Exhibit 96.2

SEC Technical Report Summary

Olaroz Lithium Facility

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1. EXECUTIVE SUMMARY

This report discloses the lithium brine mineral resource for Allkem Limited's (Allkem's) Olaroz Lithium Facility (Olaroz). Olaroz is a brine mining and processing facility that began operation in 2015 with the completion of Olaroz Stage 1 (Olaroz 1) producing 17,500 tons per annum (tpa) of lithium carbonate.

Olaroz has embarked on a 25,000 tpa second-stage production expansion initiative (Olaroz 2 or Stage 2) in 2018 which is scheduled to commence production in the second half of 2023 increasing the cumulative site lithium carbonate production capacity to 42,500 tpa.

This individual Technical Report is the initial report to be issued under the S-K §229.1300 regulations (the "SK regulations") in support of Allkem's listing on the New York Stock Exchange (NYSE). This report updates Olaroz resources, cost estimates, and economics as of the Effective Date.

The ongoing and proven lithium carbonate production at Olaroz 1, the advanced stage of Olaroz 2 construction and commissioning, and recent market information provide Allkem with sufficiently accurate estimation rigor to develop this report to a suitable level where both capital and operating cost accuracy is ±15% and contingency is less than or equal to 10% as defined by the SK Regulations, with remaining uncertainty associated with an expected 40-year life-of-mine. Olaroz 2 expansion elements such as mine (brine extraction), evaporation ponds, and site service infrastructure are complete, with the processing facility nearing mechanical completion and commissioning activities ongoing. Social, environmental, and government aspects are sufficiently progressed to sustain ongoing operations and progress the production ramp-up of Olaroz 2.

The reported mineral resource is based on data collected up to the Effective Date, including operational data collected from Olaroz 1 and Olaroz 2. The cost and economic estimates are current as of the Effective Date.

Conclusion, recommendations, and forward-looking statements made by QPs are based on reasonable assumptions and results interpretations. Forward-looking statements cannot be relied upon to guarantee Olaroz performance or outcomes and naturally include inherent risk.

1.1 Property Description and Ownership

Olaroz (latitude 23° 27' 46.54" South, longitude 66° 42' 8.94" West) is located in the high-altitude Puna region of northwest Argentina, where extensive lithium brine resources are present beneath salars. Olaroz was only the second lithium brine project to be developed in Argentina and the first in 20 years.

The Olaroz Lithium Facility is located in the province of Jujuy at 3,900 m altitude, adjacent to the paved international highway (RN52) that links the Jujuy Provincial capital with ports in the Antofagasta region of Chile that are used to export the lithium carbonate product and to import key chemicals used in the production of lithium carbonate. Olaroz is supplied with natural gas from a nearby existing supply pipeline. The climate in the Olaroz area is severe and can be described as typical of a continental, cold, high-altitude desert, with resultant scarce vegetation. The climate allows year around operation.

Allkem Limited (Allkem) is the operator and majority owner of the Olaroz Lithium Facility. Allkem Limited holds 66.5% of Olaroz through its local subsidiary Sales de Jujuy S.A. (SDJ), with the remaining project ownership held by Toyota Tsusho (TTC) (25%) and the Jujuy Energía y Minería Sociedad del Estado (JEMSE) (8.5%), hereafter referred to as the "Joint Venture".

The Joint Venture holds mineral properties that cover the majority of the Salar de Olaroz, including tenements covering 47,615 hectares and two exploration properties ("cateos") consisting of 33 mining concessions.

Olaroz is fully permitted by the provincial mining authorities and has provincial and federal permits, to allow operations for an initial forty (40) year mine life with renewable options to extend beyond 2053.

This report was amended to include additional clarifying information in October 2023 and November 2023. The basis of the report is unchanged. The changes and their location in the document are summarized in Chapter 2.1

1.2 Geology and Mineralization

The Olaroz salar is located in the elevated Altiplano-Puna plateau of the Central Andes. The Puna plateau of north-western Argentina comprises a series of dominantly NNW to NNE trending reverse fault-bounded ranges up to 5,000-6,000 m high, with intervening internally drained basins at an average elevation of 3,700 m. High evaporation rates together with reduced precipitation have led to the deposition of evaporites in many of the Puna basins since 15 Ma, with borate deposition occurring for the past 8 Myr. Precipitation of salts and evaporites has occurred in the center of basins where evaporation is the only means of water escaping from the hydrological system.

Mineralization in the Olaroz salar consists of lithium dissolved in a hyper-saline brine, which is about eight times more concentrated than seawater. The lithium concentration is the product of the solar evaporation of brackish water which flows into the salar as groundwater and occasional surface water flows. The concentrated brine with lithium is distributed throughout the salar in pore spaces between grains of sediment. The brine also extends a considerable distance away from the salar, beneath alluvial gravel fans around the edges of the salar. These areas are largely unexplored by the company to date. In addition to lithium, there are other elements, such as sodium, magnesium, and boron, which constitute impurities that are removed in the ponds and in the processing plant.

Given the greater depth of exploration from 2019 onward and improved geological understanding the geological interpretation was previously simplified to five major hydrogeological units (UH1 to UH5). The uppermost unit consists of the upper halite and northern sequence of the salar (UH1), underlying sand silt and clay units (UH3), a halite-dominated sequence (UH4), a lower sequence with more sandy units (UH5) and a unit of alluvial sediments that surround the salar (UH2) and extends to considerable depth in the west of the salar.

1.2.1 Porosity Sampling

Porosity samples from 2020 diamond holes were previously sent to the Geosystems Analysis laboratory in Tucson, Arizona, USA for porosity testing using the Rapid Brine Release (RBR) test method to measure specific yield (drainable porosity). Check porosity samples were analyzed in the DB Stephens and Associates laboratory in Albuquerque, New Mexico USA.

One of the diamond holes and the majority of the Stage 2 production wells were profiled with geophysical logging tools, including a Borehole Magnetic Resonance (BMR) tool, that provided in-situ measurements of porosity and permeability. The geophysical logging confirms the correlation of individual sub-units across the salar. An analysis of the BMR data, together with laboratory porosity data from recent and historical cores at Olaroz and core samples collected by Allkem in the Cauchari Project to the south, in the southern extension of the Olaroz basin, provided the basis for assignment of porosity values for the resource estimate. No new laboratory porosity data has been collected since June 2023.

Laboratory-specific yield ([Sy] = drainable porosity) values vary between 9%+/-8% for sandy material, 6%+/-5% for silt mixes, 4%+/-2% for halite, and 2%+/-2% for clay-dominated material, as determined by laboratory samples. The overall specific yield porosity of sediments to 650 m is lower than in the 2011 resource. The resource reduction is due to the presence of the halite-dominated unit (UH4) and lesser sand units below the upper 200 m, except the deeper sand unit.

1.2.2 Brine Sampling

Drilling has confirmed the previously defined lateral zoning in brine concentrations broadly continues at depth, and it is likely that brine will continue to the base of the basin. As drilling has progressed towards the south it has confirmed the previous observations of flow rates in this area, with new wells in the south of the properties. These new wells are producing at:

- 70 l/s and 629 mg/l (E26),
- 54.7 l/s and 539 mg/l (E24 average),
- 30.3 l/s and 660 mg/l (E22 average),
- 542 mg/l (E09) to 786 mg/l Li (E08),
- flow rates from over 10 l/s to over 60 l/s (E09 and E26).

These wells provide samples representative of the aquifers intersected by these wells. Brine samples are collected weekly for analysis from the original Stage 1 (PP series) and Stage 2 expansion (E series) production wells and from check samples in external laboratories.

Brine samples from historical exploration drilling were analyzed in a number of commercial laboratories, principally the Alex Stuart laboratory in Mendoza, Argentina. Since construction of the Olaroz S1 brine samples have been analyzed in the Olaroz site laboratory, with check samples sent to the Alex Stuart laboratory in Jujuy, Argentina, with analysis of duplicates, standards, and blank samples. Results are considered to be sufficiently robust for resource estimation.

Table 1-1 shows a breakdown of the principal chemical constituents in the Olaroz production brine including maximum, average, and minimum values, based on brine samples used in the brine resource estimate that were collected from the production wells.

Table 1-1 - Maximum, average, and minimum elemental concentrations of the Olaroz Brine from 2017-2021 pumping data.

Analyte	Li	K	Mg	Na	Ca	B	SO_4	Cl
Units	**mg/l**	**mg/l**	**mg/l**	**mg/l**	**mg/l**	**mg/l**	**mg/l**	**mg/l**
Maximum	1,238	10,311	3,054	138,800	988	2,439	36,149	202,982
Mean	728	5,183	1,668	115,437	453	1,336	16,760	181,805
Minimum	465	1,716	859	101,000	217	673	4,384	149,207
Standard Deviation	124	984	374	3,991	84	190	3,685	6,664

The resource was estimated using the historical sonic and diamond drilling, recent diamond drilling and results from production wells, to maximize use of the available information. SDJ has operated 29 production wells installed to depths of between 300 and 450 m for up to 5 years and 9 productions well installed to 650 m depth for 3 years. These wells provide important production history and continuity of brine concentration over this period to support the updated resource estimation to a 650 m depth.

1.3 Exploration Status

1.3.1 Current exploration

The initial exploration conducted at Olaroz indicated the property contained a very significant brine volume that would support multiple stages of development. The Stage 1 development of 17,500 tpa lithium carbonate was based on drilling conducted to a depth of 200 m, supported by interpretation of the Olaroz basin from gravity and electrical geophysics. The geophysical data indicated the salar occupies a deep basin, which has now been confirmed by drilling to have a depth greater than 1,400 meters locally.

Drilling to support Stage 2 of Olaroz has been to depths between 400 and 650 m, depending on the location within the basin. This deeper drilling has provided further information around sedimentation during basin filling and confirmed that deposition of coarser grained higher porosity and permeability sediments on the western side of the basin. Drilling has been undertaken in a number of stages:

- Exploration drilling from 2009 through 2011. This included FD, C and CD-series exploration diamond drill holes.

- Production wells for Stage 1, installed to 200 m depth, with some wells subsequently deepened, from approximately 2012 through 2014. These are the PP-series production wells. Later wells included wells below 200 m, such as P301 and P302.
- Drilling of deep exploration well E01, during 2019.
- Production wells for Stage 2, installed to 650 m depth in the east of Olaroz and 450 m in the west. These are the E-series holes. Three DDH-series diamond holes were drilled along the eastern property boundary in this campaign.

Geophysics on Olaroz was conducted over multiple campaigns:

- Audio-magnetotelluric (AMT) and gravity geophysics 2009.
- SEV electrical geophysics 2016.
- Extensive grid gravity and groundmagnetic survey, 2017, used to define the depth of the basin, which is the lower limit on the resource.

Drilling has not yet intersected the basement rocks beneath the Salar, despite drilling a 1,400 m deep exploration hole in one of the deeper locations in the basin. The existing model contacts have not been changed at this time. Additional drilling to depth is required to define the lowest extents of basin. This is an underestimation of basement thickness, with recent holes such as E24 and E26 completed to below this surface, while in unconsolidated sediments. This surface will be updated when drilling intersects the basement surface and allows for better control of the contact.

Drilling undertaken to support the Stage 2 resource upgrade has consisted of production well installation and limited HQ diamond exploration holes. Limited accommodation at Olaroz site due to restrictions related to Covid-19 resulted in drilling of only three of the planned 650 m deep HQ diamond holes as monitoring wells. Fifteen new production wells were installed for Stage 2. Production wells have been installed on a 1 km grid, as for the original wellfields.

1.3.2 Exploration Potential

The resource is open both laterally and to depth. Laterally, the resource is currently limited to within the salar outline, except in the south around E26. Very limited drilling has been undertaken outside the salar. This limited drilling, and extensive geophysical surveys, indicate the brine body extends south of Olaroz beneath gravels to Cauchari, where drilling by the now 100% owned South American Salars defined a resource in 2019. Brine is also interpreted to extend north under the Rio Rosario delta. These areas are to be further evaluated to support a third stage of expansion at Olaroz. A combination of diamond and rotary drilling is planned in these areas.

The resource is currently defined to >650 m depth (or more shallowly where the gravity survey indicated the basin may be shallower and drilling is shallower than 650 m) and controlled by the basement contact interpreted from the basin wide geophysical survey.

One deep exploration hole drilled to 1,408 m, slightly north of the northern production wellfield, has not intersected the basement rock (bedrock). The gravity survey supports a large area of similar depth in this part of the basin. To date no drilling in the Olaroz basin has intersected basement (bedrock).

The Exploration Target ranges between 14 and 33.6 million tonnes (Mt) lithium carbonate equivalent (LCE), depending on the values used for porosity and lithium concentration, having the potential to substantially increase the current resource. It must be stressed that an exploration target is not a Mineral Resource. The potential quantity and grade of the exploration target is conceptual in nature, and there has been insufficient exploration to define a Mineral Resource in the volume where the Exploration Target is outlined. It is uncertain if further exploration drilling will result in the determination of a Mineral Resource in this volume.

1.4 Development and Operations

Olaroz is an established lithium brine production, evaporation, and processing operation. Olaroz has extensive infrastructure and facilities supporting saleable lithium carbonate production.

The Olaroz 1 well field and ponds have been operating successfully since 2013. The Olaroz plant has been processing lithium on site for sale of lithium carbonate product since 2015 as part of the Stage 1 operation.

1.4.1 Mineral Processing and Recovery Methods

The process design was loosely based on that at Silver Peak in the USA. The chemical behavior of the brines under evaporation was studied extensively in pilot scale ponds, along with the key plant process steps such as lime addition, impurity removal and carbonation. The purification process via conversion to lithium bicarbonate was pilot tested at the University of Jujuy. Testing was conducted between 2009 and 2011.

The process design is a conventional pond evaporation and concentration operation. Lithium brine grading approximately 650 mg/L is extracted from the wellfields, pumped to evaporation ponds, and mixed with lime which precipitates magnesium as the hydroxide and gypsum. After concentration brine is processed in the plant to produce lithium carbonate product. These precipitates settle out in the first evaporation pond and primarily halite and Glauber salt are precipitated in the sequence of evaporation ponds as they reach solubility limits. Additional lime is added toward the end of the evaporation sequence to control the Mg levels feeding the plant.

The lithium concentration in the ponds increases progressively to approximately 6,500 to 7,500 mg/l Li, depending on seasonal impacts, prior to processing in the plant. Most of the remaining Mg, Ca and B are precipitated in the plant prior to final conversion of lithium-to-lithium carbonate with soda ash at 85°C. Some of the primary lithium carbonate is redissolved as soluble bicarbonate using carbon dioxide at low temperature, filtered, and purified by ion exchange, then reprecipitated as lithium carbonate that exceeds battery grade purity.

These products are then filtered, washed, and dried for packaging in bulk bags and trucked to the Antofagasta port in Chile for export.

The second stage of Olaroz (Olaroz 2) is near the final stages of construction, using the original design with modifications and improvements based on operation of the Stage 1 project.

1.4.2 Olaroz Stage 2 expansion

Installation of Olaroz 2 expanded production wellfield was completed in 2022. A total of 15 production wells were installed and designed to produce brine from 450- and 650-meters depth, depending on the location in the salar. The expansion wells fill in the space between existing northern and southern wellfields in the center of the salar.

Stage 2 development is designed with a substantial increase in the evaporation pond area with the addition of 9 km^2 of new ponds.

A second 25,000 tpa processing plant is completing construction to increase the cumulative annual production to 42,500 tpa LCE. The Olaroz 2 process plant design is based upon the original Stage 1 plant but with improved equipment selection and processing design optimizations based on gained operating experience.

Operation of the Stage 1 plant since 2015 has allowed optimization of many activities and systems in plant operation, with improved operational procedures and performance. Operation since 2015 has proven that the process is reliable and meets product market quality requirements.

1.5 Mineral Resource Estimates

The current June 30, 2023, Mineral Resource estimation is the most recent estimate, and supersedes previous estimates which include:

- A March 27, 2023, estimate released in a JORC announcement.
- An April 2022 NI 43-101 resource estimate technical report.
- The 2011 NI 43-101 feasibility study technical report.

The April 2022 Resource update was the first resource estimate since the resource estimate contained in the 2011 feasibility study technical report containing engineering details of Olaroz. The April 2022 estimate resulted in a substantial expansion in the resource base at Olaroz from 6.4 Mt LCE in the 2011 resource to a total of 16.1 Mt LCE. The updated resource included 5.1 Mt of Measured Resources and 4.6 Mt of Indicated Resources, with the remaining 6.4 Mt classified as Inferred resource. The Inferred resource is below 650 m depth and outside the area of 1 km spaced production (rotary) drilling areas, additional work is needed to upgrade these areas in the future.

The lithium grade of the measured resource (0-200 m depth) in the center of the Olaroz Salar is 774 mg/l, with the underlying Indicated resource (200-650 m depth) 747 mg/l. This is the area of current and planned Stage 2 brine production. The Inferred resource underlies and surrounds the M&I Resources, with a grade of 596 mg/l.

Resource estimated since 2011 were defined to the base of the basin, as defined by the gravity geophysics. No holes drilled to date have intersected the basement rocks.

The 2011 resource defined as part of the original project feasibility study defined a lithium carbonate (LCE) resource to a depth of 200 m depth. Production wells were subsequently installed to 200 m depth for stage 1 production.

1.5.1 Resource Update effective 30 June 2023

The March 2023 Resource update resulted in an incremental increase in the resource base at Olaroz, with the addition of the Maria Victoria property. The resource was reclassified in June 2023 (documented in this report), based on the results of pumping from Stage 2 wells, with the conversion of a significant part of the indicated resources to measured status. Currently measured resources consist of 11.5 Mt lithium carbonate equivalent (LCE) [previously 7.3 Mt in March 2023], 3.8 Mt [previously 7.1 Mt] of indicated resources, and 7.2 Mt of inferred resources of LCE [previously 6.0 Mt].

Measured resources are defined to cover the entire salar area to a minimum 200 m depth, as exploration drilling was originally conducted across the salar area to 54 m and 200 m depth. The deeper extension of the measured resource is based on the drill hole depth, with the resource 650 m depth in the east of the salar and 450 m deep in the west, where drill holes are shallower. Measured resources are defined to 350 m depth around holes drilled in the Maria Victoria property, in the north of Olaroz.

Lithium brine beneath the measured resource, to 650 m depth, is classified as Indicated, around the western edge of the salar. From 200 to 350 m below surface in the north of the salar (with lesser drilling density), outside the 2.5 km radius of influence of drilling in the Maria Victoria property, and south of the salar around hole E26 are also classified as Indicated Resources.

Inferred mineral resources are defined between 350 m and 650 m in the north of the salar, where there is less drilling. Inferred resources are also defined between 650 m and the base of the basin. The base of the basin is defined by the gravity geophysical survey, with areas significantly deeper than 650 m defined.

The lithium grade of the measured resource (0-650 m and less in the west of the salar) in the salar is 659 mg/l Li, with the underlying Indicated resource (200-650 m and 200 to 350 m) averaging 592 mg/l Li. This is the area of current Stage 2 brine production. The inferred resource underlies and surrounds the M&I resources, having a grade of 581 mg/l Li for the resource from 350 to 650 m and 655 mg/l for the resource below 650 m. Extension of the resource to the south has increased the resource size but also added sediments with excellent porosity and permeability characteristics, although this has reduced the lithium grade of the resource slightly.

This report contains an update of the Olaroz resource estimated to the base of the basin, as defined by a gravity geophysical survey. The basement surface is an underestimate of the actual depth of the basement, as it has been exceeded by drill holes in multiple locations, including drill hole E01 deep hole to 1,408 m depth. No holes drilled to date have intersected the basement rocks. The deeper part of the basin and extensions of the brine beneath adjacent areas of gravel allow for potential further expansion of production capacity in a third stage of the Olaroz lithium facility beyond 42,500 tonnes per annum. However, it is anticipated this third stage would utilize brine that has not yet been quantified in the north of the Olaroz salar (salar).

This resource update is the first to include resources that are defined outside the surface of the salar (around E26), and it is expected that additional resources will be defined to the north and south of the salar in the future with additional exploration. Exploration carried out by Allkem and Advantage Lithium demonstrated brine at potential economic concentrations continues over extensive areas south of Olaroz, underneath the Archibarca alluvial fan (area of gravels), towards Allkem's Cauchari Resource, and north beneath the Rosaria delta and surrounding alluvium.

Sediments beneath the salar comprise aquifers with different porosities and permeabilities. The surface outline of the salar is used to delimit the majority of the area of the resource estimate, which is larger than the 2011 Resource. The current resource includes a southern extension where hole E26 has been drilled off the salar and covers some small properties east of and outside the main body of the properties, for a combined total of 148 km^2. The brine-saturated sediments are known to extend beneath alluvial sediments surrounding the salar but to date, insufficient drilling has been carried out in these areas to support resource estimation there. The resource estimate is limited laterally by the property boundaries with minority property owners (Lithium Americas Corp and other owners) in the salar to the east and north of the properties owned by Allkem and SDJ.

1.5.2 Inputs and Estimation Methodology

The distribution of lithium and other elements was estimated for this estimate and previous superseded models from April 2022 and March 27, 2023, from point sampling data from the upper 200 m of the model where samples are typically spaced every 6 m in the 200 m holes and 3m or less in the 54 m holes. Below the upper 200 m, the resource was estimated based on the pumped samples from the production wells, with a single average value per hole representing the average pumped value, assigned to the screen intervals from which the hole was pumped.

1.5.3 Resource Classification

The block model was constructed with 500 m wide by 500 m length by 20m depth blocks, with blocks only reported inside of the resource area for the portion of the block within the salar outline. The resource estimate was undertaken using Datamine software with variograms developed for the point samples from the upper 200 m. Estimation was undertaken using ordinary kriging. Ordinary kriging is the most commonly used kriging method.

The resource (Table 1-2 and Table 1-3) was estimated using 4 passes with expanding search parameters for the search strategy. The results of the first two passes are nominally equated to blocks classified as measured and indicated, with the latter two passes equating to blocks classified as Inferred.

