AUSTRALIAN POTASH

31 Ord Street, West Perth WA 6005
PO Box 1941, West Perth WA 6872
+61 8 9322 1003
australianpotash.com.au
ABN 58 149 390 394

ASX Announcement
21 November 2017

PUMPING TEST CONFIRMS DRAINAGE FROM ENTIRE PALAEOCHANNEL SEQUENCE INTO BASAL PRODUCTION AQUIFER

Highlights:

- **Long-term test-pumping confirms assumptions of drainage of brine from the clay sedimentary layer into the highly permeable basal sand layer, or the lower production aquifer**
- **The clay sedimentary layer contains over 32% of the JORC Indicated Mineral Resource estimate of 12.7Mt contained SOP**
- **The clay continually re-charges the production aquifer over the long term, supplying brine into the production aquifer over the life of mine**
- **Test-pumping results confirm the long-term viability of the bore-abstraction process and are consistent with regional and global hydrogeological models for brine abstraction**
- **External hydrogeological consultants review of brine abstraction method confirms bore-field development will optimise yield at Lake Wells**

Australian Potash Limited (ASX: APC) (**APC** or the **Company**) is pleased to provide an update on the Lake Wells Sulphate of Potash (SOP) project incorporating the first results of the long-term pumping-test program currently underway.

The results of two important bodies of work provide significant new information which has confirmed key resource estimation and extraction parameters. The results highlight both the potential for a good resource/reserve conversion ratio given the increased confidence in the data.

Key outcomes and project implications include:

- First results of the long term test pumping program used to confirm the downward drainage of brine assumption in the JORC Mineral Resource Estimate (MRE), with strongly positive implications for long-term yield and extractable SOP volumes;
- The confirmation of bores as the optimal method of extraction as envisaged in the Scoping Study following an external review by leading hydrogeological consultancy firm AQ2.

Australian Potash, Executive Chairman, Matt Shackleton commented: "The strong set of results released today highlights the significant progress APC is making in systematically de-risking the Lake Wells SOP project.

"The confirmation of key inputs utilised in our high returning scoping study demonstrates the robust nature of the study work completed to date. Of further encouragement is the identification of opportunities by our team to continue to enhance the value of the project through optimisation of evaporation and transport parameters during the feasibility study.

"We continue to believe that the largest reported indicated resource amongst the WA SOP aspirants, favourable hydrogeological setting and bore abstraction method, no native title constraints and access to established road and rail infrastructure provides a significant advantage for APC at Lake Wells as we push to deliver a high returning project for shareholders into the growing global SOP market."

Technical Summary (Refer Appendix 1)

A long-term pumping test was commissioned to demonstrate that the Lake Wells Potash Project (LWPP) palaeochannel performs in a similar manner to the palaeochannel borefields near Kalgoorlie, in that abstraction from the basal sand aquifer induces downward drainage of the intermediate clay. A successful test outcome is a significant response in the intermediate clay, which indicates brine is recoverable from all sections of the stratigraphic sequence.

Abstraction commenced from the basal sand aquifer (TPB003) on 20 October at a constant rate of 15 L/s. Contrary to the conservative analytical calculations of overlying aquifer response times, measurable responses in the clay monitoring bore (LWDRM006) occurred in the first day of testing (which was better than anticipated).

Additionally, measurable responses occurred in the upper sand monitoring bore (PLAC026), from the second day of testing. This monitoring bore is placed above the clay layer, confirming drainage from the entire clay sequence.

After 25 days of testing, 31 metres of drawdown has been recorded in the intermediate clay monitoring bore, and 0.35 metres of drawdown in the upper sand aquifer monitoring bore. Groundwater analysis is conducted using a logarithmic time scale, with a 25 day-test therefore representing a confident forecast of life-of-mine sustainability.

This magnitude of response indicates the intermediate clay overlying the basal sand aquifer is relatively hydraulically conductive and brine hosted within the strata overlying the basal sand is accessible and recoverable by abstraction from the basal aquifer alone. The scoping study included 32% of the Indicated JORC Compliant Mineral Resource Estimate, as measured using specific yield, in the intermediate clay unit.

Trade-Off Summary: Bores and Trenches (Refer Appendix 2)

The LWPP is unique in that the resource is contained throughout a sedimentary sequence up to 170 metres thick and comprising a surficial aquifer, an upper sandy aquifer and a deep and highly-permeable basal sand aquifer, which occurs up to 170 metres below ground level (mbgl). The aquifers are interbedded with silts and clays. Bore extraction targeting the basal sands was recommended as the optimal abstraction solution in the scoping study, providing a more constant yield and grade than trenches.

Trenches are generally constructed to a maximum depth of approximately 6m and therefore only capture the shallow resource. As such, there is a risk that flow-rates from the trenches will decline with time as the water level approaches the base of the trench. Although this decline may be offset by the replenishment of the shallow aquifer with periodic rainfall recharge, the non-enriched recharge water will have a diluting effect on the brine grade.

As per the recommendation of the trade-off summary report, APC will adopt bores as preferred brine abstraction method, given the thick sequence of brine-saturated sediments and a proven basal sand aquifer that occurs at LWPP.

AUSTRALIAN POTASH

For further information, please contact

Matt Shackleton
Executive Chairman
m.shackleton@australianpotash.com.au
+61 (0)438 319 841

Released through Sam Burns, Six Degrees Investor Relations, +61 400 164 067

Follow Australian Potash on Twitter @OzPotash

APPENDIX 1: Technical Discussion

Brine Abstraction

Reviews of the performance of palaeochannel borefields in the Roe palaeodrainage system near Kalgoorlie indicate that palaeochannel water levels tend to stabilise when a quasi-steady state equilibrium develops between borefield abstraction and inflows from downward drainage, rather than continued storage depletion.

In the case of the Lake Wells Potash Project (LWPP), 32% of the Mineral Resource Estimate (MRE) is contained within the clay between the basal sand aquifer and the upper sand aquifer.

The long-term pumping test was commissioned to demonstrate that the LWPP palaeochannel performs in a similar manner to the palaeochannel borefields near Kalgoorlie, in that abstraction from the basal sand aquifer induces downward drainage of the intermediate clay. A successful test outcome will be a significant response in the intermediate clay, which indicates brine is recoverable from all sections of the stratigraphic sequence.

Background

Palaeochannels are former deep river valleys that eroded into the bedrock within the broad palaeodrainages and are now infilled with sediment. The basal sands form the major regional aquifer in the Goldfields region. Palaeochannels act as regional drains with groundwater moving through the palaeochannel sand whilst receiving groundwater from surrounding bedrock.

In the vicinity of Kalgoorlie, the sedimentary sequence is commonly less than 60 m thick comprising basal sand overlain by plastic clay, in turn concealed by a thin alluvial cover (Kern and Commander, 1993[1]). In the Northern Goldfields, the palaeochannel depth often exceeds 130m, and comprises substantially thicker sequences of upper alluvium (Johnson et al, 2000[2]).

In the late 1980s, the introduction of new gold processing technologies and resultant expansion of the gold industry led to a rapid increase in groundwater demand. Mining companies developed numerous production borefields in the Tertiary palaeochannels to meet this demand for local hypersaline groundwater.

Ion (1998)[3] reviewed groundwater utilisation from the Roe Palaeodrainage between 1984 and 1996 and demonstrated that only a portion of the groundwater pumped came from storage, with the remainder resulting from delayed drainage.

Johnson, 2007[4], reviewed the palaeochannel aquifers in the Kalgoorlie region and concluded, '*Large sections of the palaeochannel have reached a steady-state condition, rather than continuing water level decline, which implies that groundwater abstracted is from downward drainage or recharge rather than storage depletion. There appears to be more than sufficient hypersaline groundwater resources available for utilisation of the mining industry.*'

Johnson also noted, '*Bore hydrographs show that the water level tends to decline rapidly in the first three years after the commencement of groundwater abstraction. After the initial drawdown, the water levels stabilise or establish a quasi steady-state equilibrium representing inflows from downward drainage or recharge rather than storage depletion*'.

An important hydrogeological consideration of palaeochannels is the transition from confined to unconfined conditions as a result of groundwater abstraction. During the period of abstraction when the aquifer is confined, the groundwater storage in the palaeochannel aquifer is virtually unchanged. Groundwater is produced by aquifer compression, and drainage from overlying strata and adjacent weathered bedrock. When the palaeochannel aquifer becomes unconfined, the groundwater storage in the palaeochannel itself starts to become depleted and contributes much more water than aquifer compression (*Figure 3*). The unconfined phase is characterised by a slow rate of drawdown.

