ASX ANNOUNCEMENT

ASX: APC

20 April 2021

Front End Engineering Design (FEED) positions K-Brite™ at the Premium End of the Global SOP Market

- **Optimised sustainable Sulphate of Potash development will produce 170,000 tonnes per annum of premium priced K-Brite™ SOP products for distribution across the world's most lucrative markets**

Increase in output	√	**+ 20,000 tonnes per annum**
Granulation circuit	√	**To capture premium priced end of SOP market**
Bagging plant	√	**To capture premium priced end of SOP market**
Organic certification	√	**To capture premium priced end of SOP market**
Global distribution agreements	√	**To capture premium priced end of SOP market**
EPC Development	√	**Price, schedule and performance guarantees**

- **Five (5) binding take-or-pay offtake agreements covering 90% of optimised forecast output executed with Tier 1 global fertiliser distribution partners providing downside price protection and uncapped upside premium**
- **Summary of key metrics**

NPV_8: A$614 million	**IRR: 21%**	**Annual EBITDA: A$124million**
Pre-production CAPEX:	**A$292m incl. granulation and bagging circuits**	
Operating cost:	**US$251/tonne FOB**	
Annual production:	**170,000 tonnes per annum**	
Life of Mine:	**30 years**	

- **Approved A$140 million, 17-year loan facility from the Northern Australian Infrastructure Facility (NAIF)**
- **Export Finance Australia (EFA) have provided conditional approval for a A$45 million, 10-year loan facility**
- **Commercial banks progressing with due diligence/credit approval processes for proposed core debt and typical project facilities**
- **More than 75%, by value, of Project construction contracts awarded on an Engineering, Procurement and Construction (EPC), lump sum basis providing schedule, cost and performance guarantees**
- **Renewable hybrid power solution to generate base-case 44% renewable energy penetration (REP) rate with pathway to 60% REP through battery energy storage system (BESS) build-out**

- **Lake Wells SOP Project is positioned as the lowest CO_2 emitting SOP project development in Australia, enhancing global decarbonising of the fertiliser supply chain with APC's K-Brite™ SOP to replace energy-intensive Mannheim SOP use in key markets**
- **K-Brite™ products certified for use in organic agriculture by institutions covering the European Union with other global market's organic certification applications pending**
- **Green label debt verification providing assurance of the positive environmental contribution Lake Wells SOP products will make to the environment**

Australian Potash Limited (ASX: APC) (**APC** or the **Company**) is pleased to provide the results of the Front-End Engineering and Design (**FEED**) program.

Australian Potash Managing Director and CEO, Matt Shackleton, said: "The Lake Wells Sulphate of Potash Project has always been somewhat unique across the peer space for being the only project to be developed with 100% bore-field abstraction of brine, with no re-charge or rainfall factors included in the largest Australian JORC compliant Measured SOP resource of 18.1 million tonnes. The mine plan uses a mere 24% of this resource over the projected 30-year mine life.

"SOP is globally regarded as the premium form of the essential, non-substitutable potassic fertilisers. We are immensely proud to be developing an operation using an industry high 44% renewable energy penetration rate - we will produce Australia's lowest carbon footprint SOP and will generate approximately one-third of the emissions attributable to a comparable sized Mannheim SOP process.

"As well as being certified for use in organic agriculture in many countries into which it will be distributed, the LSOP has received Green Loan verification. K-Brite™ SOP can rightly be regarded as a truly green fertiliser.

"The suite of offtake agreements we have executed with our Tier 1 global distribution partners give APC not only downside price protection, but they also afford the Company unlimited upside price premium. We will manufacture a range of premium finished products that will allow our partners to sell into the world's highest price points for SOP. The A$614 million NPV_8 includes the granulation and bagging circuits required to tap these premium price points.

"The syndicated development debt being finalised includes a A$140 million facility with Northern Australia Infrastructure Facility (NAIF) and conditional credit approval for a A$45 million facility with Export Finance Australia. Commercial banks, both domestic and international, continue their due diligence and credit approval processes with a view to providing core debt and working capital & cost overrun facilities normal to this type of development.

"We have significantly de-risked the construction of the LSOP with more than 75% by value of Project contracts being arranged on a lump sum EPC basis. These arrangements provide our stakeholders with protection against time and cost over-runs, and in operations, guarantees for performance. In addition, approximately 20% of all construction contracts will be awarded to Aboriginal businesses or joint ventures that are majority controlled by Aboriginal corporations.

"We now look forward to progressing to a final investment decision to develop the Lake Wells SOP Project."

This release was authorised by the Board of the Company.

Using the sun and the wind, with high-penetration renewable power, Australian Potash is going to produce organically certified, environmentally sustainable green Sulphate of Potash that will go to the world's most productive and high-value markets.

Front End Engineering and Design Program

Results Summary

April 2021

FEED Highlights

SOP PRODUCTION
170,000
TONNES PER ANNUM

PROBABLE RESERVE
3.6 M TONNES
MEASURED RESOURCE
18.1 M TONNES
OF SULPHATE OF POTASH

RENEWABLE ENERGY
60%
↑
44%

LOW CO_2 EMISSIONS
66% less
THAN MANNHEIM

GREEN LOAN VERIFICATION ✓

90%
OF PROJECTED OUTPUT UNDER OFFTAKE

PREMIUM PRODUCTS
STANDARD
GRANULAR
WATER SOLUBLE

ORGANIC CERTIFICATION ✓

K-BRITE™

INITIAL MINE LIFE
30 YEARS

PRE-TAX NPV_8
A$614M

ANNUAL EBITDA FORECAST
A$124M

CAPITAL COST
A$292M

PRE-TAX IRR
21%

CASH COST
US$251/t

PAYBACK PERIOD
4.5 years

NAIF FUNDING
A$140M

Australian Government
EFA FUNDING*
A$45M
*Conditional credit approval received

MINING TENURE ✓

ENVIRONMENTAL APPROVALS ✓

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1. Dictionary and acronyms

The following words, acronyms and abbreviations have the following meanings.

AACE	Association for the Advancement of Cost Engineering
APC	Australian Potash Limited
BOO	Build Own Operate
DFS	Definitive Feasibility Study[i]
EPC	Engineering, Procurement and Construction
FEED	Front End Engineering Design
Gl/year	Giga litres per year
IPP	Independent Power Producer
JORC Code	Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves, 2012 Edition
KWhr	Kilowatt hour
L/s	Litre per second
LCOE	Levelised Cost of Energy
LSOP	Lake Wells Sulphate of Potash Project
mg/L	Milligrams per litre
MOP	Muriate of Potash
MRE	Mineral Resource Estimate
ORE	Ore Reserve Estimate
PPA	Power Purchase Agreement
Project	Lake Wells Sulphate of Potash Project
REP	Renewable Energy Penetration rate
SOP	Sulphate of Potash
Thalweg	Palaeochannel centre line
tpa	Tonnes per annum

2. Forward Looking Statements and Disclaimers

This announcement contains forward-looking statements that involve a number of risks and uncertainties. These forward-looking statements are expressed in good faith and believed to have a reasonable basis. These forward-looking statements reflect current expectations, intentions or strategies regarding the future and assumptions based on currently available information. Should one or more of the risks or uncertainties materialise, or should underlying assumptions prove incorrect, actual results may vary from the expectations, intentions and strategies described in this announcement. No obligation is assumed to update forward-looking statements if these beliefs, opinions and estimates should change or to reflect other future developments.

3. Executive Summary

Following the release of the Definitive Feasibility Study in 2019, Australian Potash Limited completed an AACE Class 2 Front End Engineering Design program (+10% / -5%) on developing the Lake Wells Sulphate of Potash Project into steady state operations for a mine life of 30 years.

The FEED completed optimisation of the outcomes of the DFS across four main areas:

- Bore-field design;
- Harvest and pre-concentration pond design;
- Product variants; and
- Project schedule.

Further test work and design was also completed to enable tendered positions to be achieved around specific scope of works. The previously disclosed Mineral Resource Estimate and Ore Reserve estimate[i] as reported in compliance with the 2012 edition of the JORC Code, did not change during the FEED program and remain at:

- 18.1 million tonnes contained SOP in a Measured Mineral Resource Estimate; including
- 3.6 million tonnes contained SOP in a Probable Ore Reserve.

Mine plan production of SOP will be abstracted 100% from the existing Measured Mineral Resource Estimate, including the Probable Ore Reserve, with no consideration given to the effect potential contribution that 'aquifer re-charge' or 'rainfall recharge' may have on the MRE. Optimisation of the bore-field design has led directly to an increase in output of 20,000 tonnes per annum of high-grade SOP from the LSOP.

With the strategic goal of maintaining scheduled time to operations, notwithstanding the optimised brine abstraction volumes and concomitant increase in output, the optimisation of the concentration pond design focussed on expanding the total pond area efficiently and developing the most feasible brine transfer systems between and through this expanded pond network.

During the FEED program, several commercial agreements were executed around the marketing and distribution of the LSOP's premium suite of SOP products. Five binding offtake agreements with four Tier 1 global fertiliser industry counterparties are in place at the time of this release, which allow APC to access the highest premium price points in the SOP markets into which it will be distributed. In order to maximise premium pricing, the LSOP process flow sheet was augmented to include unit operations that provide the capability to produce SOP products to the specifications demanded in these premium markets. Both a granulation circuit and a begging plant are now included in the FEED process flow sheet.

K-Brite^{TM}, the trademarked brand of LSOP product, will be produced in a bulk and bagged packaging format, and to premium water-soluble, standard (or crystallised/powdered) and granulated specifications.

All products produced have been accredited for use in organic agriculture in the European Union, with accreditation processes underway for the premium North American and Australian markets.

A high Renewable Energy Penetration rate hybrid power station will be developed at the LSOP, which has the effect of reducing the previously disclosed levelised, or net present cost, of energy and providing material reductions in carbon emissions compared to similar operations world-wide. In addition, the commercial agreements around the provision of green power to the LSOP ensure the Project will capture future advances in technology around both renewable power generation and storage.

Debt issued to develop Lake Wells has been granted Green Loan verification in accordance with the Green Loan Principles set out by the LMA and the APMLA[ii]. The green loan verification confirms the positive environmental contribution the LSOP will have on the global supply of SOP.

Logistics chains have been extensively modelled based upon the executed offtake agreements, relative amounts of bulk and bagged output to be delivered, and a competitive tendering process. The LSOP will operate an export logistics solution that has bulk SOP being transported via Narngulu to the mid-west Port of Geraldton, and containerised SOP exporting via the rail terminal at Leonora through Fremantle Port.

The Lake Wells palaeovalley presents surficially as a chain of salt lakes into and around which Australian Potash will develop bore-fields to abstract the potassium rich brine from which premium Sulphate of Potash will be produced.

4. Brine Resources and Reserves

The Mineral Resource (MRE)[iii] and Ore Reserve Estimates (ORE)[i] reported at the time of release of the DFS results remain unchanged and are reported here for ease of reference.

The MRE and ORE were estimated and reported in compliance with the 2012 edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves' (JORC Code) and accompanying Brine Guidelines.

The LSOP encompasses a MRE classified 100% to the Measured category. The ORE is classified to the Probable category.

A Measured MRE is that part of a MRE for which quantity, grade, density, shape and physical characteristics of the MRE are estimated with sufficient confidence to allow the application of modifying factors to it in support of detailed mine planning and final evaluation of the economic viability of the deposit: that is, estimate an Ore Reserve.

A Measured MRE may be converted to a Probable Ore Reserve or a Proved Ore Reserve. Conservatively, APC consider it more appropriate to classify hydrogeological mineral resources such as minerals contained in brine, as Probable Ore Reserves, to account for the inherent uncertainties in hydrogeological systems including the very long-lived nature of these systems. A typical hydrogeological cross-section is depicted in Figure 1.

a. 18.1 Million Tonne Measured MRE

Table 1 Measured Resource Estimate

Hydrogeological unit	Volume of Aquifer (MCM)	Specific Yield (Mean)	Drainable Brine Volume (MCM)	K Conc[n] (mg/L) (mean)	K (potassium) Tonnes	SOP[1] Tonnes
Loam	5180	10%	518	4009	2.08	4.6
Upper Aquitard	10772	7%	754	3020	2.28	5.1
Crete	479	5%	24	2386	0.06	0.1
Upper Sand	801	17%	136	3435	0.47	1.0
Lower Aquitard	9502	8%	760	3367	2.56	5.7
Mixed Aquifer	440	17%	75	3645	0.27	0.6
Basal Sand	503	23%	116	3415	0.40	0.9
Total	**27677**	**9%**	**2383**	**3402**	**8.11**	**18.1**

[1] The measured potassium content in brine can be expressed in units of sulphate of potash (SOP or K_2SO_4) by multiplying K by 2.229 and assuming complete conversion and no limiting reagent.

b. 3.6 Million Tonne Probable ORE

Benefiting from multiple high yielding aquifers, and two high storage and low yielding aquitards, the LSOP is ideally suited to brine abstraction via a conventional bore-field. Utilising a conventional bore-field and modifying factors a Probable Ore Reserve was estimated. A summary of SOP recovery from the aquifers and Probable ORE for the LSOP are presented in the tables below.

Table 2 Probable Ore Reserve Estimate

Brine Volume Recovered (Mm^3)	Average Produced K Concentration (mg/L)	K Mass (MT)	SOP[1] Mass (MT)	Proportion of Measured Resource
490	3,325	1.6	3.6	20%

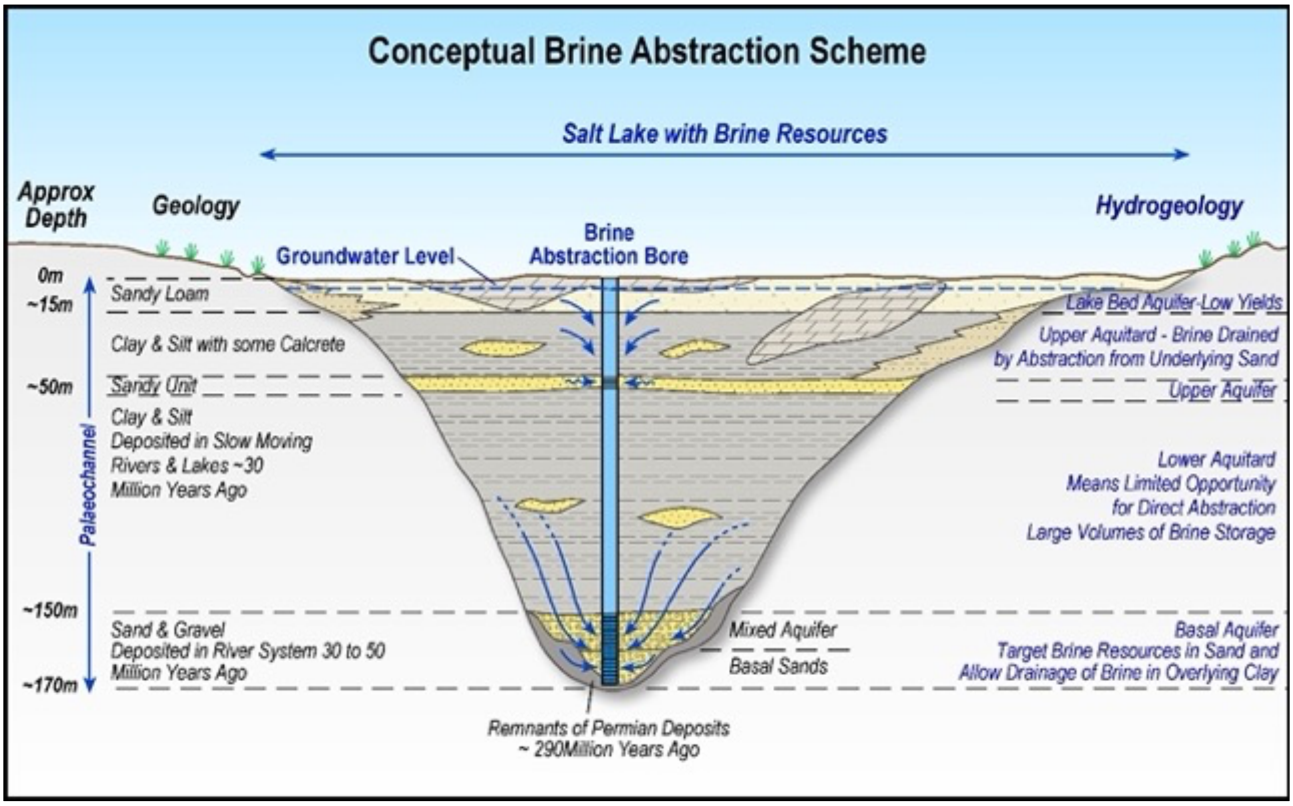

Figure 1 Conceptual palaeovalley brine abstraction scheme

c. Mine Plan

The life of mine production plan recovers 3.6Mt of SOP, or 1.6Mt of potassium, from the total MRE. Taking into account seepage losses, plant recovery losses and entrainment, the recovered potassium equates to approximately 26% of the total MRE at the commencement of operations.

The ORE is derived from the MRE, and is therefore a subset of the MRE, not an addition to it. Of the total, gross recovered minerals from the aquifer system over the 30-year life of mine, 80% comes from the Probable Ore Reserve estimate and 20% from the Measured MRE.

To view an animation of the genesis of the Lake Wells palaeochannel, sedimentary profiles, and proposed mining operation please visit https://youtu.be/2G0gtzyS7iw.

Table 3 Abstracted brine and potassium & SOP mass for 30 year life of mine

Brine Volume Recovered (Mm³)	Mining Period (years)	Average Pumping Rate (L/s)	K Concentration (mg/L)			Mass Potassium Recovered (MT)	Mass SOP[1] Recovered (MT)	Proportion of Measured Resource
			Start	End	Weighted Average			
630	30	671	3,700	3,300	3,325	2.13	4.75	26%

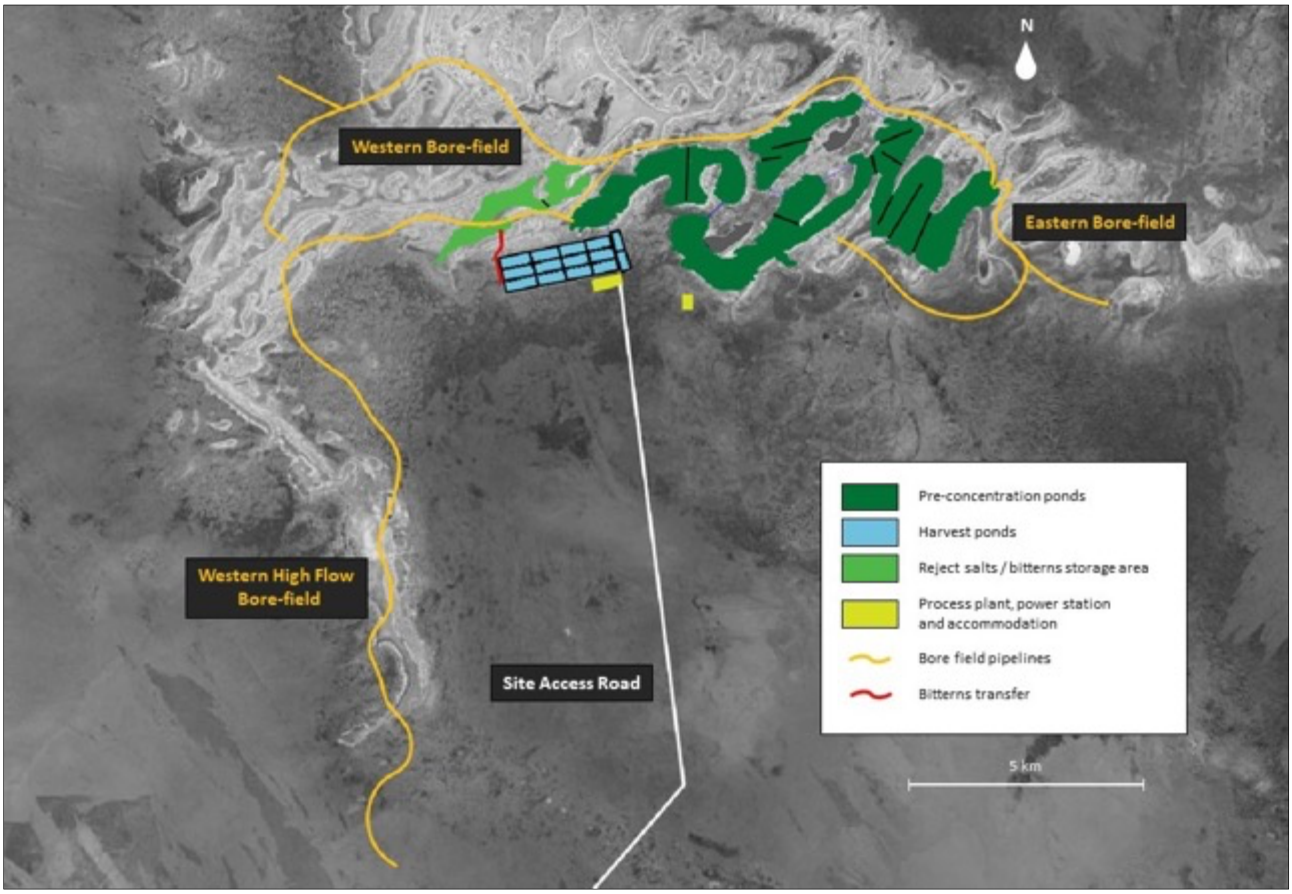

Figure 2 Site General Arrangement

5. Brine Abstraction

The brine abstraction model was optimised through FEED leading to an increase in production of SOP from brine to 120,000 tpa from 100,000 tpa in the DFS.

The optimisation program across the brine abstraction model focused on developing abstraction from high flow bores in the western bore-field where yields in some bores are modelled at approximately 18 L/s. The bore-field will initially comprise 79 bores connected by HDPE pipelines serviced with overhead reticulated power supplying the bores.

Table 4 Bore-Field Well Developments and Yield by Area

Bore-field Pipeline	Number of Bores	Yield (L/sec)
Western, High Flow Zone	26	380
Western	33	160
Eastern	20	70

To maintain target SOP production, abstraction rates of ~610 L/s are required initially, increasing to around 655 L/s in year 15. By year 20, brine abstraction reaches a maximum of approximately ~700 L/s to sustain SOP production. 79 operational bores are required in year 1, and bores are added in areas north and west of the main thalweg and extending to the south in the second half of year 2. By year 21, 172 bores will be operational. Of the 79 initial bores, 33 are in the Western bore-field, 26 in the Western high flow zone and 20 in the Eastern bore-field.

The potassium concentration is predicted to decline from 3,700 mg/L in year 1 to close to 3,300 mg/L by year 30. The life of mine average concentration is predicted to be 3,325 mg/L.

Prioritising the development of the high flow western bore-field maximises the delivery of brine to the evaporation ponds in the early years of operation and de-risks the overall project execution schedule. It also allows for the bore-field to be staged over the mine life as shown in Figure 3 and demonstrates the sustaining flow in later years from additional bores as shown in Figure 4.

The FEED program included development of the design basis and scope of work for the bore-field package that includes the bore fit-outs, pipelines and overhead power lines. The bore-field package has been tendered based on an EPC delivery (lump sum, schedule and performance guarantee) to de-risk project execution. The results of the FEED include the preferred contractors negotiated tendered submission.