- The measured Resources are defined to 200 m across the salar, based on historical exploration drilling. Below 200 m depth they are within 2.5 km of E-series and PE-series (in Maria Victoria) production wells and earlier drilling, extending to 650 m depth in the east of the resource area, shallowing to 450 m in the west. In the north of the salar the Measured Resource is restricted to 350 m depth, around the PE-series holes.
- Indicated resources are within 2.5 km of the E26 production well south off the salar and 5 km of the deeper E-series wells and 2.5 km of the PE-series wells overlapping diameters of influence in the north of the salar. Here Indicated Resources are defined to a depth of 350 m (corresponding to the depth of PE-series wells in the Maria Victoria property). These resources are all defined within a tight polygon outline around the salar limit.
- Inferred resources are defined below Indicated resources (below 350 m) in the north of the salar, with minor peripheral blocks of Inferred resources in the south of the resource, external to hole E26. Future drilling is expected to significantly increase the classification of Measured and Indicated resources.

The Resource is presented below inclusive and exclusive of Reserves. Because no Reserve has yet been defined for the Olaroz project, the inclusive and exclusive Resource table are alike.

Table 1-2 - Summary of Brine Resources, Exclusive of Mineral Reserves, effective June 30, 2023.

Category	Total Lithium (Million Tonnes) (3)	Total Li_2CO_3 Equivalent (Million Tonnes) (3)	Average Li (mg/L)	Attributable Lithium (Million Tonnes) (4)	Attributable Li_2CO_3 Equivalent (Million Tonnes) (4)
Measured	**2.17**	**11.54**	**659**	**1.57**	**8.33**
Indicated	**0.72**	**3.83**	**592**	**0.50**	**2.66**
Total Measured and Indicated	**2.89**	**15.38**	**641**	**2.06**	**10.99**
Inferred	**1.36**	**7.25**	**609**	**1.11**	**5.88**

1. S-K §229.1300 definitions were followed for Mineral Resources.
2. The Qualified Person for these Mineral Resource estimates is an employee of Hydrominex Geoscience set forth herein for Olaroz.
3. Total numbers are representative at 100% basis.

4. Numbers are reported on an attributable basis. Olaroz is managed through the operating joint venture company "SDJ", which is owned 66.5% by Allkem, 25% by TTC and 8.5% by JEMSE. In addition to its stake in SDJ, Allkem also owns 100% of six properties immediately in the north of Olaroz, these properties are reported on a 100% basis.
5. Comparison of values may not add up due to rounding or the use of averaging methods.
6. Lithium is converted to lithium carbonate (Li_2CO_3) with a conversion factor of 5.323.
7. The estimate is reported in-situ and exclusive of Mineral Reserves, where the lithium mass is representative of what remains in the reservoir after the LOM. To calculate Resources exclusive of Mineral Reserves, a direct correlation was assumed between Proven Reserves and Measured Resources, as well as Probable Reserves and Indicated Resources. Proven Mineral Reserves (from the point of reference of brine pumped to the evaporation ponds) were subtracted from Measured Mineral Resources, and Probable Mineral Reserves (from the point of reference of brine pumped to the evaporation ponds) were subtracted from Indicated Mineral Resources. The average grade for Measured and Indicated Resources exclusive of Mineral Reserves was back calculated based on the remaining brine volume and lithium mass.
8. Note that the resource above has been depleted for the historical well production which is approximately 0.291 million tonnes of lithium carbonate equivalent (LCE). 0.286 million tonnes of LCE were depleted from measured resource and 0.005 million tonnes of LCE was depleted from indicated resource (associated with the accumulative production of well E-26).
9. The cut-off grade used to report Olaroz is 300 mg/l.
10. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability, there is no certainty that any or all of the Mineral Resources can be converted into Mineral Reserves after application of the modifying factors.
11. As of June 30, 2023, no estimated mineral reserves have been developed for Olaroz in accordance with Item 1302 of Regulation S-K.

Table 1-3 - Summary of Brine Resources, Inclusive of Mineral Reserves, effective June 30, 2023.

Category	Total Lithium (Million Tonnes) (3)	Total Li_2CO_3 Equivalent (Million Tonnes) (3)	Average Li (mg/L)	Attributable Lithium (Million Tonnes) (4)	Attributable Li_2CO_3 Equivalent (Million Tonnes) (4)
Measured	2.17	11.54	659	1.57	8.33
Indicated	0.72	3.83	592	0.50	2.66
Total Measured and Indicated	2.89	15.38	641	2.06	10.99
Inferred	1.36	7.25	609	1.11	5.88

1. S-K §229.1300 definitions were followed for Mineral Resources.
2. The Qualified Person for these mineral resource estimates is an employee of Hydrominex Geoscience set forth herein for Olaroz.
3. Total numbers are representative at 100% basis.
4. Numbers are reported on an attributable basis. Olaroz is managed through the operating joint venture company "SDJ", which is owned 66.5% by Allkem, 25% by TTC and 8.5% by JEMSE. In addition to its stake in SDJ, Allkem also owns 100% of six properties immediately in the north of Olaroz, these properties are reported on a 100% basis.
5. Comparison of values may not add up due to rounding or the use of averaging methods.
6. Lithium is converted to lithium carbonate (Li_2CO_3) with a conversion factor of 5.323.
7. Note that the resource above has been depleted for the historical well production which is approximately 0.291 million tonnes of lithium carbonate equivalent (LCE). 0.286 million tonnes of LCE were depleted from measured resource and 0.005 million tonnes of LCE was depleted from indicated resource (associated with the accumulative production of well E-26).
8. The cut-off grade used to report Olaroz is 300 mg/l.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability, there is no certainty that any or all of the Mineral Resources can be converted into Mineral Reserves after application of the modifying factors.
10. As of June 30,2023, no estimated Mineral Reserves have been developed for Olaroz in accordance with Item 1302 of Regulation S-K.

1.6 Capital and Operating Cost Estimates

Certain information and statements contained in this section and the report are forward-looking in nature. Actual events and results may differ significantly from these forward-looking statements due to various risks, uncertainties, and contingencies, including factors related to business, economics, politics, competition, and society. All forward-looking statements in this Report are necessarily based on opinions and estimates made as of the date such statements are made and are subject to important risk factors and uncertainties, many of which cannot be controlled or predicted. Olaroz stands as an operating mine, and the capital cost does not consider expenditures that have already been absorbed by Allkem in the prior development phases, also called sunk cost. Ongoing capital outlays unrelated to the direct Olaroz 2 operation are not considered.

1.6.1 Capital Cost for Stage 2

The Olaroz 2 expansion construction progress reached 99.5% completion as of 30 June 2023.

Capital investment, up to mechanical completion, for Olaroz Stage 2, including equipment, materials, indirect costs, and contingencies during the construction period was estimated to be US$ 425 million. Out of this total Direct Project Costs represent US$ 393 million; Indirect Project Costs represent US$ 31.6 million. All budget cost has been expensed as of June 30, 2023, when Olaroz achieved substantial mechanical completion. Table 1-4 details the Capital Cost.

Table 1-4 - Capital Expenditures: Stage 2.

Description	Capital Intensity (US$ / t Li_2CO_3)	CAPEX Breakdown US$ m
Direct Costs		
Wells	1,061	27
Brine Handling	1,068	27
Evaporation Ponds	3,907	98
Liming Plants	1,126	28
LCP & SAS	6,163	154
BOP	1,308	33
Camps	1,104	28
Total Direct Cost	**15,737**	**393**
EPCM	**830.**	**21**
Owner Costs	**433**	**11**
TOTAL CAPEX	**17,000**	**425**

The total sustaining and enhancement capital expenditures for Olaroz over the total Life of Mine (LOM) period are shown in the Table 1-5 and includes both Stages 1 and 2. Sustaining capital includes pond harvesting, well maintenance, plant maintenance, operations improvements, and license to operate items. Enhancement capital includes well field, pond, and process capital to maintain or improve operations performance.

Table 1-5 - Sustaining and Enhancement CAPEX (Stage 1 and 2).

Description	US$ / t Li_2CO_3 (LOM)	Total LOM US$ m	Total Year* US$ m
Enhancement CAPEX	85	111	-
Sustaining CAPEX	388	508	16
Total	**472**	**619**	**16**

* Long Term estimated cost per year

1.6.2 Operating Costs Basis of Estimate

The operating costs estimate for Olaroz was updated by Allkem's management team. Most of the operating costs are based on labor and consumables that are in use at Olaroz operation.

Table 1-6 provides a summary of the estimated cost by category for a nominal year of operation.

Table 1-6 - Operation Cost: Summary.

Description	US$ / t Li_2CO_3 (LOM)	Total LOM US$ m	Total Year* US$ m
Variable Cost	2,467	3,233	100
Fixed Cost	1,682	2,205	69
TOTAL OPERATING COST	**4,149**	**5,438**	**169**

* Long Term estimated cost per year

The indicated capital and operational costs accurately reflect the incurred and future expected costs for Olaroz 2 and can be utilized for economic analysis.

1.7 Economic Analysis

Certain information and statements contained in this section and in the report are forward-looking in nature. Actual events and results may differ significantly from these forward-looking statements due to various risks, uncertainties, and contingencies, including factors related to business, economics, politics, competition, and society. All forward-looking statements in this Report are necessarily based on opinions and estimates made as of the date such statements are made and are subject to important risk factors and uncertainties, many of which cannot be controlled or predicted.

1.7.1 Market Studies

The QPs have relied on external market consultants Wood Mackenzie for lithium market related demand and price predictions. The lithium supply chain is expected to remain restricted in the short term (2-3 years) with gradual growth in supply in response to growing demand. This is expected to provide a positive price environment for the Olaroz Stage 2 Project.

There is a 3 percent mine mouth (boca de mina) royalty on the value of production to the provincial Jujuy government, considered the value of the brine after the deduction of the costs of extraction, processing and transportation. There is an export fee of 4.5% on the FOB price, as regulated by Decree Nr. 1060/20.

In addition to the royalty JEMSE, the Jujuy provincial mining body holds an 8.5% interest in the Olaroz lithium facility, which is to be paid back from their share of Olaroz profit. There are no other royalties, back-in rights, remaining payments, or encumbrances on the Allkem JV or 100% owned Olaroz Lithium properties.

The Olaroz lithium facility permitting process addressed community and socio-economic issues. The Olaroz expansion will provide new employment opportunities and investment in the region, which is expected to be positive.

1.7.2 Economic estimate

Olaroz Stage I production will reach nominal capacity of 17,500 metric tons per year (t/yr) of lithium carbonate once all enhancement projects are completed. Olaroz Stage 2 expansion is expected to support a production rate of 25,000 metric tons per year (t/yr) of lithium carbonate for an estimated operational life of approximately 32 years. This would result in the production of approximately 543,030 dry metric tons (dmt) of saleable lithium carbonate. When considering both Stage 1 and 2, the total saleable product is estimated to be 1,310,670 dmt of lithium carbonate for the Life of Mine (LOM).

- Product Quality: The saleable product for Stage 2 is expected to be of technical grade. However, it's important to note that the Stage 1 includes both Technical and battery-grade lithium carbonate.
- Pre-Tax Net Present Value (NPV): The pre-tax NPV@10% is estimated to be US$ 7,145 million.
- Post-Tax Net Present Value (NPV): After considering applicable taxes, the post-tax NPV@10% is estimated to be US$ 4,644 million.
- Life of Mine (LOM) Operating Cost: The estimated operating cost over the life of the mine (LOM) is projected to be US$ 4,149 per metric ton of lithium carbonate produced.

In conclusion, the financial analysis of Olaroz Stage 1 and 2 demonstrates promising results, with substantial net present values and robust projected revenue and operating cash flow figures.

The key metrics are summarized in Table 1-7. Summary of LOM annual financial projection.

Table 1-7 - Base Case Main Economic Results (100% Attributable basis)

Summary Economics		
Production		
LOM	yrs	32
First Production Stage 2	Date	Q3 CY23
Full Production Stage 2	Date	2024
Capacity Stage 1 + 2 (Stage 2)	tpa	42,500
Investment		
Capital Investment Stage 2 (Initial)	US$m	425
Sustaining Investment Stage 1 + 2 (per year)	US$m per year	16
Development Capital Intensity (Stage 2)	US$/tpa Capacity	17,000
Cash Flow		
Operating Costs	US$/t LCE	4,149
Avg Sale Price	US$/t LCE	24,798
Financial Metrics		
NPV @ 10% (Pre-Tax)	US$m	7,145
NPV @ 10% (Post-Tax)	US$m	4,644
NPV @ 8% (Post-Tax)	US$m	5,546
IRR (Pre-Tax)	%	NA
IRR (Post-Tax)	%	NA
Payback from production start	yrs	NA
Tax Rate	%	35%

1.7.3 Sensitivity Analysis

The sensitivity analysis examined the impact of variations in commodity prices, production levels, capital costs, and operating costs on Olaroz's NPV at a discount rate of 10%.

The commodity price has the most significant impact on Olaroz's NPV, followed by production levels, OPEX, and CAPEX. Price emerges as the most influential factor with a high correlation. Even under adverse market conditions, such as unfavorable price levels, increased costs, and investment challenges, Olaroz Stage 1 and 2 remains economically viable.

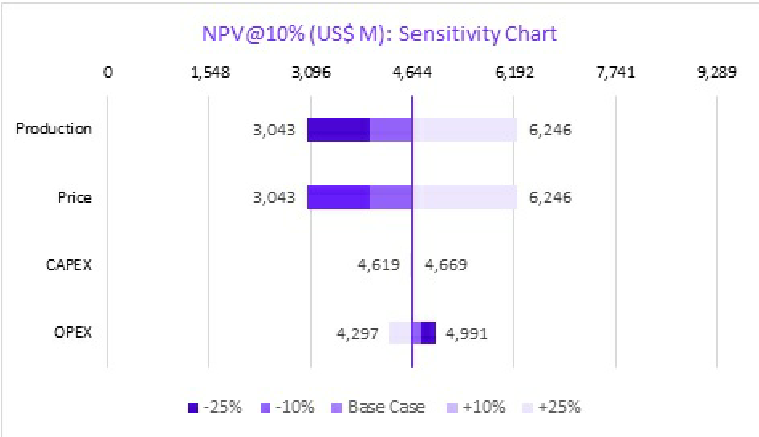


Figure 1-1 Sensitivity Chart

Based on the assumptions detailed in this report, the economic analysis of Olaroz Stage 1 and 2 demonstrates positive financial outcomes. The sensitivity analysis further strengthens Olaroz's viability, as it indicates resilience to market fluctuations and cost changes.

1.8 Conclusions and QP Recommendations

Olaroz hosts a large lithium resource to support Stages 1 and 2. Additional exploration is likely to define additional resources north and south of the existing resources. Olaroz has an operating history from 2013 and a proven lithium production process. There is potential for the expansion of Olaroz and improvement of efficiencies and synergies with expansion and this is currently under evaluation to meet rising market demand.

The study concludes that the operating Olaroz 1 and Olaroz 2 expansion represents economic feasibility. The Olaroz 1 plant has proven effective process design and saleable product quality to support the economic evaluation.

The collected data and models are deemed reliable and adequate to support the Mineral Resource estimate, cost estimates, and the indicated level of study.

The authors recommend monitoring wells be installed for ongoing evaluation of long-term changes in brine levels and brine concentrations to further support and refine long-term economic feasibility. Further exploration drilling is recommended before any further production expansions.

1.9 Revision Notes

The report was prepared by the QPs listed herein.

This individual Technical Report is the initial report to be issued under the S-K §229.1300 regulations and, therefore, no revision note is attached to this individual Technical Report.

2. INTRODUCTION

This section provides context and reference information for the remainder of the report.

2.1 Terms of Reference and Purpose of the Report

This Technical Report Summary was prepared in accordance with the requirements of Regulation S-K, Subpart 1300 of the SEC.

Technical information is provided to support the Mineral Resource Estimate for Allkem's operations in Sal de Vida, including conducted exploration, modeling, processing, and financial studies. The purpose of this Technical Report Summary is to disclose Mineral Resources and related economic extraction potential.

The Olaroz lithium facility is located in the Olaroz Salar, in the Puna region of the province of Jujuy, at an altitude of 3900m above sea level, 230 km northwest of the capital city of Jujuy. Olaroz site is adjacent to the paved highway RN52 which passes through the international border with Chile, 50 km to the northwest (Jama Pass), continuing to the major mining center of Calama, and the port of Mejillones, near Antofagasta in northern Chile.

Allkem holds an extensive property position across the Olaroz Salar. Refer to Section 3. At Olaroz, Allkem owns 66.5% of properties via SDJ a joint venture company with TTC (25%) and JEMSE (8.5%), and other properties at the north of Olaroz via La Frontera Minerals and Olaroz Lithium. Allkem holds additional properties on the western and eastern sides of the Cauchari Salar, which is a southern continuation of the Olaroz Salar.

An estimate of the Olaroz resource was undertaken in 2011 as part of the Olaroz Feasibility Study, prior to commencement of construction of Stage 1 of the Olaroz Lithium Facility. The estimate identified a Measured and Indicated Resource of 6.4 Mt of LCE over an area of 93 km^2 from surface to a maximum depth of 200 m (the 2011 Resource). Subsequent to development of Olaroz Stage 2 Project additional drilling has been conducted, resulting in the resource update outlined in this report.

This report has been prepared in conformance with the requirements of the SK Regulations. This individual Technical Report is the initial report to be issued in support of Allkem's listing on the New York Stock Exchange (NYSE).

The report was amended to include additional clarifying information in October 2023 and November 2023. The basis of the report is unchanged. The changes and their location in the document are summarized as follows:

- Amended date added to title page
- Change in reference to the decree regulating export fees (Chapter 1.7.1)
- Final forecast recovery (Chapter 10.4)

- QP Statement on the adequacy of metallurgical testing data (Chapter 10.5)
- QP Statement on Environmental Compliance and closing and reclamation costs (Chapter 17)
- Additional information regarding production quantities (Chapter 13.1)
- Additional information regarding the calculation of the cut-off grade (Chapter 11.6)
- Clarification regarding the accuracy of estimates (Chapter 18)
- Additional economic information regarding key assumptions and LOM totals (Chapter 19.2)
- A minor reduction in commercial expenses with a minor positive impact on net present value (Chapter 1.7.2, Chapter 19.3, Chapter 19.5)
- Change in cut-off grade calculation (Chapter 11.6.1)
- Minor typos and non-material fixes

2.2 Qualified Persons and Site Visits

2.2.1 Qualified Persons

The following served as the Qualified Persons for this Report in compliance with 17 CFR § 229.1300:

- Mr. Murray Brooker of Hydrominex Geoscience; and
- Mr. Mike J. Gunn of Gunn Metallurgy.

The QPs have prepared this Report and take responsibility for the contents of the Report as set out in Table 2-1.

Table 2-1 - Chapter Responsibility.

REPORT CHAPTERS		Qualified Persons
1	Executive Summary	All
2	Introduction	Employee of Hydrominex Geoscience
3	Project Property Description	Employee of Hydrominex Geoscience
4	Accessibility, Climate, Local Resources, Infrastructure, Physiography	Employee of Hydrominex Geoscience
5	History	Employee of Hydrominex Geoscience
6	Geological Setting and Mineralization and Deposit Types	Employee of Hydrominex Geoscience
7	Exploration	Employee of Hydrominex Geoscience
8	Sample Preparation, Analyses and Security	Employee of Hydrominex Geoscience
9	Data Verification	Employee of Hydrominex Geoscience
10	Mineral Processing and Metallurgical Testing	Employee of Gunn Metallurgy
11	Mineral Resource Estimates	Employee of Hydrominex Geoscience
12	Mineral Reserve Estimates	All
13	Mining Methods	Employee of Hydrominex Geoscience
14	Processing and Recovery Methods	Employee of Gunn Metallurgy
15	Project Infrastructure	Employee of Gunn Metallurgy
16	Market Studies and Contracts	Employee of Gunn Metallurgy
17	Environmental Studies, Permitting, and Social or Community Impact	Employee of Hydrominex Geoscience
18	Capital and Operating Costs	Employee of Gunn Metallurgy
19	Economic Analysis	Employee of Gunn Metallurgy
20	Adjacent Properties	Employee of Hydrominex Geoscience
21	Other Relevant Data and Information	Employee of Hydrominex Geoscience
22	Interpretation and Conclusions	All
23	Recommendations	All
24	References	All
25	Reliance on Information Supplied by the Registrant	All

Mr. Murray Brooker from Hydrominex Geoscience is a Member of the Australian Institute of Geoscientists (AIG), a Registered Professional Geoscientist in Australia (RPGeo) and a member of the International Association of Hydrogeologists (IAH). Mr. Brooker is an independent consultant to the lithium industry and a Qualified Person (QP) as defined by 17 CFR §229.1300. Mr. Murray Brooker has worked extensively on lithium and potash salt lakes since the beginning of 2010, working on projects in Argentina, Chile, Australia, and China. His roles have included acting as a consultant for lithium producers, providing advice on wellfield development, undertaking, and managing drilling projects, installing exploration and production wells for lithium extraction, undertaking geological modelling, and supervising the development of groundwater models and the definition of lithium Resources and Reserves. Mr. Brooker is not an employee of or otherwise affiliated with Allkem.

Mr. Gunn is a Chartered Professional Fellow of the Australasian Institute of Mining and Metallurgy (MAusIMM). Mr. Gunn is an independent consultant to the lithium industry and a Qualified Person (QP) as defined by 17 CFR §229.1300. Mr. Michael Gunn holds a B.App.Sc. in Metallurgy from UNSW, Australia, and has 45 years of work experience in the mineral processing industry, specializing in mineral processing operations and process design. Work has been undertaken in a wide range of metals with large and small mining houses in both line operational roles and as a design or project commissioning consultant. Feasibility study and process design skills were gained working in various roles with major engineering and consulting groups. A broad range of mineral processing and hydrometallurgy design and process consulting assignments have been completed overseas and in Australia. Mr. Gunn is not an employee of or otherwise affiliated with Allkem.

Allkem is satisfied that the QPs meet the qualifying criteria under 17 CFR § 229.1300.

2.2.2 Site Visits

Mr. Brooker is familiar with the Olaroz lithium facility area and has visited Olaroz many times prior to 2020. He last visited Olaroz on November 21, 2022. During the various site visits, he toured the general areas of mineralization, infrastructure, and the drill sites. Additionally, the visits included inspection of core, cutting, logs and additional geological and hydrological information, and the review of the pumping systems.