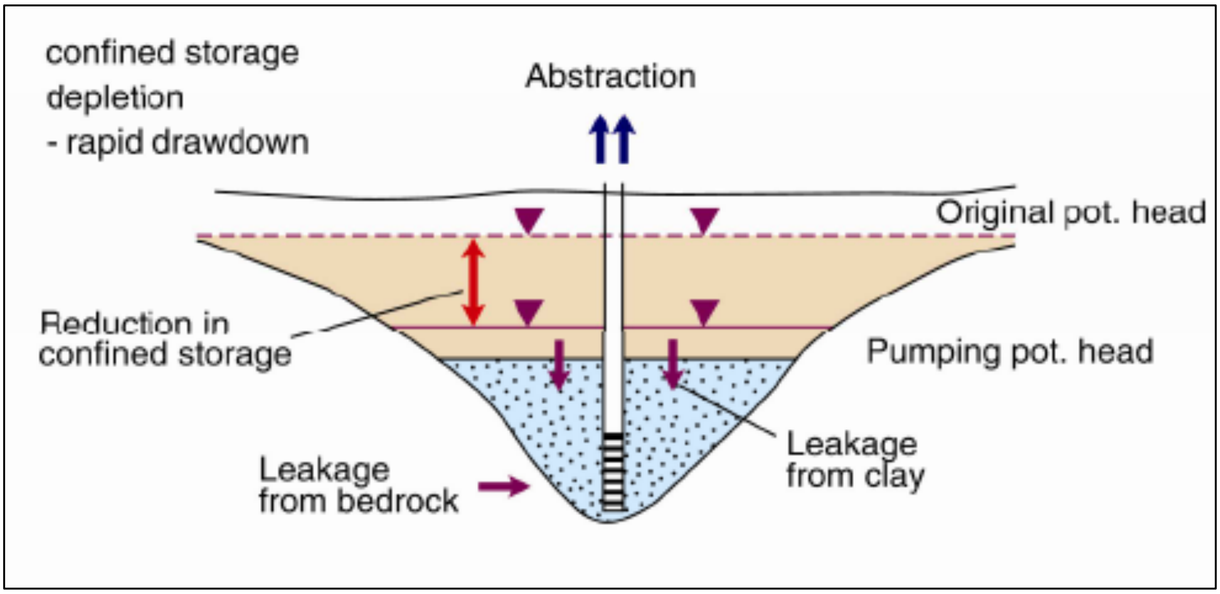
---

[1] **Kern, A.M.** and **Commander, D.P**., 1993, *Cainozoic stratigraphy in the Roe Palaeodrainage of the Kalgoorlie Region*: Western Australia Geological Survey, Report 34, Professional Papers, p. 85-95.

[2] **Johnson, S.L., Commander, D.P.**, and **O'Boy, C.A**., 2000, *Groundwater resources of the Northern Goldfields*: Water and Rivers Commission, Hydrogeological Record Series, Report HG 2, 57p.

[3] **Ion, N**., 1998, *Assessment of hypersaline groundwater use in the Kalgoorlie-Norseman region*: Water and Rivers Commission, Hydrogeology Report HR102 (unpublished).

[4] **Johnson, S.L**., 2007, *Groundwater abstraction and aquifer response in the Roe Palaeodrainage*, Department of Water, Hydrogeological Record Series, HG 23



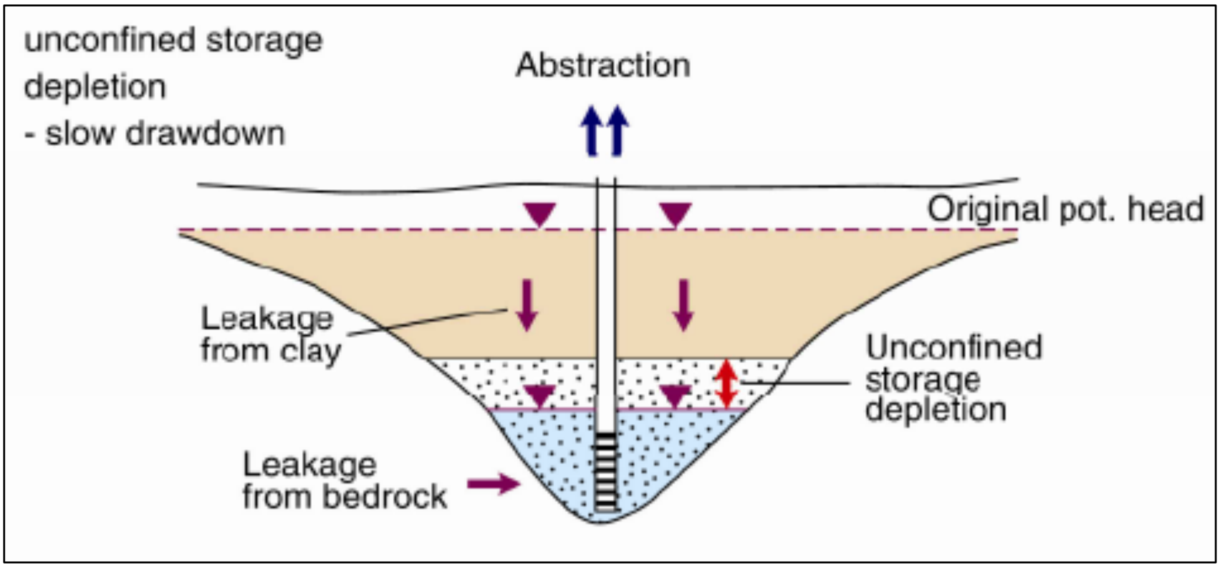


Figure 3: Palaeochannel cross section showing confined and unconfined storage depletion

Test Setup

Testing involved sustained pumping from basal aquifer bore TPB003, a bore that was constructed and tested in 2016, while simultaneously monitoring water levels in 5 monitoring bores screened in the basal sand, intermediate clay, and upper sand.

Abstracted brine was discharged into 2 drains constructed for the previous test in 2016. The test production and monitoring bore details are summarised in Table 1.

Analytical calculation suggested a test of up to 60 days duration and 15 L/s abstraction rate may be required to induce a measurable response in the intermediate clay and, potentially, upper sand aquifer.

	Site	Aquifer	Easting[1]	Northing[1]	Drilled Depth (m)	Screened interval (m)
TPB003	B	Basal Sand	492418	6983734	168	144-168
PLAC026	B	Upper Sand	492431	6983714	59	47-59
LWDRM001	B	Basal Sand	429411	6983720	168	144-168
LWDRM006	B	Intermediate Clay	492439	6983723	124.5	116-122
LWDRM004	C	Basal Sand	494442	6986516	175	163-175
LWDRM005	C	Upper Sand	494398	6986525	71.5	65.5-71.5

Table 1: TPB003 Pumping and Monitoring Bore Summary

Preliminary Observations

Abstraction commenced from the basal sand aquifer (TPB003) on the 20th October at a constant rate of 15 L/s.

Contrary to the pessimistic but possible analytical calculations of overlying aquifer response times, measurable responses in the clay monitoring bore (LWDRM006) occurred in the first day of testing.

From the upper sand monitoring bore (PLAC026), measurable responses occurred from the second day of testing.

After 25 days of testing, 31 metres of drawdown has been recorded in the intermediate clay monitoring bore, and 0.35 metres of drawdown in the upper sand aquifer monitoring bore.

This magnitude of response indicates the intermediate clay overlying the basal sand aquifer is relatively hydraulically conductive and brine hosted within the strata overlying the basal sand is accessible and recoverable by abstraction from the basal aquifer alone.

Over time the volume of brine draining from the overlying strata is likely to increase and approach a quasi-steady state equilibrium with the abstraction rate, at which time drawdowns will slow markedly.

For the Roe palaeodrainage borefields Johnson (2007) reviewed, this equilibrium often occurred approximately 3 years after the commencement of abstraction. The basal sand hydrograph on Figure 4 is already showing some indication that the rate of drawdown is slowing.

Extrapolating from the current hydrograph suggests that 15 L/s may be achievable from the basal aquifer alone at Site B for the current 20 year LOM.

APC intend to draw simultaneously from both the basal and upper sand aquifers, which will augment the achievable abstraction rate from each site.