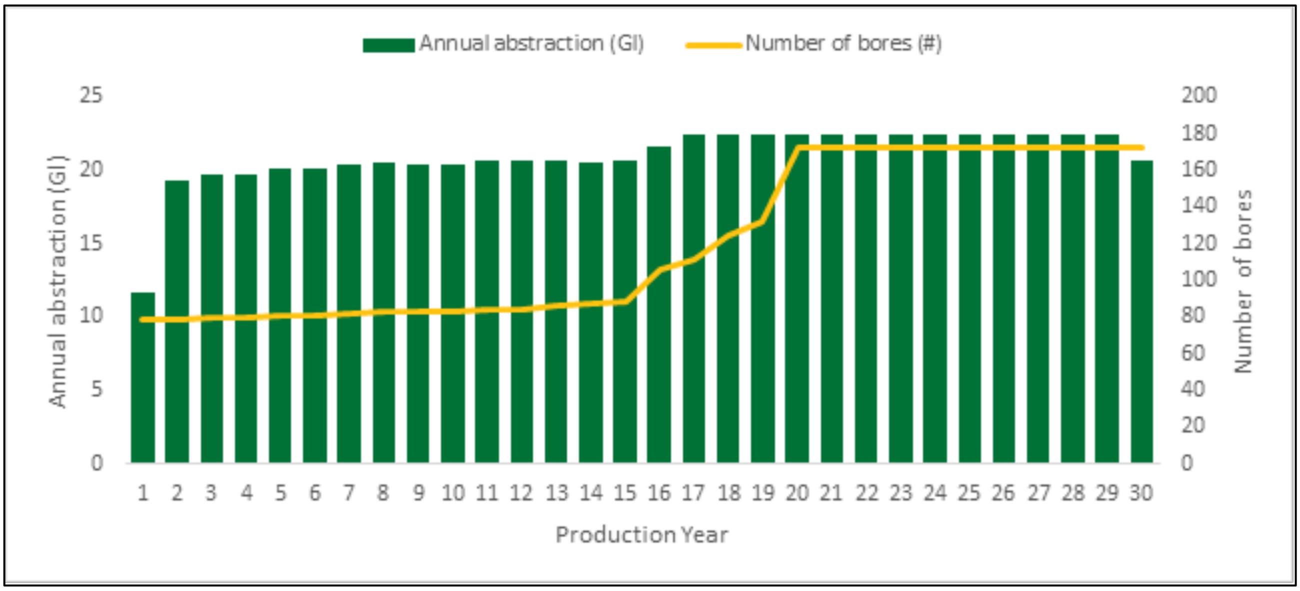

Figure 3 Brine production and bore-field expansion

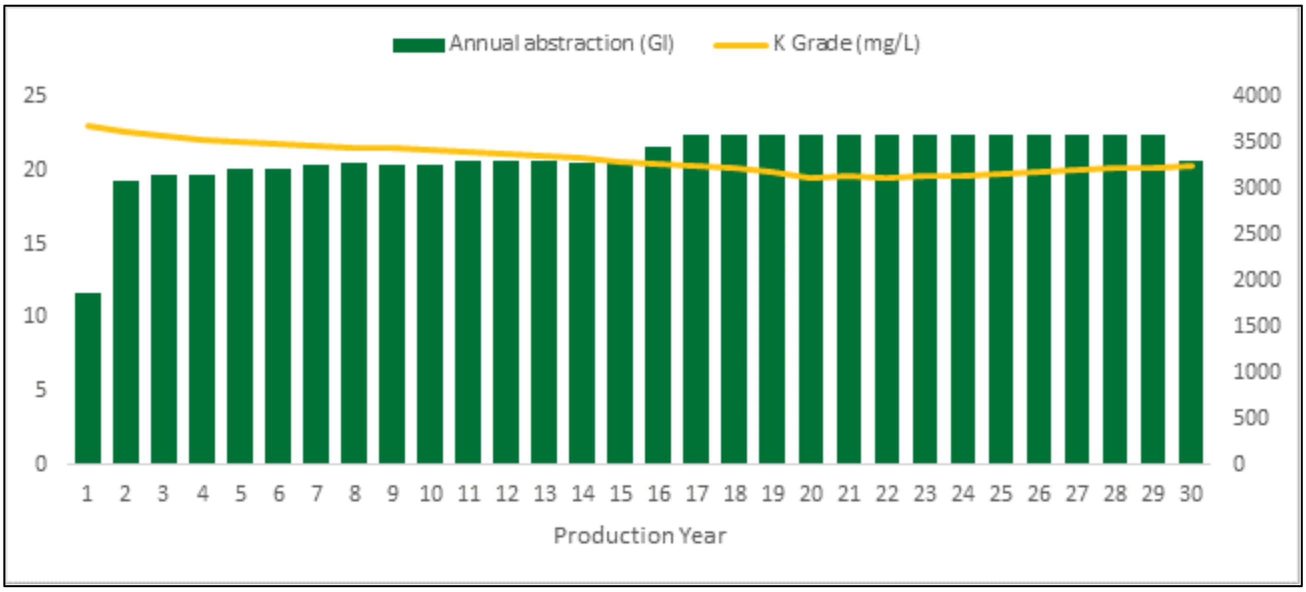

Figure 4 Brine production and SOP Grade LOM

6. Evaporation Ponds

Optimisation of the brine abstraction model to increase production of SOP from brine to 120,000 tpa has increased the overall area of the evaporation pond network.

A buffer pond has been introduced into the evaporation pond network to manage the seasonal fluctuations in evaporation.

A three-stage evaporation pond network will be constructed utilising the existent, ideal, solar and wind resources at Lake Wells to concentrate the brine abstracted from the palaeochannel.

The pond network will comprise:

- A buffer pond constructed on the lake playa to manage seasonal fluctuations in evaporation;
- Six pre-concentration ponds constructed on the lake playa and configured to take advantage of the natural clay layer and topography;
- Transfer pump stations, channels and related culverts;
- Harvest ponds constructed off-playa with HDPE lining where potassium bearing salts from the pre-concentration ponds are crystalised and harvested; and
- A reject salts and bitterns storage area.

Additional work completed on the evaporation pond design as part of the FEED comprised:

- Detailed review of all pond modelling assumptions and equations;
- Update of the pond model design as a result of changes in the hydrogeological model, including ionic composition, grade and throughput;
- Further studies into leakage and their subsequent incorporation into a detailed start up model;
- Integration of environmental constraints into the pond network design and further consideration of surface water flows and diversion around these areas;
- Optimisation of harvest crystalliser layout to a 3x4 cell arrangement and the incorporation of site constraints to minimise cut to fill volumes for earthworks;
- Incorporating a process recycle brine pond into the harvest ponds, receiving discharge from the processing plant and facilitating the accumulation and buffering of pre-concentration pond feed; and
- Cost benefit analysis of harvest methods, plant in-load systems and equipment selection.

7. Processing

Tier 1 marketing agreements provide APC with the opportunity to benefit from uncapped upside on sales revenue into premium SOP markets. Premium price points in these markets are accessed with granulated, bagged SOP. The processing facility has been augmented through FEED with both granulation and bagging plants.

The process plant capacity was increased to 170,000 tpa of SOP, up from 150,000 tpa in the DFS. Production is based on a target mix of 120,000 tpa of SOP from brine and 50,000 tpa of SOP from MOP conversion as shown in Figure 5.

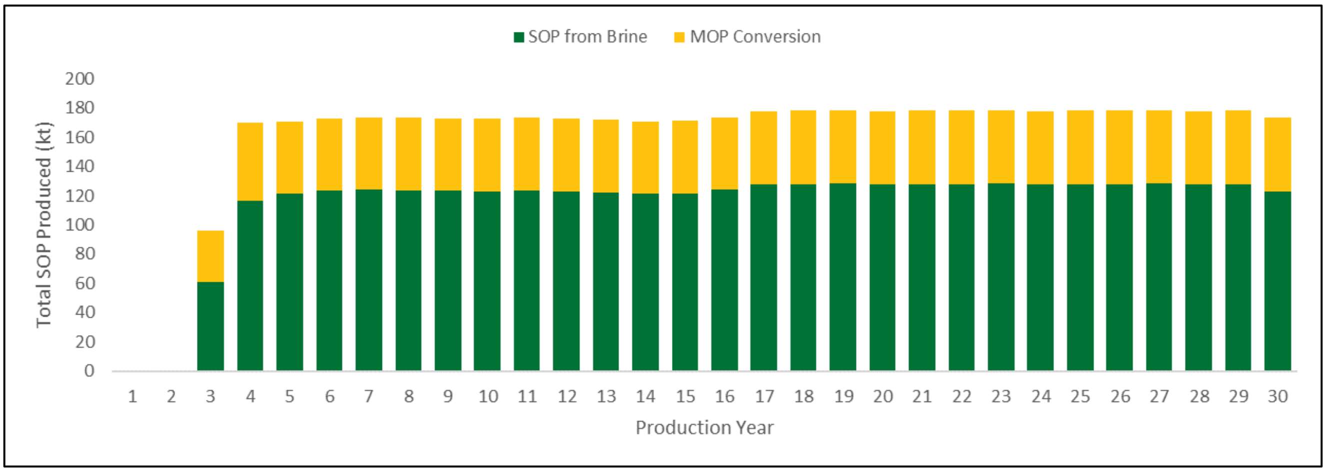

Figure 5 SOP Production Ratios

The process flow sheet reflects a simple and time proven method for producing high purity SOP from potassium rich brine. The flow sheet is shown in Figure 6.

SOP is also produced through the reaction between Potassium Chloride (MOP) and the excess magnesium sulfate that exists within the process plant solutions, called the kieserite process. This method of SOP production has been used since 1970's. This salt-reaction process is not to be confused with the Mannheim Process.

The SOP processing facility has been designed to include a granulation plant and a bagging plant to achieve product premiums and maximise revenue through the offtake agreements.

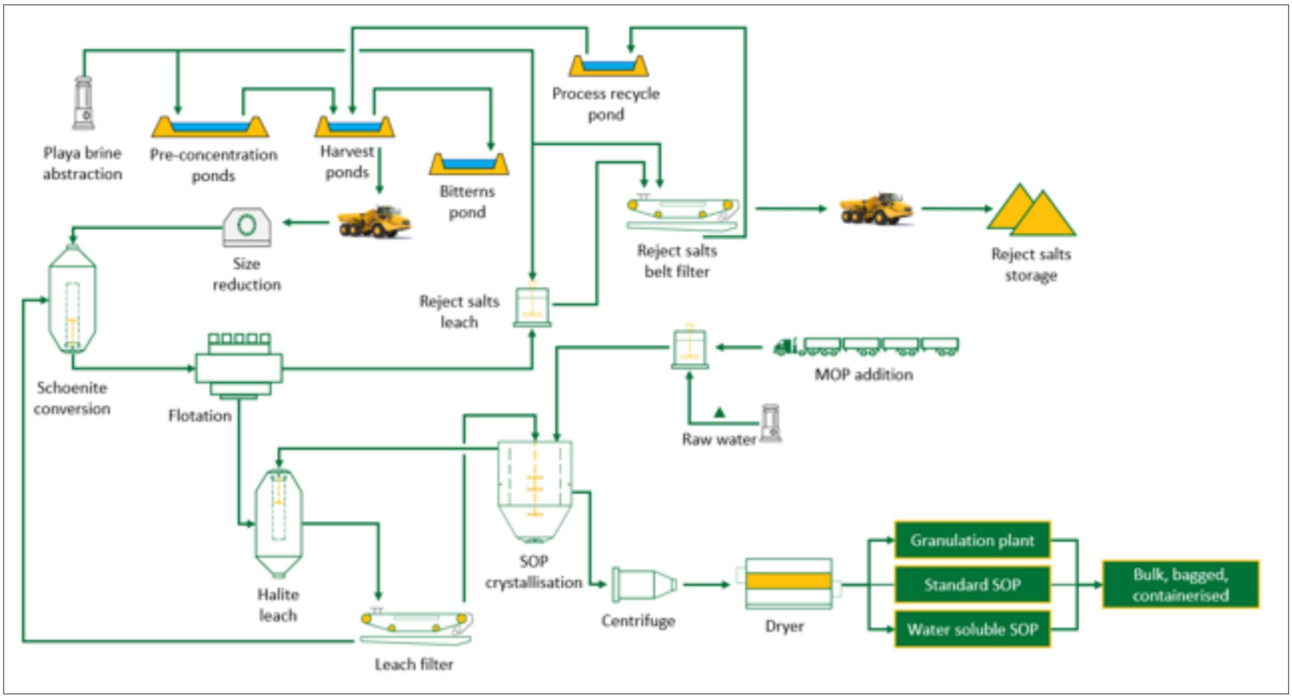

Figure 6 Process Flow Sheet

The process flow sheet developed in the DFS was carried forward in the FEED. A number of changes representing the optimisation of the unit processes, integration of further test work results or design changes that reflected operating concepts were completed. The key outcomes were:

- Additional test work programs to demonstrate production of a high purity (>53% K_2O) water soluble product;
- Granulation test work to produce a premium granulated product;
- Water treatment options of raw water to meet the demand for a premium product integrated into the processing plant design;
- Integration of offtake partner requirements for product format, including bulk outload methods and bagged products;
- Plant materials of construction cost-benefit analysis and surface treatment definition; and
- Optimisation of reagent selection, ensuring organic certification of inputs was achieved.

The FEED program produced design documents and scope sufficiently detailed to enable a Perth based engineering firm to accurately bid on the project and provide a process guarantee for EPC (lump sum) delivery of the project.

The process plant has been enhanced for the increased throughput but also incorporating the bagging and granulation areas. Below is a 3D image of the possible layout for the process plant, refer Figure 7.

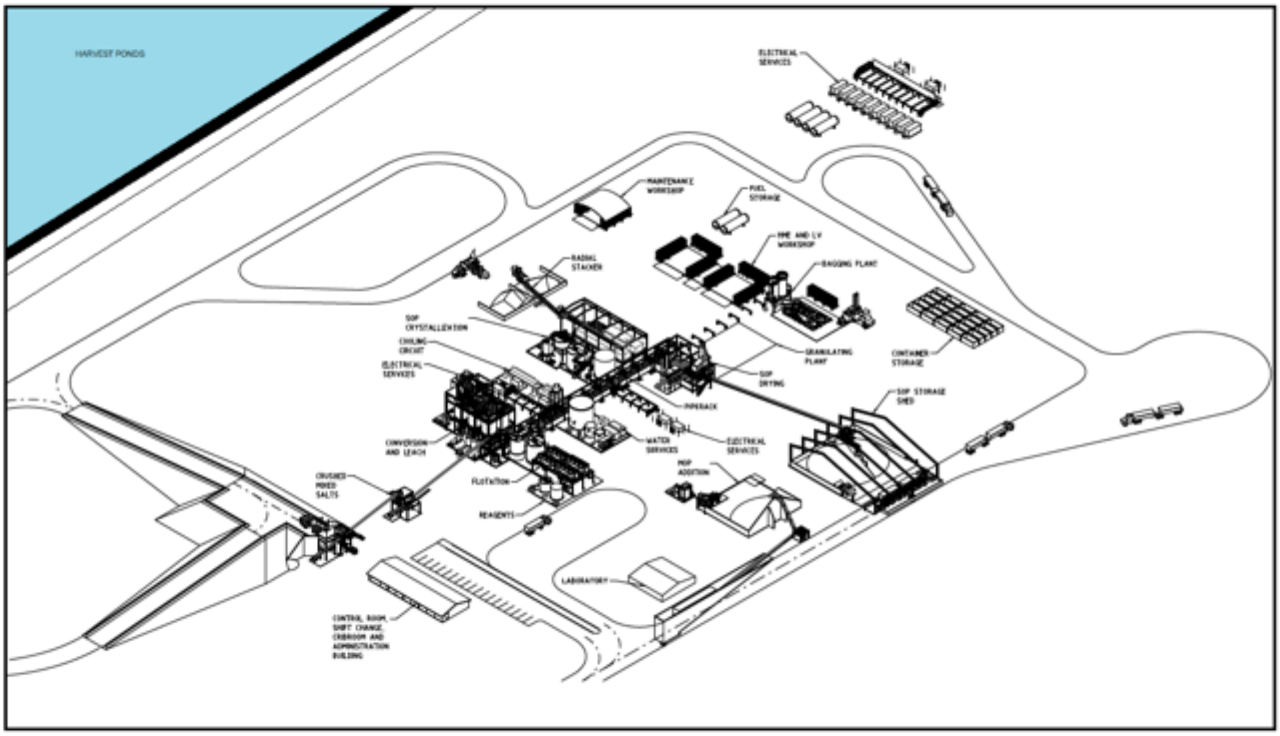

Figure 7 Schematic layout of LSOP process plant

8. Non-Process Infrastructure

The FEED power solution for the LSOP is a high Renewable Energy Penetration rate hybrid power station.

The Lake Wells village operational capacity has been increased in size to 120 rooms from 100 with capacity for 200 rooms during construction.

The FEED progressed detail designs and contracts on the following Non-Process Infrastructure:

- High renewable energy penetration rate hybrid power plant;
- Communications system;
- Lake Wells Village;
- Raw water supply; and
- Access roads.

Hybrid Power Plant

APC completed a study to assess the technical and economic viability of renewable power integration into the power plant. The study indicated that given the long life of the operation, investment in renewable energy sources (i.e., solar power, wind power and battery storage (BESS)) provided a lower levelised cost of energy (LCOE), when compared to the DFS model using thermal power (i.e., gas-fired generators) only (and provided under a 10-year Power Purchasing Agreement (PPA) under a Build, Own, Operate (BOO) arrangement).

During FEED, Independent Power Producers (IPPs) were invited to provide proposals to complete an Early Contractor Involvement (ECI) programme, involving the assessment of a hybrid power plant, complete with design and cost models wherein renewable energy penetration (REP) rates were to be optimised.

In addition, the power station had to operate for at least 25 years without major repairs or retrofits with all components being designed for at least this lifetime. All components had to be capable of withstanding all mechanical, thermal, aerodynamic and electrical induced loads during the design life.

The IPPs presented a series of power-mix scenarios under long term PPA & BOO arrangements, with the optimal configuration comprising:

- 12 MW of gas-fired generators;
- 7.2 MW of solar (PV);
- 3.6 MW wind turbine; and
- 1.8 MW of BESS.

This hybrid power configuration results in an REP rate of approximately 44% with an LCOE lower than the costs included in the DFS.

Figure 8 A large solar array will be developed

The PPA is being negotiated to capture the financial benefit to LCOE from future advances in technology. The IPP has indicated that with the addition of renewable energy generation and storage in the future, the REP can be elevated to over 60% with only a modest increase to the LCOE, based on current technologies and assuming there are no advances in the generation or storage of renewable energy. Naturally, should this assumption prove to be incorrect, the financial benefit to any advances in technology will be reflected through the LCOE.

Communication System

A dual ECI process with two Perth-based telecommunications companies familiar with providing communications infrastructure to remote resource projects was conducted. The ECI involved the design of a microwave tower alignment between Laverton and site, creating a wide area network communications solution typical to a remote area mine-site.

At site, a 100-metre tower complete with a long-term evolution transmitter that will provide mobile 4G coverage across the site and bore-fields will be installed. High-speed internet connectivity will allow the efficient distribution of entertainment and data communications site-wide, including to the Lake Wells Village.

Lake Wells Village

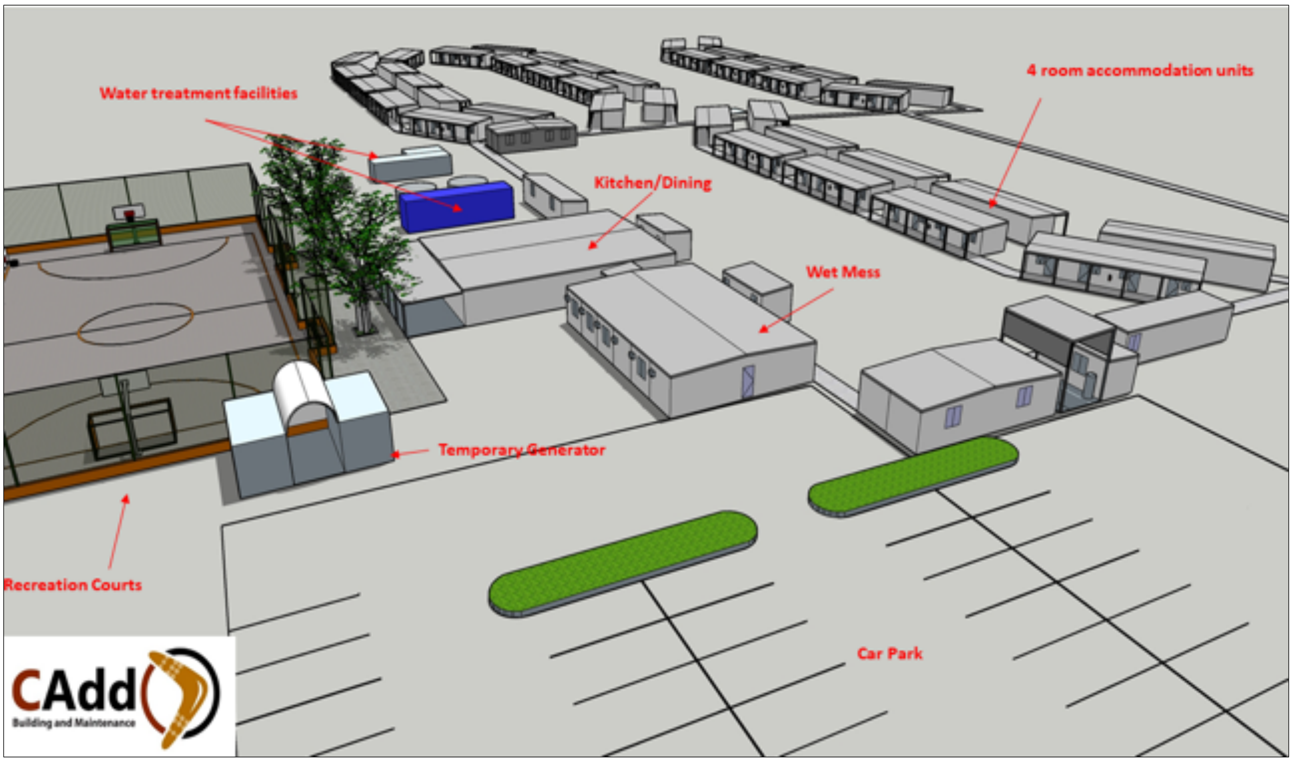

Figure 9 Lake Wells Village layout

The size of the Lake Wells Village increased from 100 rooms to 120 rooms over DFS design, reflecting operations expansion to accommodate the increased SOP output. Furthermore, to accommodate the construction workforce during project execution, 80 temporary rooms will be installed. Other elements of the Lake Wells Village, including the wastewater treatment plant and potable water treatment plant, are typical for resource projects of similar size in Western Australia.

The Lake Wells Village design and construction tender was developed on these bases but also encouraged contractors to include design features that add to the Village aesthetic and livability. An example of included designed benefits to the Lake Wells Village units are larger beds and washers & dryers in each room.

Raw Water Supply

Low total dissolved salt (TDS) groundwater is required to supply the operations with water suitable for consumption and processing at a total estimated demand of less than 1 GL/yr. The FEED work continued to identify low TDS groundwater areas and assess the water quality and quantity.

Low TDS water supply will be sourced from two bore-fields: the southeast bore-field will comprise up to five duty bores; the northeast bore-field will comprise up to six duty and two standby bores. Bore fit outs, pipelines and dedicated power supply systems were designed and priced as part of the bore-field EPC Tender.

Access Roads

The Lake Wells Road upgrade design developed in the DFS was generally maintained during FEED. Minor modifications to a re-alignment section will be implemented. Construction work to upgrade the Lake Wells Road will be completed later in the execution schedule, on time for product transport. The current condition of the Lake Wells Road was deemed adequate for transport of people, plant and equipment during project execution provided periodic maintenance is conducted.