Mr. Gunn is familiar with the Olaroz lithium facility area and has visited Olaroz many times prior to 2020. His last visit to the Olaroz site was during 2023. During the visit he reviewed the existing infrastructure, evaporation ponds, current carbonate plant and the stage 2 construction progress. Additionally, he had meetings with Olaroz technical staff related to the current process of the plant and reviewed the differences with stage two.

2.3 Effective Date

The Effective Date of this report of the Mineral Resource and Reserve estimates is June 30, 2023.

2.4 Previous Technical Reports

This SEC Technical Report Summary is the first that has been prepared for the Olaroz Lithium Facility . Thus, this report is not an update of a previously filed Technical Report Summary under the SK Regulations.

Other relevant technical reports for Olaroz, were Canadian National Instrument (NI) 43-101 compliant report titled: "Olaroz Resource Update April 2022, Olaroz Lithium Facility Stage 2 Technical Study, dated April 4th, 2022", prepared by Brooker and Gunn and filed with the Canadian Securities Exchange System for Electronic Document Analysis and Retrieval (SEDAR).

2.5 Sources of information

Extensive information is available at Olaroz from drilling dating back to 2008, when exploration for lithium commenced on the Olaroz Project. There is also extensive reported information available further to the south, conducted by Allkem subsidiary South American Salars (SAS) and to the west by Lithium Americas Corp. The geology in these areas appears very similar to that encountered on Olaroz . Reports referred to include:

- Technical Report: Olaroz Resource Update April 2022, Olaroz Lithium Facility Stage 2 Technical Study, dated April 4th, 2022", prepared by Brooker and Gunn.
- Prefeasibility Study of the Cauchari JV Lithium Project Jujuy Province, Argentina. Report prepared by Worley Parsons and FloSolutions (Chile) for Advantage Lithium Corp. October 22, 2019.
- Olaroz Project Large Exploration Target Defined Beneath Current Resource. Orocobre news release October 23, 2014.
- The Evaluation of Brine Prospects and the Requirement for Modifications to Filing Standards. Houston et. al., 2011. Economic Geology V106 pp 1225-1239.
- Technical Report on the Olaroz Salar Lithium-Potash Project Jujuy Province, Argentina. NI 43-101 report prepared for Orocobre Ltd. by John Houston and Mike Gunn, May 13, 2011.

Additional more general information has been obtained from public data sources such as maps produced by the Argentine Geological Survey (Servicio Geológico Minero Argentino [SEGEMAR]), satellite imagery from sources such as Google Earth, and published scientific papers in geological journals by Argentine and international scientists.

2.6 Specific Characteristics of Lithium Brine Projects

Although extensive exploration and development of new lithium brine projects has been underway for the last decade it is important to note there are essential differences between brine extraction and hard rock (spodumene) lithium, base metal, industrial mineral, or precious metal mining. Brine is fluid hosted in an aquifer and thus can flow and mix with adjacent fluids once pumping of the brine commences. An initial in-situ resource estimate is based on knowledge of the geometry of the aquifer, and the variations in porosity and brine grade within the aquifer.

Brine deposits are exploited by pumping the brine to the surface and extracting the lithium in a specialist production plant, generally following brine concentration through solar evaporation in large evaporation ponds. To assess the recoverable reserve, further information on the permeability and flow regime in the aquifer and the surrounding area is necessary to be able to predict how the lithium contained in brine will change over the Olaroz life. These considerations are examined more fully in Houston et. al., (2011) and in the Canadian Institute of Mining (CIM) and Joint Ore Reserve Committee (JORC) (Australia) brine reporting guidelines. The reader is referred to these key publications for further explanation of the details of brine deposits.

Hydrogeology is a specialist discipline which involves the use of specialized terms which are frequently used throughout this document. The reader is referred to the glossary for definition of terms.

2.7 Units of Measure & Glossary of Terms

2.7.1 Currency

Units in the report are metric. The currency is the US dollar, unless otherwise mentioned.

2.7.2 Units and Abbreviations

Table 2-2 lists the abbreviations employed in this report, while Table 2-3 lists the units employed.

Table 2-2 - Acronyms and Abbreviations.

Abbreviation	Definition
AA	atomic absorption
AACE	Association for the Advancement of Cost Engineering
AISC	all-in sustain cost
AMC	Argentina Mining Code
Andina	Andina Perforaciones S.A.
BG	battery-grade
CAGR	Compound annual growth rate
CAPSA	Compañía Argentina de Perforaciones S.A.
CIM	Canadian Institute of Mining, Metallurgy and Petroleum
CRP	Community Relations Plan
DCF	discounted cashflow
DIA	Environmental Impact Assessment (Declaración de Impacto Ambiental)
EIR	Environmental Impact Report
Energold	Energold Drilling Inc.
ERH	Evaluation of Hydric Resources (Evaluación de Recursos Hidricos)

Abbreviation	Definition
ESS	stationary energy storage
EV	electric vehicles
EVT	evapotranspiration
FEED	Front End Engineering Design
FOB	free on board
G&A	General and Administrative
GBL	gamma-butyrolactone solvent
GHB	general head boundary
GIIP	Good International Industry Practice
GLSSA	Galaxy Lithium (Sal de Vida) S.A.
GRI	Global Reporting Initiative
Hidroplus	Hidroplus S.R.L.
HSECMS	Health, Safety, and Environmental Management System
ICP	inductively coupled plasma
IRR	Internal rate of return
IX	ion exchange
JORC	Joint Ore Reserve Committee (Austraila)
KCl	potassium chloride
Kr	hydraulic conductivity in the radial (horizontal) direction
Kz	hydraulic conductivity in the vertical direction
LC	lithium carbonate
LCE	lithium carbonate equivalent
LFP	lithium-iron-phosphate
Li	lithium
LOM	life of mine
MCC	motor control centre
NI	Canadian National Instrument
NVP	net present value
NaCl	Halite Salts
OSC	Ontario Securities Commission
OIT	Operator interface terminal
PG	Primary grade
PPA	power purchase agreement
QA/QC	quality assurance/quality control
QP	Qualified Person
RO	reverse osmosis
RC	reverse circulation
SRM	standard reference material
SX	solvent extraction
TDS	total dissolved solids
TG	technical grade
VFD	variable frequency drive

Table 2-3 - Units of Measurement.

Unit	Description
°C	degrees Celsius
%	percent
AR$	Argentinean peso
US$	United States dollar
dmt	dry metric tonnes
g	grams
GWh	Gigawatt hours
ha	hectare
hr	hour
kg	kilogram
L	litres
l/min	litres per minute
l/s	litres per second

Unit	Description
l/s/m	litres per second per metre
kdmt	thousand dry metric tonnes
km	kilometre
km2	square kilometers
km/hr	kilometre per hour
ktpa	kilotonne per annum
kVa	kilovolt amp
M	million
m	meters
m2	square metre
m3	cubic meters
m3/hr	cubic meters per hour
m bls	meters below land surface
m btoc	meters below top of casing
m/d	meters per day
min	minute
mm	millimeter
mm/a	millimeters annually
mg	milligram
Mt	million tonnes
MVA	megavolt-ampere
ppm	Parts per million
ppb	parts per billion
t	tonne
s	second
Sy	Specific yield or Drainable Porosity unit of porosity (percentage)
Ss	Specific Storage
tpa	tonnes per annum
µm	micrometer
µS	microSeimens
V	volt
w/w	weight per weight
wt%	weight percent
yr	year

3. Property Description

3.1 Property Location, Country, Regional and Government Setting

Olaroz (latitude 23° 27’ 46.54” South, longitude 66° 42’ 8.94” West, Gauss Kruger, POSGAR 2007, Zone 3) is located 230 kilometers northwest of the capital city San Salvador de Jujuy in the province of Jujuy at 3,900 m altitude, adjacent to the paved international highway (RN52) that links the San Salvador de Jujuy with ports in the Antofagasta region of Chile. Refer to Figure 3-1.

The joint venture holds mineral properties that cover the majority of the Salar de Olaroz, covering 47,615 ha, consisting of 33 mining tenements and 2 exploration properties (“cateos”). Allkem commenced exploration at Olaroz in 2008 and has been extracting lithium since 2013 and producing lithium carbonate since 2015 from the Stage 1 operations of Olaroz. Further, in July of 2023, Allkem achieved first production from the Stage 2 operations of Olaroz.

In addition to its stake in SDJ, Allkem also owns 100% of six properties immediately in the north of Olaroz, which contribute an additional 9,575 ha. The properties in the far north of the salar and over gravel sediments of the Rosario River delta and surrounding alluvial material are interpreted to overlie a deeper extension of the salar. In addition to those six properties, Allkem has also acquired the Maria Victoria property in the north of Olaroz, which contribute an additional 1,800 ha.

None of these six wholly owned Allkem properties are in production. Further exploration drilling and test work is planned to confirm the scale of lithium potential of these properties.

The Olaroz lithium facility site is adjacent to the paved highway RN52 which passes through the international border with Chile, 50 km to the northwest (Jama Pass), continuing to the major mining center of Calama, and the port of Mejillones, near Antofagasta in northern Chile.

Approximately 35 km to the north of Olaroz there is a dehumidifying and compression station on a regional gas pipeline, reached by the N-S road along the west side of Olaroz Salar. A dedicated spur pipeline supplies gas to Olaroz.

Approximately 60 km to the south of Olaroz site a railway crosses from northern Argentina to Chile, providing potential access to several ports in northern Chile. There are several local villages within 50 km of Olaroz site and the regional administrative center of Susques (population 2,000) is within half an hour’s drive.

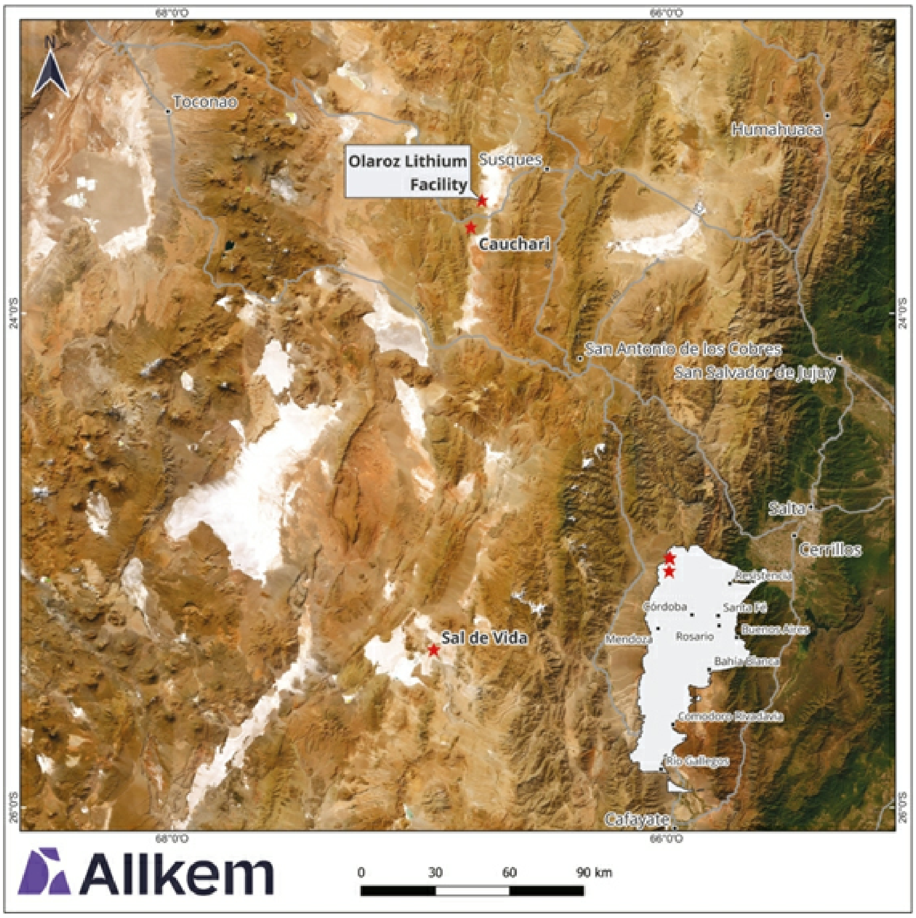


Figure 3-1 - Location of Olaroz.

3.1.1 Government Setting

Olaroz is subject to the governing laws of Argentina, and provincial laws of Jujuy province.

Olaroz is fully permitted by the provincial mining authorities and has provincial and federal permits, to allow operations. There is a 3% royalty on the value of production to the provincial government. In addition to the royalty JEMSE, the Jujuy provincial mining body holds an 8.5% interest in the Olaroz lithium facility, which is to be paid back from their share of Olaroz profit.

3.1.2 Argentinian Licensing System

Two tenement types exist in the Argentine mining regulations, Cateos and Minas. Cateos (Exploration Permits) are licenses that allow the holder to explore the tenement for a period of time that is proportional to its size. An Exploration Permit of 1 unit (500 ha) is granted for a period of 150 days. For each additional unit (500 ha) the period is extended by 50 days. The maximum allowed permit size is 20 units (10,000 ha) and which is granted for a period of 1,100 days. The period begins 30 days after granting the permit. A relinquishment must be made after the first 300 days, and a second one after 700 days. The applicant should pay a canon fee of $1,600 Argentine pesos per unit (500 ha) and submit an exploration work plan and environmental impact assessment.

Minas (Mining/exploitation Permits) are licenses which allow the holder to exploit the property (tenement) subject to regulatory environmental approval. Minas are of unlimited duration, providing the property holder meets its obligations under the Mining Code. The Olaroz properties are predominantly minas. Requirements to maintain license in good standing include:

- Paying the annual rent (canon) payments.
- Completing a survey of the property boundaries.
- Submitting a mining investment plan.
- Meeting the minimum investment commitment.

Additional details related to the properties are as follows:

- According to information provided in the applications for mining rights, all of the Olaroz properties are located on Fiscal Lands. Fiscal Lands are state-owned lands and allow for access for exploration and mining companies.
- All claims within a given property must be surveyed, and the maximum claim area is 100 ha.
- Investment Plans, including detailed expenditures, must be filed with the granting authority, which is the Jujuy province Department of Mines. The expenditure commitment detailed in the Investment Plans must be met within five years of filing the application for the properties. Twenty percent of the aggregated forecasted investments shall be incurred in each of the 1st and 2nd year of the plan.
- The Annual Mining Fee must be paid in advance, in two equal instalments due on December 31st and June 30th.
- The total required fees and expenditures are shown in Argentine pesos. The exchange rate at the close of business Friday, June 30, 2023, was 267 (seller) = US$1 dollars, as provided by the Argentine National Bank (Banco de la Nación Argentina), as published on its website (http://www.bna.com.ar/).
- An Environmental Impact Report (IIA) must be submitted and approved before exploration work commences and must be updated every 2 years.
- Investment Plans must be filed for properties.

3.1.3 Licenses and Coordinate System

The SDJ properties are shown in Figure 3-2. The property co-ordinates (and all other co-ordinates used in this report) are in the Argentine coordinate system, which uses the Gauss Krueger Transverse Mercator Olaroz Projection and the Argentine Posgar 94 datum. The properties are located in Argentine GK Zone 3.

3.2 Mineral Tenure, Agreement and Royalties

3.2.1 Surface Rights and Mineral/Surface Purchase Agreements

SDJ holds 33 mining properties covering approximately 34,307 ha and 2 exploration rights ("Cateos") covering and additional 13,308 ha. Allkem commenced exploration at Olaroz in 2008 and has been extracting lithium brine since 2013 and producing lithium carbonate since 2015 from the Stage 1 operations of Olaroz.

The mining licenses are summarized in Table 3-1 with the property names, file numbers and details of the approvals related to each of the license.

The status of properties has not been independently verified by the QPs, who take no responsibility for the legal status of the properties.

3.3 Mineral Rights and Permitting

Environmental impact reports have been submitted to allow drilling and other activities on the properties. Environmental approvals for drilling are issued for a period of 2 years and can be renewed subsequent to the original approval. Additional approvals are required for mining to begin, principally submission and approval of a comprehensive Olaroz Project EIA. The Olaroz lithium facility is fully permitted for Stage 1 (operating) and Stage 2 (under commissioning) operation and lithium production.

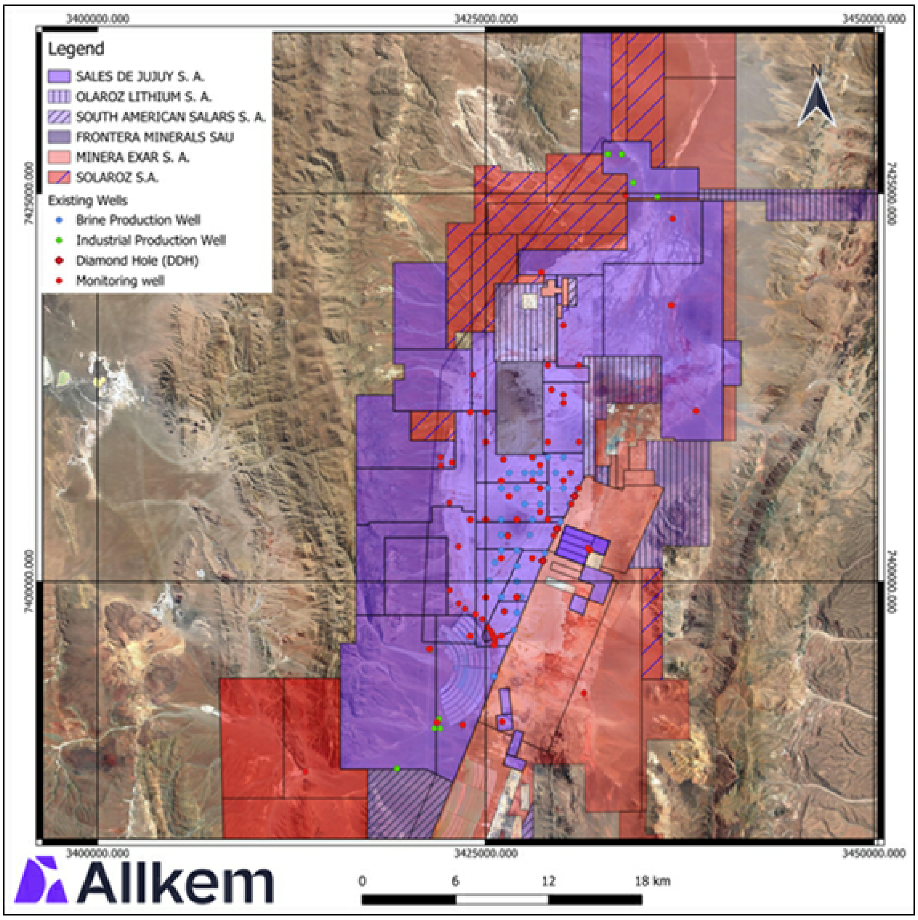


Figure 3-2 - Location of the Olaroz properties and neighboring properties.

Table 3-1 - SDJ property details.

Id.	Title		Tenure Type	Status of Concession	Minerals	Area (ha)	Community Surface Rights
	Name	File #					
1	San Antonio Norte	943-R-08	Exploitation Concession	Granted/registered14/08/12 (Resolution 12-J-2012)	Borates, Lithium, salts	563.79	Olaroz Chico
2	San Antonio Sur	944-R-09	Exploitation Concession	Granted/registered 23/07/12 (Resolution 04-J-2012)	Borates, Lithium, salts	432.06	Olaroz Chico
3	San Juan Norte	963-R-08	Exploitation Concession	Granted/registered 23/07/12 (Resolution 05-J-2012)	Borates, Lithium, salts	1,194.85	Olaroz Chico
4	San Juan Sur	964-R-09	Exploitation Concession	Granted/registered 13/07/12 (Resolution 06-J-2012)	Borates, Lithium, salts	805.07	Olaroz Chico

Id.	Title		Tenure Type	Status of Concession	Minerals	Area (ha)	Community Surface Rights
	Name	File #					
5	San Antonio Oeste I	1137-R-09	Exploitation Concession	Granted/registered 10/07/12 (Resolution 10-J-2012).	Borates, Lithium, salts	1,199.34	Olaroz Chico
6	San Antonio Oeste II	1137-R-09	Exploitation Concession	Granted/registered 23/07/12 (Resolution 09-J-2012)	Borates, Lithium, salts	1,198.58	Olaroz Chico
7	San Fermin Norte	1134-R-09	Exploitation Concession	Granted/registered 23/07/12 (Resolution 07-J-2012)	Borates, Lithium, salts	895.61	Olaroz Chico
8	San Fermin Sur	1135-R-09	Exploitation Concession	Granted/registered 23/07/12 (Resolution 08-J-2012)	Borates, Lithium, salts	1,098.86	Olaroz Chico
9	San Miguel II	945-R-08	Exploitation Concession	Not yet granted.	Borates, Lithium, salts	1,493.94	Portico de Los Ande Susques - El Toro
10	María Pedro y Juana	112-D-1944	Exploitation Concession	Granted/registeres 31.07.2002 (Resolution 154-J-2002)	Borate, Lithium and others	300.00	Olaroz Chico -Huancar
11	Santa Julia	1842-S-12	Exploitation Concession	Granted/registered 27/09/19 (Resolution 40-J-2019)	Borates, Lithium, salts	2,988.20	Olaroz Chico
12	Mercedes III	319-T-05	Exploitation Concession	Granted/registered 13/07/12 (Resolution 11-J-2012)	Borates, Lithium, salts	1,472.24	Olaroz Chico
13	La Nena	29-M-96	Exploitation Concession	Granted/registered 15/12/09 (Resolution 127-J-2009)	Borates,	99.96	Olaroz Chico
14	Demian	039-M-98	Exploitation Concession	Granted/registered 29/12/2005 (Resolution 136-J-2005)	Borates,	96.60	Olaroz Chico
15	Juan Martin	40-M-98	Exploitation Concession	Granted/registered 16/12/2009 (Resolution 31-J-2009)	Borates, lithium, and potassium	103.85	Olaroz Chico -Huancar
16	Maria Norte	393-B-44	Exploitation Concession	Granted/registered 30/09/2002 (Resolution 164-J-2002)	Borates, lithium, and potassium	99.92	Olaroz Chico
17	Analia	131-I-86	Exploitation Concession	Granted/registered 11/04/2002 (Resolution 25-J-2002)	Borates, lithium	99.92	Olaroz Chico
18	Mario	125-S-44	Exploitation Concession	Granted/registered 16/07/1996 (Resolution 175-J-1996)	Borates	99.93	Portico de Los Andes Susques - Olaroz Chico
19	Ernesto	112-G-04	Exploitation Concession	Granted/registered 26/05/2005 (Resolution 54-J-2005)	Borates, lithium, and potassium	99.99	Olaroz Chico
20	Josefina	114-V-44	Exploitation Concession	Granted/registered 18/07/1997 (Resolution 138-J-1997)	Borates, lithium, and potassium	99.79	Portico de Los Ande Susques - Huancar - Olaroz Chico
21	Humberto	117-A-44	Exploitation Concession	Granted/registered 18/07/97 (Resolution 137-J-1997)	Borates, lithium, and potassium	99.80	Olaroz Chico
22	Lisandro	126-T-44	Exploitation Concession	Granted/registered 23/11/994 (Res. 319-J-1994)	Borates, lithium, and potassium	99.96	Olaroz Chico
23	Potosi IX	726-L-07	Exploitation Concession	Granted/registered 29/10/2021 (Resolution 78-J-2021)	Gold, silver, copper, lithium	2,889.98	Olaroz Chico
24	Cateo	498-B-06	Exploration	Granted/registered on 05/04/23 (Resolution 11-J-23) / Mine application for the same area on 16/06/23 (Rioros III)	1° and 2° Category	7,336.17	Olaroz Chico - El Toro-Portico de Los Andes Susques
25	Rioros I	1206-P-09	Exploitation Concession	Granted/registered 05/04/23 (Resolution 12-J-23)	Disem. Borate, Lithium and others	2,983.16	Olaroz Chico - El Toro-Portico de Los Andes Susques
26	Rioros II	1215-P-09	Exploitation Concession	Not yet granted.	Borates, lithium, and potassium	793.24	Olaroz Chico