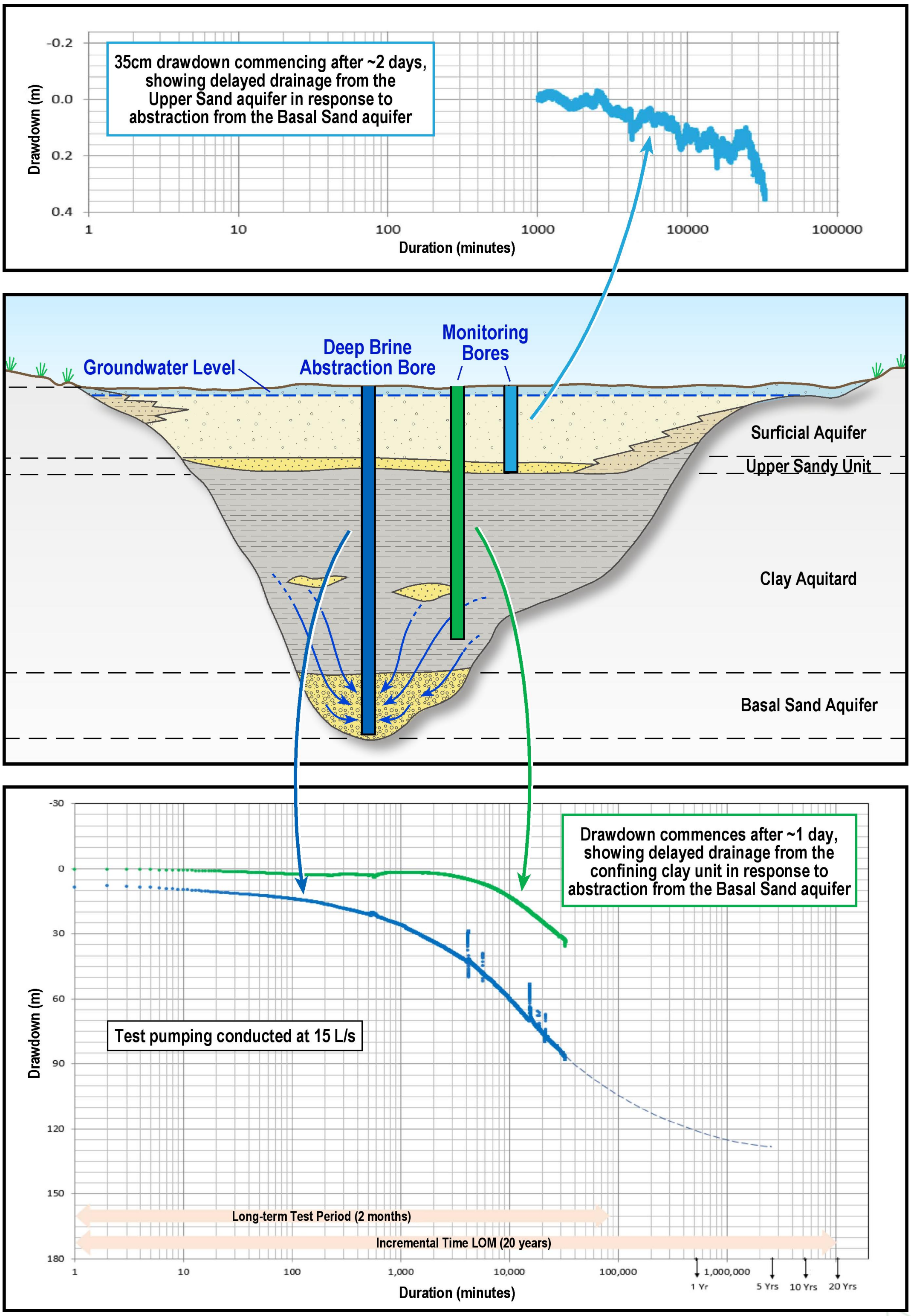


Figure 4: Test Production Bore (TPB03) and monitoring bores at Site B

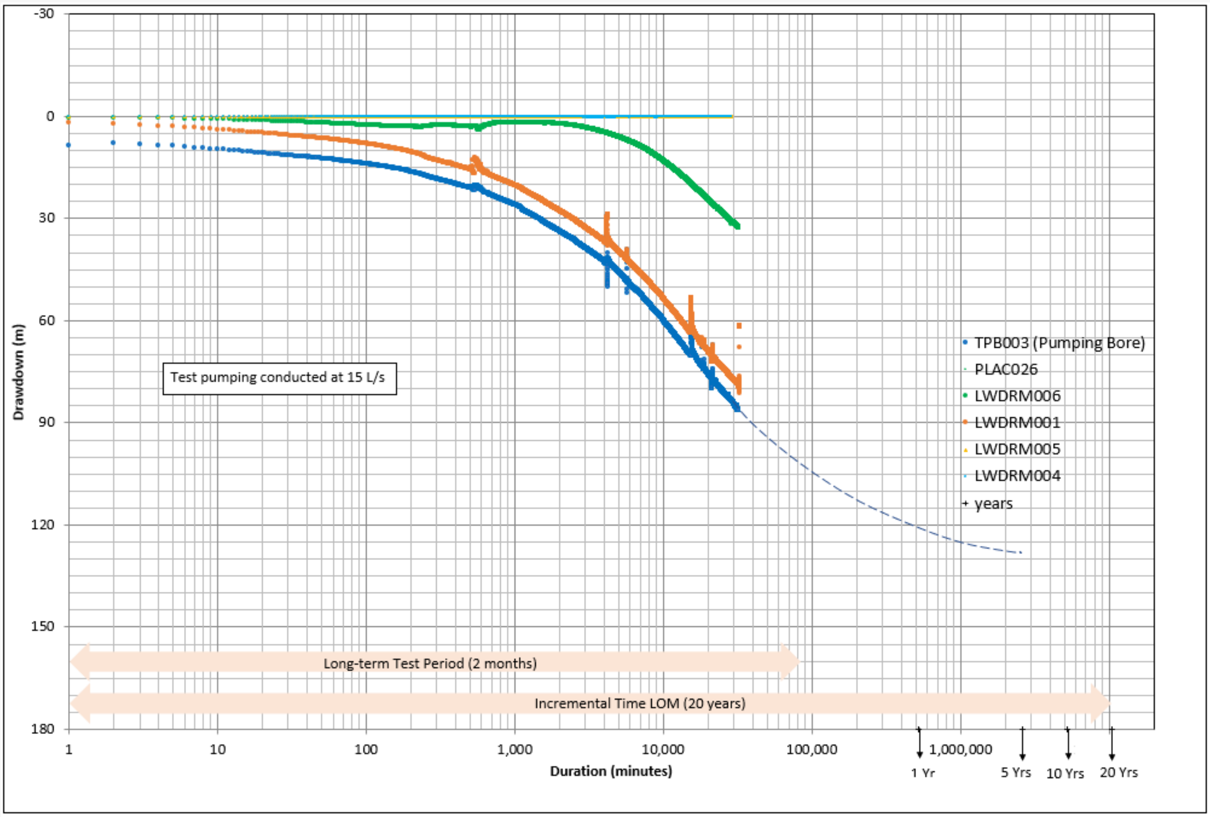


Figure 5: TPB003 Test Pumping Response

APPENDIX 2: Conceptual Trade-Off Study

Level 4, 56 William Street
Perth WA 6000

PO Box 976
South Perth 6951
Western Australia

Tel +61 8 9322 9733

www.aq2.com.au

AQ2 Pty Ltd
ABN 38 164 858 075

Executive Summary

APC have engaged AQ2 to undertake a conceptual trade-off study of bores versus trenches as methods of abstracting brine at APC's Lake Wells Potash Project (LWPP). APC's LWPP is unique in that the resource is contained throughout a sedimentary sequence up to 170 m thick. The sequence comprises a surficial aquifer, an upper sandy aquifer and a deep and highly-permeable basal sand aquifer, which occurs up to 170 metres below ground level (mbgl). The aquifers are interbedded with silts and clays.

LWPP's hydrogeological setting provides a large available drawdown for brine-abstraction bores with opportunities to augment abstraction in the basal sand from other aquifers in the sequence Additionally, pumping from the basal sand should result in delayed drainage from the overlying sediments. This process has supported long-term groundwater abstraction by numerous mine water supply borefields throughout the WA Goldfields drawing from similar deep paleochannels, for periods in-excess of 20 years (Johnson et al, 1999; Johnson, 2007; Turner et al, 1994). Delayed drainage water originates from interbedded clays and silts, is mineralised and therefore will not have a diluting effect on the brine grade.

By contrast, trenches are generally constructed to a maximum depth of 6 m to 10 m and therefore only abstract the shallow brine-resource. Moreover, at Lake Wells, the shallow material is highly variable, ranging from permeable gypsum to low permeability clay (in fact, it is the presence of low permeability clay in the upper sequence that means unlined evaporation ponds are worthy of investigation). With less than 10 m of available drawdown and variable permeability, there is a risk that flow-rates from trenches will decline with time as the water level approaches the base of the trench (depending on the hydraulic parameters of the surficial aquifer). Although this decline may be offset by the replenishment of the shallow aquifer with periodic rainfall recharge, the non-enriched recharge water may have a diluting effect on the brine grade.

Trenches require a significant area of lake surface and, given the potential for declining abstraction rates or grade, there is a risk the trench network will have to be regularly expanded into new areas. Additionally, an extensive network of trenches will be difficult to maintain especially during a flood event when the lake surface is inundated.