9. Logistics

Lake Wells is located approximately 160 kilometres from Laverton and benefits from established road infrastructure to site. LSOP's premium suite of SOP products will be produced in the following formats.

Table 5 SOP Product Variants

	Bulk	Bagged
Standard (loose crystallised SOP)	Yes	Yes
Granulated SOP	Yes	Yes
Water-Soluble SOP	No	Yes

The bulk products will be transported 1,050kms for export through the Port of Geraldton. The bulk logistics solution uses dedicated super quad trucks that will haul from Lake Wells to a storage facility at Narngulu. B-double trucks will then haul the 14kms from Narngulu to Port of Geraldton for ship loading.

SOP ship loading trials have been undertaken in conjunction with Mid-West Ports confirming the suitability of the Berth 4 ship loader. APC has entered into a Co-operation Agreement with Mid-West Ports to negotiate and enter into a Port Services Agreement to secure capacity. The SOP bulk logistics solution will be utilised to back-haul MOP imported through Port of Geraldton to Lake Wells.

Figure 10 Bulk product export and MOP back-haul logistics chain

The bagged products will be bagged and loaded into containers at site. Containers will be transported 280kms from Lake Wells to the Leonora rail terminal on triple road trains. Containers will then be loaded onto regular container freight trains running from Leonora to Fremantle Port.

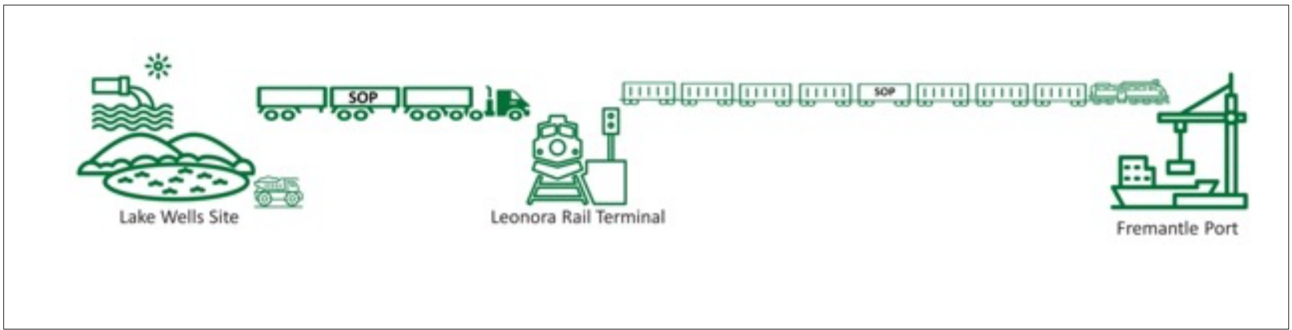

Figure 11 Bagged and Containerised Product Export Logistics Chain

During the FEED program the logistics scope was defined and tendered. Tender submissions were received, and a preferred bidder selected. Discussions are ongoing to further optimise the logistics solutions. The FEED results include the negotiated tendered submission with the preferred bidder.

Bitumen sealing of the Great Central Road ('Outback Way') between Laverton and the Lake Wells Road has commenced. Main Roads WA has contracted the Wongutha Way Alliance to conduct the program of road surfacing. It is anticipated that the 80km section of the Great Central Road that forms part of the LSOP access, will be sealed prior to the commencement of operations.

Figure 12 Great Central Road Surface Sealing Program

10. Contracting Strategy and Project Execution

The FEED program focused on clearly defining battery limits, design bases and scopes of work across packages to ensure package and contractor interface risk is well understood and mitigated during project execution.

The LSOP will be delivered under a contracting model that seeks to minimise risk across schedule, cost, quality, and safety.

The following risk-mitigation strategies have been adopted to achieve drive the lowest risk profile for project execution and ultimately operations:

- More than 75%, by value, of Project contracts will be lump sum EPC contracts underpinned by:
    - Cost;
    - Schedule; and
    - Performance guarantees provided by the contractor;
- Packages are being awarded to experienced Tier 1-2 contractors and packages are being aggregated as feasible to minimise number of contractors delivering packages in order to mitigate interface risks;
- Bore-field and process plant packages are being awarded on an aggregated basis to the Principal Contractor which is a WHS accredited contractor under the WHS Scheme administrated by the Office of the Federal Safety Commissioner; and
- Capable and experienced APC owner's team to manage construction packages (safety, controls, approvals, interfaces, design reviews, QA and QC).

A summary of the major construction packages is provided below:

Table 6 Contracting Strategy by Package

Package	Contracting Strategy	Risk Mitigants
1. SOP processing plant	EPC SOP process plant and Bore-field aggregated packages delivered by one contractor	Lump sum Schedule and process guarantee
2. Bore-field		
3. Bore drilling	Schedule of rates	Schedule guarantees Specialists KPI's on productivity
4. Earthworks & Civils	Schedule of rates	Schedule guarantees Specialists KPI's on productivity
5. Village	EPC	Lump sum Schedule guarantee
6. Power	EPC delivered under a BOOT arrangement	Lump sum Schedule and performance guarantee

All major construction packages have been tendered and bids received on the above basis. Tender submissions have been negotiated and preferred bidders have been notified. Contracts are currently being conformed with the preferred bidders. The results of the FEED program include the negotiated tendered submission received from the preferred bidders.

The critical path in the project execution is through the brine abstraction and evaporation to ensure sufficient harvest salts are stockpiled prior to commissioning the SOP processing plant. The bore-field optimisation program focused on high yielding bores to maximise abstraction in the early periods to optimise the evaporation cycle and production of harvest salts. The project execution schedule is provided below:

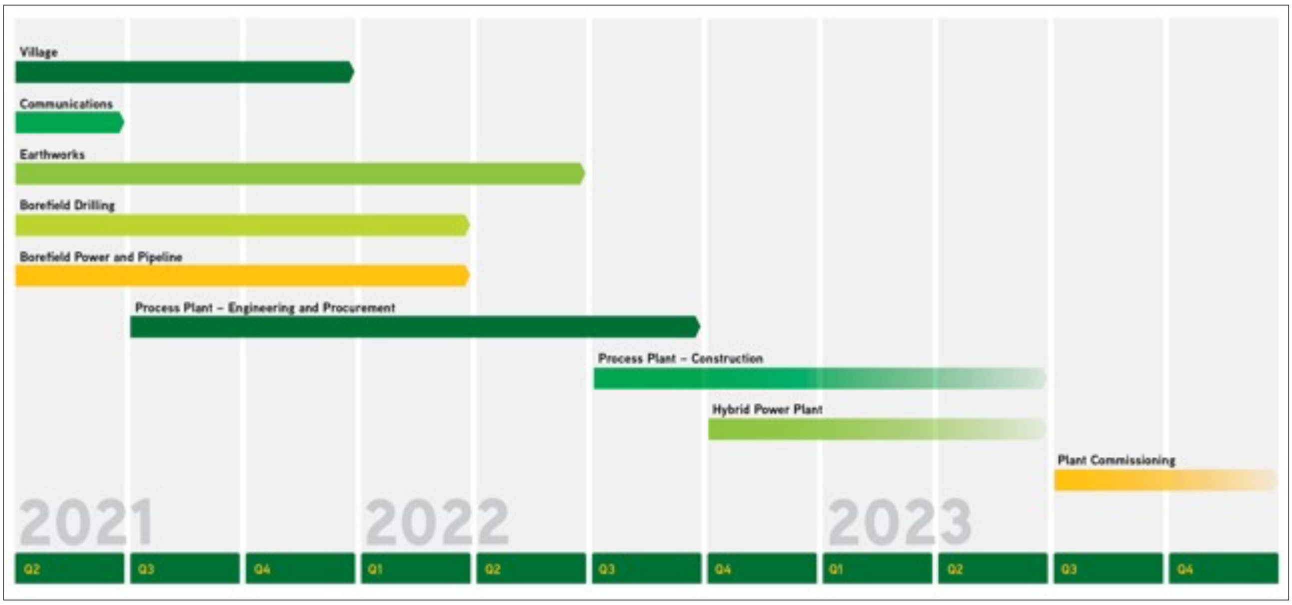

Figure 13 Project Execution and Operational Development Schedule

11. Marketing and Distribution

a. Premium Suite of SOP Products

Lake Wells will produce three premium organic SOP products branded as K-Brite. The products are standard (powdered) SOP, granulated SOP, and water-soluble SOP. K-Brite products have been certified suitable for use in international organic farming in compliance with European regulations.

Test work undertaken during the DFS and FEED confirmed the following typical premium specifications of the three products:

Table 7 Typical LSOP Product Specifications

	K-Brite Standard	K-Brite Granulated	K-Brite Water-Soluble
K_2O %	51-52%	50-51%	53%
Sulphur (S)	18%	18%	18%
Chloride (Cl)	<0.3%	<0.3%	<0.1%

The FEED program confirmed the ability to produce a granulated and water-soluble product through additional testwork and engineering[iv]. In addition, it was confirmed that having a bagging plant at site, albeit with incremental capital and logistics costs, results in capturing higher premiums further down the SOP value chain. The premiums captured down the value chain are materially NPV accretive.

b. Offtake Agreements

Lake Wells has secured five offtake agreements across both well-established SOP markets and high growth SOP markets, which together account for 90% of FEED output. The five offtake agreements with four tier one counterparties have been secured to diversify geographies and counterparties and seek to minimise risk. All offtake partners have established SOP distribution networks in their respective jurisdictions.

The FEED results have incorporated the pricing and costs negotiated and agreed in the offtake agreements.

About our Offtake Partners[v vi vii viii ix]

Redox is an Australian based company which since 1965 has grown into one of the world's leading chemical and raw material distributors to industry. With offices in all major Australian and New Zealand cities, Redox has reported significant year on year growth for over a decade. Headquartered in Sydney, Redox's corporate values align closely with APC's with a dedication to integrity, hard work and persistence. To learn more about Redox, please visit the Redox website.

HELM is a Hamburg, Germany, based family-owned company established in 1900. HELM is one of the world's largest chemicals marketing companies. The company secures access to the world's key markets through its specific regional knowledge as well as its subsidiaries, sales offices and participations in over 30 countries. As a multifunctional marketing organization HELM is active in the chemicals industry, in the crop protection industry, in pharmaceuticals and in the fertilizer industry. To learn more about the HELM AG, please visit the HELM website.

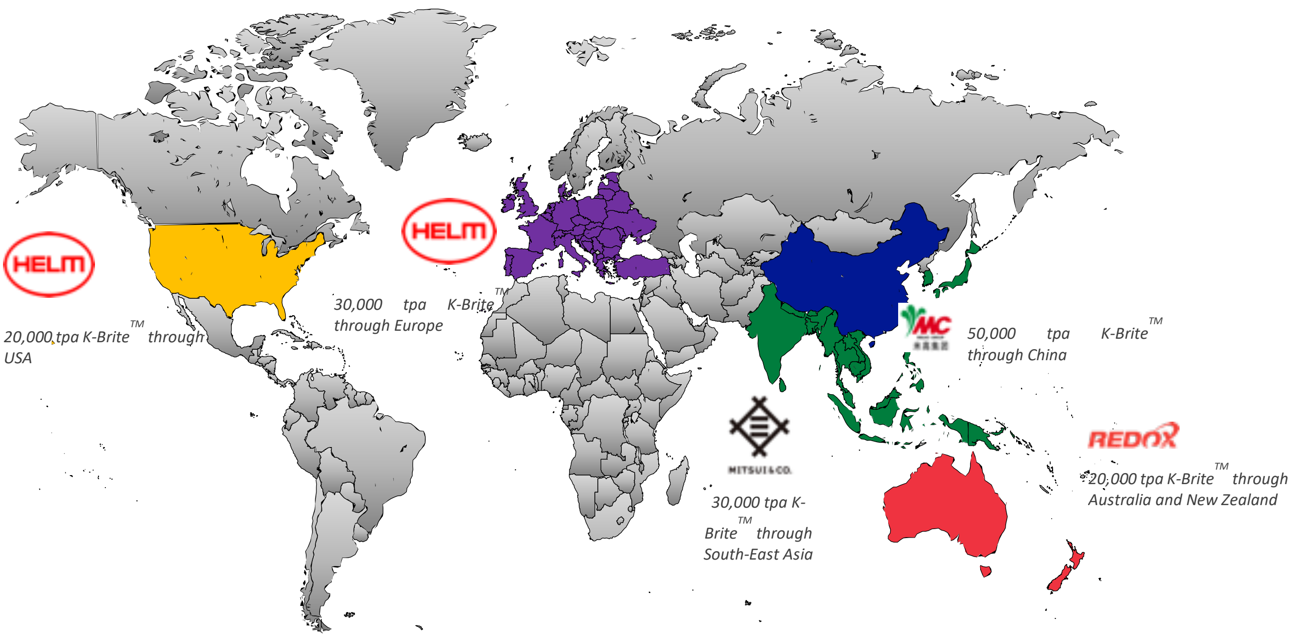

Figure 14 Geographically Diverse Offtake Marketing and Distribution Agreements

Mitsui & Co. (Asia Pacific) Pte. Ltd. is a 100% owned Singapore domiciled subsidiary of Mitsui & Co. Ltd. Mitsui & Co., Ltd (8031: JP) is a global trading and investment company with a diversified business portfolio that spans approximately 65 countries in Asia, Europe, North, Central & South America, The Middle East, Africa and Oceania. Mitsui has a long heritage in Asia, where it has established a diverse and strategic portfolio of businesses and partners that gives it a strong differentiating edge, provides exceptional access for all global partners to the world's fastest growing region and strengthens its international portfolio. For more information on Mitsui & Co.'s businesses please visit the Mitsui website.

Migao International (Singapore) Pte Ltd is a fully owned subsidiary of Migao Group Holdings Limited ('Migao Group'). Migao Group**,** a privately-owned specialty fertiliser manufacturer and distributer established in 2003, is headquartered in Hong Kong, with a regional distribution and corporate centre in Singapore. In 2019, Migao produced over 1 million tonnes of specialty potassium fertilisers, including potassium sulphate (SOP) and potassium nitrate (NOP), from its seven production facilities across mainland China. Migao has a strategic intent to expand its position in fertiliser supply chains within and external to China, aligning well with APC's offtake partner strategy to secure Tier 1 long-term agreements into the material global SOP markets. To learn more about the Migao Group, please visit the Migao website.

Table 8 Summary of Offtake Agreements

	REDOX	Migao	Mitsui	HELM		Total
Volume	20,000	50,000	30,000	30,000	20,000	**150,000**
Jurisdiction	Australia	China	South-east Asia	Europe	North America	**Global distribution**

12. Financials and Conclusions

The FEED program focused on defining scopes and the design basis for all material capital and operating costs. These packages have been tendered and the negotiated tendered submissions included in the FEED results. The level of accuracy for the capital and operating costs is +10% / -5% in accordance with AACE Class 2 guidelines.

a. Project Returns and Cashflows

The inputs used in the financial modelling for the LSOP have been based on the finalised offtake agreements, negotiated tendered submissions with preferred contractors for capital and operating costs, the brine abstraction plan on the reserves and resources, and the physicals from the pond modelling and plant specifications subject to the process guarantee. A 30-year mine life was confirmed in the FEED program and used in the financial modelling.

Table 9 Macro Financial Assumptions

Macro financial assumptions	Unit	
SOP price (FOB)	US$/t SOP	$550
FX rate	US$:A$	0.70
Discount rate (post-tax nominal)	%	8
Corporate tax rate	%	30
State government royalty	%	2.5
Inflation factor	%	2

A summary of the Project's financial metrics is provided in the table below:

Table 10 Macro Financial Outcomes

Financial metric	Unit	
Project NPV_8 (pre-tax, nominal)	A$m	614
Project NPV_8 (post-tax, nominal)	A$m	398
IRR (pre-tax)	%	21
IRR (post-tax)	%	18
Annual average EBITDA	A$m	124
Annual average free cash flow (pre-tax)	A$m	119
Operational payback period	Years	4.5

b. Sensitivity Analysis

A sensitivity analysis has been undertaken based on key project sensitivities including SOP price, foreign exchange, capital expenditure, and operating costs. The results of the sensitivity analysis on pre-tax NPV is presented in the chart below:

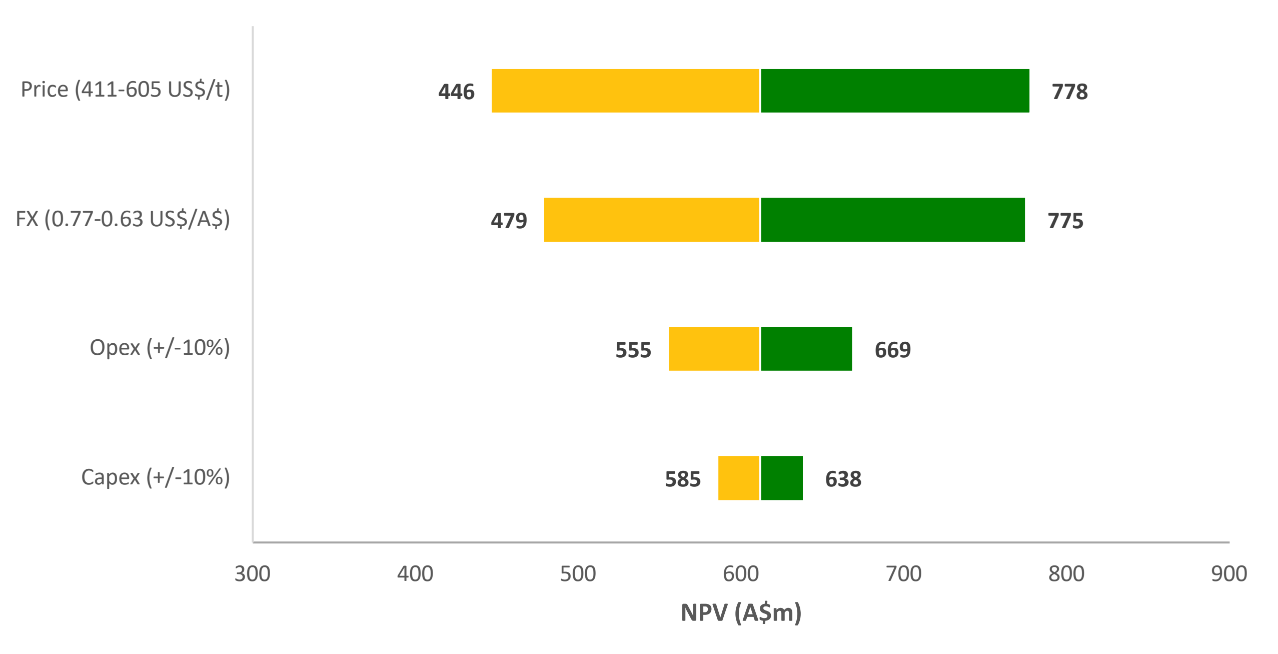

Figure 15 Financial Sensitivity Tornado Chart

c. Capital Cost

The total capital cost for Lake Wells is A$266m plus a contingency of A$26m. The capital cost has been built up from tendered bids aligned with the contracting strategy seeking to de-risk project execution. Over 75% of the capital cost estimate is based on lump sum pricing with schedule and performance guarantees.

Table 11 Pre-production Capital Expenditure

Capital expenditure	A$m
Owners team	18
Bore drilling and development	16
Bore-field fit out, pipeline, HV	36
Earthworks and ponds	40
SOP processing plant	104
Granulation & bagging plant	36
Non-process infrastructure	16

Total Capex (excluding contingency)	**266**
Contingency	26
Total Capex (including contingency)	**292**

The capital spend profile has been based on the contract schedules in the preferred tendered submission and aligned with the project master schedule. The capital spend profile is initially loaded with the critical path activities being the bore-field development and pond construction prior to the capital spend on the SOP processing plant and other infrastructure.

Sustaining capital will be incurred over the life of mine including for items such as the brine and process water bore-field expansion and pond embankment lifts. The annual sustaining capital included in the financial model equates to A$20/t SOP over the life of mine.

The FEED capital estimate has increased from the DFS capital estimate due to (A$Δ compared to DFS):

- Increase in production from 150ktpa to 170ktpa (Δ = A$28m);
- Inclusion of a granulation and bagging plant to produce premium product variants to optimise pricing premiums (Δ = A$36m);
- Change of execution strategy from EPCM to lump sum EPC resulting in a risk, or insurance, premium being priced by contractors into the bid prices (Δ = A$14m); and
- Resulting increase in pro-rata (%) contingency (Δ = A$6m).

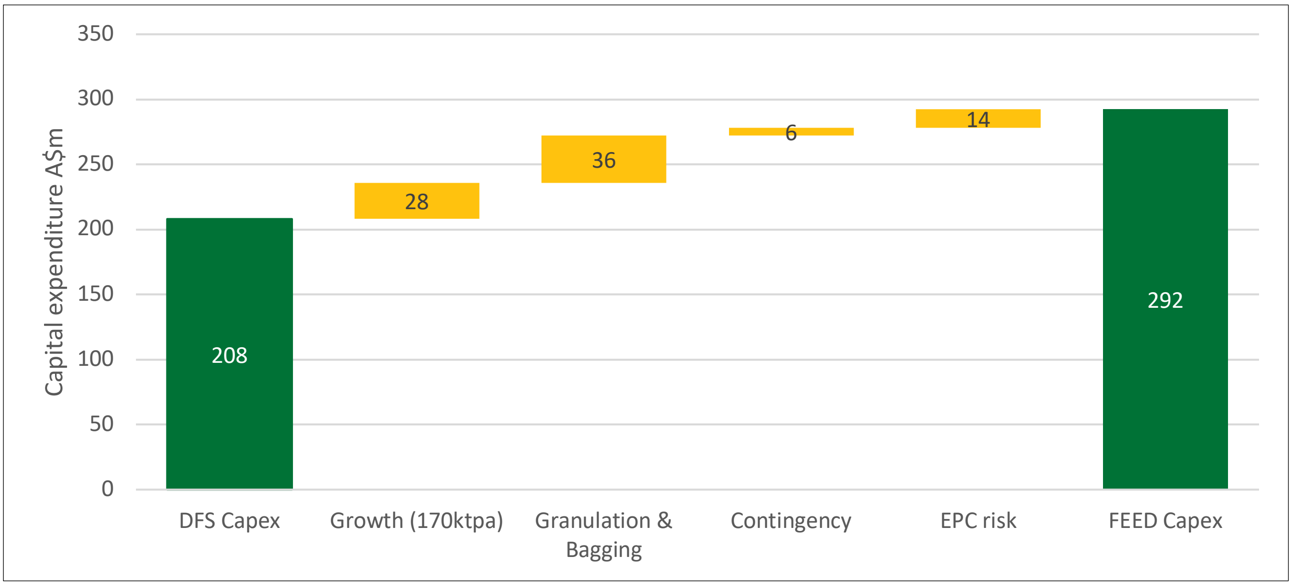

Figure 16 De-risked FEED CAPEX

d. Operating Cost

The Lake Wells C1 cash operating cost is projected at US$251/t SOP for 170,000tpa over the life of mine.

Table 12 Life of Mine Operating Cash Costs

Operating cash costs (US$/t SOP)	Brine SOP	MOP Conversion	Combined
Annual Production	**120,000**	**50,000**	**170,000**
Salt harvesting	13	-	9
Power supply	49	3	35
Reagents and consumables	12	266	85
Labour	57	-	41
Export logistics (FOB)	59	59	59
Maintenance	4	-	3
Indirects	27	-	19
Total cash costs	**221**	**328**	**251**

Operating costs have been estimated based on defined scopes and tendered submissions for all material items. Operating costs for brine SOP are US$221/t SOP and when combined with the SOP produced from the MOP conversion process operating costs are US$251/t SOP.