Id.	Title		Tenure Type	Status of Concession	Minerals	Area (ha)	Community Surface Rights
	Name	File #					
27	Riolitio	1205-P-09	Exploitation Concession	Not yet granted. Covers area not overlapping with Cateo 498.	Borates, lithium, and potassium	339.37	Olaroz Chico - El Toro-Portico de Los Andes Susques
28	Oculto Norte	946-R-08	Exploitation Concession	Not yet granted. Pending due to third party appeal.	Borates, Lithium, salts	331.76	Olaroz Chico
29	Regreso II	1671-S-11	Exploitation Concession	Not yet granted	Borates, lithium, alkali, metals	1,507.45	El Toro Rosario
30	Cateo	1274-P-09	Exploration	Not yet granted	Borates, Lithium, salts	5,972.09	Olaroz Chico
31	Potosi III	520-L-06	Exploitation Concession	Not yet granted.	Gold, silver and Disem. Borate, Lithium and others	1,896.52	Olaroz Chico
32	Potosi IV	521-L-06	Exploitation Concession	Not yet granted.	Gold, silver and Disem. Borate, Lithium and others	2,048.99	Olaroz Chico
33	Potosi V	522-L-06	Exploitation Concession	Not yet granted.	Gold, silver and Disem. Borate, Lithium and others	2,000.00	Olaroz Chico
34	Potosi VI	147-L-03	Exploitation Concession	Granted/registered 26/05/05 (Resolution 49-J-2005).	Gold, silver, lithium	1,933.81	Olaroz Chico
35	Potosi VIII	725-L-07	Exploitation Concession	Not yet granted.	Gold, silver and Disem. Borate, Lithium and others	2,940.43	Olaroz Chico
36	Rape	58-B-02	Exploitation Concession	Granted on 21/06/05 (Resolution 72-J-2005).	Borates, lithium potassium	1,907	Olaroz Chico - Portico de Los Andes Susques
37	Rape I	401-A-05	Exploitation Concession	Not yet granted.	Borates, lithium potassium	95	Olaroz Chico
38	Basilio	72-S-02	Exploitation Concession	Not yet granted.	Borates, lithium potassium	1,825	Olaroz Chico
39	South I	1195-P-09	Exploitation Concession	Not yet granted.	Gold, copper, alkaline metals	2,859	Portico de los Andes Susques - Huancar
40	South II	1200-P-09	Exploitation Concession	Not yet granted.	Gold, copper, alkaline metals	2,790	Portico de los Andes Susques
41	Cristina	184-D-1990	Exploitation Concession	Granted on 3/07/1996 (Resolution 67-J-1996)	Borates, lithium potassium	100	Olaroz Chico
42	María Victoria	121-M-2003	Exploitation Concession	Granted/Registered 16/09/2010 (Resolution 22-J-2010)	Disem. Borates, Lithium and others	1,800	Olaroz Chico

3.3.1 Agreements and Royalties

Argentina is a federal country, with significant power invested in the provinces, which control mining within the province. There is a 3% mine mouth (boca de mina) royalty on the value of production to the provincial Jujuy government, considered the value of the brine after the deduction of the costs of extraction, processing and transportation.

In addition to the royalty JEMSE, the Jujuy provincial mining body holds an 8.5% interest in the Olaroz lithium facility, which is to be paid back from their share of Olaroz profit. There are no other royalties, back in rights or remaining payments or encumbrances on the Allkem SDJ JV or 100% owned Olaroz Lithium properties. There is an export fee of 4.5% on the FOB price, as regulated by Decree Nr. 1060/20.

3.4 Environmental Liabilities and Other Permitting Requirements

The properties where extraction of lithium is ongoing are subject to ongoing environmental approval, with ongoing monitoring of water levels and quality conducted throughout the properties and the surrounding area. Annual or more frequent reports on the environmental condition of the properties are prepared and regularly filed with the relevant authorities.

Ongoing EIA renewals are required on all properties as outlined in Table 3-2.

The properties outside of the production area been subject to limited or no exploration drilling. Environmental permits are held for these properties, although no significant exploration has yet been conducted.

Table 3-2 - Summary of mining EIA situation, fees, and investment.

Id.	Interest	Title		Environmental Impact Assessment Status	Status		
		Name	File #		Semi-annual canon fee*	Pithead Royalty**	Others Royalty
1	Sales de Jujuy S.A.	San Antonio Norte	943-R-08	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	Annual payments of USD 50,000 in favor of Silvia Rodriguez. Payments corresponding to years 2023 y 2024 still pending.
2	Sales de Jujuy S.A.	San Antonio Sur	944-R-09	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	Annual payments of USD 50,000 in favor of Silvia Rodriguez. Payments corresponding to years 2023 y 2024 still pending.
3	Sales de Jujuy S.A.	San Juan Norte	963-R-08	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	Annual payments of USD 50,000 in favor of Silvia Rodriguez. Payments corresponding to years 2023 y 2024 still pending.
4	Sales de Jujuy S.A.	San Juan Sur	964-R-09	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	Annual payments of USD 50,000 in favor of Silvia Rodriguez. Payments corresponding to years 2023 y 2024 still pending.
5	Sales de Jujuy S.A.	San Antonio Oeste I	1137-R-09	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	Annual payments of USD 50,000 in favor of Silvia Rodriguez. Payments corresponding to years 2023 y 2024 still pending.
6	Sales de Jujuy S.A.	San Antonio Oeste II	1137-R-09	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	Annual payments of USD 50,000 in favor of Silvia Rodriguez. Payments corresponding to years 2023 y 2024 still pending.
7	Sales de Jujuy S.A.	San Fermin Norte	1134-R-09	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	Annual payments of USD 50,000 in favor of Silvia Rodriguez. Payments corresponding to years 2023 y 2024 still pending.
8	Sales de Jujuy S.A.	San Fermin Sur	1135-R-09	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	Annual payments of USD 50,000 in favor of Silvia Rodriguez. Payments corresponding to years 2023 y 2024 still pending.
9	Sales de Jujuy S.A.	San Miguel II	945-R-08	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	To be paid	Apply	Annual payments of USD 50,000 in favor of Silvia Rodriguez. Payments corresponding to years 2023 y 2024 still pending.

Id.	Interest	Title		Environmental Impact Assessment Status	Status		
		Name	File #		Semi-annual canon fee*	Pithead Royalty**	Others Royalty
10	Sales de Jujuy S.A.	María Pedro y Juana	112-D-1944	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	No
11	Sales de Jujuy S.A.	Santa Julia	1842-S-12	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	Annual payments of USD 50,000 in favor of Silvia Rodriguez. Payments corresponding to years 2023 y 2024 still pending.
12	Sales de Jujuy S.A.	Mercedes III	319-T-05	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	No
13	Sales de Jujuy S.A.	La Nena	29-M-96	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	No
14	Sales de Jujuy S.A.	Demian	039-M-98	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	No
15	Sales de Jujuy S.A.	Juan Martin	40-M-98	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	No
16	Sales de Jujuy S.A.	Maria Norte	393-B-44	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	No
17	Sales de Jujuy S.A.	Analia	131-I-86	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	No
18	Sales de Jujuy S.A.	Mario	125-S-44	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	No
19	Sales de Jujuy S.A.	Ernesto	112-G-04	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	No
20	Sales de Jujuy S.A.	Josefina	114-V-44	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	No
21	Sales de Jujuy S.A.	Humberto	117-A-44	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	No

Id.	Interest	Title		Environmental Impact Assessment Status	Status		
		Name	File #		Semi-annual canon fee*	Pithead Royalty**	Others Royalty
22	Sales de Jujuy S.A.	Lisandro	126-T-44	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	Last payment on June 2023	Apply	No
23	Sales de Jujuy S.A.	Potosi IX	726-L-07	Last EIA Exploitation approved on Res. 032/2023 (31.03.2023) - Renewal under evaluation (filed on Dec.22)	To be paid	Apply	No
24	Sales de Jujuy S.A.	Cateo	498-B-06	Exploration EIA approved by Res.159/2021 (14.10.21)	Does not apply	Does not yet apply	No
25	Sales de Jujuy S.A.	Rioros I	1206-P-09	Exploration EIA approved by Res.159/2021 (14.10.21)	To be paid	Does not yet apply	No
26	Sales de Jujuy S.A.	Rioros II	1215-P-09	Exploitation renewal under evaluation (filed on Dec.22)	To be paid	Does not yet apply	No
27	Sales de Jujuy S.A.	Riolitio	1205-P-09	Exploitation renewal under evaluation (filed on Dec.22)	To be paid	Does not yet apply	No
28	Sales de Jujuy S.A.	Oculto Norte	946-R-08	Exploitation renewal under evaluation (filed on Dec.22)	To be paid	Does not yet apply	Annual payments of USD 50,000 in favor of Silvia Rodriguez. Payments corresponding to years 2023 y 2024 still pending.
29	Sales de Jujuy S.A.	Regreso II	1671-S-11	Exploitation renewal under evaluation (filed on Dec.22)	To be paid	Does not yet apply	No
30	Sales de Jujuy S.A.	Cateo	1274-P-09	Exploration new EIA under evaluation (filed on March.22)	Does not apply	Does not yet apply	No
31	Sales de Jujuy S.A.	Potosi III	520-L-06	Exploration approved by Res. 020/2014 (15.10.2014) - Exploration new EIA under evaluation (filed on March.22)	To be paid	Does not yet apply	No
32	Sales de Jujuy S.A.	Potosi IV	521-L-06	Exploration approved by Res. 020/2014 (15.10.2014) - Exploration new EIA under evaluation (filed on March.22)	To be paid	Does not yet apply	No
33	Sales de Jujuy S.A.	Potosi V	522-L-06	Exploration approved by Res. 020/2014 (15.10.2014) - Exploration new EIA under evaluation (filed on March.22)	To be paid	Does not yet apply	
34	Sales de Jujuy S.A.	Potosi VI	147-L-03	Exploration approved by Res. 020/2014 (15.10.2014) - Exploration new EIA under evaluation (filed on March.22)	Last payment on June 2023	Does not yet apply	No
35	Sales de Jujuy S.A.	Potosi VIII	725-L-07	Exploration approved by Res. 020/2014 (15.10.2014) - Exploration new EIA under evaluation (filed on March.22)	To be paid	Does not yet apply	No
36	Olaroz Lithium S.A.	Rape	58-B-02	To be presented for Exploration	Last payment on June 2023	Does not yet apply	No
37	Olaroz Lithium S.A.	Rape I	401-A-05	To be presented for Exploration	Does not yet apply	Does not yet apply	No

Id.	Interest	Title		Environmental Impact Assessment Status	Status		
		Name	File #		Semi-annual canon fee*	Pithead Royalty**	Others Royalty
38	Olaroz Lithium S.A.	Basilio	72-S-02	To be presented for Exploration	Does not yet apply	Does not yet apply	No
39	Olaroz Lithium S.A.	South I	1195-P-09	To be presented for Exploration	Does not yet apply	Does not yet apply	No
40	Olaroz Lithium S.A.	South Ⅱ	1200-P-09	To be presented for Exploration	Does not yet apply	Does not yet apply	No
41	Olaroz Lithium S.A.	Cristina	184-D-1990	To be presented for Exploration	Last payment on June 2023	Does not yet apply	No
42	La Frontera Minerals S.A.U.	María Victoria	121-M-2003	Exploration EIA approved by Res N° 11/17 (06.10.17) - Renewal under evaluation (filed on Dic.20)	Last payment on June 2023	Does not yet apply	No

*SDJ is required to pay Jujuy province for the mining properties that are granted/registered (except for the cateos) an immaterial semi-annual “canon” fee pursuant to the Argentine Mining Code.

**On the other hand, and in accordance to Provincial Constitutional Law of Jujuy, Provincial Law 5791/13, Resolution 1641-DPR-2023 and other related regulatory decrees and supplementary regulations, SDJ is required to pay monthly royalties in consideration for the minerals extracted from its concessions. The monthly royalties equal to 3% of the mine head value of the extracted ore, calculated as the sales price less direct cash costs related to exploitation and excluding fixed asset depreciation. Further, pursuant to Federal Argentine regulations, a 4.5% export duty on the free on board (“FOB”) price by a mining company is to be paid when exporting product, as regulated by Decree Nr. 1060/20. In addition to the royalty, Jujuy Energía y Minería Sociedad del Estado (JEMSE), the Jujuy provincial mining state owned company, holds an 8.5% interest in SDJ.

4. ACCESSIBILITY, CLIMATE, PHYSIOGRAPHY, LOCAL RESOURCES, AND INFRASTRUCTURE

This section summarizes the accessibility, climate, physiography, local resources, and infrastructure for Olaroz.

4.1 Accessibility

The most accessible route to Olaroz area is from the city of San Salvador de Jujuy. The route RN 9 follows northwest approximately 60 km to Purmamarca. From here the RN 52 road ascends steeply to the Puna Plateau and continues from 150 km to the regional town of Susques. From Susques the international road to Chile continues to climb, before descending on the eastern side of the Olaroz Salar. This paved road continues around the southern end of Olaroz, crossing the divide with the Cauchari Salar to the South. The entrance road to the Olaroz processing plant is reached by a gravel road (Route 70) that turns off the international road and continues north along the western side of the salar for 6 km. The entrance to Olaroz is on the right, on the alluvial gravels that slope down to the salar.

An alternative way to reach Olaroz is from Salta, which has an international airport and a range of hotels and services. To drive from Salta, one follows mostly paved Route 51, approximately 170 km northwest from Salta to the town of San Antonio de los Cobres, continuing on the gravel provincial highway Route 51 to the town of Olacapato, before continuing north along the west (Route 70) or east side (new alternative route) of the Cauchari Salar, reaching the international road that leads to Chile. The gravel road (Route 70) to the Olaroz plant entry is a continuation of Route 70 on the western side of the Cauchari Salar. From the road along the east of the Cauchari Salar the turn off to Olaroz along Route 70 is 6.5 km to the west along the paved international road, in the direction of the Chilean border (Figure 4-1).

Both Jujuy and Salta have international airports with regular flights to Buenos Aires. Olaroz has full infrastructure available including water (dedicated wells), gas (pipeline), and electricity (from gas generation). The Puna gas pipeline crosses to the north of Olaroz Salar and Allkem has constructed a connection to this pipeline for Olaroz. A railway line connecting northern Argentina to Chile passes along the southern end of Cauchari Salar, approximately 60 km to the south of Olaroz site.

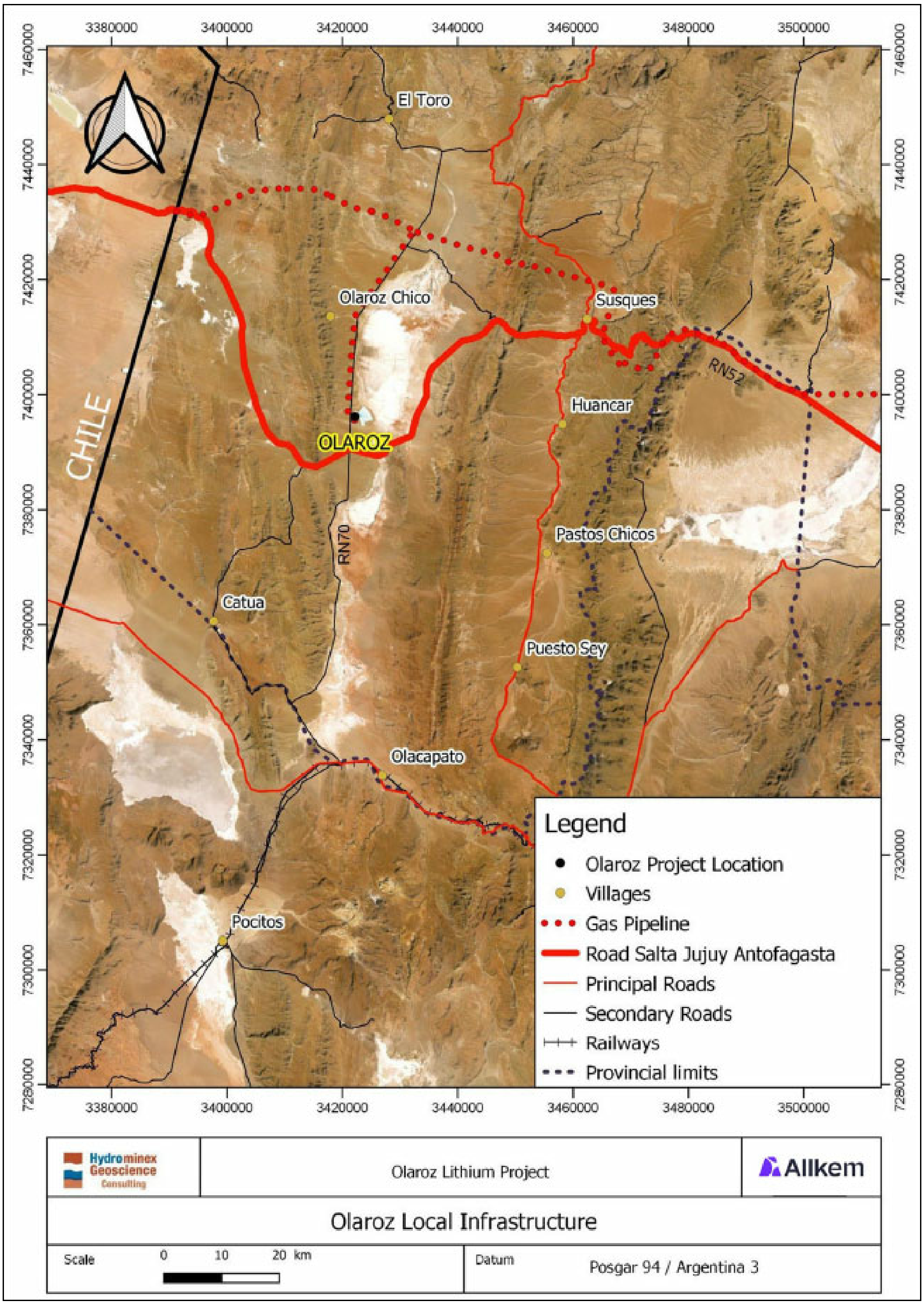


Figure 4-1 - Olaroz location and local population centers.

4.2 Topography, Elevation, Vegetation and Climate

4.2.1 Physiography

The Altiplano-Puna is an elevated plateau within the central Andes (see Figure 4-1 and Figure 3-1 above). The Puna covers part of the Argentinean provinces of Jujuy, Salta, Catamarca, La Rioja, and Tucuman with an average elevation of 3,700 masl (Morlans, 1995; Kay et. al., 2008).

The Altiplano-Puna Volcanic Complex (APVC) is associated with numerous stratovolcanoes and calderas. Investigations have shown that the APVC is underlain by an extensive magma chamber at 4-8 km depth (de Silva et al., 2006).

The physiography of the region is characterized by generally north-south trending basins and ranges, with canyons cutting through the Western and Eastern Cordilleras. There are numerous volcanic centers in the Puna, particularly in the Western Cordillera, where volcanic cones are present along the border of Chile and Argentina.

Dry salars (Salar) in the Puna occur within many of the closed basins (see Figure 4-2 below), which have internal (endorheic) drainage. Inflow to these salars is from summer rainfall, surface water runoff and groundwater inflows. Discharge is though evaporation.

Physiographic observations regarding Olaroz Salar include:

- The drainage divides between the Olaroz Salar to the north and the Cauchari Salar to the south is coincident with the international Hwy RN 52 crossing between these Salar and continuing west to link Argentina to Chile at the Jama pass.
- The large Archibarca alluvial fan is present on the southwestern side of Olaroz Salar and in part separates the Olaroz Salar and Cauchari Salar. There are a number of smaller alluvial fans along the western side of the Olaroz Salar, with larger alluvial fans on the margins of the Salar in the north. Alluvial fans are also developed further south in Cauchari Salar.
- The Rio Rosario enters the Olaroz Salar from the north and flows south towards the center of the Salar, only causing flooding in the Salar in wetter years. This is the major freshwater flow into the Olaroz Salar.
- The Rio Ola enters the Cauchari-Olaroz drainage basin from the west and flows through the Archibarca alluvial fan, infiltrating into the gravels of the alluvial fan.
- The Olaroz - Cauchari drainage basin covers some 6,000 km^2 with the nucleus of Olaroz Salar covering approximately 160 km^2.
- The surface of the Olaroz Salar is essentially flat and comprised of several different types of salt crust, which reflect the different history of the salt crust.