Given the thick sequence of brine-saturated sediments and proven basal sand aquifer that occurs at LWPP, it is recommended that bores should be explored as the preferred brine abstraction method and trenches should be considered a second-option only. It is recommended that long-term test pumping should be undertaken to confirm the hydraulic response of the aquifer system and the process of delayed drainage.

1. INTRODUCTION

Australian Potash Ltd (APC) is investigating the feasibility of developing the Lake Wells Potash Project (LWPP). The project is located on the southern and western portions of Lake Wells, some 500km north-east of Kalgoorlie and 300km north east of Laverton. The project is located in proximity to critical infrastructure providing opportunity for bulk-distribution of potash.

APC currently propose to produce up to 300,000 tonnes per annum (Tpa) of Sulphate of Potash (SOP). SOP is contained within hyper-saline groundwater occurring in the sediments beneath and adjacent to Lake Wells. APC propose that the groundwater will be abstracted, subject to solar evaporation and SOP recovered from the residual salts. Surplus sulphate will be used to augment production through Muriate of Potash conversion.

With a view to ensuring current studies focus on development priorities, APC have engaged AQ2 to undertake a conceptual hydrogeological trade-off study of bores versus trenches as methods of abstracting the Lake Wells brine resource. Our study assesses both the technical and logistical aspects of both methods of abstraction.

2. PROJECT SETTING & HYDROGEOLOGY

Details of the project setting have been described in previous Resource assessments (ie Aquaterra Doc 058E_024b, dated 10th March, 2017) and are therefore not included in detail in this report; rather a brief summary of relevant points to this study are provided below.

2.1 Hydrogeological model

Table 1 summarises the conceptual hydrogeological model that underpins the APC's LWPP Resource. As shown in Figure 1, the three main aquifers that can be targeted for brine abstraction comprise: the surficial unit, the upper sandy unit and the basal paleochannel sand; with abstraction from the sand aquifers aiming additionally aiming to cause some delayed-drainage from the overlying silts and clays.

2.2 Rainfall Recharge

Lake Wells is located on the north-eastern margin of the Yilgarn Craton in the interior of Western Australia; an arid region with an average annual rainfall of approximately 200 mm.

LWPP occurs in the southwest region of the lake and has an approximate surface area of 170km2. On the basis of 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, indicate that a week-long storm event with a 1% Annual Exceedance Probability (AEP) would result in a 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. Surface water connection across the lake is poorly defined. Smaller rainfall events would likely result in the development of ponds within the overall lake bed, whilst it is possible that the entire lake could be interconnected during high levels of inundation, following infrequent, large rainfall events (refer Figure 2 below).

Figure 2: Seasonal Flooding on a Salt Lake

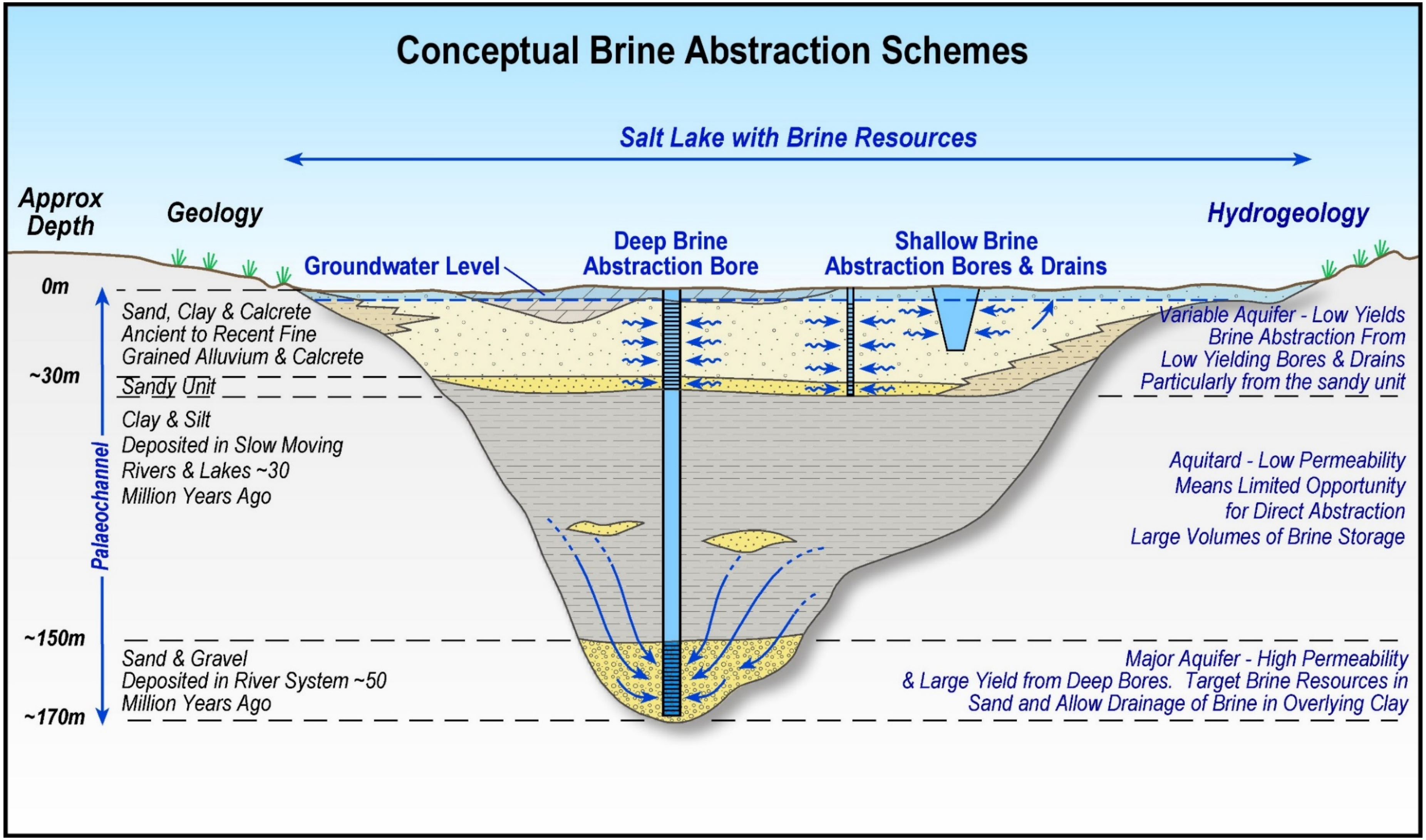
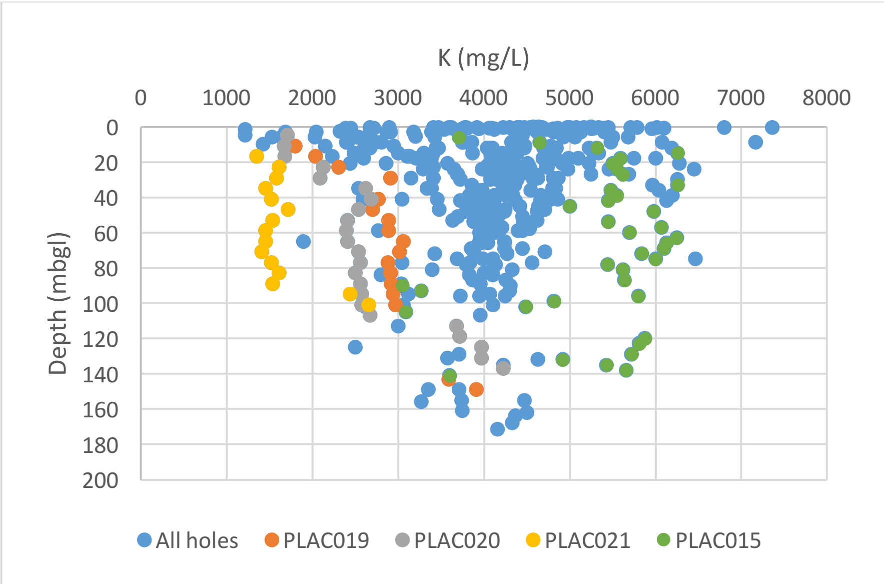