The Lake Wells C1 cash cost places the project in the first quartile of the SOP global industry cost curve.

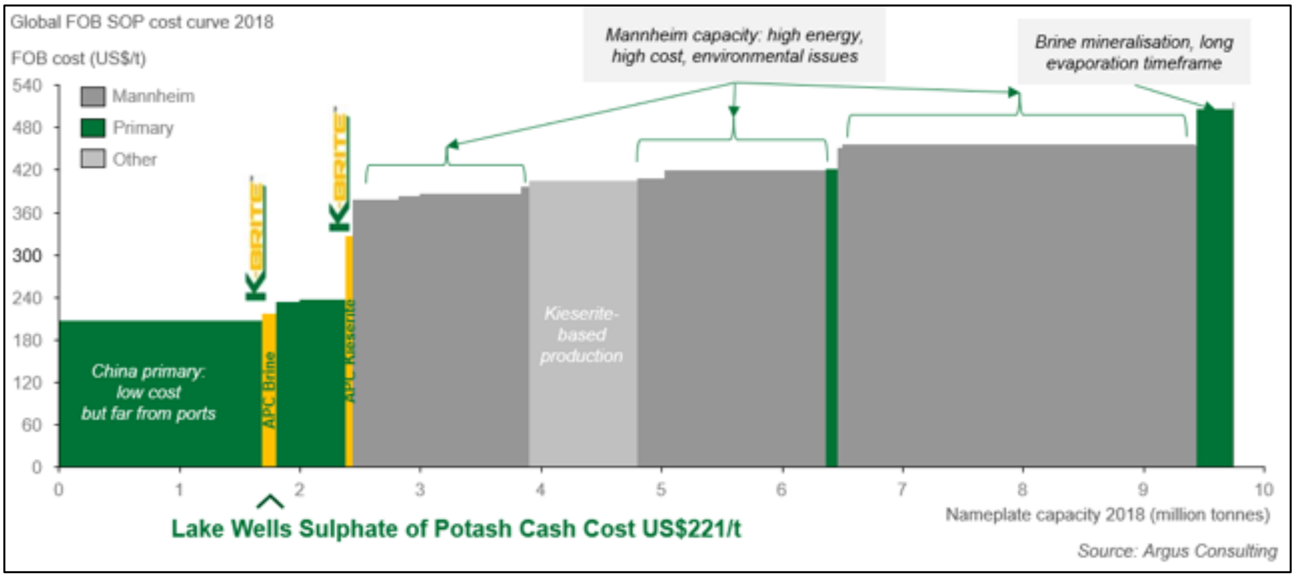

Figure 17 Globally Competitive Lowest Quartile OPEX

13. Environmental, Social and Governance

a. Environmental approvals, operating licences and work permits

The Minister for Environment issued Statement number 1162 'Statement that a Proposal May be Implemented' (*Environmental Protection Act 1986*) in respect to the Lake Wells Potash Project on 1 February 2021. Implementation conditions and procedures typical for a mineral resources project development were outlined in the Statement, driving sustainable environmental outcomes across flora and vegetation, terrestrial fauna, inland water and subterranean fauna, and cultural heritage management.

The Minister for Aboriginal Affairs has issued consent for the Notice submitted under section 18(2) of the *Aboriginal Heritage Act 1972*. In providing consent the Minister gave regard to the recommendation of the Aboriginal Cultural Materials Committee and the general interest of the community. The consent was unconditional and recognised that the intended use (of the land) will not impact any Aboriginal site within section 5 of the *Aboriginal Heritage Act 1972*.

The Department of Water and Environmental Regulation has issued a licence to take water under section 5C of the *Rights in Water and Irrigation Act 1924* for the LSOP.

The Department of Water and Environmental Regulation has issued a licence to construct as many wells as required under section 26D of the *Rights in Water and Irrigation Act 1924* for the LSOP.

Application to the Department of Water and Environmental Regulation for a works approval under Division 3, Part V of the *Environmental Protection Act 1986* is pending.

Applications to the Department of Mines, Industry Regulation and Safety for approval of a Mining Proposal, under section 82A(2)(b), and a Mine Closure Plan under section 84AA of Part IV, Division 3 of the *Mining Act 1978* are pending.

b. Tenure

The Lake Wells SOP project comprises 21 mineral tenements covering an area of approximately 1,297 square kilometres.

Table 13 Tenure

Tenure Granted and under application	Area Km^2
Exploration licences (15)	991
Mining leases (6)	306
Total tenure (21 minerals titles)	**1,297**

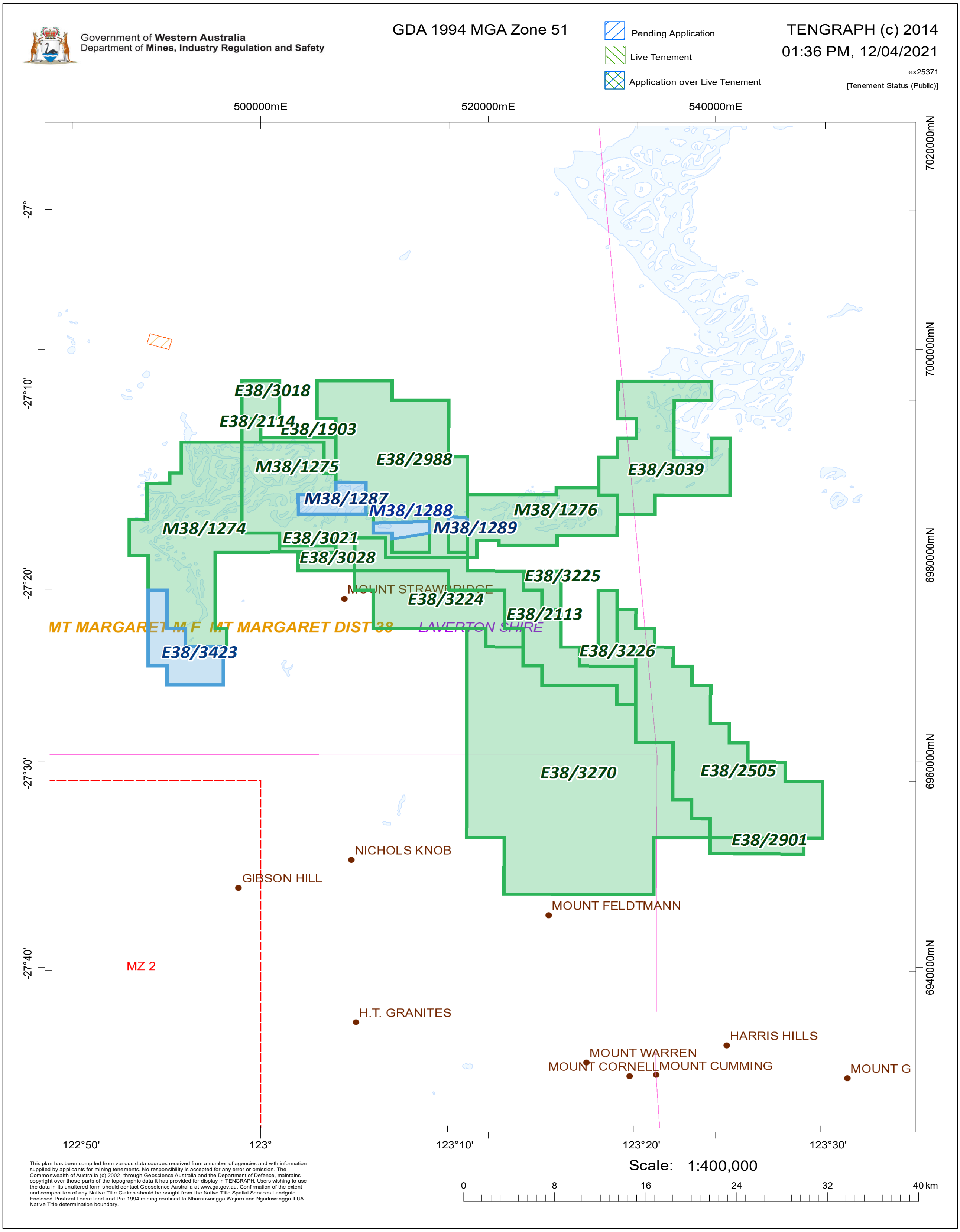

Figure 18 Tenure

c. **Laverton School STEM Program**

In 2020, the Company held a STEM Innovation Day (Science, Technology, Engineering and Maths, STEMID) at the Laverton School, with students in years 1 – 12 from Laverton and the remote annexes of Cosmo Newberry and Mulga Queen, and Mt Margaret School, attending. The purpose of the STEMID was to introduce the concept of curriculum augmentation programs to the teacher cohort across the district, and to introduce hands on learning of STEM subjects to students. Following the very strong positive feedback to the STEMID, the Company has contracted with external STEM provider Firetech to provide a STEM augmentation program through the Laverton School for the 2021, 2022 and 2023 teaching years.

At the time of writing (April 2021) the Laverton School STEM Program had completed Term 1 of the 2021 teaching year. Programs have been developed for the balance of the 2021 school year, with iterative customization of programs based upon student, parent and teacher feedback.

Figure 19 Laverton STEM Program, Laverton School, Term 1 2021

d. **Laverton Vocational Education and Training Program**

The Company has dedicated resources to the development and implementation of an adult vocational education and training program – the Laverton VET Program – with a target start date of Q4 2021. The strategic goal of the LVET program is to contribute meaningfully to improving the economic capacity of local and regional Aboriginal people.

Based upon the highly successful adult training program initiative in Wiluna, which is a collaborative effort between the Shire of Wiluna, Central Regional TAFE and industry, APC established an initial working group to develop a Laverton based VET program commencing in 2021, with the specific aim of developing new vocational skill sets within local and regional Indigenous communities.

The initial working group comprised representatives from Industry, the Western Australian State Government's Department of Training and Workforce Development, the Goldfields-Esperance Development Commission, the Laverton Shire, the Wirrpanda Foundation, the Pakaanu Aboriginal Corporation and the North Regional Metropolitan TAFE and Central Regional TAFE.

Experiences with initiating a similar VET program at Wiluna have shown that early communication with potential VET participants around the elementary question 'what skills would you like to acquire' leads to increased participation and more successful training outcomes, as understanding this fundamental need allows VET programs to be tailored to address these training wants.

Central to the post-training success of the Wiluna graduates has been the opportunity to embed their skills through immediate employment. Remote road work and remote civil/mines work is on-country work and has the strong support of Elders. APC will require labour for various roadworks, particularly on the Lake Wells Road which presents a great opportunity for a training ground for newly acquired skills.

Another fundamental tenet to the success of the Laverton VET program will be the initial, on-going and continuous support of trainee family networks. To this end, the consultation process with Laverton based families (in the first instance) has commenced: without the support of family networks, the opportunity and temptation to not complete any training programs has proven to be difficult to resist. The Laverton VET program has been designed around the principles of:

- Engage with Indigenous families to identify trainees and training wants and needs;
- Engage with families of trainees through the training programs to assist the continuous support of trainees by those families; and
- Ensure that there are employment opportunities available immediately training programs have been completed to imbed newly acquired skill sets.

It is anticipated that VET training program delivery will commence in Q4 2021, with modelling of the infrastructure solution to deliver a proposal Q3 2021.

e. Commitments to Aboriginal employment

The funding solution being developed for the construction and initial operation of the LSOP includes a concessional, long tenor debt facility of A$140 million from the Northern Australia Infrastructure Facility (NAIF). Central to NAIF's consideration of the Company's application for finance was its tangible commitment to improving the economic capacity of local and regional Aboriginal stakeholders.

Embedded in the Indigenous Engagement Strategy submitted, reviewed and subsequently approved by NAIF, were targets for direct Aboriginal employment. Australian Potash Limited is committed to meeting at a minimum, and exceeding when possible the targets outlined below.

Table 14 Indigenous Employment Targets

	Pre-development	Development	Operations
Indigenous Employees	2	3	15
Total Employees	17	22	95
Indigenous Employment Ratio (IER)	12%	14%	15%

f. Public Benefits Analysis

A Public Benefits Assessment was made into the LSOP as part of the NAIF application process by EY, an accounting firm. Among other aspects of that APC will address through the development and operation of the LSOP, EY focused on:

- Investment in radio link communications;
- Upgrades to the public access road; and
- A Community Engagement and Economic Capacity strategy involving:
  - employment opportunities to Indigenous Australians; and
  - an adult Vocational Education and Training (VET) facility in Laverton.

EY's identified that the LSOP is set to procure 30% of required equipment and supplies from Northern Australia, and to provide employment for a targeted minimum 30 – 40 local and regional people. In addition, EY noted the Company's committed FEED hybrid renewable power solution, and the high REP making the LSOP the lowest carbon emitting SOP across the emerging SOP sector in Australia.

The essential tenet of a 'public' benefits analysis is that the subject project is able to demonstrate benefits that extend beyond those that accrue to the company – that is, there must be benefits accruing to the public.

Quantifiable public benefits of the Lake Wells SOP project stem from:

- Future benefits to communities from education and training programs at the proposed Laverton TAFE facility and STEM education program at Laverton School;
- Medical benefits from the proposed upgrading of an airstrip to be Royal Flying Doctor Service (RFDS) compliant;
- Community benefits from investment in radio link communications;
- Vehicle operating cost (VOC) savings due to the access road upgrade; and
- Travel time savings due to the access road upgrade.

From the multiplier impacts, APC's direct spending in Northern Australia translates to $547.8 million and for the state as a whole, APC's direct spending of $1,305 million translates to $2,727 million in terms of an overall economic impact.

14. Appendices

a. Mineral Resource Estimate and Ore Reserve Estimate

Climate and Hydrology

Lake Wells is located at the northern end of the Eastern Goldfields Region of Western Australia. The region is arid with an average annual rainfall of approximately 200 mm and characterised by hot, dry summers and cold winters. Average maximum temperatures of around 30°C, though daytime temperatures can exceed 40°C during the summer (December to February), with overnight temperatures below zero possible during the winter (June to August). Pan evaporation rates for the area are estimated to be 3,200 mm/year, such that the potential evaporation rates in the area far exceed the annual rainfall. The large environmental moisture deficit provides opportunity for solar evaporation.

The Lake Wells Sulphate of Potash Project is located in the southwest region of the lake. From a review of available Shuttle Radar Topography Mission (SRTM) data for the region, the southwest lake area is estimated to have a catchment area of 6,600 km^2, with the majority of the catchment area flowing from the west. The LSOP lake chain has an approximate surface area of 170 km^2. Based on an assumed average annual runoff yield of 1%, 200 mm average annual rainfall would result in, on average, 80 mm of water reporting across the lake area over the year. However, Intensity-Frequency-Duration (IFD) curves for the site, sourced from Bureau of Meteorology (BOM), indicate that a week-long storm event with a 1% Annual Exceedance Probability (AEP) would result in rainfall of 198 mm; almost the annual average in a single event. The volume of water reporting to the lake may be considerably larger for a single high magnitude / low-frequency rainfall event.

Dependent upon the actual rainfall distribution in any year, a portion of the water reporting to the lake will infiltrate the lake-bed sediments. Lake Wells constitutes an internally draining terminal basin where there is no surface water outflow. Surface water connection across the lake is poorly defined, and smaller rainfall events would likely result in the development of ponds within the overall lakebed. It is possible that the entire lake could be interconnected during high levels of inundation.

Geological Setting

Lake Wells is located on the north-eastern margin of the Yilgarn Craton, at the southern margins of the Earaheedy Basin, in the interior of Western Australia.

A well-developed system of rivers drained the interior of Australia during the Tertiary period, up to 65 Ma (e.g. Beard 2002, Magee 2009, de Broekert 2005). These Tertiary river systems formed within a series of broad, approximately 50 km wide ‘Primary Valleys’ (De Broekert 2005) in an undulating plateau carved through the glacial period of the Permian. In Central and Western Australia, the Tertiary is marked by three broad cycles of weathering followed by erosion and deposition; these three (3) cycles are preserved in the geology of the central and western interior of the continent:

- **Early Tertiary** (Palaeocene – Eocene) weathering and erosion of a deeply incised river-system within which alluvial sand was deposited;
- **Mid Tertiary** (Oligocene – Miocene) weathering, reworking, and subsequent deposition of the weathered regolith mainly as fine-grained sediments in low-energy fluvial and lacustrine environments; significant sand interbeds can occur; and

- **Late Tertiary** – recent (Pliocene-Holocene) reworking and deposition of alluvial, colluvial, aeolian and eluvial deposits. The Late Miocene saw a marked increase in aridity and the dramatic reduction of the nothofagidites rain forests that covered the area until that time (Huo et. al. 2008). Pleistocene marked the on-set of the current arid conditions which also continued the formation of playa-lakes and brine-formation, most of which date from 1 Ma to 0.5 Ma (Fujioka and Chappell 2014); evaporate and precipitate formations (gypsum, halite and calcrete) also occur within the late-Tertiary sediments.

The early-Tertiary sediments were deposited in river valleys eroded either directly into Archean basement or, in some instances, into older sedimentary strata overlying the Archean basement. Tectonic movements during the mid-Tertiary, combined with the onset of aridity at the end of the Miocene, resulted in significant changes to Tertiary river-courses, such that the current drainage system and direction does not always align with the palaeo-drainage systems.

Palynological analysis completed on four samples from centrally located exploration bore PLRC018 provides the basis for age determination for the LSOP geological sequence. Samples collected between 142 m and 164 m below surface, from the mixed aquifer and basal sand units indicate a reliable age at the Miocene/Pliocene boundary (Milne 2018). The age assignment fits with Tertiary phytogeography and precipitation model from Martin (1994) (Figure 20), Hou et. al (2008), and others.

Precipitation models derived from phytogeography and supporting evidence such as that shown in Figure 20 provide useful corroboration for the sediments observed at the LSOP, and their mode of deposition. This outline of Tertiary phytogeography reconstruction (Martin 1994) indicates climatic conditions consistent with those necessary for the deposition of the host sediments to the LSOP brine. The green line indicates the period for the basal sand, while the yellow line is the upper sand. For example, the spike in rainfall seen at the Miocene/Pliocene boundary that exceeded 1,500 mm per year can usefully explain the flow necessary within valleys to erode existing fluvial and lacustrine deposits, and deposit clean coarse sand derived from local sources. Falling rainfall and reversion to the trend of increasing aridity explain both the charcoal beds seen in the exploration drilling as the existing rainforests dried and burned, and the swamp trending to lacustrine sediments were deposited as the rivers dried up and lakes formed within the valleys.

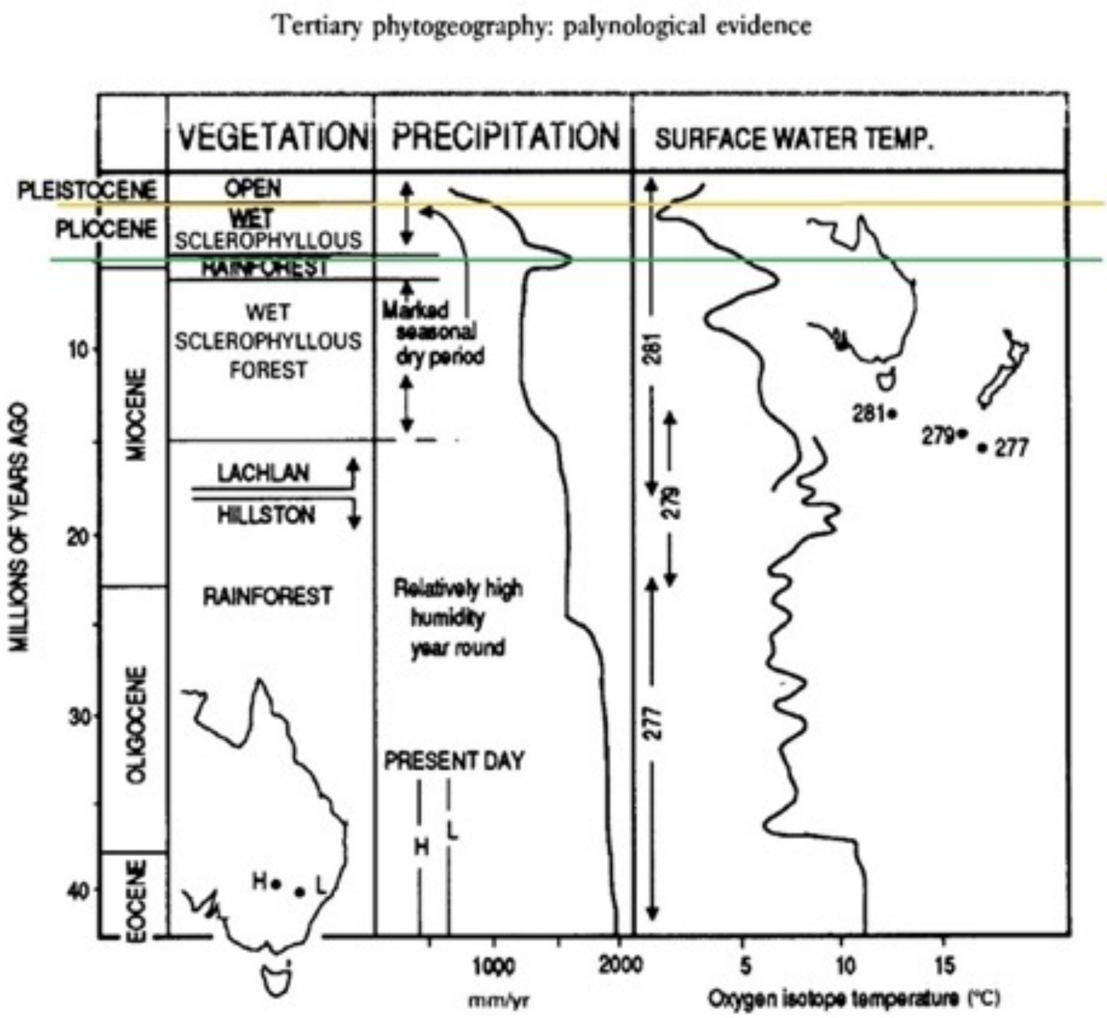

Figure 20 Outline of Tertiary Phytogeography from Martin 1994.

During the Tertiary, the Carnegie and Keene palaeorivers drained from the north into the Wells palaeoriver (Beard, 2002). Consistent with the geologic history of the region, investigations at the LSOP show a deep palaeovalley extending continuously through the Project area and towards the north-eastern and south-western tenement boundaries. The Wells-Carnegie system was extensive, with eroded valleys up to 170 m deep and ultimately drained to the proto-Eucla coast (Beard, 2002). Thus, sediments underlying the current Lake Wells Playa Lake infill a large Tertiary palaeo-valley and are demonstrated to extend over a wide area both upstream and downstream.

Deposit Type and Mineralisation

The LSOP mineral resource is a brine comprising the high concentrations of potassium and sulphate required to form potassium sulphate (SOP) salts. The mineralised brine at the LSOP is contained within the Tertiary sediments described above, and within fractures in the surrounding basement.

Exploration

Historical Data

Early gold-exploration drilling was undertaken in the area by Western Mining, Croesus Mining and more recently AngloGold Ashanti (AngloGold). A summary of the legacy drilling results is available through public record and, in the case of AngloGold, through data provided to APC. Additional gold exploration was undertaken by APC. While this work did not involve brine-sampling, the drilling results contribute to geological control of the basement topography of the area, along with limited information on the sedimentary stratigraphy within the valley-fill sediments. A total of 1,273 non-brine-exploration drill holes provide geological data relevant to the project area.