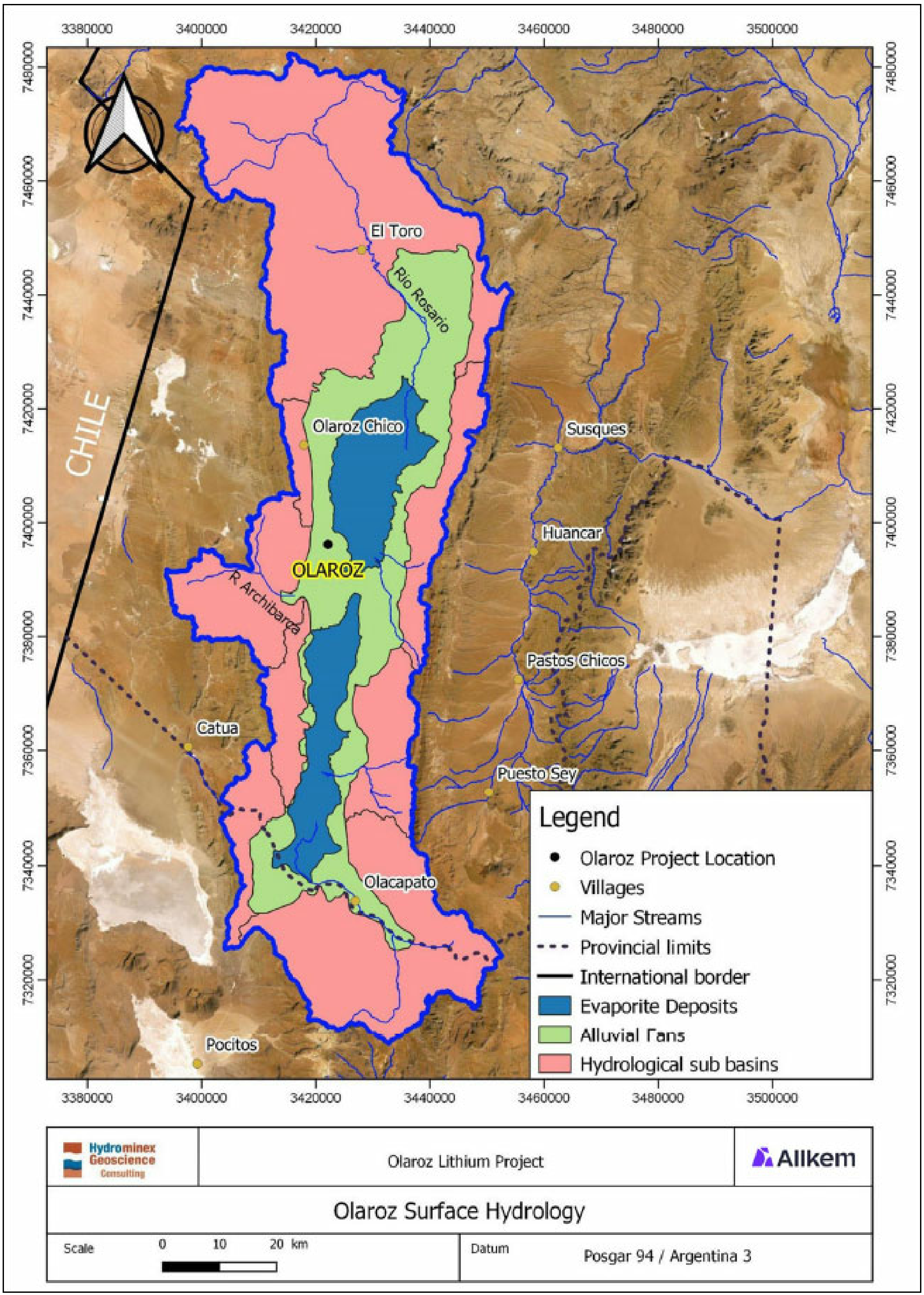


Figure 4-2 - Basin hydrology with major streams and drainages.

4.2.2 Climate

The climate in the Olaroz area is severe and can be described as typical of a continental, cold, high-altitude desert, with resultant scarce vegetation. Daily temperature variations may exceed 25°C. Solar radiation is intense, especially during the summer months of October through March, leading to high evaporation rates. The rainy season is between the months of December to March. Occasional flooding can occur in the salar during the wet season. Year-round travel and operation are possible with appropriate clothing.

There are three weather stations operating for Olaroz since 2012, with one station located in Cauchari Salar and two stations located further north in Olaroz Salar. The stations maintain a continuous record of temperature, atmospheric pressure, and liquid precipitation, among other meteorological variables of interest. There is no continuous record of direct evaporation measurements, and therefore evaporation is calculated indirectly from other parameters.

In addition to these stations, the National Institute of Agricultural Technology INTA has historical monthly rainfall data in northwestern Argentina, for the period 1934-1990 (Bianchi, 1992), of which three stations (Susques, Sey and Olacapato) are located near the Cauchari-Olaroz hydrological basin. The locations of the relevant weather stations for Olaroz are shown in Figure 4-3 and Table 4-1 provides summary information for each of the stations.

4.2.2.1 Precipitation

The rainy season is between the months December and March when most of the annual rainfall occurs often in brief convective storms that originate from Amazonia to the northeast. The period between April and November is typically dry. Annual rainfall tends to increase towards the northeast, especially at lower elevations. Significant control on annual rainfall is exerted by ENSO (El Niño-Southern Oscillation) (Houston, 2006a) with significant yearly differences in rainfall linked to ENSO events. Figure 4-4 shows the average monthly rainfall data at the ponds monitoring site on Olaroz and Figure 4-5 shows annual rainfall for relevant weather stations shown in Figure 4-3. The average annual precipitation is approximately 49.5 mm for Olaroz site from 2015-2020. Figure 4-6 shows the long-term rainfall for weather stations in Figure 4-3 with actual or factored data.

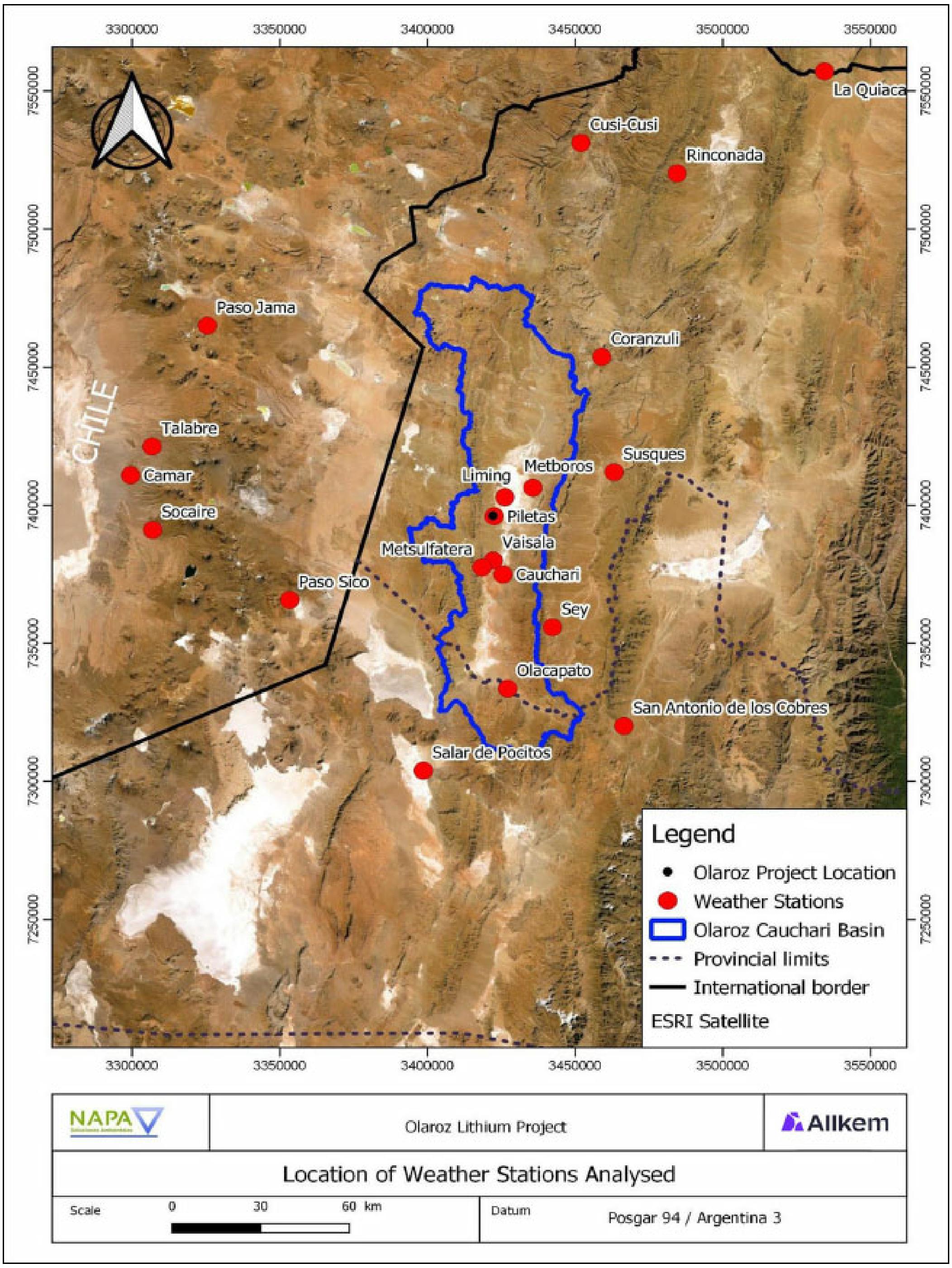


Figure 4-3 - Location of weather stations in the vicinity Olaroz. Note: The Liming, Piletas and Cauchari stations are operated by SDJ. Other stations include historical government stations.

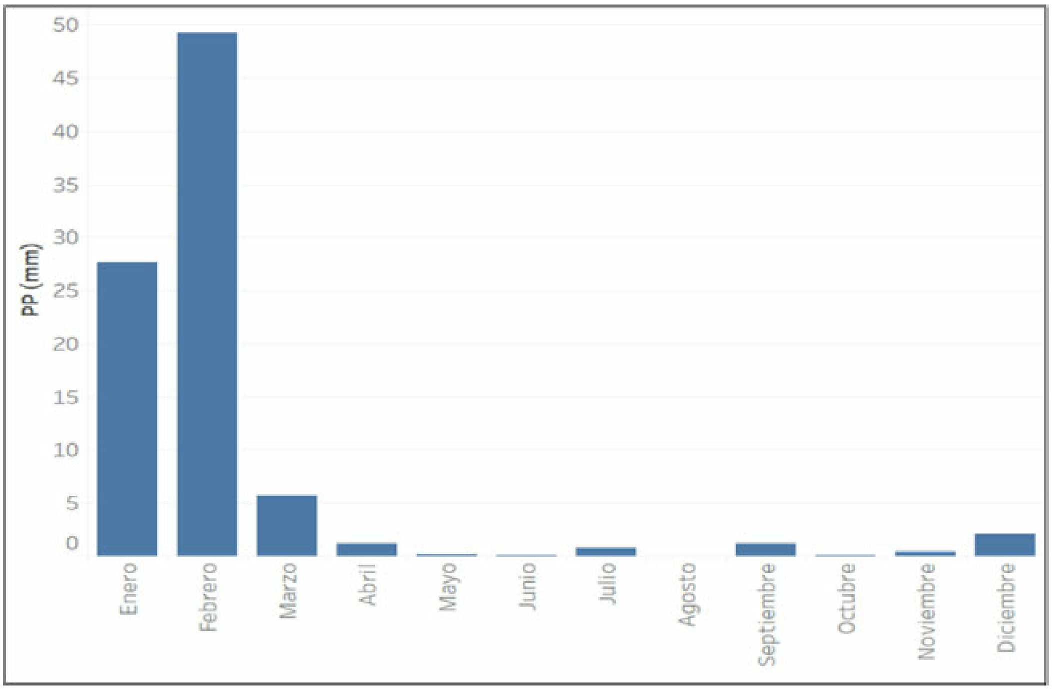


Figure 4-4 - Average monthly rainfall, Piletas (ponds) weather station from 2015 - 2020.

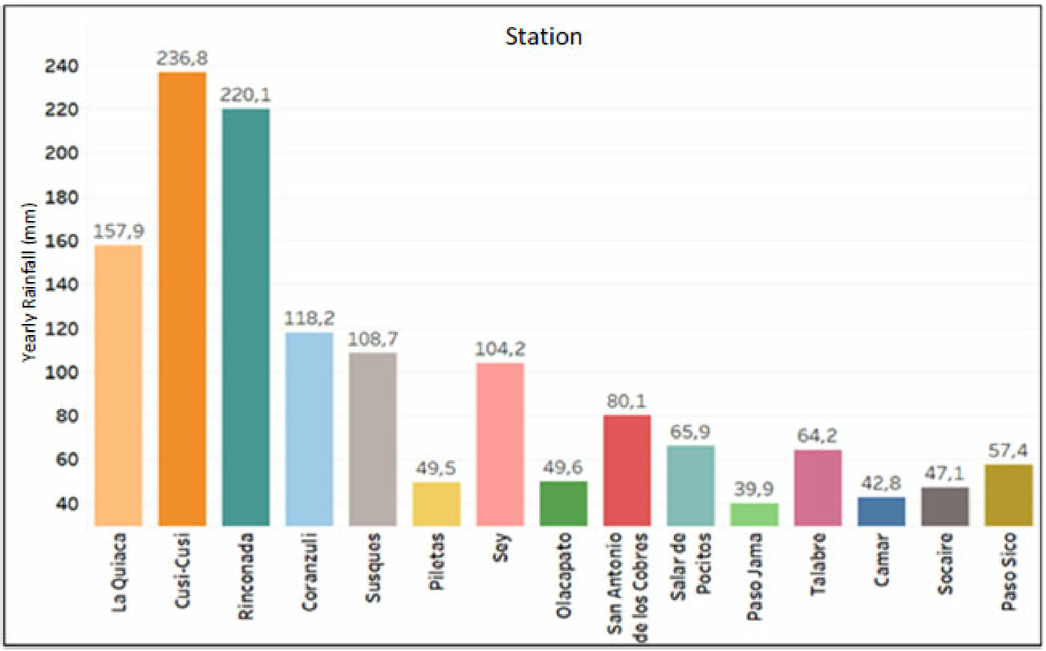


Figure 4-5 - Average annual rainfall (mm) at stations across the Puna region in Argentina and Chile (after NAPA, 2021).

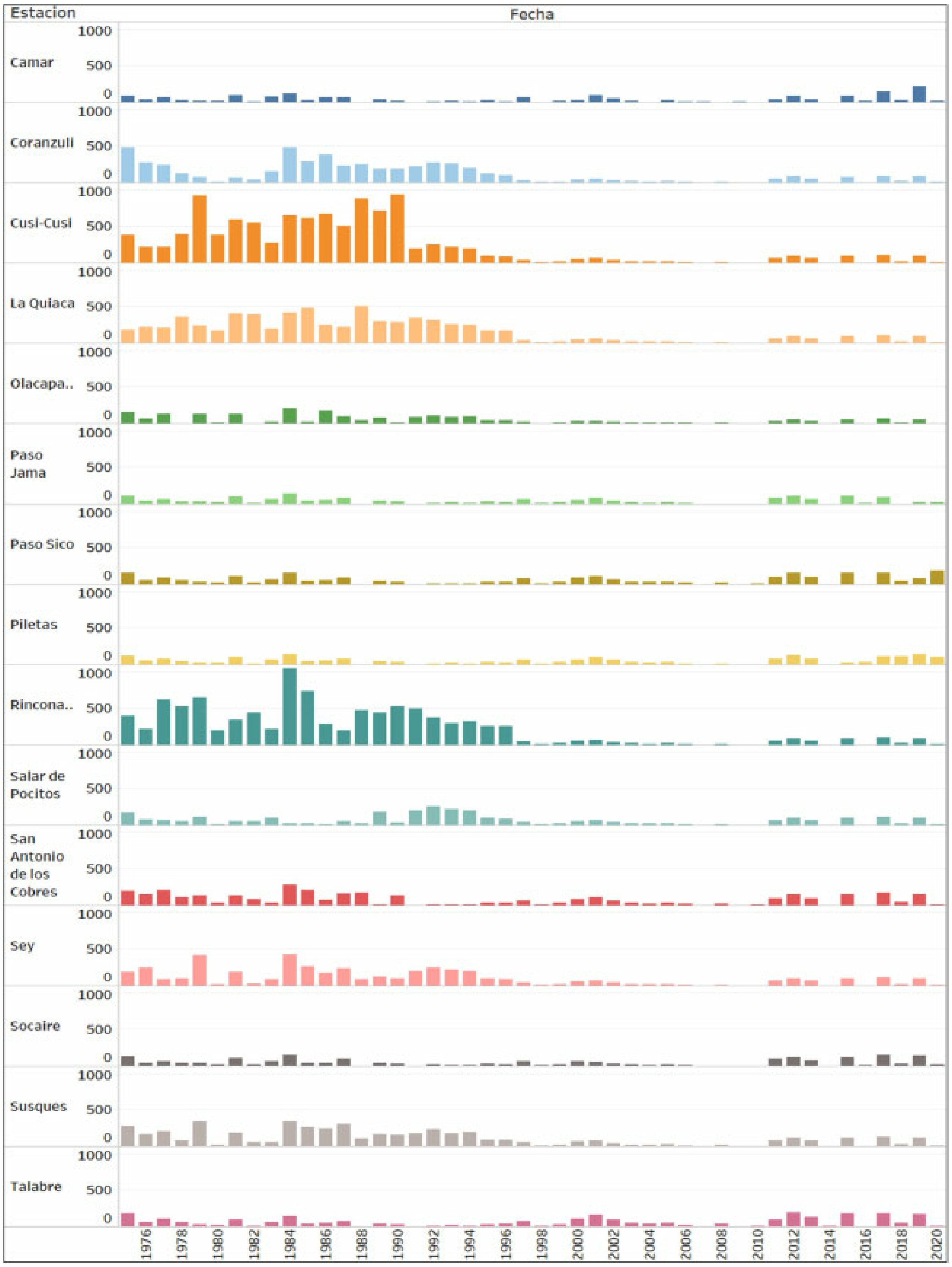


Figure 4-6 - Long term rainfall at the weather stations shown in Figure 5.3 (after NAPA, 2021).

Table 4-1 - Location of SDJ and surrounding weather stations.

Station	Easting Zone 3 Posgar 94	Northing Zone 3 Posgar 94	Elevation M asl	Period	Owner	Location	Frequency
Cauchari	**3,425,500**	**7,374,877**	**3,918**	**2015-2020**	**OC**	**Argentina**	**Daily**
Coranzuli	3,459,000	7,453,684	4,100	1972-1996	INTA	Argentina	Monthly
Cusi-Cusi	3,451,924	7,531,180	3,930	1978-1990	INTA	Argentina	Monthly
La Quiaca	3,534,396	7,557,054	3,492	1934-1990	SMN	Argentina	Monthly
Liming	**3,426,176**	**7,402,920**	**3,904**	**2012-2020**	**OC**	**Argentina**	**Daily**
Metboros	3,435,630	7,406,343	3,915	2010-2011	LAC	Argentina	**Daily**
Metsulfatera	3,418,421	7,377,459	3,915	2010-2011	LAC	Argentina	**Daily**
Olacapato	3,427,142	7,333,569	3,820	1950-1990	INTA	Argentina	Monthly
Piletas	**3,422,503**	**7,396,002**	**3,942**	**2015-2018**	**OC**	**Argentina**	**Daily**
Rinconada	3,484,558	7,520,173	3,950	1972-1996	INTA	Argentina	Monthly
Salar de Pocitos	3,398,548	7,303,853	3,600	1950-1990	INTA	Argentina	Monthly
San Antonio de los Cobres	3,466,484	7,320,058	3,775	1949-1990	INTA	Argentina	Monthly
Sey	3,442,302	7,355,790	3,920	1973-1990	INTA	Argentina	Monthly
Susques	3,463,204	7,411,974	3,675	1972-1996	INTA	Argentina	Monthly
Vaisala	342,222,013	7,379,986	3,900	2010-2020	LAC	Argentina	**Daily**
Camar	3,299,434	7,410,812	2,700	1975-2019	DGA	Chile	**Daily**
Paso Jama	3,325,456	7,465,028	4,680	2016-2019	DGA	Chile	**Daily**
Paso Sico	3,353,273	7,365,648	4,295	2016-2019	DGA	Chile	**Daily**
Socaire	3,306,888	7,391,046	3,251	1975-2019	DGA	Chile	**Daily**
Talabre	3,306,698	7,421,187	3,300	1975-2019	DGA	Chile	**Daily**

4.2.2.2 Temperature

Temperature records are available from the Liming and Piletas stations since 2012. Average monthly temperature data are available from the Olacapato, Susques and Sey stations for the period between 1950 and 1990. Table 4-2 shows the average monthly temperature for the five stations in Olaroz area, with temperatures varying from 1.2 to 11.1 degrees at the Piletas site. Figure 4-7 shows the average monthly temperature distribution throughout the year.

Table 4-2 - Average daily temperature data.