Figure 1: Conceptual Brine Abstraction Schemes

Table 1: Summary of Conceptual Hydrogeological Model for LWPP

Age	Geology	Hydrogeology	Extent	Status	Paleo-Depositional Environment
Pliocene / Quaternary	**Mixed sand, clay, calcrete and evaporite.** Periods of Playa Lake development and arid landforms (dunes, ephermeral creeks with alluvial wash, groundwater calcrete)	**Aquifer** - Brine storage potential and moderate levels of recovery. Moderate pumping potential from shallow moderate yielding bores targetting calcrete and sandy horizons or shallow trenches. T: low - ~5 m^2/d to 15 m^2/d. Likely to receive surface water recharge / dilution in upper 20m.	Extensive - occurs over most of modern lake surface. Variable with sand-clay proportions and 30m to 90m thick.	**Identified** - Drilled during aircore, mud-rotary and drilling and auger programme; weighted mean SOP content:7.8 kg/cu.m	Becoming arid - Alternating cycles of arid and very arid - varying with Northern Hemisphere glacial/interglacial periods
Pliocene	**Predominantly sand unit with variable clay content.** Period of higher energy deposition prior to playa Lake development.	**Aquifer** - Brine storage potential and moderate to high levels of recovery. Moderate pumping potential from shallow moderate yielding bores. (T: ~10 m^2/d to 30 m^2/d)	Extensive but discontinuous - anticpated to occur over most of modern lake though with variable thicknesses (ranging between 3 and 15m). Variable clay content. Occurs at depths ranging between 20 and 77m.	**Identified** - Drilled during aircore, mud-rotary and drilling programme; test pumping of TPB001; weighted mean SOP content:7.8 kg/cu.m	Becoming arid - Alternating cycles of arid and very arid - varying with Northern Hemisphere glacial/interglacial periods
Miocene	**Clay (with minor sand interbeds).** Continental-interior wide deep weathering producing deep clay regolith. Deposited in low-energy environments as lacustrine and alluvial clays (eg Perkolili Shale)	**Aquitard** - large brine storage but low recovery due to low specific yield. Limited opportunity for direct pumping but longterm source of leakage to support pumping from underlying sand.	Extensive - underlies modern lake surface and is over 100m thick in places.	**Identified** - Drilled during aircore and mud-rotary drilling programme; weighted mean SOP content 8.3 kg/cu.m	Warm wet with forest becoming drier through period and shift to open scrub-woodland (as climate dries)
Eocene	**Coarse Sand.** High-energy basal sands in interior-wide paleo drainage system (eg Wollubar Sandstone). Incision of inset-valleys occurs within broad drainage pattern already established and is interior-wide.	**Aquifer** - large brine storage potential, high levels of recovery (due to specific yield) and good pumping potential (T: ~35m^2/d) to depressurise and underdrain overlying clay. Up to 100m of available pumping draw-down.	Longitudinally extensive and laterally constrained to paleochannel thalweg (base of channel). Occurs ~100mbgl in the east and 150mbgl in the west, along entire paleochannel length with typical thickness of 25m.	**Identified** - Geophysical survey. Drilled during aircore and mud-rotary drilling programme; test pumping of TPB002 and TPB003; weighted mean SOP content 8.3 kg/cu.m	Warm-temperate wet becoming cool temperate wet (the latter associated with reestablishment of S.hemisphere ice sheets and increase drift of Australia from Antartica.

The variable annual surface water flow pattern on the lake will likely produce some variability in the quality of brine in the shallowest lake bed sediments, both in space and time. Figure 3 demonstrates the wide range of brine concentration at surface compared to the more consistent brine concentrations at depth in the deepest basal sands.



Notes: PLAC019, 20 and 21 are located in the eastern lake area and PLAC15 has the highest brine concentrations in the western area.

Figure 3: Potassium (K) Concentration with Depth

3. ASSESSMENT OF TRENCHES

3.1 Technical aspects of Trench abstraction

Trenches target the surficial aquifer, with their depth of construction generally limited to approximately 6 m – 10 m. Deeper trenches will be progressively more expensive as the width of the trench will have to increase to accommodate a batter angle on the sides to maintain trench stability.

The limited depth of the trench will restrict the maximum drawdown that can be achieved (ie pumping can not continue once the water level drops below the bottom of the trench) and, dependent on the hydraulic characteristics of the surficial aquifer, there is a risk that the rates of the abstraction will decline.

Although, recharge during inundation of the lake surface may replenish some of the surficial aquifer and allow water levels to rise periodically, the recharge water is fresh and is therefore anticipated to have a diluting effect on the brine concentrations. (Generally, the process would involve some mixing of rainfall-recharge with water retained in the pore-space of material previously dewatered by the trench, with an overall dilution over time).

Modelling has been conducted to assess both the potential decline in abstraction rate with time and the potential effect of brine dilution in response to recharge events. These assessments are described below.

3.1.1 Decline in abstraction rates

Numerical modelling has been conducted with Modflow (McDonald and Harbaugh, 1988) using the Groundwater Vistas (ESI, 1996 – 2011[2]) graphical user interface. A one-layer model was set up for three different lithological compositions which could occur in the surficial aquifer unit: clay rich sediments, evaporites and sand rich sediments.

The adopted hydraulic parameters for each lithological type are detailed in Table 2, with parameters based on PSD sample analyses from LWPP and documented parameters from Agrimin Ltd (2017), Kalium Lakes Ltd (2017) and Salt Lake Potash Ltd (2017).

Table 2: Modelled Parameters

	k (m/d)	Sy	Porosity
Clay-rich	0.1	3%	40%
Evaporite	10	10%	40%
Sand-rich	1	15%	30%

Each model used a minimum cell size of 2 m, to simulate pumping from trenches, with a maximum cell size of 20 m close to the model boundaries. The model used an extent of 4km (north south and east west) to minimise boundary effects and used a storage depletion approach (i.e. all model boundaries were set as the no flow type). The models were not calibrated to testing or operational data, but were used to predict a range of trench pumping rates.

All models were also assigned the following parameters:

- Base of model at 5 m
- Top of model at 11 m
- Initial water level at 11 m
- A 10 year operational period

For the evaporites and Sand-rich sediments, pumping from a total length of 1.2km of trenches was included at a rate of 6.5 L/s per km of trench length. For the Clay rich sediments, pumping was included at a rate of 1.6 L/s per km of trench length (~25% of the pumping rate set for the evaporites and Sand-rich sediments). Three trenches were modelled, with each trench assumed to be 400m long with a spacing between trenches of 300m. Pumping from the trenches was simulated at maximum rates to within 2m of the bottom of the trench elevation. When modelled water levels were drawn down to this elevation, pumping rates were then assumed to decrease linearly over the next metre to zero.

For each lithological composition, three frequencies of lake inundation (recharge) have been simulated. - every year, every two years and every five years. Recharge over the surface of Lake Wells was assumed to be sufficient to replenish all water removed by pumping in the preceding one, two or five years. Recharge was assumed to occur over a period of 10 days, with each recharge event resulting in a recovery in modelled water levels and an increase in total trench pumping rate.

Figure 4 presents the results of the modelling. The modelling indicates the evaporite unit can sustain the high abstraction rates (6.5 L/s per km) when recharge events occur every one to two years and that inflow rates will only decline to approximately 5 L/s per km when the aquifer is only replenished every 5 years. However, the model results for the trenches in the sand-rich unit show inflow rates declining from 6.5 L/s per km to approximately 3 L/s per km, 2 L/s per km and 1 L/s per km for the one year, two year and 5 year recharge events respectively. Similarly, the clay rich model shows predicted inflow rates declining from 1.6 L/s to rates ranging between 0.2 and 0.4 L/s per km for each of the recharge scenarios.