Surface and Airborne Geophysics

Definition of the basement profile was aided using the horizontal to vertical spectral ratio (HVSR) passive seismic geophysical technique. A total of 462 km of passive seismic surveys were completed over the project, as illustrated in Figure 21, with 160 km of this added as part of the FEED program.

Sample spacing for data collection is generally 100 m, though 50 m spacing was used in areas where additional detail was needed to resolve some complexity. Data output was calibrated against drilling data to provide a robust and predictable model, that was then further tested with additional drilling.

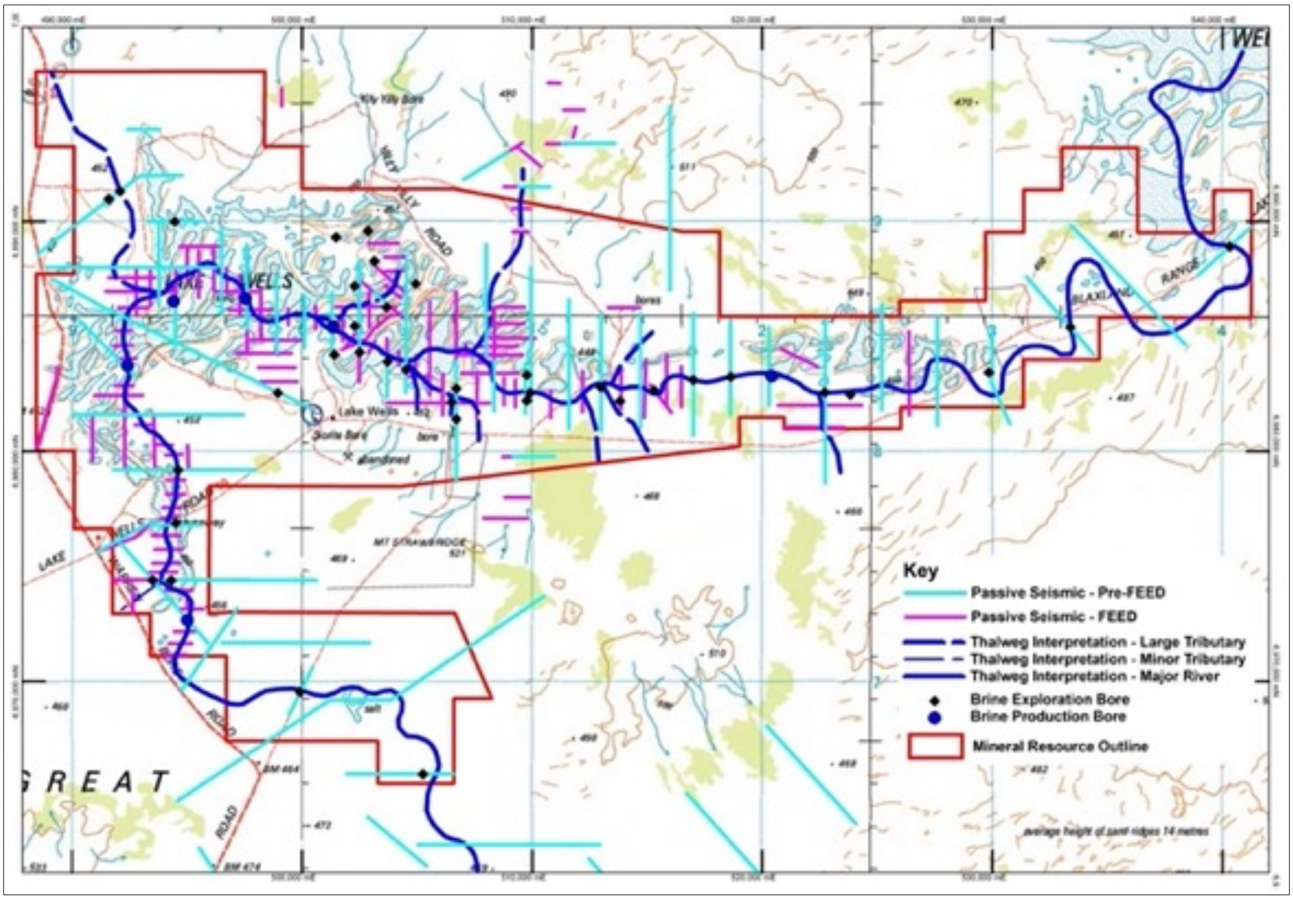

Figure 21 Brine focused exploration within Measured Mineral Resource Estimate

Magnetic data was used to connect seismic cross sections. Airborne magnetic data can assist in the interpretation of channel systems in several ways (Gunn and Dentith, 1997), though those relevant to the LSOP are erosion into magnetic basement rocks leaving a mappable response, concentration of detrital magnetite and/or magnetic rocks along the valley floor; and maghemite formed within basal sediments. As depicted in Figure 22, the magnetic image is used for the interpretation of the location of the thalweg, or basal channel of the deposit. The blue line is the interpreted thalweg where the erosion of the magnetic basement rocks has resulted in a mappable, low magnetic, response.

Magnetic data at a line spacing of 100 m, or in some areas 50 m, cover the project area from which variously processed images were generated. Interpretation of the magnetic data that reveals both the erosion into magnetic basement model and accumulation of magnetic detritus, was completed to provide a 2D thalweg map - combining the interpreted thalweg of the palaeochannel from the 2D magnetic images with the section views generated by the passive seismic data results in a precise 3D model of the palaeovalley. Validation and refinement of the model are then completed using both recent brine targeted drilling, and legacy minerals exploration drilling data.

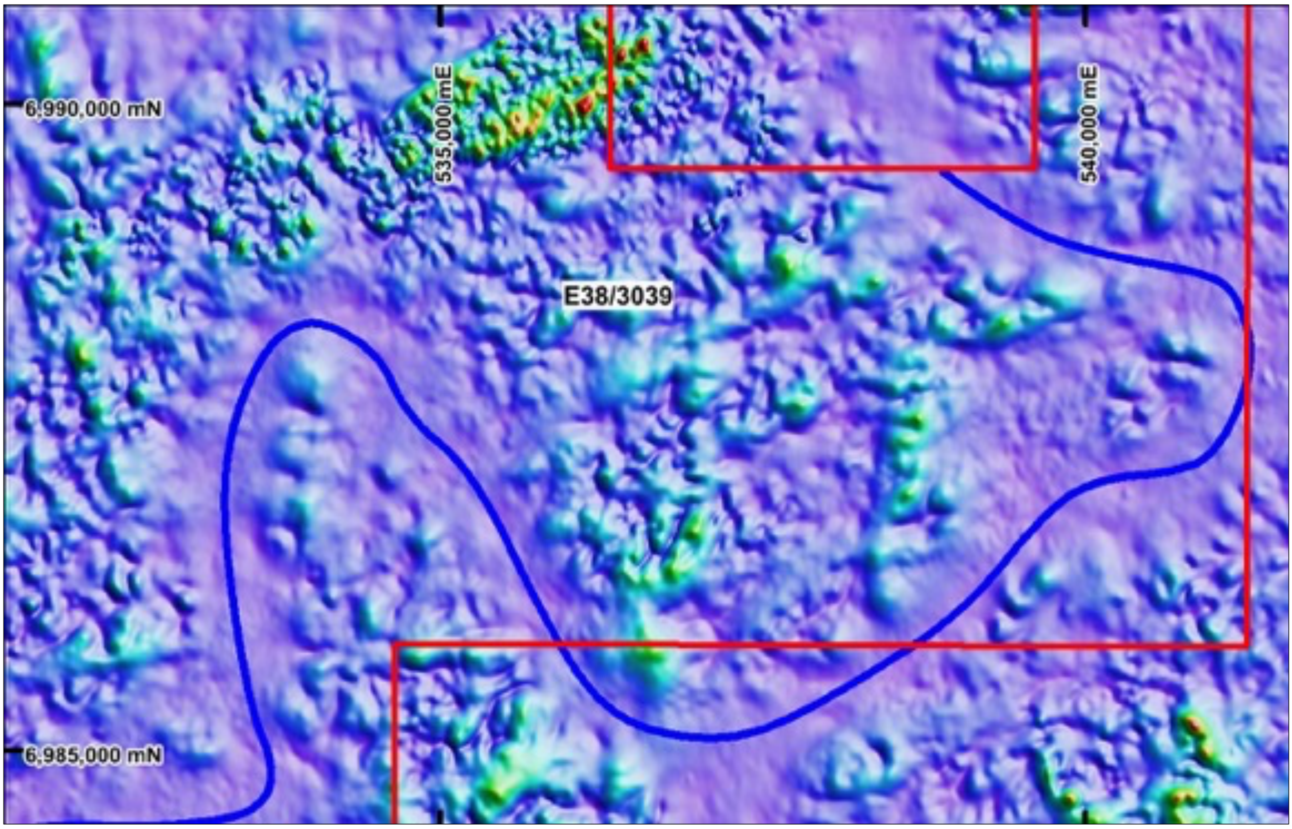

Figure 22 Magnetic Image through a Section of the MRE

Drilling

Between 2015 and 2019, APC has conducted several drilling and bore construction programmes resulting in the completion of eighty drill holes and bores. Brine exploration holes to a maximum depth of 186 m, have predominantly been drilled by air-core (AC) or reverse-circulation (RC) methods, with mud-rotary (MR) and dual-rotary (DR) techniques used for the construction of monitoring and production bores. Also, five diamond core holes were drilled for geological control.

Lithological logging was conducted for all drill holes, and hydrogeological data (i.e. airlift yields during drilling) recorded when drill methods allow. For the AC and RC-drilled holes, brine samples were collected at yielding intervals for hydrochemical analysis and drill samples were collected for particle size distribution (PSD) analysis.

Seven test production bores were installed to date at the LSOP; comprising TPB001 to TPB003 installed in 2016, LWDRP001 and LWDRP002 installed in 2017 and 19LWPB01 and 19LWPB02 installed in 2019. Bore TPB001 intersects only the upper aquifer unit while bores TPB002, and TPB003 are screened against (and sealed within) the basal aquifer. Bores LWDRP01, LWDRP02, 19LWPB01 and 19LWPB02 are all screened against both the upper and basal aquifer units. Monitoring bores adjacent to the 2017 and 2019 production bores were installed to target specific hydrostratigraphic units.

Downhole Geophysics

Understanding the fluid storage and movement properties of brine hosting sediments is a critical element in the assessment of the Lake Wells potassium and sulphate resource. Downhole borehole magnetic resonance (BMR) logging was conducted on eighteen holes in July 2019, using a Javelin JP175 supplied by Vista Clara Corp, USA. The tool is sensitive to pore space fluids allowing the determination of porosity, mobile (or unbound) fluid content, bound fluid content (specific retention) and permeability.

Test Pumping

Step rate and constant rate pumping tests were conducted at the seven installed production bores. Initially, in 2016, short-term constant rate tests were conducted for durations of between 7 and 10 days at bores TPB001 to TPB003. In 2017 and 2019 constant rate tests of approximate 30-day durations were conducted on TPB02, TPB03 and the subsequently installed production bores, except the lower yielding bore LWDRP02 for which a 12-day test was conducted.

Brine samples were collected at intervals during the constant rate test pumping to assess any changes in brine hydrochemistry over time, and to compare with results from targeted exploration samples.

Mineral Resource Estimate

Hydrostratigraphy

Consistent with the regional geological description above, the drilling results show a deep palaeovalley ranging between 150 and 170 m in depth, infilled with predominantly lacustrine clays and sand interbeds. Palynological dating was used to determine the age of the deepest sediments, with an age assignment at the Miocene / Pliocene boundary, or late Tertiary age.

The drill-holes on the margins of the palaeovalley generally intercept basement which provided control on the width and cross-sectional shape of the valley system. Moreover, boundary conditions were encountered during long-term pumping tests and this data also allow estimation of the width of the basal channel aquifer.

Sedimentary geological units within the LSOP are described below:

- An extensive surficial aquifer unit of Quaternary mixed alluvial/lacustrine sediments comprising:
    - Thin (approximately 0.1-1 m) of sandy loam, including local laterite and evaporite deposits, overlying the entire lake area

- An underlying, low permeability, clay-rich unit with minor sand horizons extending across the entire lake area
- Local areas of permeable calcrete and / or silcrete, laterite and evaporate deposits

- Pliocene clay rich layer, though generally with a higher sand and silt content than the lower clay zone. This layer averages 35 m thick with a maximum thickness of 55 m, pinching out against basement rocks along the valley walls. The upper clay zone is noticeably distinct from the lower in several areas, notably lighter colour reflecting lower carbon content, and increased oxidation. Toward the surface of the unit large halite crystals have grown indicating periods of supersaturation in brine
- A Pliocene to Pleistocene boundary aquifer unit of predominantly sand at the base of upper clay unit, occurring at depths ranging between 35 m and 70 m, with thicknesses varying between 1 m and 12 m. It was encountered in multiple brine and mineral exploration drill holes and is anticipated to be continuous both along the length and across the width of the palaeovalley. This unit will contribute to the ability to abstract brine from the overlaying clay units through depressurisation and vertical leakage
- A Pliocene clay dominant unit comprising puggy lacustrine clay with minor sandy interbeds. This unit was logged extensively during exploration drilling programmes. This clay has demonstrated a high porosity and contains a substantial volume of brine. The clay unit will act as a confining layer for the underlying basal sand and provide a source of brine via downward leakage during the pumping of the basal sand aquifer
- A Miocene/Pliocene boundary mixed aquifer unit comprising interbedded sand, clay, and charcoal rich paleosol units. Pumping from this moderately permeable aquifer and underlying basal sand aquifer will lower the hydrostatic pressure within these units, facilitating drainage of brine from the overlying clay dominant unit
- A basal sand was encountered in over 25 drill holes located across the entire project area with an age assignment from palynology of the Miocene/Pliocene boundary. The presence of this sand is consistent with the regional geological description, and continental scale environmental reconstructions. The sand forms a highly permeable aquifer and will a have relatively high specific yield
- In places, there are thin remnants of Permian glacial deposits (diamictites) overlying the Archean basement. The encountered Permian deposits are well indurated, quartz-cobble conglomerates, though other types are possible.

Recharge

Direct lake recharge was applied to the steady state calibration of the hydrological model though the majority of this was lost from the groundwater system by evaporation. Additionally, the unpredictable rainfall over the area makes any prediction based on this parameter unreliable.

While there will be recharge, APC has adopted a conservative stance and discounted this from the model.

Aquifer Parameters

Aquifer parameters were determined from PSD analyses, test pumping, and downhole Borehole Magnetic Resonance (BMR) logging, with methods of data analyses and results described below.

Analysis of the PSD was undertaken on 155 lithological samples — 102 samples (excluding QA/QC samples) represent the hydrostratigraphic units within the Measured Resource area; PSD samples from “consolidated rock” (i.e. calcrete / silcrete and basement) and outside the Measured Resource area have not been considered. The PSDs were used to estimate permeability, specific yield and porosity for the identified hydraulic units. Methods described by Saxton and Rawls (2006) of the USDA, were used to estimate hydraulic parameters from PSD data.

It was determined that the PSD-derived estimates of hydraulic parameters for each of the hydraulic units an approximate log-normal distribution (as is common for granular aquifers). The mean of the log-normal distribution was as adopted as the representative value with the representative range derived from the +/- 1 standard deviation.

Test pumping of the seven production bores demonstrates the permeability of both the upper and basal sand aquifers and a feasible method of brine abstraction. Estimates of aquifer transmissivity were derived from the test pumping data using AQTESOLV software (by HydroSOLVE Inc.), utilising different analysis methods to compare the results for both drawdown and recovery data.

Transmissivity (T) is a function of hydraulic conductivity (or permeability) and aquifer thickness. As such, much of the variation in transmissivity will relate to variations in the thickness of the sand aquifers. Values of aquifer permeability (k) were derived by dividing the aquifer transmissivity, calculated from the pumping tests, by the interpreted aquifer thicknesses.

The basal aquifer generally behaves as a confined system although a leaky response is evident from the long-term test pumping at 19LWPB002 and it is anticipated that leaky conditions will eventuate at all deep pumping locations, resulting from the drainage of the brine from the overlying units.

The pumping tests to date have not been of sufficient duration to induce unconfined conditions within the aquifer sequence. As such, no estimates of specific yield (unconfined storage) can be made from the test pumping data. Instead, specific yield was estimated from the PSD analyses and BMR logging. It should be noted that confined storage and specific yield are different storage properties and cannot be compared.

Downhole BMR logging was conducted in 18 bores to provide in-situ estimates of permeability, specific yield and porosity. The identified hydrostratigraphic units are clearly defined from the BMR logging data. There are, however, some anomalies evident at intervals, indicative of drilling disturbance or washouts. The BMR data was filtered by level of confidence (reliability), such that the data against the washout zones can be filtered out from the data set. Two approaches were used to achieve estimates of aquifer parameters from the BMR data. For specific yield and porosity estimates, the objective was to derive bulk values that are representative of each of the hydrostratigraphic units. As such, each reliable (i.e. filtered) specific yield and porosity value from the BMR logging was grouped by hydrostratigraphic unit (using Leapfrog Geo), and the mean of the log-normal distribution and +/- 1 standard deviation were derived for each unit. As the washout zones tend to occur predominantly in sandier, less consolidated units, the BMR data for these units (i.e. the upper and basal aquifers) are unreliable due to a large amount of filtered data.

The adopted value of permeability for each hydrostratigraphic unit should be representative of the zones that influence flow (rather than a bulk permeability value). Therefore, a different analysis method was used to derive representative permeability values from the BMR data. The assignment of the filtered permeability values to the hydrostratigraphic units was conducted manually for each BMR log (rather than by using Leapfrog), such that the more clayey intervals were assigned to the aquitard units and the more-sandy zones to the aquifers. To further reduce the influence of any washout zones not picked up by the filtering process, recorded permeability values were capped at 5 m/d. As before, the mean of the log-normal distribution and the +/- 1 standard deviation for each unit were then calculated.

Table 15 summarises the aquifer parameters derived from the PSD analyses, test pumping and BMR logging. Also presented in this table are the adopted modelled parameters.

Table 15 Summary of Derived Aquifer Parameters

Hydrogeological Unit	Permeability (m/d)				Specific Yield (%)		
	PSD	BMR[1]	Test Pump	Model	PSD	BMR[2]	Model
Lower bound	0.02	0.18		0.30	5	6	
Loam (mean value)	**0.17**	**1.27**			**11**	**10**	**10**
Upper bound	1.18	3.92		0.30	23	17	
Lower bound	0.01	0.04		0.03	4	3	
Upper Aquitard (mean value)	**0.04**	**0.20**			**6**	**7**	**7**
Upper bound	0.11	0.97		0.15	10	19	
Lower bound		2.66		1.00		4	
Crete (mean value)		**3.44**				**8**	**5**
Upper bound		3.98		1.00		19	
Lower bound	0.06	1.04	0.1	0.50	7	6*	
Upper Sand (mean value)	**0.52**	**1.88**	**0.5**		**17**	**12***	**17**
Upper bound	4.51	3.42	2.2	3.00	38	23*	
Lower bound	0.01	0.04		0.07	4	2	
Lower Aquitard (mean value)	**0.04**	**0.16**			**7**	**8**	**8**
Upper bound	0.16	0.58		0.80	12	22	
Lower bound	0.08	0.50		0.40	9	2	
Mixed Aquifer (mean value)	**0.46**	**1.38**			**17**	**6**	**17**
Upper bound	2.58	3.79		0.80	34	17	
Lower bound	0.25	1.92	0.10	2.00	14	5*	
Basal Sand (mean value)	**1.00**	**2.57**	**0.60**		**23**	**11***	**23**
Upper bound	4.06	3.13	2.30	3.00	39	25*	

1 - Derived from zones that influence flow
2 - Represenative of entire hydrostratigraphic unit
* Affected by large amounts of washout zones

Groundwater Levels

Depth to water was measured in monitoring drill holes on a quarterly basis since 2019, and a robust ground water level model is being formed. The depth to water ranges between 0.12 and 13 m below ground level (mbgl); the latter occurs progressively towards the east and the larger body of Lake Wells presumably driven by greater evaporation on the exposed lake surface there.

The data show the brine is at or close to the surface of the lake sediments and the entire sedimentary sequence beneath the lake is saturated with brine.

Hydrogeochemistry and Brine Concentration

Comprehensive brine sampling and analyses was conducted by APC across the entire LSOP area. Assays were undertaken on samples throughout the geological sequence including the basal sand.

It should be noted that the brine samples collected during exploration drilling represent steady-state conditions. They do not represent the brine-quality that will result from mixing between aquifers and periodic surface water inputs that will occur under operational pumping conditions. Test pumping samples are mixtures of brine collected from a producing bore and will therefore be a close representation of the brine grade that can be expected in a production scenario. Exploration samples and test pumping samples were interrogated, and the correlation errors are not considered to affect the Resource calculations materially. However, to ensure conservatism, where multiple assays are available on a specific sample, then the lowest measured potassium concentration was adopted in calculating the Resource.

Salient aspects of the overall results are summarised in Table 16.

Table 16 Summary of Potassium, Sulphate and SOP Concentration

Hydrogeological Unit	No of Assays Used in Brine Modelling[1]	Potassium (mg/L)			Sulphate (mg/L)			SOP (mg/L) Weighted Mean Average[3] (Measured Resource)
		Median	Average[2]	Std Deviation	Median	Average[2]	Std Deviation	
Loam	125	4,330	4,168	1,248	20,750	20,131	5,437	8,941
Upper Aquitard	190	4,150	3,937	1,273	22,500	22,452	6,787	6,735
Crete	40	3,925	3,515	1,483	22,100	20,469	8,565	5,320
Upper Sand	24	3,990	3,811	1,036	25,300	24,404	7,357	7,660
Lower Aquitard	319	3,700	3,582	1,306	21,400	22,131	7,597	7,509
Mixed Aquifer	26	3,585	3,333	1,061	21,200	20,943	7,924	8,129
Basal Sand	25	3,720	3,250	1,029	22,100	21,852	6,654	7,616
Total	**749**							7,455

Notes

1 *Excludes QA/QC assays and assays from transient conditions (ie test pumping of production bores).*

2 *Average values are simply arithmetic means of all samples provided to summarise numerous assay results; they do not represent a weighted mean average.*

3 *Weighted Mean Averages for the Measured Resource area are derived from the brine modelling.*

It should be noted that the average values for potassium and sulphate in Table 16 are arithmetic means from all samples. The average values are not weighted to reflect the relative proportion of one sample compared to another (i.e. a sample over a 1 m interval and a sample over a 10 m interval have the same weighting in the arithmetic mean). The non-weighting means they do not reflect the average brine concentration within each formation. In modelling the Measured Resource, the weighted mean average concentration of SOP is derived; this takes account of the relative proportions of high and lower concentrations and provides averages that are representative of the overall aquifer.

Weighted mean average concentrations of potassium and additional major ions were derived from the Resource modelling and are presented in Table 17, together with key ratios.

Table 17 Weighted Mean Average Concentrations and Key Major Ion Ratios

	Weighted Average concentration (mg/L)						Key Ratios				
	K	Ca	Na	Mg	SO_4	Cl	$Cl:SO_4$	K:Mg	SO_4:K	Na:K	SOP (mg/L)
LAKE WELLS											
Loam	3,202	697	50,394	6,291	16,519	88,992	5.39	0.51	5.16	15.74	7,140
Upper Aquitard	3,286	694	52,730	6,603	17,333	92,731	5.35	0.50	5.28	16.05	7,327
Crete	2,910	781	44,563	6,336	16,664	78,697	4.72	0.46	5.73	15.31	6,489
Upper Sand	3,386	680	56,887	7,106	18,634	98,294	5.27	0.48	5.50	16.80	7,552
Lower Aquitard	3,538	648	58,049	7,250	18,793	101,326	5.39	0.49	5.31	16.41	7,890
Mixed Aquifer	3,246	657	56,378	7,022	18,782	95,723	5.10	0.46	5.79	17.37	7,239
Basal Sand	3,438	663	56,036	7,219	19,502	95,497	4.90	0.48	5.67	16.30	7,667

The brine sample collection during the test pumping of the production bores provide data relating to the variation in brine concentrations under transient conditions. Although there are minor fluctuations in concentrations, the results show no evidence of blending with low-grade groundwater over the approximately 30 days of abstraction.