Temperature ºC												
Station	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Piletas	11.1	10.6	10.0	7.3	3.8	1.9	1.2	2.8	5.7	7.1	8.4	9.8
Liming	10.7	10.4	9.3	6.2	2.6	0.5	-0.3	1.7	4.6	6.9	8.4	10.7
Olacapato	10.8	10.7	9.9	7.5	4.2	2.2	1.6	3.9	5.9	8.2	9.9	10.6
Sey	10.2	10.1	9.4	7.0	3.7	1.8	1.3	3.4	5.4	7.6	9.2	9.9
Susques	11.3	11.2	10.5	8.1	4.9	3.0	2.5	4.6	6.6	8.9	10.4	11.1

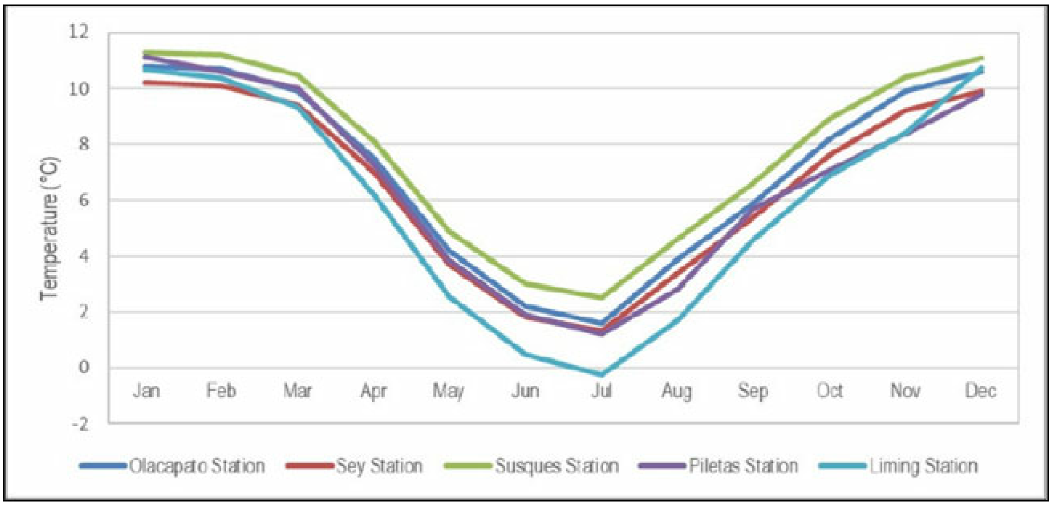


Figure 4-7 - The average monthly temperature at different weather stations (after Worley and Flow Solutions, 2019).

4.2.2.3 Evaporation

Various approaches have been carried out to determine the evaporation for Olaroz Salar. Measurements for Olaroz Salar include sampling and monitoring of fresh water and brine Class A evaporation pans since 2008 (Figure 4-8 and Table 4-3).

The pan evaporation data are plotted in Figure 4-8 and show that the maximum evaporation rates occur during October, November, and December. During the summer months of January through March, a decrease in wind speed and increase in cloud cover tend to decrease the effective evaporation. The minimum evaporation takes place during the winter months, when lower temperatures have a direct impact on evaporation. The data also shows that the evaporation of brine is lower than freshwater with differences of 21% in winter months and up to 47% in the summer months.

Figure 4-7 was prepared with PAN A Bis data from the Piletas (ponds) station, which has a composition of 70% freshwater and 30% brine (to prevent freezing in winter), which is the fluid composition most similar to freshwater used in the evaporation pan measurements.

The Piletas and Vaisala stations present absolute values of maximum evaporation in the area, given they are in the center of the basin, where climatic conditions are more favorable for evaporation in the nucleus of the salar. The Olacapato station is at the south of the salar in an alluvial zone. For the water balance the potential evaporation from each sector of the basin has been calculated. The sectors are defined as lower alluvial and marginal domains (with similar sedimentological characteristics), salar nucleus and upper-level alluvial sediments (coarser gravels). This information has been used to develop the water balance for the basin.

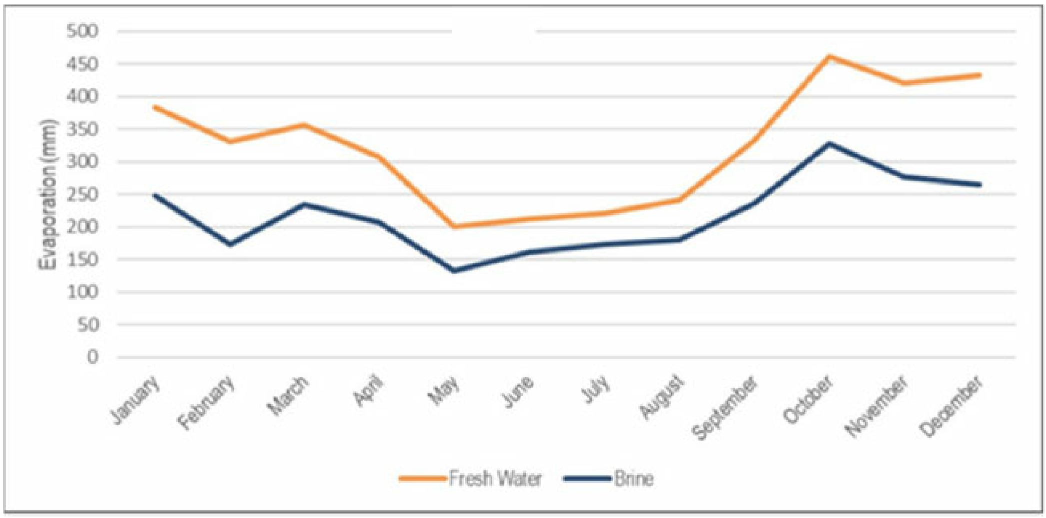


Figure 4-8 - Average monthly evaporation (mm/month) Measured from evaporation pan data at the Piletas (ponds) stations (after Worley and Flow Solutions, 2019).

Table 4-3 - Class A freshwater and brine pan evaporation data from Olaroz.

Evaporation mm/year													
Density (g/cm^3)	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Total**
1.000	383	331	356	307	201	213	221	242	332	461	421	433	3,900
1.198	248	173	234	208	133	162	173	180	236	327	276	265	2,614

4.2.2.4 Wind

Strong winds are frequent in the Puna, reaching speeds of up to 80 km/h during warm periods in the dry season. During summer, the wind is generally pronounced after midday, usually calming during the night. During this season, the winds are warm to cool. During winter wind velocities are generally higher and wind is more frequent, with westerlies the predominant wind direction.

4.2.3 Vegetation

Due to the extreme weather conditions in the region, the predominant vegetation is of the high-altitude xerophytic type adapted to high levels of solar radiation, winds and severe cold. The vegetation is dominated by woody herbs of low height from 0.40 -1.5 m, grasses, and cushion plants. With high salinity on its surface, the nucleus of the salar is devoid of vegetation.

In compliance with local regulations, SDJ undertakes ongoing environmental monitoring. The different vegetation areas are summarized below:

- Bushy steppes
- Mixed steppes
- Salar

Fauna is adapted to the extreme living conditions of high aridity, intense sunlight, and very low nightly temperatures. Many animals are nocturnal or have acquired certain physiological features and behaviors that allow them to survive in the harsh environment. The most significant mammals in the region are the vicuña (Vicugna Vicugna) and llama (Lama Glama - which are domesticated) cameloid species, foxes (Dusicyon, Lycalopex) are present and prey on small rodents such as the mole (Oculto or Tuco-Tuco - Ctenomys Opimus) and the Puna mouse (Auliscomys Sublimis). Olaroz is located within the Reserva Provincial de Fauna y Flora Olaroz - Cauchari (a regional flora and fauna reserve) and vicuñas are often seen in the vicinity of Olaroz or within Olaroz area.

4.3 Surface Water Inflows

The Olaroz Salar is a closed (endorheic) basin, meaning that there are no surface or groundwater outlets. Consequently, all water that enters the salar from the surrounding basins must be lost by evaporation under natural conditions. Numerous surface water catchments drain to the salar (Figure 4-9, showing drainages), the most important being the Rio Rosario through the northern fan-delta and the Rio Ola which enters the basin from the west via the Archibarca alluvial fan (Figure 4-10, showing topography). The Rio Ola flows infiltrates into the gravels of the Archibarca alluvial fan before reaching the Olaroz Salar.

The Rio Rosario and Rio Ola have been monitored over the last decade since exploration commenced on the Olaroz Salar. Measurements of flow are taken regularly and compared with rainfall.

4.3.1 Rio Rosario

At the point where the Rio Rosario (Figure 4-9) enters the salar nucleus the catchment area is approximately 2,000 km^2. The significant catchment relief which varies from >5,000 m where it rises on the flanks of Volcan Coyaguaima, to 4,000 m at the salar, result in significant precipitation and significant runoff. Flow monitoring has been undertaken since 2008 where the river disgorges from bedrock at 3,995 m and starts to infiltrate the basin sediments.

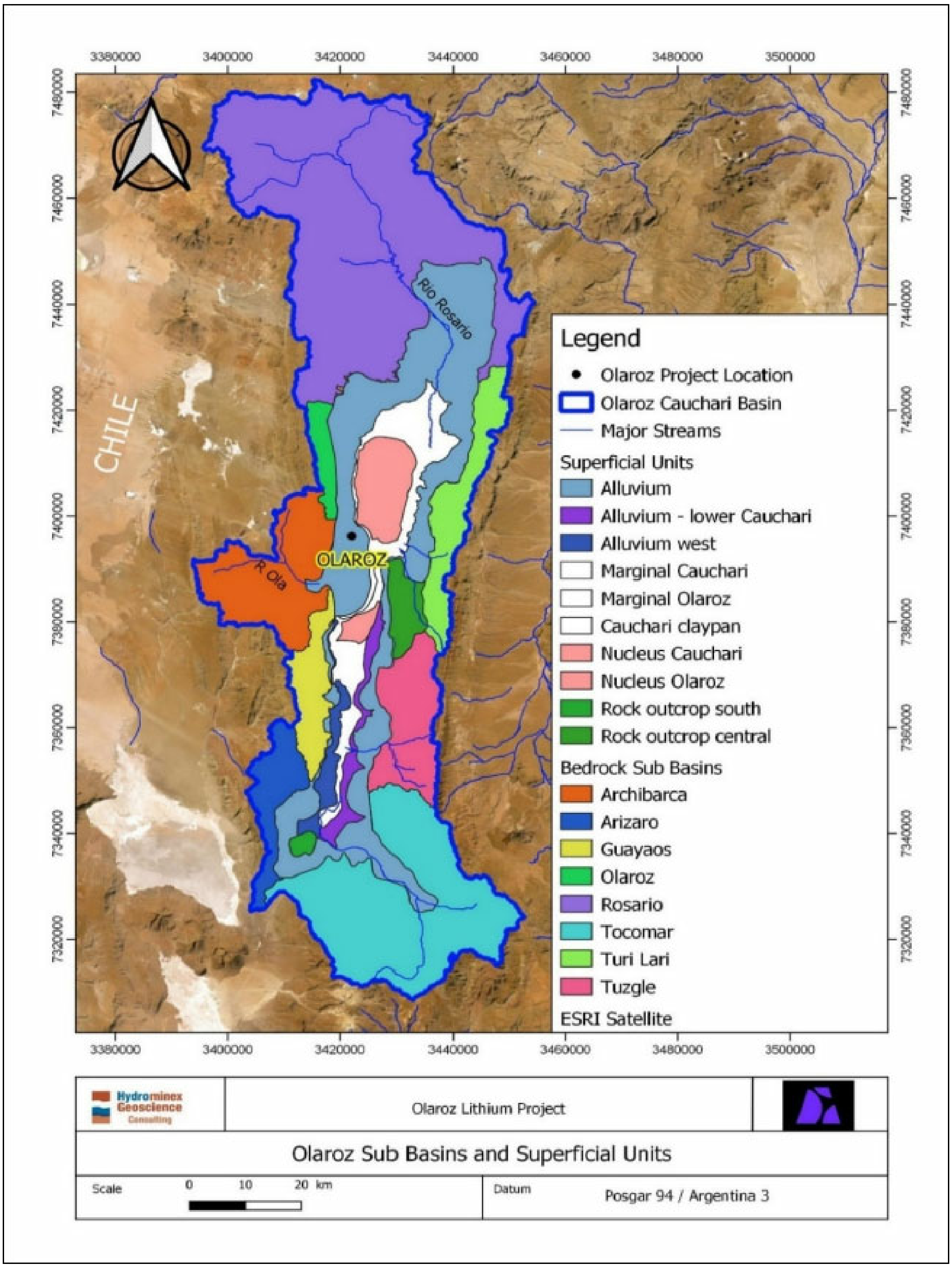


Figure 4-9 - Sub basins and surface areas in the Olaroz-Cauchari basin (after Napa 2021).

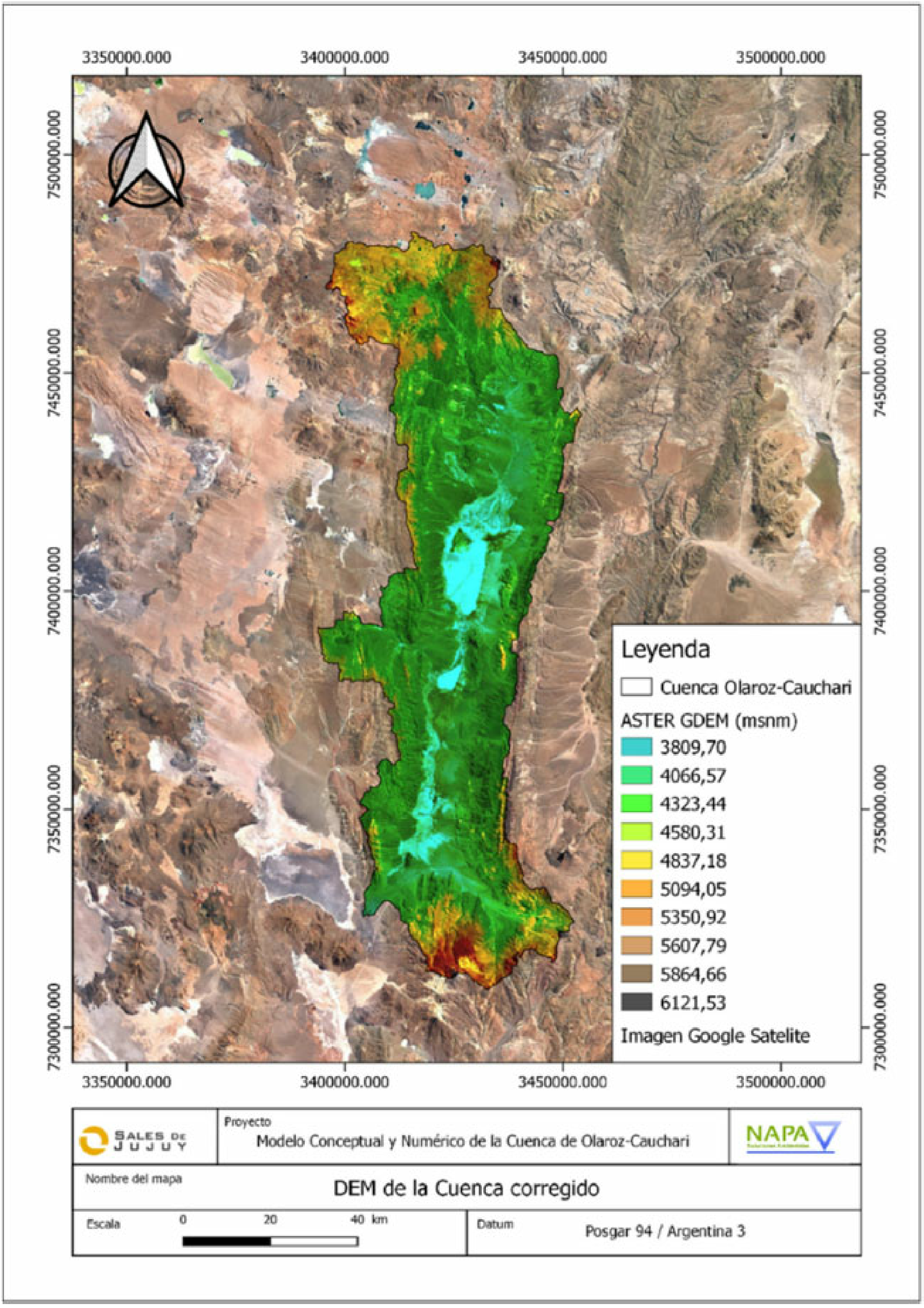


Figure 4-10 - Digital elevation model of the Olaroz Cauchari basin, showing the major surface water drainages (Napa, 2021).

4.3.2 Rio Ola

The Rio Ola (Figure 4-11) enters the Salars de Olaroz and Cauchari through the Archibarca alluvial fan from the west. Its catchment area is approximately 1,200 km^2, but relief is much lower than the Rosario catchment, with a maximum elevation of 4,400 m. Flow monitoring where the river leaves the catchment and infiltrates the fan at 4,000 m indicates a variable rate of flow between 4-14 l/s. Peak flows occur during the winter months (Figure 4-12) when evaporation is at a minimum. The results of monitoring shallow piezometers around the margins of the salar, and at the north of the Archibarca alluvial fan are shown below (Figure 4-13).

Note: The channel crosses a bedrock pass and enters the Archibarca alluvial fan, where it infiltrates before entering the salar (after Flosolutions 2019, Advantage Lithium PFS).

Figure 4-11 - The Rio Ola channel in November 2018.

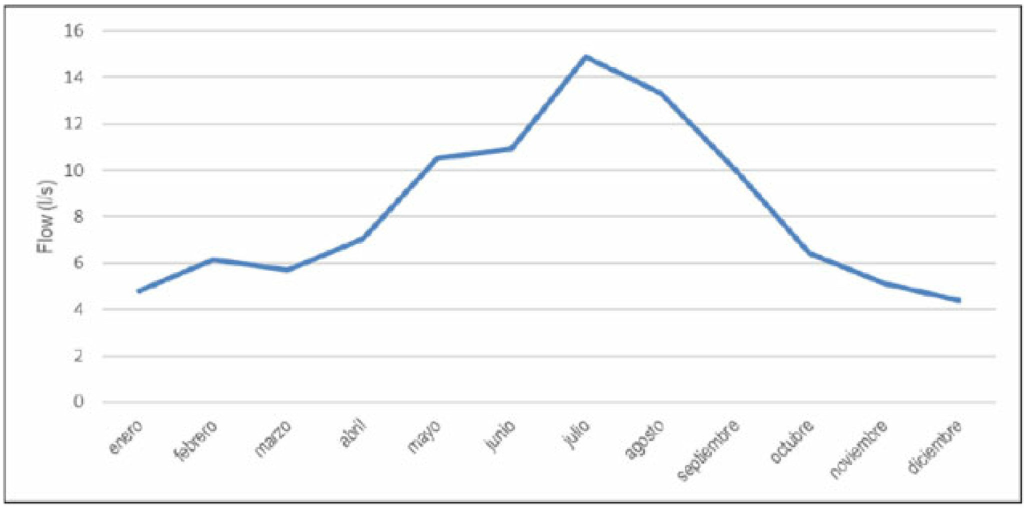


Figure 4-12 - Monthly average flows in liters/second in the Rio Ola (after Worley and Flosolutions 2019, Advantage Lithium PFS).

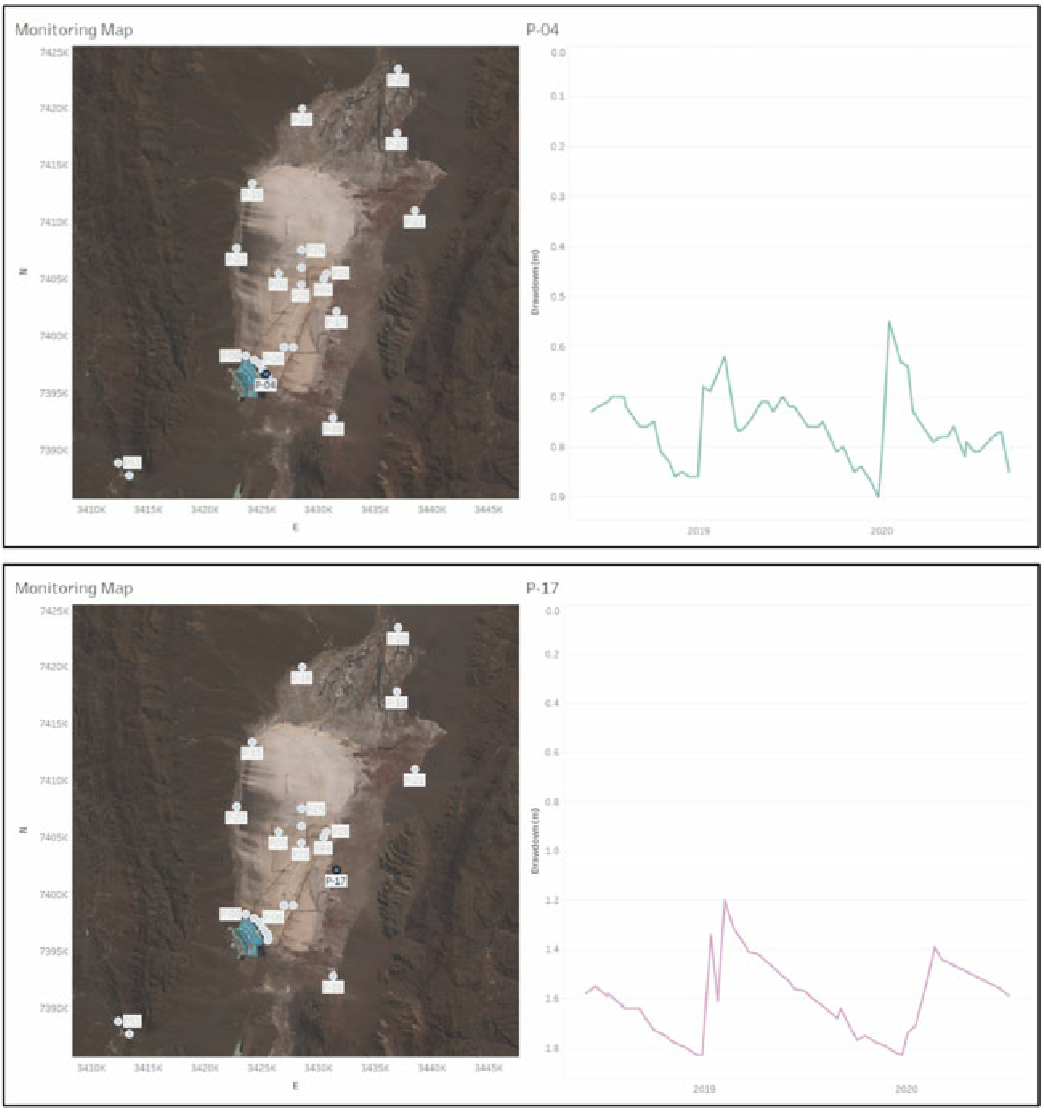


Figure 4-13 - Shallow hydrographs from the Olaroz monitoring network, with P04 in the south at the base of the Archibarca alluvial fan and P17 on the eastern side of the salar.