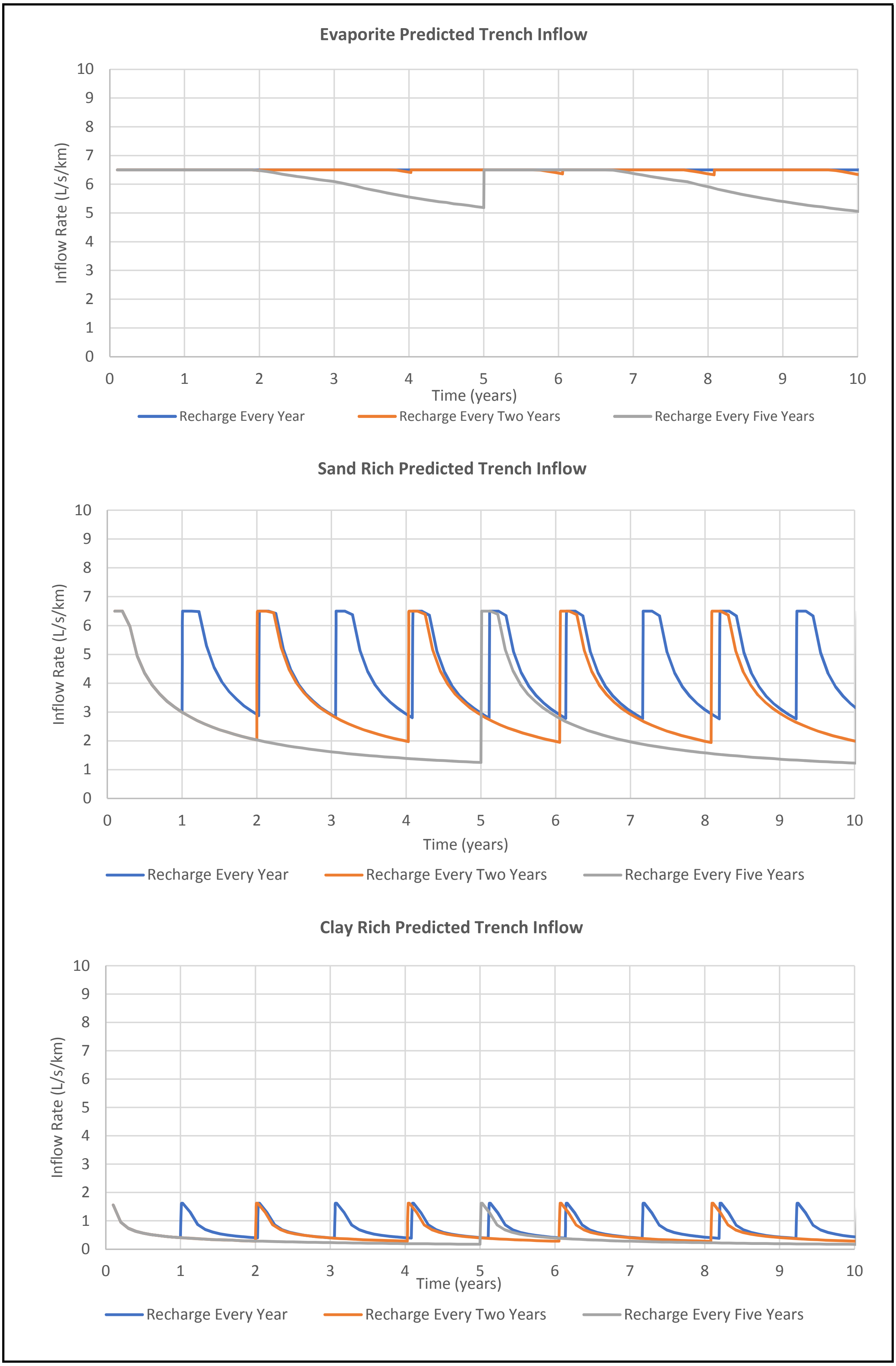
3.1.2 Dilution of brine concentrations

The potential change in SOP concentration over a ten-year period was assessed using an analytical and a numerical approach. Both approaches used the same aquifer parameters as the flow models described above. Details of each approach are described below.

Analytical Approach

A spreadsheet based mixing model was set up to predict the decrease in SOP concentrations assuming the aquifer parameters and pumping conditions outlined in Section 3.1.1 above. The approach assumed the following:

- The volume of water removed by trench pumping (between recharge events) is estimated using a Theis approach, assuming trench water levels are drawn down by 5 m.
- Recharge is sufficient to replenish all water removed (after one, two or five years of pumping).



AQ2

Predicted Trench Inflows **FIGURE 4**

F:\058\2.TECH\GW_Modelling\numerical\results\[inflow trenches.xlsx]Figure 4

- Recharging water, with zero SOP concentration is assumed to mix fully with in-situ aquifer SOP and SOP associated with the undrainable portion of the aquifer (i.e. specific retention ~ effective porosity minus specific yield) and a single aquifer SOP concentration for the aquifer is calculated using a mass balance approach.

Numerical Approach

The flow models described in Section 3.1.1 above were used as inputs to MT3DMS (Zheng and Wang, 19993) models for each lithology. The numerical approach predicts the concentration in each model cell based on the modelled aquifer abstraction and recharge outlined in Section 3.1.1 based on a conservative approach. The models were also used to predict the concentration at the mid-point of the central modelled trench, which is expected to represent the greatest decline in SOP (as this location is expected to receive the most recharge and the least inflow from the surrounding aquifer).

All models included the following assumptions:

- Complete mixing between the recharge and the in-situ groundwater (aquifer SOP and undrainable SOP) occurs after each recharge event, with no allowance made for the density difference between fresher recharge and in-situ groundwater.

- Zero SOP concentration in recharging water.

- An initial SOP concentration in the modelled aquifer of 7,805 mg/L.

- No chemical reactions (ie conservative transport and mixing of SOP).

The results of both the analytical and numerical modelling are presented in Figure 5, showing comparative results from both approaches. The predicted effects of dilution are most significant for the sand-rich unit, with a SOP grade of 7,800 mg/L potentially reducing, over a ten year period, to approximately 5,500 mg/L with recharge events occurring every 5 years; approximately 2,000 mg/L with recharge every two years and approximately 750 mg/L when recharge events occur annually.

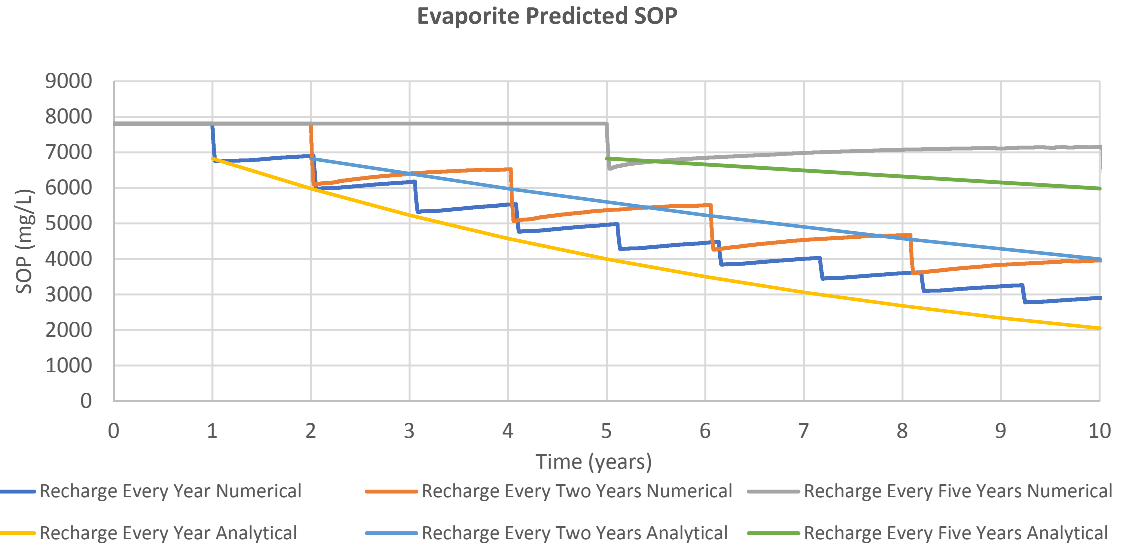
For the evaporite unit, the SOP grade is predicted to decline from 7,800 mg/L to between 2,000 and 6,500 mg/L, dependent on the frequency of recharge events. Whilst for the clay unit, the predicted effect of dilution is less significant, with the initial SOP grade of 7,800 mg/l reducing to between 4,500 and 7,000 mg/L, again, dependent on the frequency of recharge events. The clay will suffer the least dilution as it has a high specific retention (or low specific yield) to support post-recharge mixing.

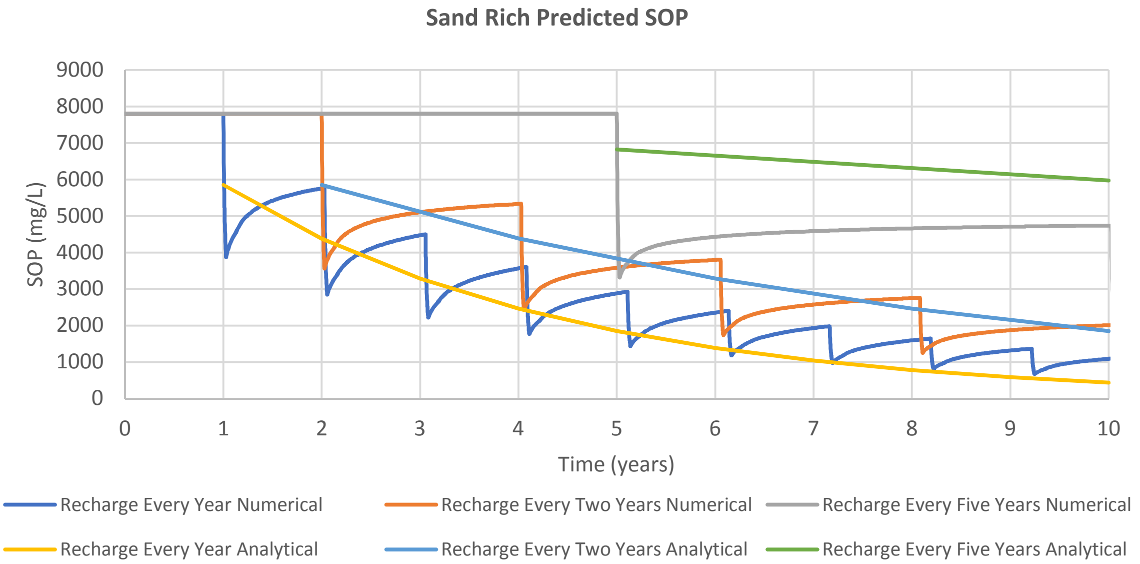
In hydrogeological settings where there are strong vertical hydraulic gradients, then trench flow and grade maybe supported by the movement of brine from deeper aquifers. Such vertical gradients are usually associated with areas of large topographic relief (such as mountainous drainage basins that surround salars in South America). These conditions do not exist at LWPP and no strong vertical gradients have been discerned in monitoring bore data.

