	Bloedite & Epsomite	39%	37%	46%	44%

Figure 2. Flotation Grade versus Recovery, showing Final Recovery and Grade



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 testwork 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
<p>Sampling techniques</p>	<p><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></p> <hr/> <p><i>Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used.</i></p>	<p>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.</p> <hr/> <p>The testwork was developed and scoped collaboratively with Veolia Water Technologies Inc. (USA) (“Veolia”) and FLSmidth Inc (“FLSmidth”) conducted at facility in Plainfield II, USA, overseen by local Veolia and FLSmidth metallurgical experts with over 30 years crystallisation and flotation experience using Veolia standard and FLSmidth standard methods and experience for testwork execution and assay determination.</p> <p>Elemental assay was determined via Atomic Absorption Spectroscopy (AAS) for the positive ions (K, Na, Mg), Ion Chromatography for the negative ions (SO₄ and Cl) per the Veolia standard procedures and practice.</p> <p>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.</p> <p>XRD sample preparation and analysis completed via a jointly developed method for schoenite/leonite hydrated salt analysis between Agrimin, NWU and Microanalysis Australia.</p> <p>XRD Quality Control leonite reference material provided by Agrimin, certified by Microanalysis Australia.</p>
	<p><i>Aspects of the determination of mineralisation that are Material to the public Report.</i></p>	<p>Not applicable.</p>

Criteria	JORC Code explanation	Commentary
	<p><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></p>	<p>Not applicable.</p>
<p>Drilling techniques</p>	<p><i>Drill type (eg core, reverse circulation, open-hole hammer, rotary air blast, auger, Bangka, sonic, etc) and details (eg core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc).</i></p>	<p>Not applicable.</p>
<p>Drill sample recovery</p>	<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>	<p>Not applicable.</p>
<p>Logging</p>	<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>	<p>Not applicable.</p>
<p>Sub-sampling techniques and sample preparation</p>	<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,</i></p>	<p>Refer to ‘Sampling techniques’ above.</p>

Criteria	JORC Code explanation	Commentary
	<p><i>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>	
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>	<p>Flotation tests were executed by FLSmidth metallurgists with extensive experience in froth flotation.</p> <p>Analytical methods determined to be appropriate with adequate oversight and considered total.</p>
	<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>	<p>Standard Veolia analytical procedure for the chemical assay, with blanks and duplicates as per the Veolia standards.</p> <p>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.</p>
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) 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>	Not applicable.
	<i>Specification of the grid system used.</i>	
	<i>Quality and adequacy of topographic control.</i>	

Criteria	JORC Code explanation	Commentary
Data spacing and distribution	<p><i>Data spacing for reporting of Exploration Results.</i></p> <p><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></p> <p><i>Whether sample compositing has been applied.</i></p>	Not applicable.
Orientation of data in relation to geological structure	<p><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></p> <p><i>If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material.</i></p>	Not applicable.
Sample security	<p><i>The measures taken to ensure sample security.</i></p>	<p>Samples for analyses were hand delivered to the assay laboratory from the flotation 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	<p><i>The results of any audits or reviews of sampling techniques and data.</i></p>	<p>No external audits of sampling techniques or analytical data have been undertaken to date.</p> <p>A metallurgical balance model (SysCAD) has been undertaken by Agrimin and Veolia to examine the Company's conceptual flowsheet/mass balance based on analytical results obtained and presented by Agrimin.</p> <p>A third-party review has been completed by Mineralis.</p> <p>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>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.</p> <p>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.</p>	Not applicable.
Exploration done by other parties	Acknowledgment and appraisal of exploration by other parties.	Not applicable.
Geology	Deposit type, geological setting and style of mineralisation.	Not applicable.
Drill hole Information	<p>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:</p> <ul style="list-style-type: none"> • easting and northing of the drill hole collar • elevation or RL (Reduced Level – elevation above sea level in metres) of the drill hole collar • 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>	Not applicable.
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>	Not applicable.

Criteria	JORC Code explanation	Commentary
	<p><i>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’).</i></p>	
<p>Diagrams</p>	<p><i>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.</i></p>	<p>Refer to Figure 1 Simplified Process Flowsheet</p>
<p>Balanced reporting</p>	<p><i>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.</i></p>	<p>Not applicable.</p>
<p>Other substantive exploration data</p>	<p><i>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, groundwater, geotechnical and rock characteristics; potential deleterious or contaminating substances.</i></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. Testwork has shown flotation can be achieved for schoenite at the conditions highlighted in this ASX release.</p>
<p>Further work</p>	<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>	<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.</p>