Hydrogeological Model and Brine Abstraction

The conceptual hydrogeological model is illustrated in Figure 23 and shows:

- The hydrogeological units that may support brine-abstraction by direct pumping

- The interaction of those units with the clay aquitards. In particular, the importance of the underlying basal sand to facilitate depressurisation and under-drainage of the clays.

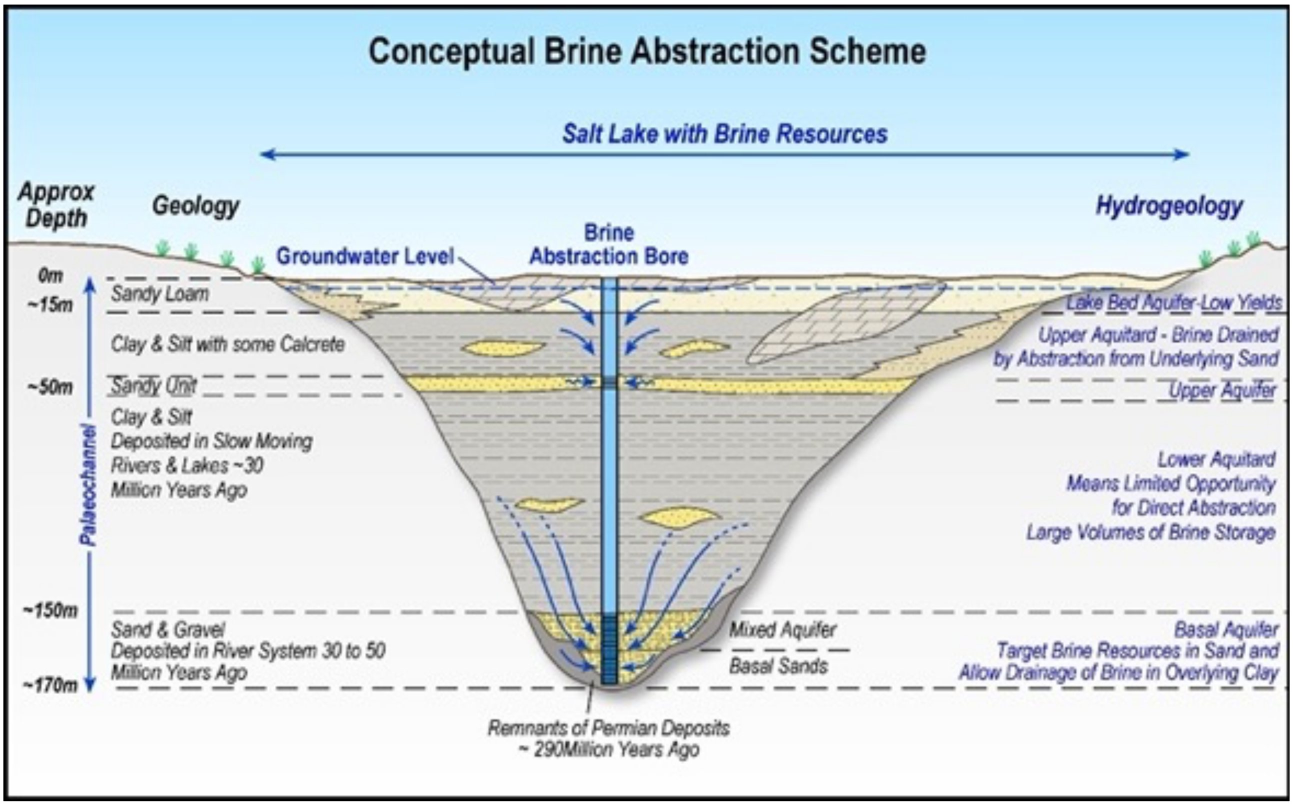

Figure 23 Conceptual Brine Abstraction Scheme

A 3D hydrogeological model was developed using Seequent Leapfrog Geo software utilising all available drilling and geophysical survey data. The modelling was based on the seven hydrogeological units and the basement into which the palaeovalley is incised.

Figure 24 illustrates the distribution of these hydrogeological units within the Resource area. Although the illustration of subsurface units is truncated at the boundaries of the Resource area, the continuous and open extent of the palaeovalley beyond the area of the Resource, is based on additional geophysical data (to the south) and Geoscience Australia's palaeochannel mapping and from detailed topographical analysis; this is consistent with the LSOP lying within a major regional palaeodrainage. Figure 25, Figure 26 and Figure 27 show geological cross-sections and the nature of the boundary between the brine-aquifer and basement.

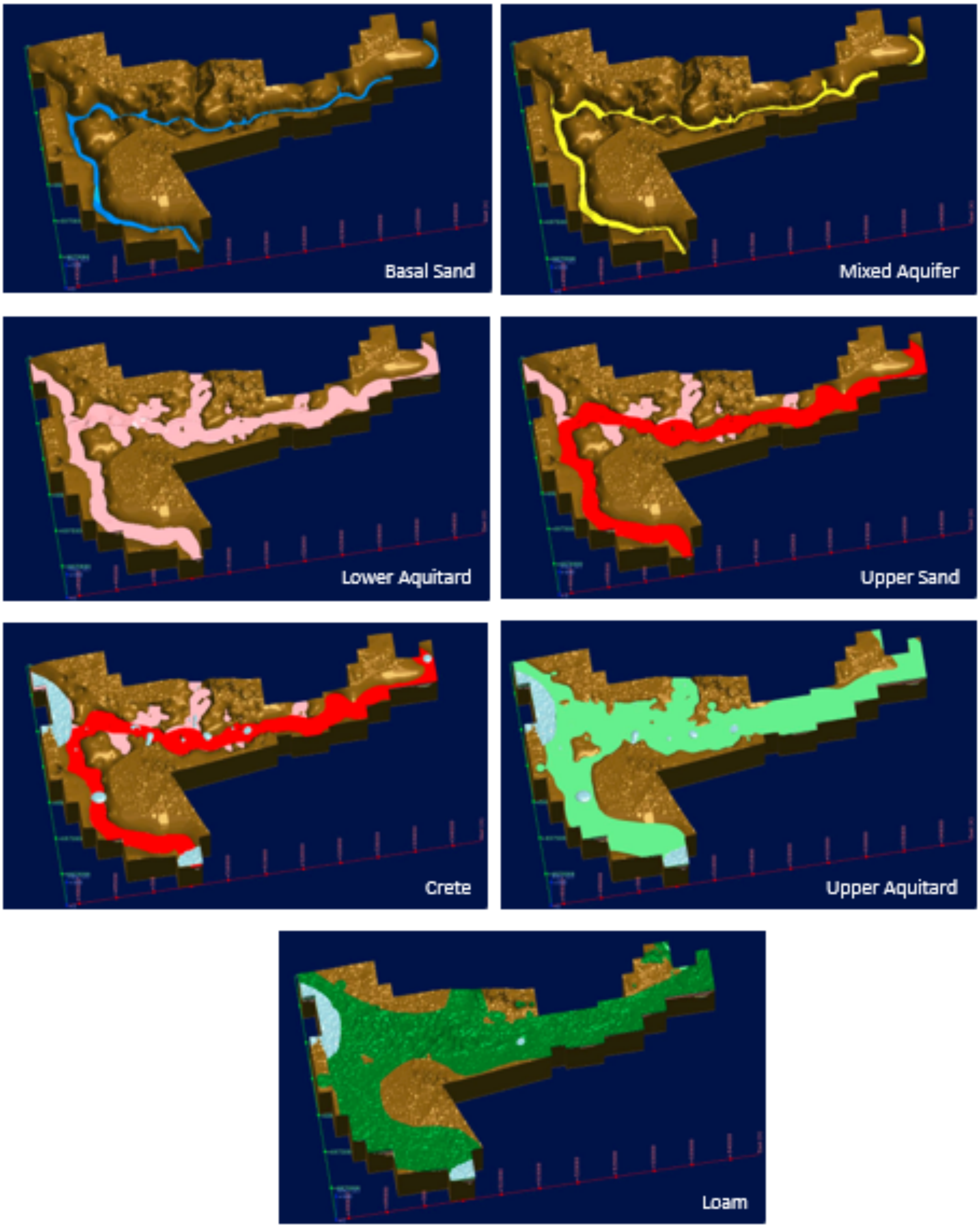

Figure 24 Hydrogeological Units Within the Resource Area

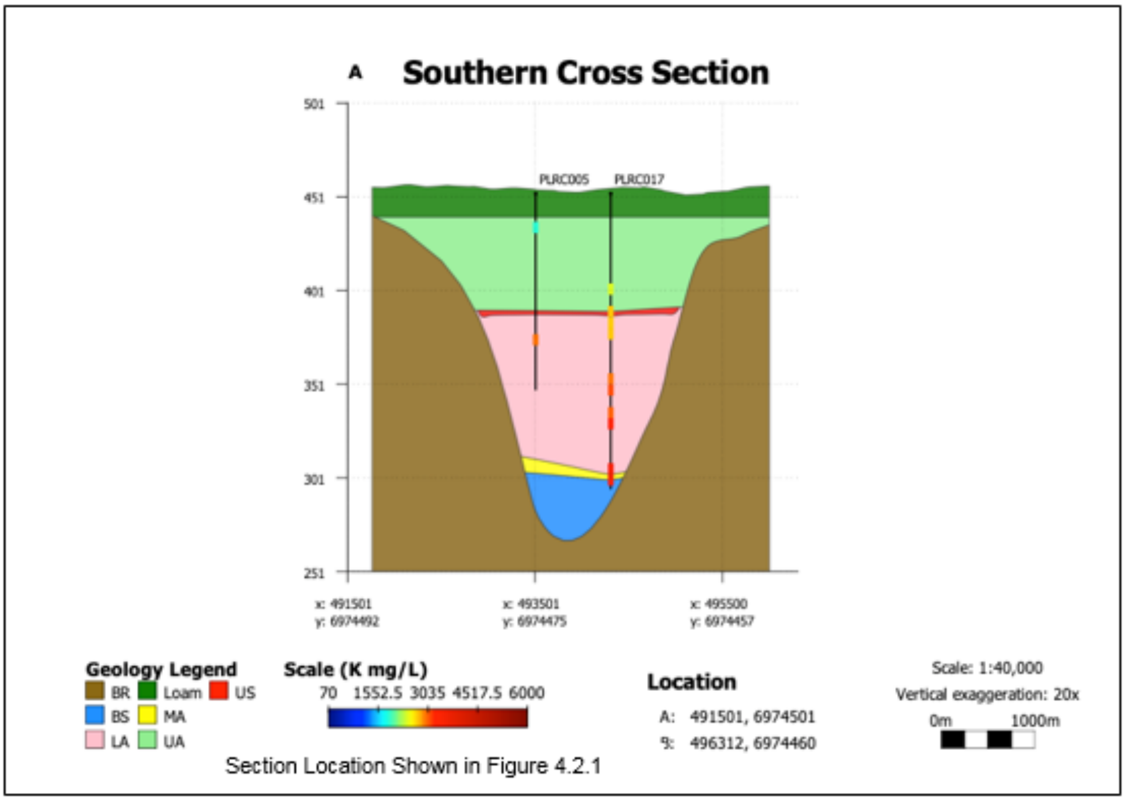

Figure 25 Southern Cross Section

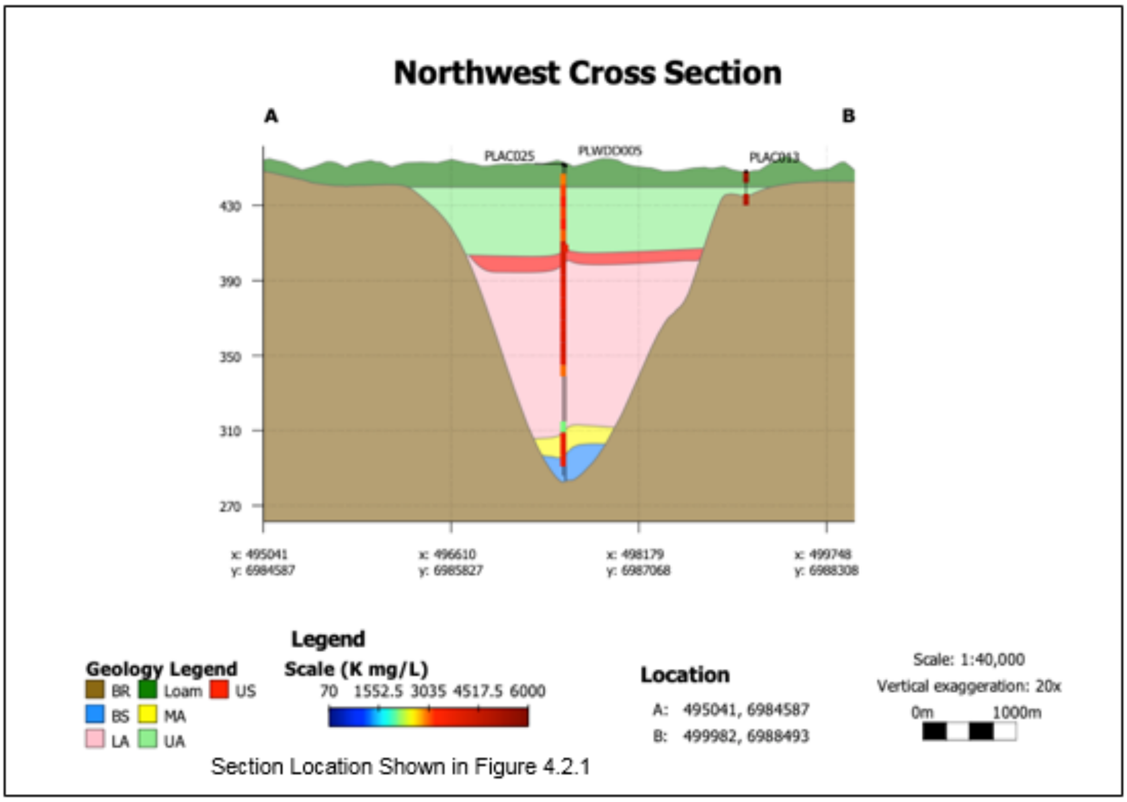

Figure 26 Northwest Cross Section

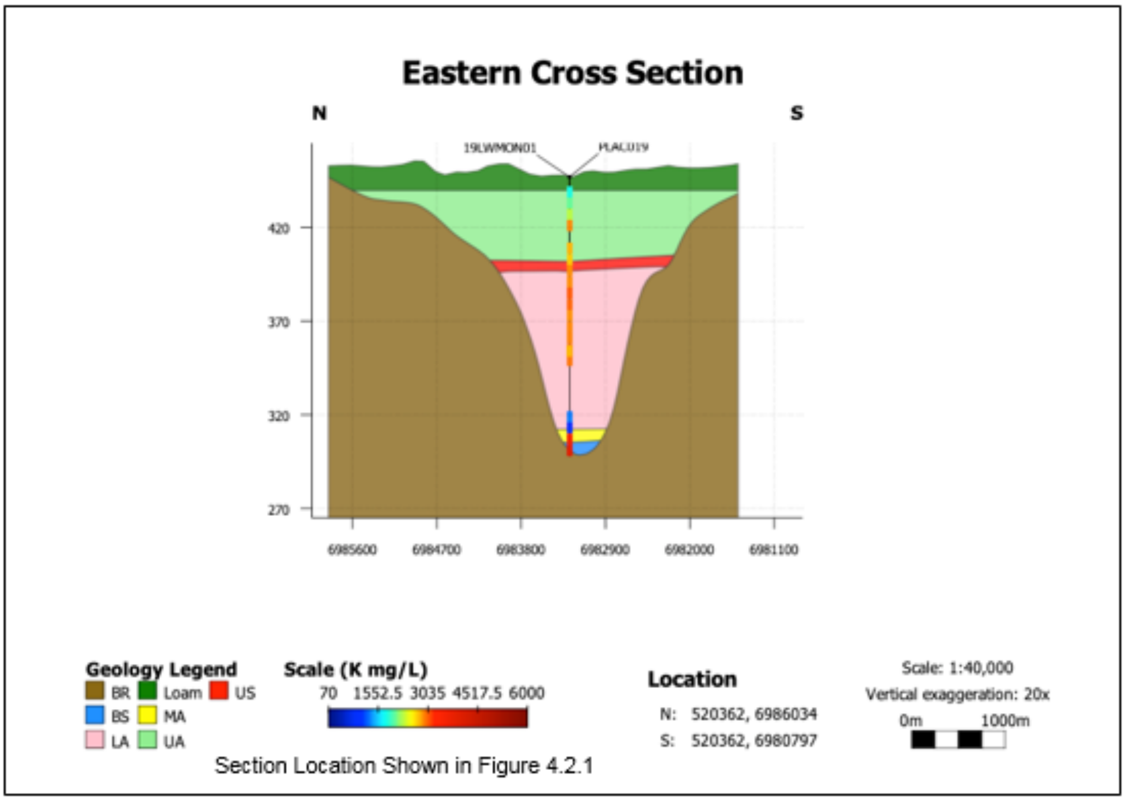

Figure 27 Eastern Cross Section

Resource Classification

A Mineral Resource Estimate (MRE) was calculated for the LSOP following the JORC Code 2012, with the accompanying Brine Guidelines adopted in 2019. Based on extensive field data and a robust geological model, the Resource was assigned to a Measured status.

A 'Measured Mineral Resource' is that part of a Mineral Resource for which quantity, grade, densities, shape and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit.

Geological evidence was derived from detailed and reliable exploration, sampling and testing gathered through appropriate techniques from test pits, drill holes, and water bores, and is sufficient to confirm geological and grade continuity between points of observation where data and samples are gathered.

Measured Mineral Resources may be converted to a Proved Ore Reserve, though in the case of brine and hydrogeological resources a Probable Ore Reserve is considered more appropriate to account for the inherent uncertainties in hydrogeologic systems.

The Measured Mineral Resource is based on the development of the conceptual hydrogeological model underpinned by the geological data described above. Salient points are:

- There are seven (7) hydrogeological units, summarised as follows:
  - **Loam**. A surficial sandy loam unit comprising mixed sand, clay and evaporites. The unit has sufficient permeability to allow direct abstraction of brine. The adopted specific yield is 10%;

- **Upper Aquitard**. An extensive lacustrine clay and fine sediment deposit. The permeability of this unit is low, such that the direct abstraction of brine is not possible, however, the silt and sand content results in a specific yield that is higher than for clay alone. The adopted specific yield is 7%;

- **Crete**. Mixed unit, comprising calcrete, silcrete, and minor ferricrete, which occurs sporadically through the surficial deposits. Most prevalent in the western extents of the Resource area. The unit has moderate permeability allowing the direct abstraction of brine and vertical drainage into the underlying sand aquifer. The adopted specific yield is 5%;

- **Upper Sand**. A sandy unit at the base of the Upper Aquitard and Crete units with moderate permeability and specific yield allowing direct abstraction of brine, the adopted specific yield is 17%. Pumping tests have confirmed brine can be abstracted from this unit from pumping bores with moderate flow rates. It is also anticipated that pumping from this unit will contribute to drainage from the overlying surficial aquifer units;

- **Lower Aquitard**. An extensive clay dominated aquitard with some sandy interbeds. The sand interbeds result in estimates of specific yield that are at the higher end of the range expected for clay. Permeability is low, and no direct abstraction will be possible from this unit. The adopted specific yield is 8%

- **Mixed Aquifer**. Interbedded sand and clay overlying the basal sand aquifer with moderate permeability and specific yield. The adopted specific yield is 17%;

- **Basal Sand**. Coarse sand deposited along the thalweg of a major palaeo-drainage system. Demonstrated both high porosity and permeability, the adopted specific yield is 23%. Pumping tests have confirmed brine can be abstracted from this and the overlying mixed aquifer units with moderate to high flow rates. Pumping from this and the mixed aquifer units will contribute to drainage from the overlying confining clay;

- Estimates of specific yield (i.e. drainable storage) for the key hydrogeological units are based on PSD analyses and reliable BMR logging. The estimates follow a log-normal distribution, and the mean of these distributions was adopted for the Measured Resource, as summarised in Table 18;

Table 18 Specific Yield Estimates for the LSOP Hydrostratigraphic Units

Hydrogeological Unit	Specific Yield (%)	Comment
Loam	10	BMR and PSD combined
Upper Aquitard	7	BMR and PSD combined
Crete	5	Adopted
Upper Sand	17	PSD data only
Lower Aquitard	8	BMR and PSD combined
Mixed Aquifer	17	PSD data only
Basal Sand	23	PSD data only

- Test pumping of production bores has provided estimates of permeability for the main aquifer units (i.e., upper sand and basal sand units) as well as demonstrating direct brine abstraction from these units. Additionally, boundary conditions from the long-term test pumping have provided estimates of the width of the aquifer units within the palaeovalley;

- The palaeovalley extent was defined by an extensive geophysical survey covering the entire area for which the MRE was estimated, supplemented with airborne magnetic data, and detailed topographic analysis from Geoscience Australia's regional mapping of the Tertiary palaeodrainage system (Bell et al., 2012);

- Potassium concentrations were measured throughout the geological sequence and across the entire area for which the Measured Resource was calculated. Also, potassium concentrations have now been monitored under transient conditions (i.e. test pumping). Where multiple assays are available, the lowest reading was adopted in the calculation;

- The volume of host aquifer was estimated from 3D hydrogeological modelling based on the seven hydrogeological units and the basement into which the palaeochannel is incised. The block model was developed using 100 m blocks, using Seequent Leapfrog Geo software;

- The volume of brine, and variations in brine, concentration were estimated using 3D hydrogeological modelling software (Leapfrog Geo) and Edge geostatistical software. 3D brine concentrations were modelled for each hydrogeological unit. However, in reality, groundwater, exists in a continuum between geological formations, and so during the modelling process, data points outside of each specific unit were also used in determining the likely distribution of potassium (K) within that unit. Three modelling approaches were used, continuous interpolant, block-modelled inverse-distance and block-modelled kriging, to provide both K concentrations (mg/L) through each unit and also the total mass (kg) of K contained within each unit. The data and outcomes for these approaches were materially consistent (within 10%), and the block-model with inverse-distance was adopted as the preferred method;

- The weighted mean average K concentration for each hydrogeological unit was then calculated from the total volume of drainable brine within that unit and the overall mass of K;

- The lateral extent of the Measured Resource is limited to:

  - Areas within the project tenements, that being tenements either owned 100% by APC, or which APC has secured exclusive rights to the contained potash within. No account is taken of brine which may be drawn in along permeable pathways from outside the tenement during pumping; and

  - Sediments beneath or near the current Lake Wells playa surface, where evaporative concentration of salts is an active process and, additional potassium and sulphate may accumulate through runoff and evaporation-concentration.

The modelled brine resources within the palaeovalley sedimentary sequence are shown in Table 19 summarises the JORC 2012 compliant Measured Resource for the LSOP. The Measured Resource is 8.1 million tonnes of potassium with a weighted mean average K grade of approximately 3,402 mg/L.