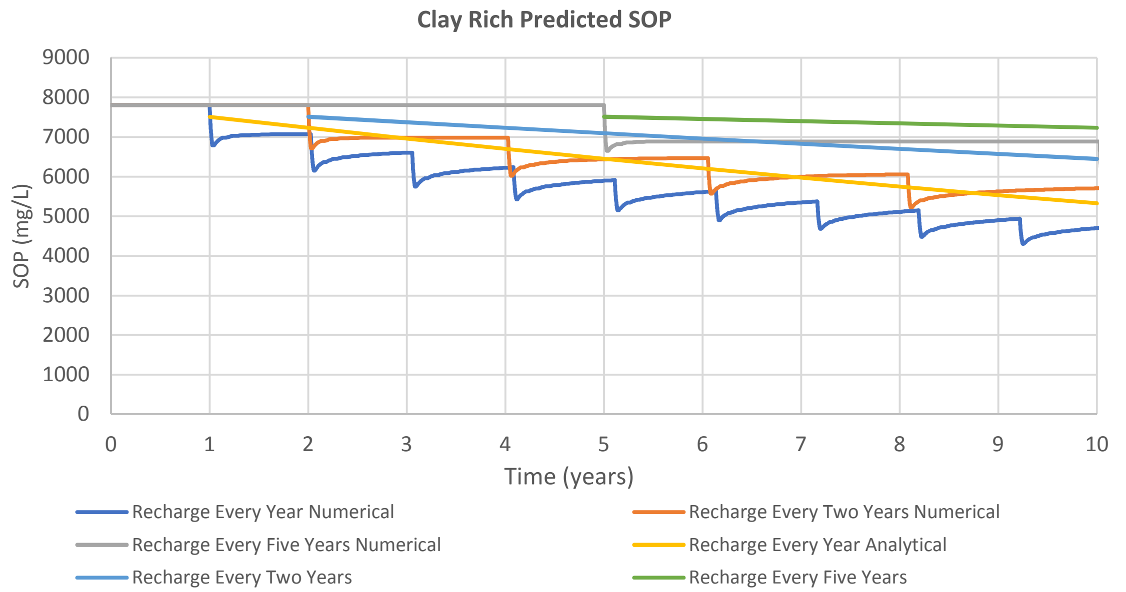
3.2 Logistical aspects of Trenches

In addition to the technical aspects of utilising trenches for brine abstraction, there are also the operational / logistical aspects which should be considered. Trenches will need to be maintained on a regular basis, particularly after periods of heavy rainfall, when slumping may occur. However, access to the trenches will be difficult immediately after heavy rainfall events and it is possible that the trenches themselves will be inundated with fresh water, potentially impacting production for a period of time. Bunds may be constructed along the margins of the trench to protect them from runoff and allow access; this may add to the construction cost.

In addition, trenches obviously cover a substantial surface area of the salt lake and, as a result of declining grade or abstraction rates, the trench network may need to be periodically expanded into new areas. In the case of the Lake Wells Project, evaporation ponds are currently planned to be located on the lake, taking advantage of the sand dunes as pond walls and the underlying clay to potentially limit the leakage from the ponds.







Predicted SOP **FIGURE 5**

4. ASSESSMENT OF BORES

4.1 Technical aspects of Bore abstraction

To date, four production bores have been installed as part of the hydrogeological investigations for the LWPP, one providing data from only the upper sand and surficial aquifers, two providing data from only the basal sand unit and two screened against the upper and lower aquifer units (the latter to mimic likely practical operational bores). Short-term (10 day) test pumping was conducted in late 2016 on three production bores and long-term testing is currently in progress.

Analysis of the test pumping data and PSD analyses have provided hydraulic parameters for the stratigraphic units as summarised in Table 3 below. Although the short-term tests allow these parameters to be determined, they are not long enough to demonstrate delayed drainage effects when pumping from the underlying, basal sand aquifer. Longer term test pumping will confirm this delayed drainage process occurs at LWPP, however, as a precedent, the process has been demonstrated by the long-term abstraction (in excess of 20 years) from many mine water supply borefields drawing from similar paleochannel aquifers in the Goldfields (Johnson et al, 1999; Johnson, 2007; Turner et al, date).

Table 3: Representative Aquifer Parameter Values

Hydro-geological Unit	Permeability Derived from PSD Analysis (m/d)		Permeability Derived from Test Pumping (m/d)		Representative Permeability (m/d)	Confined Storage from Test Pumping	Representative Specific Yield (from PSD Analysis)	Representative Porosity (from PSD Analysis)
	Lower bound	0.01						
Surficial	**Mean**	**0.04**			**0.15***		**10%***	**43%**
	Upper bound	0.17						
	Lower bound	0.38	Min	0.29		3.89E-04		
Upper Sand	**Mean**	**0.99**	Mean	1.18	**0.99**	to	**25%**	**36%**
	Upper bound	2.56	Max	2.14		6.06E-04		
	Lower bound	0.03						
Clay	**Mean**	**0.05**			**0.05**		**6%**	**47%**
	Upper bound	0.07						
	Lower bound	0.90	Min	0.66		3.77E-04		
Basal Sand	**Mean**	**1.49**	Mean	1.29	**1.49**	to	**29%**	**40%**
	Upper bound	2.47	Max	2.31		6.35E-03		

Mean values are the mean of the log normal distribution

*Representative permeability and specific yield values for the surficial aquifer are based on the results of the PSD analyses but include estimated values for silcrete in determining the mean of the log normal distribution.

Rainfall recharge will repressurise the sediments overlying the basal sand, increasing the rate of drainage from these units. Additionally, the influence of dilution from rainfall recharge, will be less when abstracting brine from the basal sand aquifer. This is indicated by the recorded measurements of brine concentration with depth (Figure 3) which shows the range in brine concentration readings generally decreasing with depth.

4.2 Logistical aspects of Bores

It is not anticipated that rainfall events will have a significant impact on the operational aspects of the bores as the bore headworks can be elevated above the surface of the lake such that they are not impacted by flooding.

The location of the bores is determined by the requirement to intersect the basal sand aquifer which may result in bores being located within the brine evaporation ponds. However, again, bore headworks can be elevated above the maximum pond level with maintenance access to the bore incorporated into the pond design.

5. CONCLUSION AND RECOMMENDATIONS

In the case of the LWPP, where a deep sequence of brine-saturated, paleochannel sediments overly a basal sand aquifer unit, production bores are the preferred abstraction method which should be further explored. It is recommended that long-term pumping-tests are evaluated with respect to indications of delayed drainage. Parameters determined from the tests will support numerical simulation modelling of the brine borefield for the life of mine.

The option of trenches should not necessarily be dismissed, but should be considered as a second priority at this time. It may be that trenches are used near the edges of the lake, outside of the paleochannel and the potential area of influence of the bores with the knowledge that both inflow rates to the trench and grade is likely to decrease with time, unless trenches are moved regularly.

Should you require any further information in relation to this Resource Assessment, please do not hesitate to contact us.

Regards

Duncan Storey

Consulting Hydrogeologist / Director

Jeff Jolly

Consulting Hydrogeologist

Author: DGS (13/11/17)
Checked: JJ (14/11/17)
Reviewed: JJ (14/11/17)

REFERENCES

Agrimin Ltd, 2017. Investor Presentation, Diggers & Dealers Mining Forum 2017.

Environmental Solutions Inc. Groundwater Vistas Version 6.96 Build 19. 1996 – 2011.

Johnson SL, Commander DP and O'Boy CA, *Groundwater Resources of the Northern Goldfields, Western Australia,* Water and Rivers Commission Hydrogeological Report Series, Report HG 2, 1999.

Johnson SL, *Groundwater abstraction and aquifer response in the Roe Paleodrainage (1990 – 2001),* Department of Water Hydrogeological Record Series, Report HG 23, 2007.