4.4 Local Infrastructure and Resources

There are several local villages within approximately 50 km of the Olaroz Project site. These include: Olaroz Chico (18 km north), Huancar (35 km east), Pastos Chicos (40 km southeast), El Toro (50 km north), Catua (40 km southwest), Puesto Sey (53 km southwest) and Olacapato 62 km south. The regional administration is located in the town of Susques (population ~2,000) some 45 km northeast of the Olaroz Project site. Susques has a regional hospital, petroleum and gas services, and a number of hotels. A year-round camp exists at Olaroz site and provides all services and accommodations for Olaroz operations. Operating personnel are sourced from the surrounding area and the closest cities of Jujuy and Salta, where many supplies are also sourced.

5. HISTORY

This section summarizes the history of Olaroz.

5.1 Historical Exploration and Drill Programs

5.1.1 Orocobre (now Allkem) pitting and drilling program 2008

Allkem (previously Orocobre until 2021) undertook pit sampling of the Olaroz Salar on a variable grid between March and May 2008, to evaluate lithium concentrations and the superficial salar geology. The initial sampling included a total of 62 brine samples from 60 pits. The results of the sampling were positive and justified the development of exploration drill holes to define a resource on Olaroz.

Allkem undertook a drilling program between 4 September and 2 December 2008 using Falcon Drilling. Twenty-two HQ3 diamond core holes were drilled, totaling 1,496.3 m. Drillhole locations were based on handheld GPS readings and their location is shown in Figure 5-1, together with other later drill holes. The initial 16 HQ3 diamond drill holes (core diameter 61 mm) in the program were drilled on a variable grid, to an average depth of 60 m. Two holes in this program were drilled to greater depths of 125.4 and 199 m. Six further HQ3 holes were drilled as monitoring wells for the hydrogeological test work.

Diamond drilling was carried out using triple tubes. However, core recoveries were low, with an average recovery of only 44%. The poor core recovery was attributed to the unconsolidated nature of the salar deposits and loss of the sand and other unconsolidated layers during drilling. Lithological units encountered include sand, silt, clay, halite and ulexite (borate).

Geophysical logs, self-potential, short, and long resistivity, and natural gamma were run in the 7 holes which had been cased to significant depths. The logging was limited to the upper sections of these holes because of fine sediment filling the basal sections through the slotted casing. Geophysical logs, together with geological logs of the recovered material provided the basis of the geological interpretation. Since the geophysical logs did not extend to the full depth of most holes, the interpretation of the deeper lithologies relied solely upon the core logging.

The drill logs were interpreted to show a near-surface halite layer, termed Zone 1. Beneath the halite unit zone 2 consisted of mixed clays, sands, and silts down to around 45-60 m below the salar surface. For holes deeper than 60 m, the underlying units were assigned to Zone 3, which showed a significant change being more consolidated, with higher clay content.

The core drill holes were reamed out with a tricone bit to a diameter of 165 mm (6 ½”) and a well screen of 100 mm (4”) diameter PVC was installed from 0.5 m below surface to the total depth of the hole, with 2-3 cm long slots. Subsequent to completion of the wells, they were developed by airlifting to establish data on potential yields, to ensure that all drilling fluid and cuttings were removed, and the brine bearing zones were in good hydraulic connection with the test well.

During airlift development and subsequent testing, airlift flow rates were monitored with a V notch weir, or more normally by filling a known volume. The airlift flow data established wells with high yields and several with low yields. This information was used to plan the subsequent pumping tests. Brine sampling was undertaken by Company staff in December 2008, with re-sampling of some wells during February 2009.

At three of the test wells, two additional holes drilled were constructed as observation wells for pumping tests carried out by Company staff. Pump testing consisted of three constant rate drawdown tests of between 5.5- and 24-hours duration, and five pumped well recovery tests. Airlift yields of up to 4.9 l/s were achieved. (Australian Groundwater Consultants & Environmental, 2009) analyzed the results, which indicated permeability ranging from 0.5-5 m/d, and specific yield from 0.02-0.26.

5.2 Historical Resource and Reserve Estimates

5.2.1 Allkem (formerly Orocobre) resource 2009

The SDJ properties were acquired by Allkem from 2008 onward. An initial resource estimate was undertaken (Geos Mining, 2009). The estimate was based on only two interpreted horizontal Zones: Zone 1 with an average thickness of 11 m and Zone 2 with an average thickness of 54 m. Values of specific yield were assigned to these zones based on observed field characteristics and literature values. Average values of 0.22 were used for sand lithologies, 0.05 for halite and 0.01 for clays. A lithology-thickness weighted specific yield was calculated for each hole for the estimate. Assays used were based on sampling conducted in 2008 and 2009.

The product of equivalent brine thickness and the average concentration in each hole provided an estimate of tonnage for each drillhole site. These values were then contoured using the minimum curvature method and the total volume calculated. These were then combined with the average lithium concentration of 787 mg/l to define the contained maiden lithium resource.

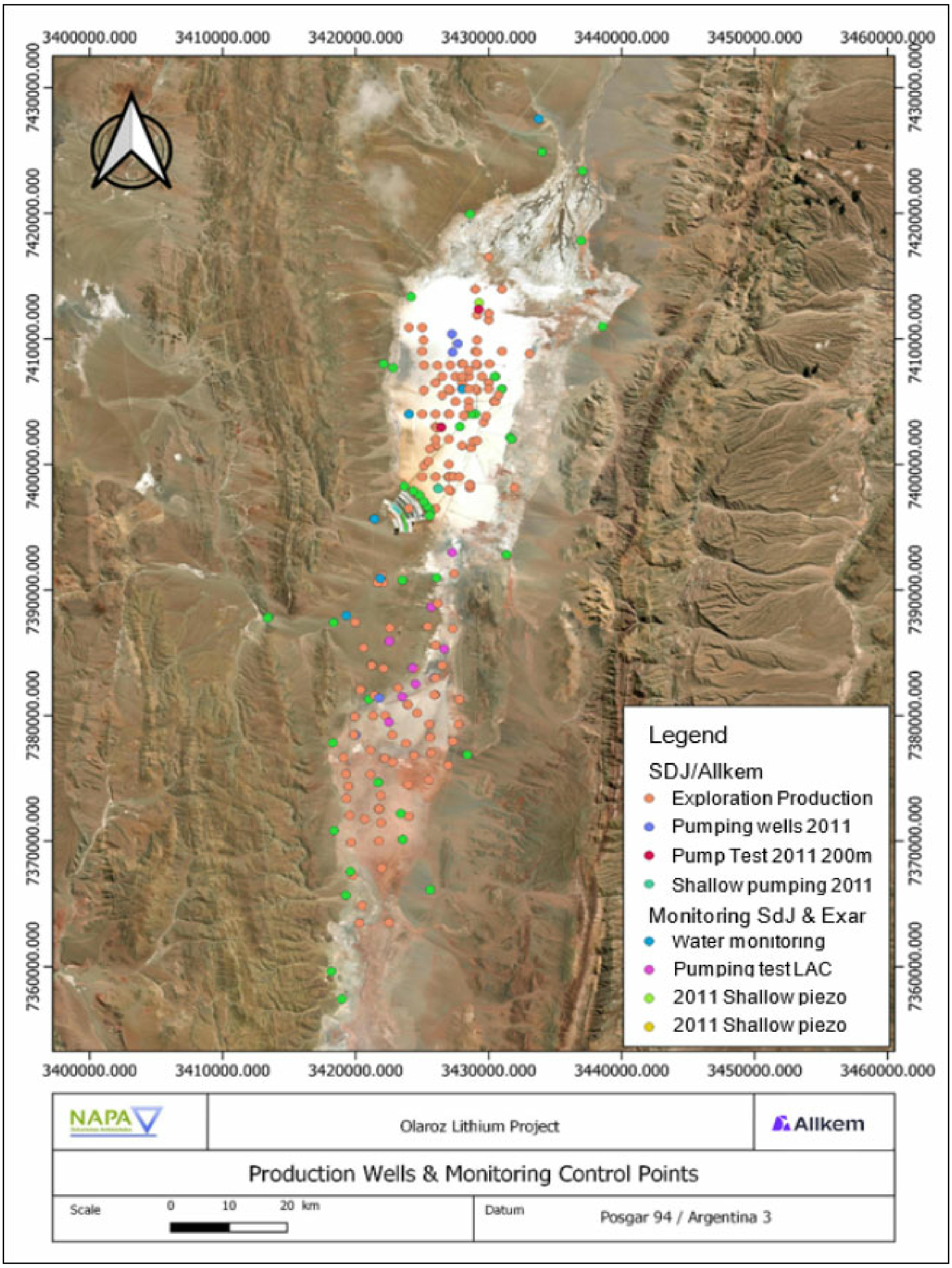


Figure 5-1 - Drilling undertaken in Olaroz and Cauchari by SDJ and other companies.

5.2.2 Initial Assessment 2009

An initial scoping study, equivalent to a Preliminary Economic Assessment study under NI 43-101, was carried out by Allkem in May 2009, following completion of the drilling, testing and the initial resource estimate. This was undertaken when Allkem was only listed on the Australian Securities Exchange and subject to different reporting regulations and terminology.

The study was an internal Allkem exercise, summarizing the work undertaken, the potential process route, the financial assumptions, and costs for capital items. Inputs into the study were provided by staff and consultants with experience on similar salar projects. The objective of the study was to ascertain if Olaroz had economic potential and set the scope for further investigations. The positive outcome of the scoping study led to planning of additional drilling and test work for Olaroz as part of a definitive feasibility study undertaken in 2010/11.

The Preliminary Economic Assessment was preliminary in nature, included Inferred Mineral Resources that by definition are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as Mineral Reserves, and there was no certainty the preliminary assessment would be realized.

5.2.3 Feasibility Study 2011

Allkem undertook an extensive program of geophysics and drilling from 2009 to 2011 to deliver the Olaroz Project feasibility study. This involved extensive fieldwork, laboratory process testing and updated resource estimation and engineering design. The details of activities are provided in the sections below.

5.2.3.1 Satellite Image Interpretation

Satellite images were interpreted to assist with the surface geological mapping in the vicinity of the salar. Satellite imagery was also used to define different geomorphic zones on the salar which have different evaporation rate characteristics (evaporation zonation). Satellite imagery also provided information regarding the surface hydrology and freshwater inflows into the salar. The satellite imagery interpretation was combined with information from the rainfall, evaporation quantified for this region and inflows measured in the Rio Ola and Rio Rosario to develop a water balance for the Olaroz Salar basin, to evaluate the effects of brine extraction over time.

5.2.3.2 Surface Geophysics

Surface geophysics was conducted by Contractor Wellfield Services to evaluate the geometry of the basin and brine body. They undertook measurement of three gravity lines and four AMT lines across the salar and in the area surrounding the salar. The gravity data was modelled to assess the depth of the basin. The gravity model was not used in the 2011 resource estimate, as the depth of the resource was controlled by the depth of drilling, with a maximum of 200 m. The gravity model was subsequently expanded and verified by more detailed gravity measurements made in 2017.

The Olaroz Salar is underlain by a deep basin (gravity data suggests up to 1.2 km deep) bounded by a pair of N-S reverse faults that thrust Cretaceous and Ordovician basement rocks over the basin margins. The basin is infilled with Cenozoic sediments. Pliocene to Recent sediments form a multilayered aquifer that acts as a host to the brine. The brine contains elevated levels of dissolved elements in solution that are of economic interest: lithium, potassium, and boron. Whilst the ultimate origin of lithium and other species is not fully known, they are likely to be associated with the Altiplano-Puna magma body that underlies the whole region.

5.2.3.3 Drilling

The 2011 program consisted of extensive drilling across the salar to evaluate the extent of brine mineralization. This program was carried out with the highest quality equipment available and included importing sonic drilling equipment to undertake the shallower part of the drilling program. It was not possible to conduct sonic drilling to 200 m depth, due to limitations with the drilling rig. Therefore, drilling to 200 m was conducted with diamond drilling.

- Sonic drilling consisted of twenty wells to 54 m depth to investigate the geology and obtain core and brine samples.
- Triple tube diamond drilling consisted of six wells to 197 m depth to investigate the geology and obtain core and brine samples.
- Core logging was undertaken for geology description and selection of samples for testing for porosity parameters.
- Core samples were collected for detailed laboratory porosity analysis of total porosity and specific yield.
- Geophysical ole logging was undertaken to support lithological characterization, correlation, and porosity evaluation.
- Brine sampling and analysis was undertaken using a bailer methodology, to collect representative brine samples and determine brine chemistry and lithium concentrations.
- Pumping tests of up to five months duration were undertaken to investigate flow conditions, determine aquifer properties, and to confirm the ability of wells to produce stable grades.
- Off-salar well drilling, water sampling and monitoring was undertaken to assist with development of the water balance and production forecasting for brine extraction.

5.2.3.4 Resource Estimate 2011

The 2011 Feasibility Study was the basis for engineering design and ultimately construction of Olaroz Stage 1. Based on the drilling conducted to explore the salar the resource was updated in this report to a total resource of 6.4 Mt of LCE, comprising 1.21 Mt of lithium metal (0.27 Mt as Measured and 0.94 Mt as Indicated), defined to a depth of 200 m.

5.2.3.5 Project Engineering Design

Based on the evaporation and engineering test work that was conducted from the start of the Olaroz Stage 1 project to 2011 a chemical process was defined for Olaroz Stage 1, with conventional evaporation ponds and a processing plant. Subsequent to the 2011 Feasibility Study detailed engineering was completed, to build the project. Olaroz Stage 1 was constructed from 2013 through to 2015, with the initial installation of production wells, evaporation ponds and production plant.

5.3 Agreement with Toyota Tyusho

Olaroz was built in partnership with Japanese trading Toyota Tsusho Corporation (TTC) and the mining investment company owned by the provincial Government of Jujuy, Jujuy Energia y Mineria Sociedad del Estado (JEMSE).

The partnership with TTC began in January 2010, through the execution of a definitive joint venture agreement to develop Olaroz. This agreement provided a comprehensive financing plan structured to secure TTC's direct participation in, and support for, funding the planned development at Olaroz. In turn, TTC's participation in Olaroz was through a 25% equity stake at Olaroz Project level. In a business where product quality is paramount, TTC's investment provided a strong endorsement of the quality of the Olaroz resource, and the high purity battery grade product produced at the Olaroz Lithium Facility.

5.4 Agreement with JEMSE

Jujuy Energía y Minería Sociedad del Estado (JEMSE) became an Olaroz partner in June 2012. JEMSE's participation in Olaroz is held through an 8.5% equity stake at SDJ level which provides the Provincial Government with a direct interest in the development of the Olaroz Lithium Facility.

The Olaroz Lithium Facility is managed through the operating company, Sales de Jujuy S.A. The shareholders are Sales de Jujuy Pte. Ltd. and JEMSE. The corporate structure is shown in Figure 5-2.

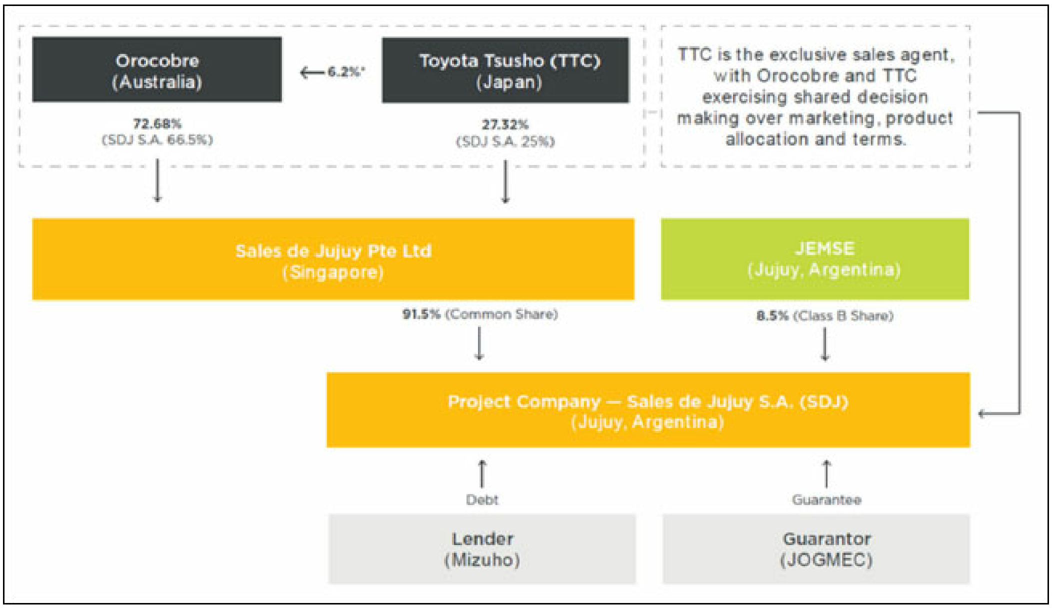


Figure 5-2 - Allkem (formerly Orocobre) ownership and Olaroz Project structure.

5.5 Resource Update - April 2022

Following the installation of the production wellfields for the Stage 1 project a number of deeper holes were drilled below 200 m depth, with an exploration target reported in October 2014, based on this drilling. Limited additional drilling was conducted until 2019, when the installation of production wells for the Stage 2 production began.

These wells were installed to depths of between 300 and 750 m, with the wells not completed until late 2022. The April 2022 resource update used these holes to provide information on the deeper sediments hosting brine, resulting in a substantial increase in the brine resource, compared to the 2011 resource. This resource was subsequently updated June 30, 2023.

5.6 Historical Production

5.6.1 Production well drilling

Production holes have been drilled with rotary drilling equipment, as this method is well suited to the installation of the larger diameter pipes and screens that are required for production wells, compared to the narrow diameters of diamond drill holes used for exploration and obtaining porosity and brine samples. There have been two major drilling programs installing production wells. The first of these was from 2012-2014, with the installation of production wells to 200 m depth, and several holes to greater than 300 m. This drilling was followed by the extension of several 200 m holes to 350 m depth and drilling of another hole to 450 m depth, all with rotary drilling equipment. This was followed by the ongoing expansion drilling program, commencing in 2019 and continuing, with the installation of production wells up to 650m deep (Figure 5-3).

The Olaroz expansion program was designed to include both installation of production wells and drilling of diamond drill holes, which would then be installed as monitoring wells. Due to the complication of logistics related to Covid-19 distancing and limited site accommodation, the planned number of diamond exploration and monitoring wells has not been completed and the installation of production wells was also subject to some delays.

The outcome of this situation is that the geological interpretation and sampling has relied on the installation of the new production wells for deeper information.

Traditionally sampling of brine in salars has relied on collecting samples over discrete intervals (typically with a separation from 3 to 12 m) by packer sampling or using a bailer device to purge fluid from the hole prior to sampling, allowing collection of a representative sample of brine due to inflow of formation brine into the well and sampling device. The complication with this methodology is that significant drilling fluid enters the sediments around the hole and during purging it may not be possible to remove all this fluid prior to collecting a representative brine sample. Fluorescein tracer dye can be used with drilling fluid, so that drilling fluid can be detected by the presence of dye when samples are taken. For the limited diamond drilling completed in the recent diamond drilling Fluorescein has not been used.

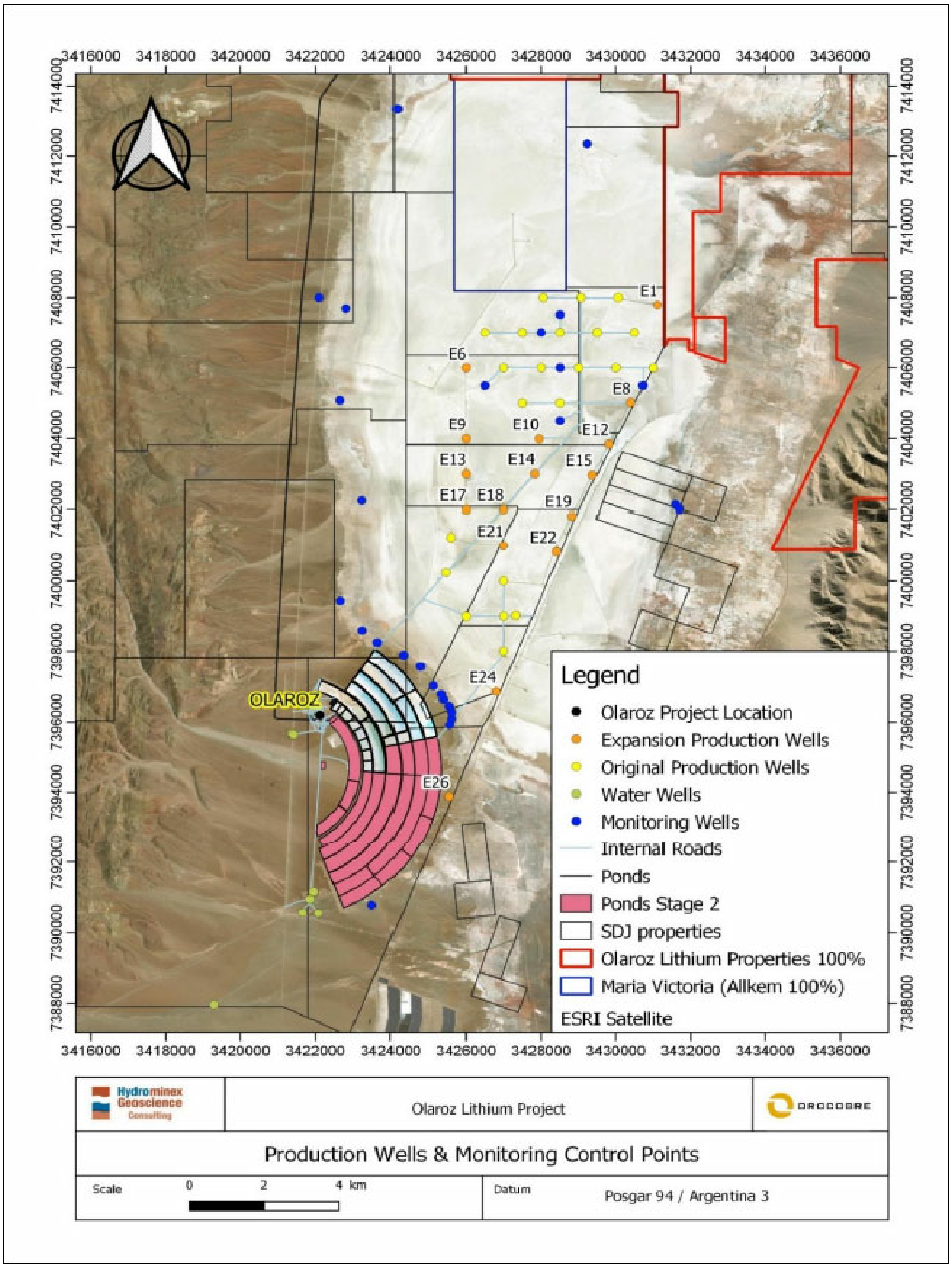


Figure 5-3 - Location of Olaroz expansion drill holes and the northern and southern wellfields

The installation of production wells involves widening the initial pilot hole and flushing the hole before the installation of well casing and screens. A gravel pack is added around the well, to minimize the amount of fine material entering the well. The well is then developed by using a jet of high-pressure air against the filters, allowing the gravel pack to settle in place and removing fine material from the well. A swab device is also used to clean the hole and gravel pack. Following use of these devices a pump is installed in the well and pumped to clean fine material from the hole. Once the pumped brine is confirmed to be free of suspended sediments the well is allowed to equilibrate before undergoing pumping tests to confirm the hydraulic characteristics of the well. For individual wells and drilling contractors' procedures varied for well development.