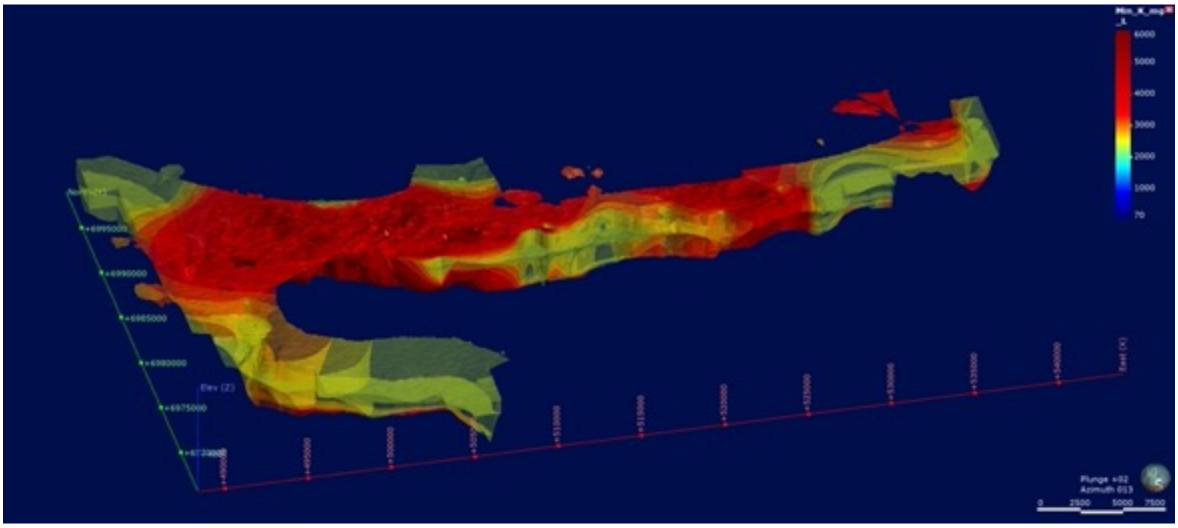

Figure 28 3D View of the Brine Resource

Table 19 Measured Mineral Resource Estimate

	Volume of Aquifer	Specific Yield	Drainable Brine Volume	K Conc (mg/L)	K Tonnes	SOP[2]
Hydrogeological Unit	MCM	Mean	MCM	Wgt Mean Ave	MT	MT
Loam	5180	10%	518	4009	2.08	4.6
Upper Aquitard	10772	7%	754	3020	2.28	5.1
Crete	479	5%	24	2386	0.06	0.1
Upper Sand	801	17%	136	3435	0.47	1.0
Lower Aquitard	9502	8%	760	3367	2.56	5.7
Mixed Aquifer	440	17%	75	3645	0.27	0.6
Basal Sand	503	23%	116	3415	0.40	0.9
Total	**27677**	**9%**	**2383**	**3402**	**8.11**	**18.1**

The MRE is a static estimate; it represents the volume of potentially recoverable brine that is contained within the defined aquifer. It takes no account of modifying factors such as the design of a bore-field (or other pumping schemes), which will affect both the proportion of the Resource that is ultimately recovered and changes in grade associated with mixing between each aquifer unit and the surrounding geology, which will occur once pumping starts. The Measured Resource also takes no account of recharge either from rainfall and runoff, or from basement sources, which is a modifying factor that may increase brine-recovery from the resource.

[2] The measured potassium content in brine can be expressed in units of sulphate of potash (SOP or K_2SO_4) by multiplying K by 2.229 and assuming complete conversion and no limiting reagent.

Ore Reserve

Through the DFS the hydrogeological model predictions indicate that for the first 20 years of abstraction the targeted SOP production of 100,000 tpa could be achieved from a bore-field comprising 70 operational bores, located along the thalweg of the paleochannel at approximately 800 m spacing. Modelled bore yields, drawing from both the upper and basal sand aquifers, range between 4 L/s to 17 L/s per bore, based on the variable aquifer parameters and sand intervals. Targeted production could be sustained for a further 10 years (i.e. 30 years in total) with the progressive addition of bores pumping only from the upper sand aquifer. The potassium concentrations are predicted to range between 3,570 mg/L to 3,255 mg/L over the 30-year life of mine.

There is inherent uncertainty in the modelling of groundwater systems for long periods into the future. This uncertainty limits the Reserve categorisation to Probable and is addressed with sensitivity and risk analysis, using a plausible range of more conservative aquifer parameters. Over 30 years, the DFS case SOP abstraction is 3.6 Mt (which represents 20% of the in-situ Measured Mineral Resource). For all sensitivity scenarios, brine production remains within 5% of the base-case estimate. The Reserve has been conservatively limited to the lower end of the sensitivity analysis, which provides 3.6 Mt SOP for a 30-year life of mine.

SOP production for 20 years is entirely supported by Probable Ore Reserves. For 30 years DFS case, 95% of SOP production is supported by Probable Ore Reserves, and 5% will be recovered from the Measured Resource. The DFS case modelling showed the additional 5% could be recovered from the Measured Mineral Resource for the proposed bore-field design. Moreover, the overall abstraction is a relatively small proportion of the Measured Mineral Resource (21% of the Resource will be abstracted over the life of the Project) which provides the potential for further risk-mitigation by the installation of infill bores if required. Given the residual Mineral Resource after 30 years, continued abstraction may be feasible. Abstraction beyond 30 years was not assessed as part of the DFS Reserve modelling.

A summary of the Probable Ore Reserve for the LSOP is presented in Table 20 below.

Table 20 Probable Ore Reserve

Brine Volume Recovered (Mm^3)	Average Produced K Concentration (mg/L)	K Mass (MT)	SOP Mass (MT)	Proportion of Measured Resource
490	3,325	1.6	3.6	20%

b. Bore-field modelling and design

As part of the FEED Optimisation programme, the following activities were completed:

- Optimisation of groundwater flow and solute transport model to evaluate abstraction from the Western Bore-field and deferring the Eastern Bore-field for as long as possible.
- Development of the design basis and scope of work for the bore fit-out, pipelines and overhead power lines.

The FEED established a revised SOP production of 120,000 tpa from brine, up from 100,000 tpa in the DFS. The FEED Optimisation assessed the 120,000 tpa SOP prolonged production from the Western Bore-field only, deferring expansion of the Eastern Bore-field later in the LOM.

Mining Method

It is proposed that the LSOP brine will be abstracted via bores screened against the upper and basal sand aquifers. As shown in Figure 23, brine abstraction will be achieved by direct pumping from the aquifer units as well as depressurisation and under-drainage of the overlying aquitards.

Brine from the bore-field will be discharged into an on-playa buffer pond from which flow is controlled into the network of on-playa pre-concentration ponds to adjust for seasonal fluctuations in evaporation. A recovery ratio of 80% was derived for the processing and conversion of contained potassium into SOP from the produced brine. The recovery ratio reflects brine entrained in the halite base of the evaporation pond network, losses through seepage, as well as plant losses. To meet the stated production target, an average of 671 L/s of brine is required from the brine bore-field.

Numerical Groundwater Model

A regional flow and solute transport groundwater model was developed by AQ2 to predict the recoverable resource from the palaeovalley aquifer system. Details of the model set-up calibration and prediction scenarios, with a summary provided in the following sections.

Model Set-Up

The regional flow and transport model were developed using Modflow Surfact (Hydrogeologic, 1996). The model extent is shown and is continuous along the entire length of the palaeovalley aquifers.

To ensure boundary effects do not influence predictions, the model boundaries extend outside of the tenement-imposed limits on aquifer units.

Model layers are assigned to represent the identified hydrostratigraphic units. The ground surface was set consistent with the 1-second Shuttle Radar Topography Mission (SRTM) Data for Australia. Aquifer and aquitard geometry and extents were set consistent with the Resource block model.

The primary groundwater inflow to the model domain is provided by rainfall recharge which originates from the large surface water catchment that discharges to the lake surface. This recharge is balanced by evaporation from the shallow water table across the lake. There are also minor groundwater inflows from upstream in the groundwater catchment (from the north west and the south), with minor groundwater outflow from downstream in the catchment (in the north east). In addition, some minor recharge is included in the surrounding basement.

Model Calibration

The model is calibrated to steady-state or pre-development water level conditions using measured water level data from 41 bores located across the current lake surface and in the surrounding basement. In general, measured water levels are replicated by the model with the difference between measured and modelled water levels generally less than one (1) m. The calculated Scaled Root Mean Square error as a proportion of the range of measured heads (SRMS) for the steady state model is 9.8%. This value can be compared to the DFS model report where the SRMS error was reported at approximately 12%.

Long term pumping testing (30 days) from seven (7) bores, was used to calibrate local scale bore specific models. These models allow data from closely spaced pumping, and monitoring bores to be used for model calibration. Hydraulic testing data has also been used to simulate similar responses to pumping in the regional model. The calibration process has provided ranges for aquifer hydraulic conductivity and confined storage coefficient for the upper aquitard, upper sand, lower aquitard, the mixed aquifer, and the lower aquifer. Calibrated aquifer parameters are summarised in Table 21.

Table 21 Calibrated Aquifer Parameters

Aquifer Unit	Horizontal Hydraulic Conductivity (m/d)	Vertical Hydraulic Conductivity (m/d)	Specific Yield (%)	Porosity (%)	Specific Storage (m-1)
Loam	0.3	0.03	10	39	NA
Upper Aquitard	0.03 – 0.15	0.0001 – 0.015	7	38	0.000002
Calcrete / silcrete	1.0	0.1	5	20	0.000002
Upper Aquifer	0.5 – 3.0	0.01 – 0.3	17	41	0.000012
Lower Aquitard	0.07 – 0.8	0.0001 – 0.08	8	45	0.000002
Mixed Aquifer	0.4 – 0.8	0.0001 – 0.08	17	39	0.000002
Basal Aquifer	2.0 – 3.0	0.2 – 0.3	23	40	0.000001- 0.0000015
Basement	0.0001	0.0001	0.1	1.0	0.0000004

Specific yield and porosity values were assigned consistent with the values derived from the particle size distribution (PSD) analyses and Borehole Magnetic Resonance (BMR) logging.

Longitudinal and transverse dispersity was set at 10 m^2/d and 1 m^2/d, respectively. The corresponding vertical dispersity values were assigned one order of magnitude lower.

Bore-field Optimisation

The DFS model, indicated up to 100 bores would be required at an 800 m bore spacing to produce 100,000 t/pa of SOP from brine. During the FEED bore-field optimisation studies, investigations covered various iterations of 800 m, 600 m, and 700 m bore spacings. The results of the FEED modelling undertaken demonstrated that a 700 m spaced bore-field with progressive infill through to year 16 was sufficient to meet the expanded target production rate of 120,000 tpa SOP from brine.

Based on the initial FEED modelling, the most effective outcome became the “base case” comprising a 700 m bore spacing. The base case extent is fully developed by Year 13 of the mine life but is then followed by additional infill bores between Years 13 and 16. Furthermore, as an alternate to the ‘base case’, an assessment of pumping from the Western Bore-field only for as long as possible to produce 120,000 tpa SOP was completed - referred to as ‘Scenario 1’. Scenario 1 was simulated to maintain SOP production of 120,000 tpa using a bore-field abstraction rate that increased over the life of the project. To achieve this the bore spacing was reduced to 600m.

To maintain the target SOP in Scenario 1, initial abstraction rate of approximately 610 l/sec are required, increasing to around 655 L/s in Year 15. By Year 20, brine abstraction reaches approximately 700 L/s to sustain SOP production.

Scenario 1 indicates an initial (Year 1) number of operational bores of 79, increasing as bores are added in the areas north and west of the main thalweg and, extending to the south in the second half of Year 2. By Year 21, 172 bores are operational. Of the 79 initial bores, 59 are in the Western Bore-field and 20 are in the Eastern Bore-field: the latter being in proximity (south and east) of the preconcentration ponds. As yields decline in the Western Bore-field Year 1 bores, the yield is supplemented from extension of the bore-field to the south. Eastern Bore-field extension is deferred to Year 15/16.

Average potassium concentration is predicted to decline from approximately 3,700 mg/L in Year 1 and to close to 3,300 mg/L by Year 20.

Bore-field Contingency Planning

Bore-field contingency modelling was undertaken to cover any situation where the primary bore-field is unable to supply the required brine for any given reason. Two (2) bore-field configurations were investigated for the base case as follows:

1. A scenario to consider multiple bore construction at each pad to allow switching between bores for maintenance and servicing requirements.
2. A scenario where additional bores are added to the central and western bore field area to cover the eventuality that planned infill in the eastern bore field is not developed or operated.

Both modelled contingency scenarios resulted in the successful production of the required brine, though each has its own cost implications. The extent to which any of the contingency scenarios needs to be accessed, if at all, will be based on bore-field construction and production data once the primary bore-field is operational.

Sensitivity Analysis

To assess the impact of the uncertainties of aquifer parameters on long term brine production, both model sensitivity and model uncertainty analysis were completed. For the sensitivity analysis, the base case model was re-run 11 times to assess the impact on brine abstraction, with key aquifer parameters adjusted to show the sensitivity of model results.

It is important to note that to stress the model and see which factors influence the outcomes by meaningful degrees, the parameter adjustments were made at the extreme ends of the possible ranges for the selected parameter.

Modelled results suggest that reductions in assigned specific yield will result in a greater reduction in predicted brine recovery than changes made to hydraulic conductivity. In addition, specific yield is the storage parameter to which there is most sensitivity; reductions in assigned specific storage are not predicted to have a significant impact on brine abstraction rates. These results are consistent with the current conceptual model and understanding how brine abstraction would operate, incorporating removal of groundwater storage.

Uncertainty Analysis

As part of the uncertainty analysis, key aquifer parameters were changed and the model recalibrated, where possible, prior to running the abstraction and grade model. Uncertainly runs were designed to accommodate both upside cases where conditions may prove to be better than modelled, and downside cases should model parameters be at the lower end of unit defined parameter range. To accommodate any changes in bore-field yield that result from the adopted changes, bore-field abstraction was optimised to achieve the target production. To achieve optimisation, the number and timing of the commissioning of production bores was adjusted, however individual bore pumping rates are unchanged from the base case predictions.

The parameters chosen for the uncertainty analysis were guided by the sensitivity analysis described above, and the results of the site water balance analysis, which showed the reliance of the LSOP brine abstraction on the specific yield of the upper aquifer. The uncertainty runs are summarised below.

- Reduction in Loam, Upper Aquitard and Upper Aquifer Specific Yield:

This case was designed to assess the potential for specific yield values to be 20% less than the assigned values, that being the lower end of the range defined by investigation to date. Results indicate that the target brine production rate can be met, though with additional bores necessary towards the end of the modelled timeframe.

- Increase in Upper Aquifer Specific Yield:

This case was designed to assess the potential for the upper aquifer to have a higher specific yield than that included in the base case model. The specific yield value assigned to the upper aquifer was increased from 17% to 20%, which is at the upper end of the values derived from investigations to date. Output from this model run suggests that from this small increase in specific yield that the number of production bores necessary to meet the target production rates drops significantly.

- Decrease in Hydraulic Conductivity of Upper Aquifer:

This case was designed to assess the importance of the upper aquifer to allow abstraction of brine draining from the upper aquitard and overlying crete and loam units. Similar to the base case the target production can still be met up until Year 16.

- Changes to Lower / Basal Aquifer:

This case was designed to assess the importance of the width and geometry of the lower aquitard, mixed aquifer and lower aquifer. The base case model set up has represented the aquifer system as a steep sided “V”- shape valley infilled with sediments. This uncertainty run was designed to account for the possibility that the aquifers are deposited in a "U"-shaped valley. Similar to the base case the target production can still be met up until Year 16.

Model Confidence

The model was set up and calibrated using the available data to provide a representation of the aquifer system. Alternative conceptualisations were investigated as part of model calibration and based on a comparison of tonnes SOP produced between the two contingency cases and the four uncertainty cases with the base case, results are within 5%. However, there is inherent uncertainty in all long-term hydrogeological modelling. More confidence in model predictions will only be achieved with longer-term operational data that provides more information on the palaeovalley aquifers and the response to long term pumping.

Bore Drilling, Bore-field Design and Installation

Bore Drilling and Construction

Brine production bores will be installed by a suitably experienced water bore drilling company. The drilling company will be responsible to advance the bores with mud-rotary drilling method to maintain open holes to the specified depth and intersection with the targeted lithology. Once the hole has reached the specified depth, bore casing will be installed, including both steel mesh casing and slotted PVC casing adjacent to the high-yield units. After the bore casing is installed, gravel filter pack will be placed, and the bore will be developed to ensure that the filter is placed and working correctly. The bore casing will be sealed at the surface and completed with a concrete pad and a steel protective cover.

Bore drilling and construction will be completed on a schedule of rates basis.

Bore-field

Design and installation of the brine bore-field involves the complete mechanical and electrical fit out of the bores, pipeline and overhead power line. The work will be completed under a fixed-fee and schedule arrangement, in accordance with the Scope of Work as summarised below.

Scope of Work

The Bore-field Contractor will be responsible for the construction and commissioning of the bore-fields, which includes the Engineering, Procurement and Construction (EPC) of three (3) distinct areas:

- Bore fit outs – supply and installation of in-well equipment, control box and bore headworks;
- Bore-field pipelines – supply and installation of a distribution system to transport brine from the wells to discharge into the ponds;
- Overhead powerlines – reticulation of power to distribute power from the Power Plant to the bores, the Processing Plant and Operations Village.

Bore Fit Out Requirements

The Bore-field Contractor shall use the information provided to design the bore fit out requirement. The contractor will incorporate all planned brine production bores (Years 0 to 5) into the initial pipeline design.

The fit out shall include the headworks and a finished connection to the main pipeline for all bores in the Western High Flow, Western and Eastern bore-fields. The bore numbers for each bore-field system are summarised in Table 22.

Table 22 Number of Bores per Area

Bore field Pipeline	Number of Bores (Year 0)
Western High Flow	26
Western	33
Eastern	20

Pipe line Requirements

The Bore-field Contractor shall design and install the Western High Flow, Western and Eastern bore-field pipelines.

The brine bore-field system, consisting of the Western High Flow, Western and Eastern bore-fields, is required to produce a total of ~21 GL/y of hypersaline water (approximately 140,000 mg/L TDS) at an initial flowrate of approximately 640 L/s.

Each bore-field pipeline shall be designed based on the information provided in Table 23, for the maximum (life of mine) flowrates, and a bore water specific gravity of 1.14 g/cm^3.

Table 23 Maximum Design Flowrate

Bore-field Pipeline	Max. Design Flowrate
Western High Flow	410 L/s
Western	160 L/s
Eastern	70 L/s

Power Distribution to Bore-fields

Two 11 kV feeders shall be provided for dedicated supplies to the bore-fields. A single 11 kV power line will provide permanent power to the Western and Western High Flow Bore-fields. A separate 11 kV power line shall be dedicated to the Eastern Bore-field.

The power line shall extend from the site power station following the road alignment provided by the Company to Western High Flow, Western and Eastern Bore-fields.

Playa brine feed to pre-concentration ponds

The pond network design was updated during FEED based on the optimized hydrogeological model which showed higher abstraction rates and volumes are feasible. A comparison between key data used in the DFS and FEED is presented in Table 24. The total playa brine abstraction requirements increased in line with increased SOP production and brine abstraction from the aquifer.

Table 24 Playa Brine Properties

<table>
<tr><th colspan="2">Item</th><th>DFS Value</th><th>FEED Value</th><th>Units</th></tr>
<tr><td colspan="2" rowspan="2">Playa Brine Flow Requirement</td><td>2,293</td><td>2,740</td><td>tph</td></tr>
<tr><td>17.57</td><td>21</td><td>GigaL/yr</td></tr>
<tr><td colspan="2">Specific Gravity</td><td>1.14</td><td>1.14</td><td>g/cm^3</td></tr>
<tr><td rowspan="6">Playa Brine Average Concentration</td><td>Na</td><td>4.52</td><td>5.31</td><td>Wt%</td></tr>
<tr><td>Mg</td><td>0.57</td><td>0.69</td><td>Wt%</td></tr>
<tr><td>Ca</td><td>0.05</td><td>0.05</td><td>Wt%</td></tr>
<tr><td>K</td><td>0.29</td><td>0.29</td><td>Wt%</td></tr>
<tr><td>SO_4</td><td>1.5</td><td>1.9</td><td>Wt%</td></tr>
<tr><td>Cl</td><td>7.9</td><td>9.1</td><td>Wt%</td></tr>
</table>

c. Evaporation ponds

Pre-concentration ponds

The purpose of the pre-concentration ponds is to concentrate the playa brine up to the point where potassium is saturated in solution and can then be transferred to the harvest ponds for the precipitation of potassium bearing minerals.

The design factors used for modelling the pre-concentration ponds are presented in Table 25. The assumptions used to derive the designs remain largely unchanged from the DFS. Three (3) key design changes were incorporated into the FEED:

- Adoption of HDPE lining on the side faces of the P1/Buffer pond due to the additional buffer height required, as a result of increased throughput, to minimise leakage;
- A bentonite slurry cut off wall, around the pre-concentration pond perimeter, as the most cost effective construction method to reduce lateral seepage; and
- Increasing the surface area of the pre-concentration ponds to meet the requirements for a 120,000 tpa of brine SOP production rates.

Table 25 Pre-concentration Pond Areas and Perimeters

Description	Name	Nominal Area (km^2)	Design Factor	Design Area (km^2)	Perimeter (km)
Preconcentration Pond 1	Buffer/P1	1.45	10%	1.59	7.10
Preconcentration Pond 2	P2	2.83	10.5%	3.13	11.88
Preconcentration Pond 3	P3	1.39	9.6%	1.52	8.29
Preconcentration Pond 4	P4	2.64	9.9%	2.90	11.09
Preconcentration Pond 5	P5	0.87	9.8%	0.96	4.86
Preconcentration Pond 6	P6	1.47	7.8%	1.58	7.05
Pre-Con Pond Total Area		**10.65**	**9.7%**	**11.68**	**50.27**

The cut-off concentrations for the preconcentration ponds and respective densities were updated for the revised design and ionic compositions and are presented in Table 26.

In steady state operations, the full discharge from the bore fields are directed into the eastern end of the P1/Buffer pond at a constant rate. Approximately 4.2 million m^3 of buffer volume is required to handle seasonal variations, or an equivalent brine height of 0.5 m to 3 m. The release of brine from the P1/Buffer Pond is controlled with flow models and gate stations that vary the discharge by month to match evaporation demands and maintain pond equilibrium.

Each pond will have a flow-control structure on the discharge stream that will be used to control flows between ponds based on a combination of the species of salts deposited in each pond and the monthly variation in evaporation rates.