Kalium Lakes Ltd, 3rd October 2017, "Pre-Feasibility Study with Maiden Ore Reserve Confirms Low Cost, Long Life and High Margin Beyondie SOP Project", announcement to ASX.

McDonald M.G. and A.W. Harbaugh. A Modular Three-Dimensional Finite- Difference Ground-Water Flow Model. US Geological Survey Open File Report 83-875, 1988.

Salt Lake Potash Ltd, 25th January 2017, "Trenching and Pump Testing at Lake Wells Confirm Brine Production Potential of the Shallow Aquifer", announcement to ASX.

Turner J, Rosen M, Milligan N, Sklash M, Townley L, Groundwater recharge studies in the Kalgoorlie region, Australian Mineral Industries Research Association Ltd, Report No 98, 1994.

Zheng, C. and p. Wang. MT3DMS: A Modular Three-Dimensional Multispecies Transport Model for Simulation of Advection, Dispersion, and Chemical Reactions of Contaminants in Groundwater Systems; Documentation and User's Guide. US Army Corps of Engineers. Engineer Research and Development Center. December 1999.

About Australian Potash Limited

Australian Potash Limited (ASX: APC) is an ASX-listed Sulphate of Potash (SOP) developer. The Company holds a 100% interest in the Lake Wells Potash Project located approximately 500kms northeast of Kalgoorlie, in Western Australia's Eastern Goldfields.

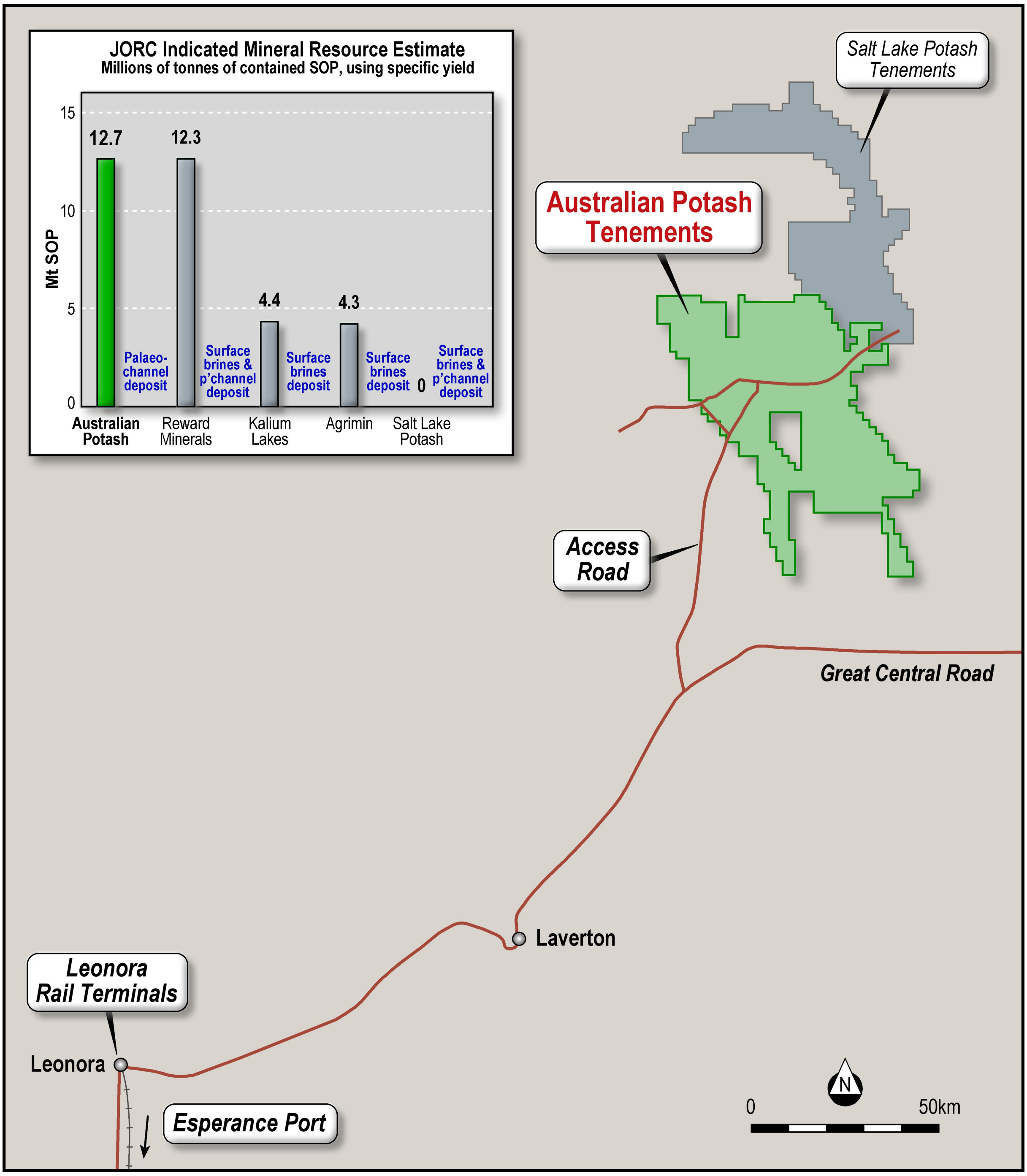
The Lake Wells Potash Project is a palaeochannel brine hosted sulphate of potash project. Palaeochannel bore fields supply large volumes of brine to many existing mining operations throughout Western Australia, and this technique is a well understood and proven method for extracting brine. APC will use this technically low-risk and commonly used brine extraction model to further develop a bore-field into the palaeochannel hosting the Lake Wells SOP resource.

A Scoping Study on the Lake Wells Potash Project was completed and released on 23 March 2017[i]. The Scoping Study exceeded expectations and confirmed that the Project's economic and technical aspects are all exceptionally strong, and highlights APC's potential to become a significant long-life, low capital and high margin sulphate of potash (SOP) producer.

Key outcomes from the Scoping Study are as follows:

- Stage 1 production rate of **150,000tpa** of premium-priced sulphate of potash (years 1 – 5)
- Stage 2 production rate of **300,000tpa** of premium-priced sulphate of potash (years 6 – 20)
- Upgraded JORC 2012 Mineral Resource Estimate comprising 14.7m tonnes of SOP, including 12.7mt in the Indicated category[i]
- Operating expenditure of A$368/US$283 tonne SOP in the first 5 years and A$343 tonne SOP over the life of mine
- At a SOP price of A$795 per tonne SOP, the Project generates LOM annual operating pre-tax cashflow[ii] of A$118m/US$81m
- Pre-production capital expenditure (Stage 1) of A$175m/US$135m and Stage 2 of A$163m/US$125m
- Life of Mine (LOM) is 20 years (inc. Stage 1 & Stage 2) –upside to LOM through continued exploration

Lake Wells is located close to existing logistics infrastructure in WA's Eastern Goldfields



APC's Lake Wells SOP Project with existing logistics infrastructure

Forward looking statements disclaimer

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 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.

Competent persons statement

The information in this announcement that relates to Exploration Targets and Mineral Resources is based on information that was compiled by Mr Jeffery Lennox Jolly. Mr Jolly is a principal hydrogeologist with AQ2, a firm that provides consulting services to the Company. Neither Mr Jolly nor AQ2 own either directly or indirectly any securities in the issued capital of the Company. Mr Jolly has over 30 years of international experience. He is a member of the Australian Institute of Geoscientists (AIG) and the International Association of Hydrogeologists (IAH). Mr Jolly has experience in the assessment and development of palaeochannel groundwater resources, including the development of water supplies in hypersaline palaeochannels in Western Australia. His experience and expertise is such that he qualifies as a Competent Person as defined in the 2012 edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Jolly consents to the inclusion in this report of the matters based on his information in the form and context in which it appears.

The Hydrogeological information in this announcement has been prepared by Carsten Kraut, who is a member of the Australasian Institute of Geoscientists (AIG), and International Association of Hydrogeologists (IAH). Mr Kraut is contracted to the Company through Flux Groundwater Pty Ltd. Mr Kraut has experience in the assessment and development of palaeochannel groundwater resources, including the development of water supplies in hypersaline palaeochannels in Western Australia. His experience and expertise is such that he qualifies as a Competent Person as defined in the 2012 edition of the 'Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves'. Mr Kraut consents to the inclusion in this report of the matters based on his information in the form and context in which it appears.

---

[i] Refer to ASX announcement 23 March 2017 'Scoping Study Confirms Exceptional Economics of APC's 100% Owned Lake Wells Potash Project In WA'. 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 March 2017 announcement, and 2. State that the material assumptions and technical parameters underpinning the estimates in the 23 March 2017 announcement continue to apply and have not materially changed.

[ii] Operating cashflows include all revenue and operating expenditure, but exclude capital expenditure.