Table 26 Preconcentration Pond Transfer Stream Compositions

Item	$CaSO_4$ (wt%)	NaCl (wt%)	KCl (wt%)	$MgCl_2$ (wt%)	$MgSO_4$ (wt%)
Playa Brine					
P1 to P2	0.17	15.25	0.63	1.03	2.56
P2 to P3	0.09	19.92	0.83	1.34	3.35
P3 to P4	0.06	21.88	0.99	1.61	4.01
P4 to P5	0.05	18.42	1.72	2.87	7.05
P5 to P6	0.00	15.63	2.34	4.67	7.95

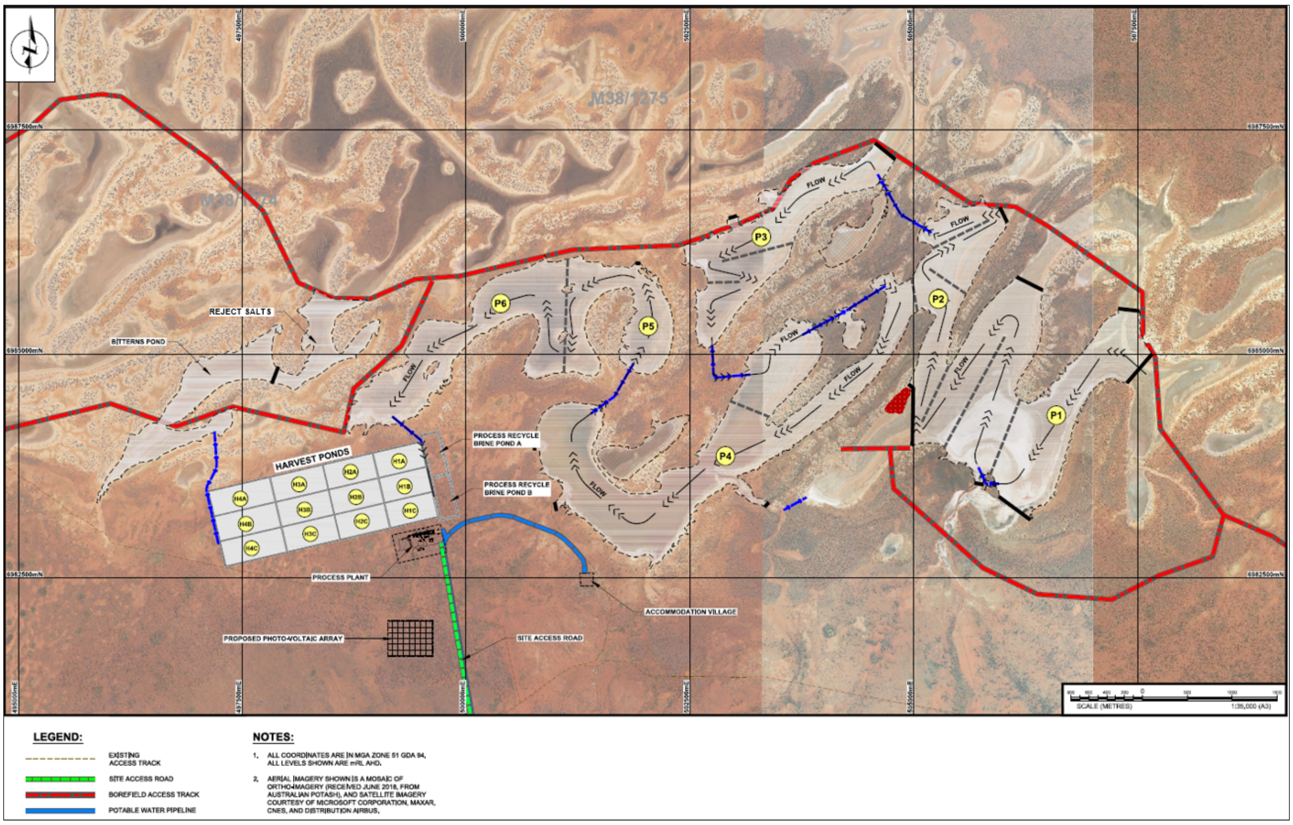

Figure 29 Layout of pre-concentration, harvest and bitterns ponds

These structures will be accessed through a light vehicle road network to allow sampling and flow control by the pond operators. Inter-pond brine flow will occur continuously throughout the year, with sampling and flow adjustment occurring weekly.

An options analysis was completed on transfer infrastructure requirements for the preconcentration pond network to manage brine flows. The following were incorporated into the FEED:

- A gravity flow pipe gate stations for P1/Buffer transfer to P2. The head height of the P1/Buffer pond is suitable for transfer under gravity, but flow volumes need to be controlled monthly to match evaporation rates.

- Transfer pump stations to raise the brine over the natural topography and compensate for rising salt levels, into the future. A total of 4 transfer pump stations are incorporated at: P2 to P3; P3 to P4; P4 to P5 and P6 to the harvest ponds.

- Detailed design and options analysis for ditches and transfer culverts, to minimise future maintenance requirements and reduce the propensity for salt to build up at key transfer locations.

Salt (Sodium chloride) builds up in several pre-concentration ponds as a waste by-product, resulting in the pond floor rising over time. At other operations, this waste salt needs to be periodically harvested and disposed of as an operational cost. The FEED pre-concentration pond design has considered grade variations over the life of mine, surface area increases due to the build-up of salt and the natural topography, to avoid the need for harvesting these waste salts. A low-cost series of berm raises over time and selecting and positioning major pump and transfer stations removes this requirement at the LSOP.

Harvest Ponds

In the harvest ponds, further evaporation results in the brine reaching potassium saturation and the precipitation of potassium bearing salts. These salts form as a solid precipitate on the floor of the harvest ponds, which are then harvested using mobile equipment and transported to the processing plant for beneficiation.

The assumptions used to derive the designs for the harvest ponds remain unchanged from the DFS. Additional optimisation work was completed that resulted in design changes, comprising:

- Incorporating all constraints and costs into models to optimise the layout of the ponds, such as: Updated costing from the DFS, preliminary costing and designs for transfer culverts, more detailed topography models and regional constraints (rocky outcrops);

- Increasing requirements to enable 120,000 tpa of SOP from brine to be produced;

- Iterative calculation of cut to fill volumes;

- Analysis of load/haul times and crystallizer opening/closing assumptions;

- Completion of all relevant specification for earthworks and HDPE liner installation; and

- Minimising the transfer distance from P6 to the harvest ponds, with a HDPE lined transfer ditch.

In general, the more pond divisions the less area is needed, but the more berms and weirs required. As a result of the FEED work, the harvest pond design was modified to a final design to incorporate three (3) parallel lines of ponds with each line consisting of four (4) cells or a total of twelve (12) cells. The loss of brine from leakage within the harvest ponds is mitigated through the installation of an HDPE membrane liner. As the brine has spent a considerable amount of time concentrating up to a higher potassium value, increased losses would impact the overall system recovery, and are therefore mitigated. This remains unchanged from the DFS model.

As part of the FEED studies, further pond modelling work was also completed on the salt species precipitating in the ponds, reflecting monthly variations in temperature. The results of the further modelling showed:

- Incorporating a process recycle brine (PRB) pond, coupled between the process plant and harvest ponds, facilitates improved buffering of brine supply to the harvest ponds and better grade;
- The harvest salt grade is lower in the winter with more halite and epsomite being precipitated;
- In the summer, the grade is slightly better than the annual average, with only halite and K bearing minerals being precipitated.

The outcomes of the optimisation work are summarised in Figure 29.

Table 27 Harvest Pond Areas

Description	Nominal Area (km^2)	Effective area (km^2)	Design Factor	Design Area (km^2)
Harvest Pond 1	0.37	0.44	5%	0.46
Harvest Pond 2	0.39	0.46	5%	0.48
Harvest Pond 3	0.41	0.49	5%	0.51
Harvest Pond 4	0.48	0.57	5%	0.59
Process Recycle Brine (PRB)				0.21
Harvest Pond Total Area	**1.65**	**1.95**	**5%**	**2.04**

A typical pipe and culvert arrangement is shown in Figure 30, Figure 31 and Figure 32.

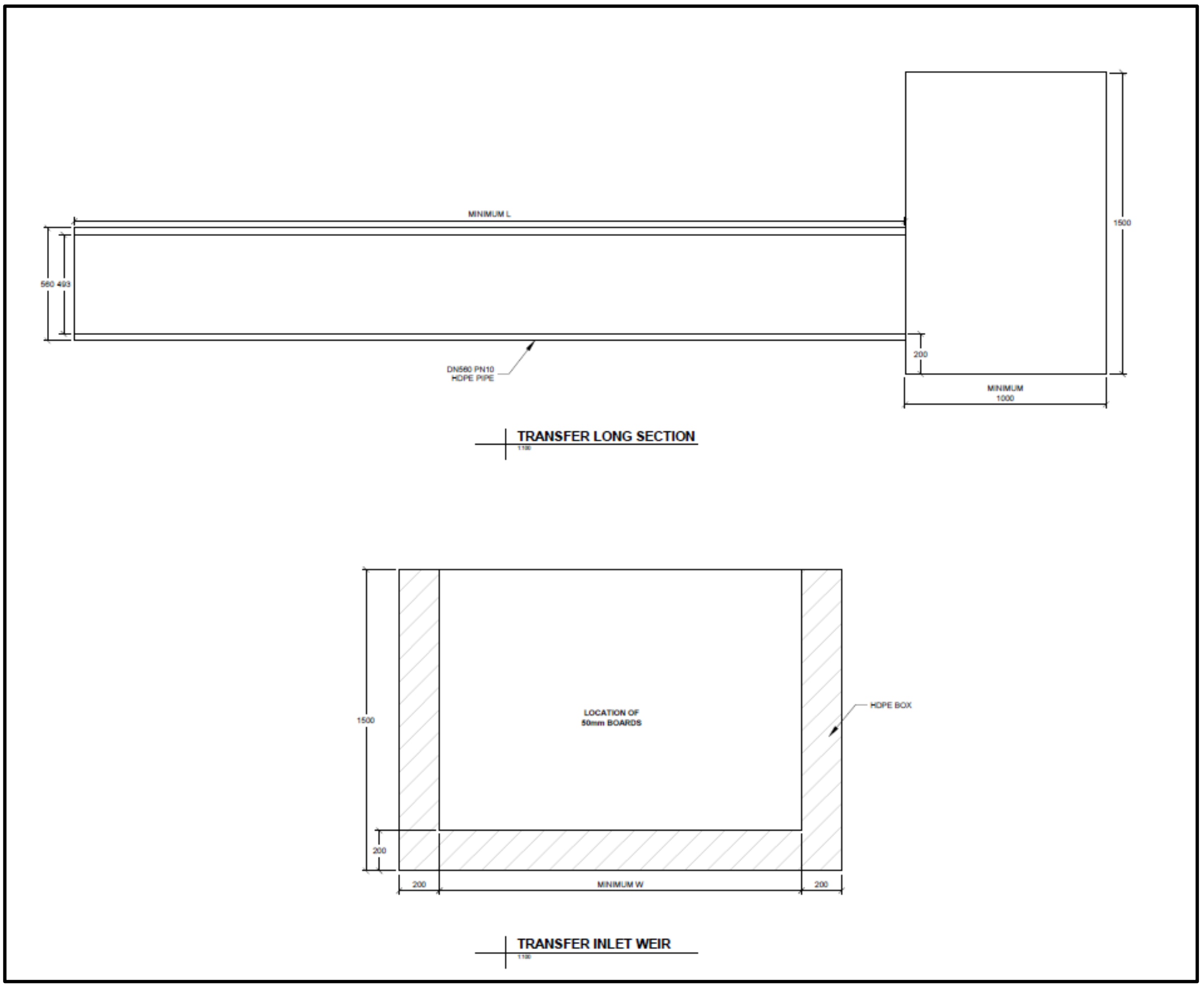

Figure 30 Typical Pipe and Culvert Configuration

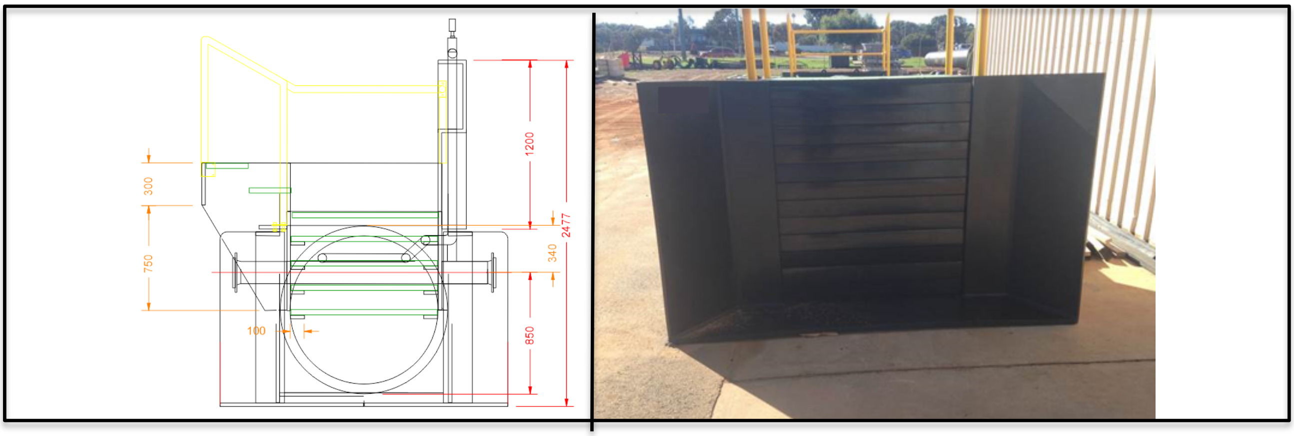

Figure 31 Typical Culvert/Weir Arrangement

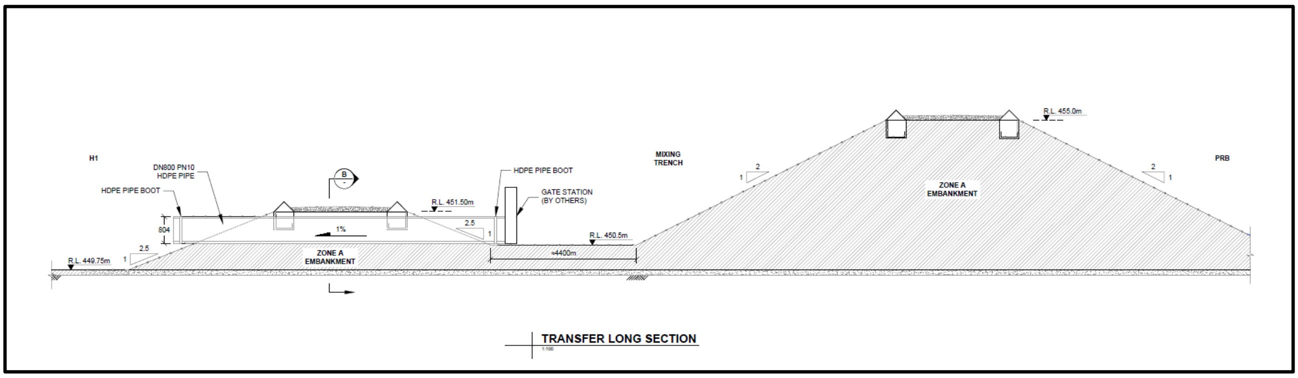

Figure 32 Typical Pipe Through Weir Configuration

Reject salts storage area and bitterns pond

Bitterns brine is the remaining solution decanted from the harvest ponds after the potassium salts have precipitated. It primarily consists of magnesium chloride. Reject salts and solid waste salts generated in the process plant that are dry stacked and must be carted to waste.

The bitterns pond and reject salts storage area were relocated as part of the FEED. The new location is an area on the playa surface that has similar properties to the pre-concentration ponds (clay lining). This was done to meet higher storage volume requirements, take into account the natural topography of the land and ensure bitterns brine remains available as a potential useful resource in the future.

The bitterns brine will initially be recovered for road maintenance and dust suppression on-site. Australian Potash has also received interest from several parties regarding the further processing of bitterns into value add magnesium products, however this has not been progressed further at this point in time.

Start up sequence

As part of FEED a detailed pond start up schedule and approximate activities-based schedule required to achieve steady-state operations was prepared. The results of this exercise drive the overall project timeline and are integrated into the project ramp up. The main goal of the start-up procedure is to reach steady state in the pond system as quickly as possible while expediting production of harvest salts and initiating plant operations as soon as possible.

During initial filling of the preconcentration ponds, flow will need to be diverted to various locations in the preconcentration ponds to maintain brine volumes, to prevent ponds drying out and control chemistry to ensure potassium salts do not precipitate from solution early. Detailed planning and integration of the bore drilling sequence, pipeline installation and overhead powerline installation are critical to ensure the start-up sequence comes to fruition effectively.

d. Process development

The design of the LSOP process has continued through the various unit process operations required to convert harvest salts to the final SOP product. A number of test work programs have been completed to date, which are summarised below:

- Central Chemical Consulting undertook mechanical evaporation studies of Lake Wells brine in a lab using abstracted brine from Lake Wells bores in order to determine density, ionic relationships, volumetric relationships and concentration-ion relationship curves;
- Synthetic brine was prepared to match the composition of the Lake Wells playa brine, then reacted to investigate all unit processes to convert from a harvest salt composition to a final SOP at Hazen Research in USA; and
- Pilot ponds were created at site and Lake Wells playa brine was fed to produce raw harvest salts. The raw harvest salts were mechanically harvested and sent to Bureau Veritas for pilot plant processing trials, under the instruction and supervision of Novopro.

As part of FEED, additional test work was completed to optimise the design and gather key information required for individual unit process designs. The test work focused on:

- Confirmatory testing on kinetics and residence times:
  - Conversion reaction measurement of size fractionated particles for the dissolution-recrystallisation process to assess the impact of particle size on reaction kinetics and completion. Confirmatory testing of the conversion reactions ability to convert carnallite to schoenite;
  - Leach – kinetics of leach reaction and filtration rate testing;
  - SOP crystallisation – kinetics and completion of reaction, final product assays and overall process recovery.
- Flotation reagent optimisation - selection of collector and optimisation of dosage rates. The parameters and conditions evaluated included: solids-liquid ratio, conditioning time, dose rate, various collector-extender combinations. Test results were evaluated based on overall concentrate recovery;
- Analysis of specific “worst case” feed material product mixtures and assessing the conversion reactions capacity to handle these; and
- Performance of granulation testing.

The results of the test work were integrated into the process design using various modelling tools including METSIM™ and PHREEQc™, to simulate, size and obtain information on the processes, and to tie the unit operations together.

e. Proposed process

The process flow diagrams and route were not substantially modified as part of FEED studies, however several changes representing both the optimisation of the flow sheet, integration of further test work results or design modifications aligning with decisions around operating concepts were completed during the FEED. In addition to these changes, the revised hydrogeological information and ionic ratios were carried through to the processing plant with the incorporation of the winter / summer pond salts predictions.

The changes include:

- Incorporation of a mixed salts roll crusher to break salt at the front end of the plant;
- Stacker screens were integrated into the design in a loop with the cage mill to ensure crushed mixed harvest salts adhere to the size requirements entering the conversion circuit;
- The conversion circuit size and design were updated to reflect test work results, including modification from a dual in series vacuum unit operation to 2 trains of parallel vacuum-atmospheric reaction vessels;
- A reagent storage shed was integrated into the design based on the selected flotation reagents and the flotation reagent selection completed;
- Flotation circuit optimised to reduce conditioning time requirements, eliminate use of extender and better assess flotation cell requirements;
- The bulk material handling methods and structures were confirmed as offtake agreements were executed including:
    - MOP bulk inload in super quad;
    - SOP outload bulk super quads;
    - Bagged products;
    - Containerised products;
    - Water soluble products.
- Major water storage tanks were converted to storage ponds, in preference to tanks;
- A weighbridge was integrated into the design;
- Material handling data were integrated into chute and transfer conveyor incline levels specific to the salt handling requirements;
- Reject salts load out was changed to a more conventional dry stack method;
- Water treatment of raw water to meet processing requirements was integrated into the processing plant design, as an outcome of further process water drilling results and the water soluble product specification;

- Plant layout was updated and compressed;
- Granulation was added to the design;
- Bagging was added to the design;
- A screening and crushing circuit is integrated into the design to enable water soluble SOP to be produced;
- Auxiliary structures and buildings such as workshops, administration and laboratory buildings were scoped and defined to meet operational requirements;
- The dry plant areas of the processing plant were increased in size to account for the better K grade salts expected to be generated in the summer months;
- Plant materials of construction were defined and a paint specification prepared;
- Sample point requirements were established, and automatic samplers integrated into the plant for some key areas; and
- Additional definition around the level of control and automation was incorporated into the design through the development of Process & Instrumentation Diagrams and an operations and control philosophy.

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15. References and citations

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[i] Refer to ASX Announcement 28 August 2019 'Definitive Feasibility Study Outstanding Financial Outcomes'. That announcement contains the relevant statements, data and consents referred to in this announcement. Apart from that which is disclosed in this document, Australian Potash Limited, its directors, officers and agents: 1. Are not aware of any new information that materially affects the information contained in the 28 August 2019 announcement, and 2. State that the material assumptions and technical parameters underpinning the estimates in the 28 August 2019 announcement continue to apply and have not materially changed.

[ii] Please refer to the Loan Markets Association, or the Asia Pacific Loan Market Association for Green Loan and Green Bond Principles.

[iii] Refer to ASX Announcement 5 August 2019 'Major Resource Estimate Upgrade'. That announcement contains the relevant statements, data and consents referred to in this announcement. Apart from that which is disclosed in this document, Australian Potash Limited, its directors, officers and agents: 1. Are not aware of any new information that materially affects the information contained in the 5 August 2019 announcement, and 2. State that the material assumptions and technical parameters underpinning the estimates in the 5 August 2019 announcement continue to apply and have not materially changed.

[iv] Refer to ASX Announcement 15 February 2021 'Organic Certification – JORC Table'. That announcement contains the relevant statements, data and consents referred to in this announcement. Apart from that which is disclosed in this document, Australian Potash Limited, its directors, officers and agents: 1. Are not aware of any new information that materially affects the information contained in the 15 February 2021 announcement, and 2. State that the material assumptions and technical parameters underpinning the estimates in the 15 February 2021 announcement continue to apply and have not materially changed.

[v] Refer to ASX Announcement 16 March 2020 'First Agreement Executed in Offtake Program'. That announcement contains the relevant statements, data and consents referred to in this announcement. Apart from that which is disclosed in this document, Australian Potash Limited, its directors, officers and agents: 1. Are not aware of any new information that materially affects the information contained in the 16 March 2020 announcement, and 2. State that the material assumptions and technical parameters underpinning the estimates in the 16 March 2020 announcement continue to apply and have not materially changed.

[vi] Refer to ASX Announcement 14 April 2020 'Second Agreement Executed in Offtake Program'. That announcement contains the relevant statements, data and consents referred to in this announcement. Apart from that which is disclosed in this document, Australian Potash Limited, its directors, officers and agents: 1. Are not aware of any new information that materially affects the information contained in the 14 April 2020 announcement, and 2. State that the material assumptions and technical parameters underpinning the estimates in the 14 April 2020 announcement continue to apply and have not materially changed.

[vii] Refer to ASX Announcement 20 July 2020 'Third Agreement Executed in Offtake Program'. That announcement contains the relevant statements, data and consents referred to in this announcement. Apart from that which is disclosed in this document, Australian Potash Limited, its directors, officers and agents: 1. Are not aware of any new information that materially affects the information contained in the 20 July 2020 announcement, and 2. State that the material assumptions and technical parameters underpinning the estimates in the 20 July 2020 announcement continue to apply and have not materially changed.

[viii] Refer to ASX Announcement 12 August 2020 'Fourth Agreement Executed in Offtake Program'. That announcement contains the relevant statements, data and consents referred to in this announcement. Apart from that which is disclosed in this document, Australian Potash Limited, its directors, officers and agents: 1. Are not aware of any new information that materially affects the information contained in the 12 August 2020 announcement, and 2. State that the material assumptions and technical parameters underpinning the estimates in the 12 August 2020 announcement continue to apply and have not materially changed.

[ix] Refer to ASX Announcement 23 November 2020 'Fifth Agreement Executed in Offtake Program'. That announcement contains the relevant statements, data and consents referred to in this announcement. Apart from that which is disclosed in this document, Australian Potash Limited, its directors, officers and agents: 1. Are not aware of any new information that materially affects the information contained in the 23 November 2020 announcement, and 2. State that the material assumptions and technical parameters underpinning the estimates in the 23 November 2020 announcement continue to apply and have not materially changed.