Screens are typically installed over long vertical intervals in wells, as outside the high permeability sandy units the sediments constitute a "leaky" package of sediments that liberates brine from the thick sequence of sediments. The brine extracted during pumping comes from different depths in a well is an averaged composition, which is influenced by the permeability of the host sediments, with higher permeability sediments contributing relatively higher flows. Brine extracted from wells has shown minimal variation since the start of pumping on Olaroz in 2012, with the variability on the scale of laboratory uncertainties.

Because of delays with diamond drilling and sampling and the difficulties of collecting brine samples in diamond drill holes to 650 m, assays from the pumped wells to 650 m deep, have been used as part of the resource estimate. Historical diamond drilling to 200 m depth showed the coefficient of variation between lithium in brine samples is low, and consequently use of brine results from production wells is considered reasonable, particularly given the history of pumping and production at the site.

5.6.2 Historical Production 2013 to 2023

Stage 1 of Olaroz was initiated in 2013 and has now been supplemented with the addition of the Stage 2, extracting brine from deeper levels in the salar, where higher capacity sandy aquifer units are noted. Historical brine extraction (as tonnes of lithium carbonate) is summarized in Table 5-1.

Table 5-1 - Historical production by year, 2013 to June 2023.

Historical Production by Year												
Year	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**Total**
Tonnes of LCE pumped	4,307	22,183	21,924	20,461	23,425	26,855	24,980	23,006	40,203	53,351	30,597	291,292

1. Production of 2023 is the cumulative until 30 of June of 2023.
2. Numbers are representative on a 100% basis.

6. GEOLOGICAL SETTING, MINERALIZATION AND DEPOSIT

This section summarizes the deposit and geological setting of Olaroz.

6.1 Regional Geology

The Olaroz Salar is located in the elevated Altiplano-Puna plateau of the Central Andes (Allmendinger, Jordan, Kay, & Isacks, 1997). The Puna plateau of north-western Argentina comprises a series of dominantly NNW to NNE trending reverse fault-bounded ranges up to 5,000-6,000 m high, with intervening internally drained basins with an average elevation of 3,700 m. The plateau is approximately 300 km wide at the latitude of Olaroz area and is bounded to the west by the Central Volcanic Zone magmatic arc of the Western Cordillera, and to the east by the reverse faulted Eastern Cordillera (Jordan, et al., 1983). This elevated plateau is a continental hinterland basin that has developed behind the main magmatic arc since the late Oligocene approximately 28 Ma (Carrapa, et al., 2005) (DeCelles & Horton, 2003) (Horton B. , 2012) (Jordan, et al., 1983). The distribution of Precambrian to recent salar sediments is shown in Figure 6-1.

Uplift and exhumation of the hinterland commenced in the late Oligocene when deformation was transferred from the west to the east towards the South American craton, compartmentalizing the former foreland region of the arc into reverse fault-bounded ranges and intervening internally drained basins, and transferring foreland sedimentation further east to what is today the Eastern Cordillera (Bosio, del Papa, Hongn, & Powell, 2010) (Carrapa, et al., 2005) (Coutand, et al., 2001) (Coutand, et al., 2006) (Gorustovich, Monaldi, & Salfity, 2011).

Timing of deformation and exhumation of each basement range in the hinterland appears to have been controlled by local structural or volcanic conditions (Alonso, 1992) (Segerstrom & Turner, 1972) (Vandervoort, 1993). Four main phases of deformation have been recognized: D1 28-25 Ma, D2 20-17 Ma, D3 13-9 Ma, and D4 5-2 Ma (Carrapa, et al., 2005). Rapid uplift and exhumation of the hinterland since the mid Miocene may be related to mantle delamination (Allmendinger, Jordan, Kay, & Isacks, 1997) (DeCelles, et al., 2015) (Kay & Kay, 1993) (Kay, Coira, & Viramonte, 1994) (Wang, Currie, & DeCelles, 2015), with the plateau reaching up to 2500 m by 10 Ma, and 3500 m by 6 Ma (Garzione, et al., 2008).

During the late Oligocene to middle Miocene continental red bed sediments approximately 1-6 km thick were deposited in the isolated, internal drained depocenters separated by mountain ranges within the hinterland, bounded in turn by the major watersheds of the Cordilleras to the west and east (Alonso, 1992) (Boll & Hernández, 1986) (Carrapa, et al., 2005) (Coutand, et al., 2001) (DeCelles, et al., 2015) (Gorustovich, Monaldi, & Salfity, 2011) (Jordan & Alonso, 1987). Sedimentation in the basins consisted of alluvial fans formed from the uplifted ranges with progressively finer fluvial sedimentation and lacustrine sediments deposited towards the low energy centers of the basins.

Deformation in the mid to late Miocene, D3 13-9 Ma (Carrapa, et al., 2005), established significant topography in the Eastern Cordillera (Deeken, et al., 2006), which created the establishment of humid conditions along the eastern Puna margin and a sustained arid to hyper-arid climate within the plateau itself (Alonso, et al., 2006).

During the late Miocene to Pliocene most tectonic deformation was transferred further east to the sub-Andean Santa Barbara thrust and fold belt (Echavarria, Hernández, Allmendinger, & Reynolds, 2003) (Jordan, et al., 1983). However, uplift and exhumation related to mantle delamination continued during this time and another 1-5 km of red bed sediments have accumulated in the hinterland basins in the last 8 Myr (Alonso, 1992) (Boll & Hernández, 1986) (Coutand, et al., 2001) (DeCelles, et al., 2015).

High evaporation together with reduced precipitation has led to the deposition of evaporites in many of the Puna basins since 15 Ma, with borate deposition occurring for the past 8 Myr (Alonso, Jordan, Tabbutt, & Vandervoort, 1991). Precipitation of salts and evaporites has occurred in the center of basins (Figure 6-2) where evaporation is the only means of water escaping from the hydrological system. Evaporite minerals including halite (NaCl), gypsum ($CaSO_4.2H_2O$) and ulexite ($B_5O_9CaNa.8H_2O$) occur disseminated within clastic sequences in the Salar basins and as discrete evaporite beds. In some mature Salars, such as the Hombre Muerto Salar, very thick halite sequences up to 900 m have also formed (Vinante & Alonso, 2006).

Several Miocene-Pliocene volcanic centers, known as the Altiplano-Puna Volcanic Complex (De Silva, 1989), cross the plateau along NW-SE crustal mega fractures (Allmendinger, Ramos, Jordan, Palma, & Isacks, 1983) (Allmendinger, Jordan, Kay, & Isacks, 1997) (Chernicoff, Richards, & Zappettini, 2002) (Riller, Petrinovic, Ramelow, Strecker, & Oncken, 2001). It has been suggested that the Miocene-Pliocene volcanism, particularly tuffs and ignimbrites, are the source of lithium, potassium, and boron, which is released into the Salar basins (Figure 6-1) from hot springs leaching these elements from the volcanic sequences (Godfrey, et al., 2013) (Risacher & Fritz, 2009).

Large changes in moisture availability also occurred on ~100 ka (eccentricity) cycles, synchronous with global glacial cycles. This is most clearly observed in drill cores from Lake Titicaca that record advances of glaciers in the Eastern Cordillera of the Andes and positive water balance in the lake coincident with global glacial stages, whereas glacial retreat and major lake-level decline was coincident with global interglacial periods (Fritz et al., 2007). In contrast, the tropical Andes north of the equator were cold and dry, with low lake levels, during glacial stages and wet and warm in the interglacial stages (Torres et al., 2013). The global glacial stages apparently were also the wettest periods in the western Amazon (Cheng et al., 2013).

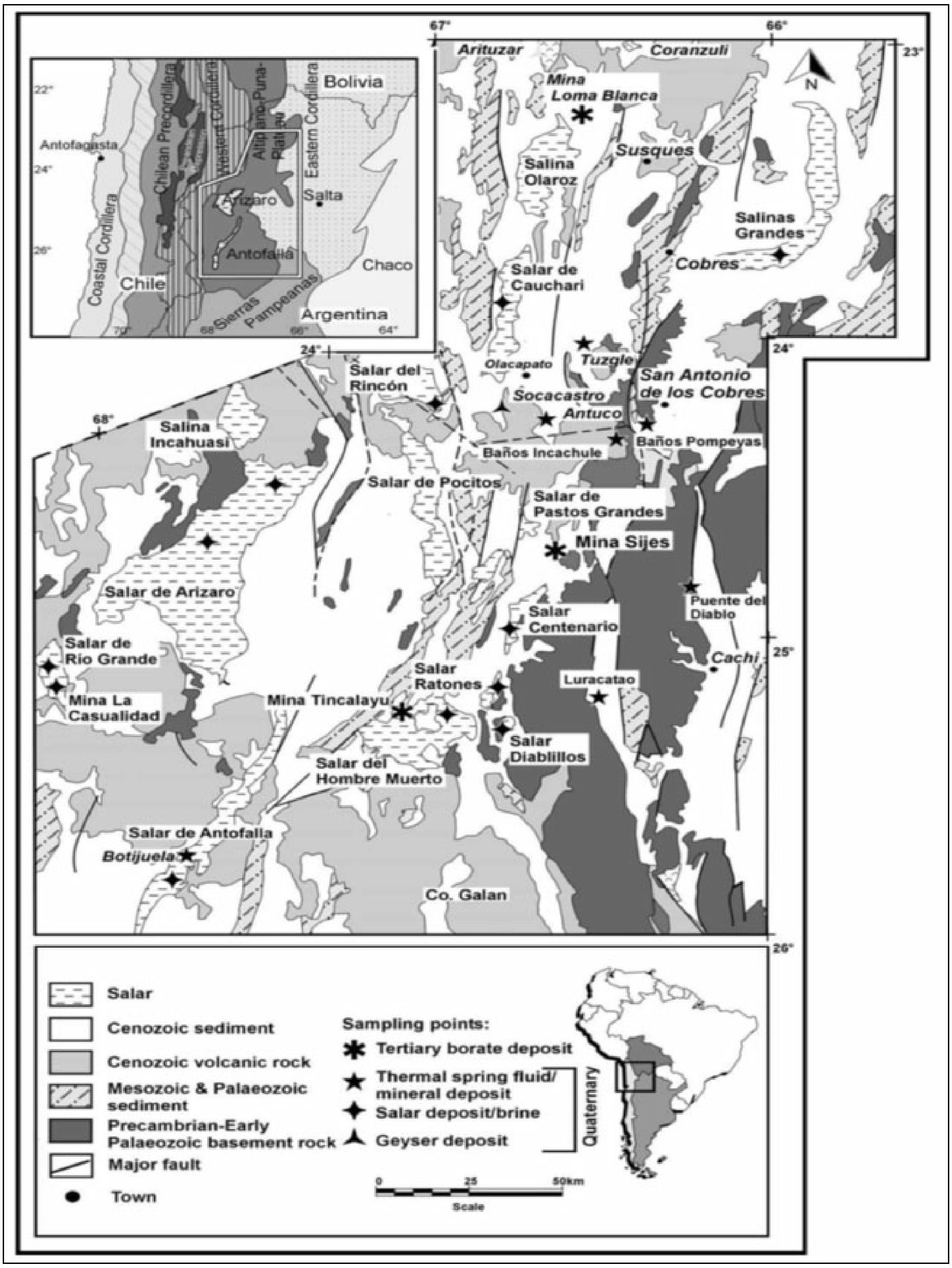


Figure 6-1 - Simplified regional geology map (Kasemann et al., 2004).

In their speleothem record, Cheng et al. (2013) found that the highest $d^{18}O$ values of the last 250 ka occurred during the mid-Holocene, implying that this was the interval of lowest precipitation over that period. In the Lake Titicaca drill core records, based on the abundance of saline diatom taxa and calcium carbonate, earlier interglacial periods were more saline than the Holocene and based on unconformities observed in seismic data (D'Agostino et al., 2002), lake levels were far lower during Marine Isotope Stage 5 than during the mid-Holocene. These low lake levels and highly elevated salinities are a result of negative water balance for a sustained period, requiring a combination of low precipitation and high evaporation, conditions that dropped lake-level below its outlet and caused the gradual build-up of dissolved solids (Cross et al., 2000; Fritz et al, 2007). The greater extremes of salinity and lake levels relative to the mid Holocene could reflect more extreme aridity, but more likely reflects longer-lasting aridity in the former period relative to the latter.

6.2 Local Geology

The deposits of the Olaroz - Cauchari basin consist of Cenozoic age sediments with a thickness greater than 1,000 m in some sectors, surrounded by two main fault systems-oriented N-S, that affect the Ordovician and Cretaceous basement.

During much of the Miocene, the basin was slowly filled by coarse-grained alluvial fans and sediments from the erosion of mountain ranges. Alluvial fill interdigitates with sediments that entered the basin from the deltaic fluvial system of the Rosario River to the north or from alluvial fan systems located on the east and west flanks of the Olaroz - Cauchari basin. The Rosario River system is more extensive compared to the alluvial fan systems, covering approximately a 2,000 km^2 catchment area to the north. The best developed active alluvial fan system is the Archibarca fan, which originates in the extreme west of the basin and has a catchment area of approximately 1,200 km^2.

As the deposition space in the basin narrowed, the sedimentary sequences were reworked, and the sediments became progressively finer higher up in the sequence. During the Pliocene, different sedimentary architectures such as river flats or alluvial fans can be seen, which give rise to predominantly sandy units. With a progressively more arid climate during this period, evaporitic deposits appeared, with abundant halite. This unit is probably of Pleistocene age, and a continuation towards the south, into the Cauchari salar, is observed, which suggests both sub-basins (Olaroz and Cauchari) operate hydrologically as a single entity.

The halite units suggest a continuous subsidence in the center of the basin, linked to variable climatic conditions. Units are developed where mainly clayey sediments dominate, although it is common to observe intercalations of sandy layers and silty sheets and halite layers that would indicate a change in lake facies to fluvial facies, probably linked to the succession of different energy episodes in the Basin. The main source of sedimentation appears to have been the Río Rosario watershed to the north. However, in the middle sector of the basin it is observed that during the formation of the clayey and saline unit sediment began to be supplied into the southwestern part of the salar from the Archibarca sub-basin.

The upper layer of the sedimentary sequence is predominantly clayey and silty, with intercalations of sand and carbonate layers. In addition, it is common to find levels of halite and ulexite intercalated.

Three major depositional cycles occurred during what is presumed to be largely the Pleistocene-Holocene. The first (deepest) cycle represents clastic sediments deposited in shallow freshwater conditions in much of the salar, influenced by the alluvial and deltaic fans located around the margins of the salar. This cycle is overlaid by a layer that is considered to represent a short but significant transition to more humid conditions. This second (shallower) cycle consists of evaporites (predominantly halite) and suggests salar conditions, with some sediment supply of volcanic or hydrothermal origin.

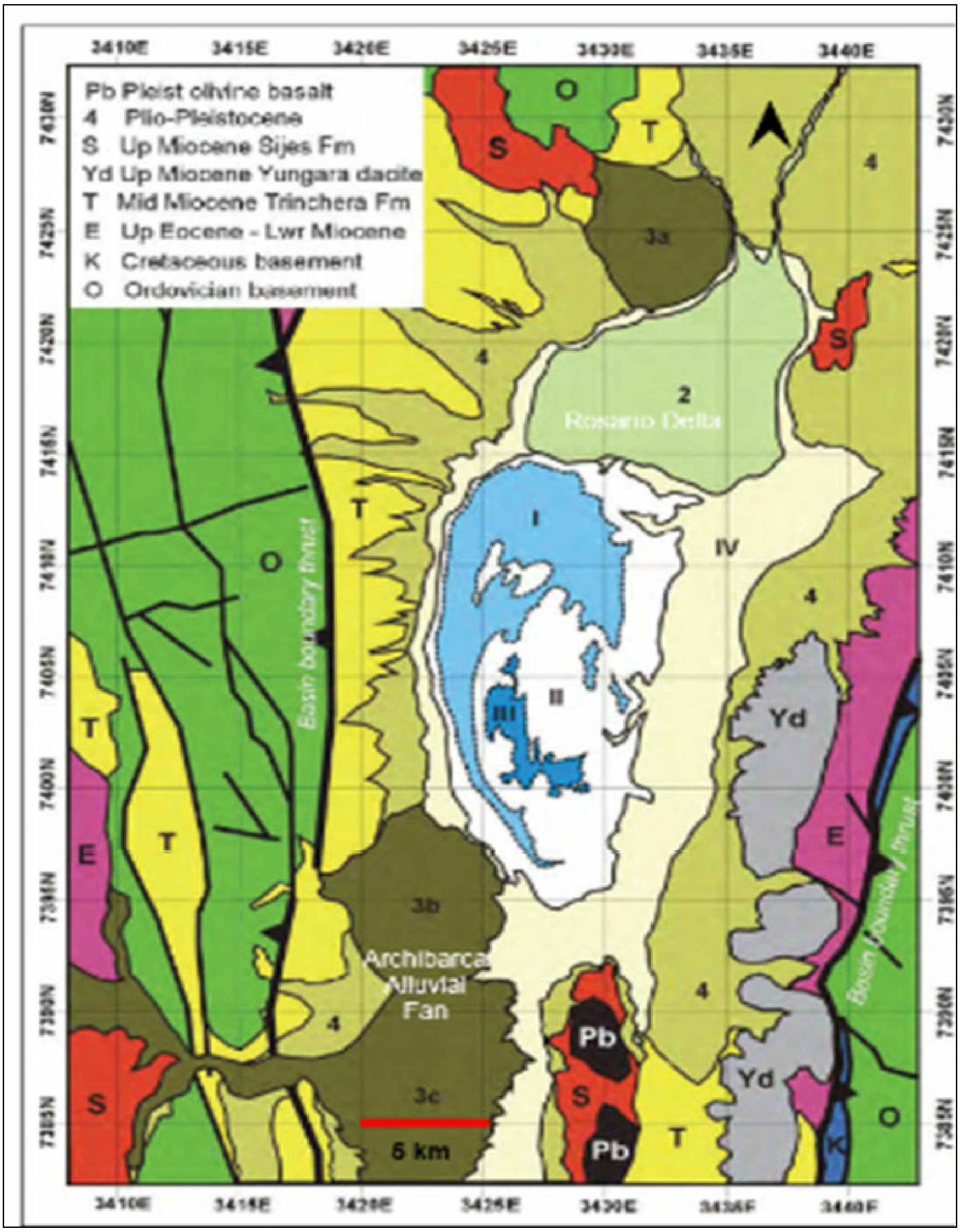
The third and final cycle of sediments consists of the most superficial deposits in the basin, and suggests a return to relatively arid conditions, coinciding with clastic sediments and a surficial halite layer largely confined to the center of the basin.

The surficial salt crust can be subdivided into three types, depending on its age and development. The oldest crust appears with a rough pinnacle morphology (<0.5 m), as described in other salt flats. A recent crust is represented by halite with well-developed or shrinkage polygons. A further type of crust is reworked by the precipitation of halite and smooth with high reflectance and represents areas that recently suffered flooding due to precipitation or from surface water inflows onto the salar. This texture is most strongly developed along the western side of the salar.

6.3 Local and Property Geology

6.3.1 Structural Setting

The Olaroz basin is a major north-south trending basin, which together with the Cauchari basin as the southern continuation, has a north south extent of approximately 170 km. The basin is approximately 35 km wide in the Olaroz section. The basin is bounded by Ordovician metasediments and younger sediments, including extensive Tertiary terrestrial sediments, that are present in bands along the eastern and western margins of the basin (Figure 6-2). These units are superimposed by a series of thrusts, trending north south, that have generated the mountain ranges bounding the salars, with the salars subsiding relative to the uplifted mountain ranges. The younger lithologies are generally closest towards the salar. The Olaroz Salar has been confirmed by gravity geophysics and drilling to extend to greater than 1 km deep, with the deepest hole to date drilled to 1,400 m, to confirm the basin stratigraphy. The salar basin has subsided in response to uplift of the surrounding ranges, with normal faulting likely to control the basin subsidence in a consistent orientation through the basin. The structural control of basin development has resulted in consistent patterns of sedimentation in the basin related to uplift and erosion.



Legend: 2 is the Rosario River delta. 3a, 3b and 3c are alluvial fans developed around the side of the basin. 4 is talus material and smaller alluvial fans around the margin of the basin. I, II and III are different salt crusts on the salar. IV is the surrounding marginal zone, with mixed types of evaporites.

Figure 6-2 - Geological map of the Olaroz area, based in part on mapping by Segemar.

6.3.2 Geomorphology

The Olaroz properties are located over the large Olaroz Salar, which has dimensions of 20 km north-south and 9 km east west, for an area of approximately 160 km^2. The salar is at an altitude of approximate 3,940 m above sea level. The salar is a large salt pan that is surrounded by alluvial fans on the east and west and by a large delta built around the Rosario River in the north. The southern end of the Olaroz Salar is delimited by the international road, which crosses the connection with the Cauchari Salar to the south, which continues down the valley occupied by both salars to the township of Olacapato.

The southern extent of the Olaroz Salar is also delimited by the Archibarca alluvial fan, a large alluvial fan which progrades into the Olaroz Salar and has been an important source of coarser sediments in the salar. The Archibarca fan is built from sediments that are transported by the Rio Ola, which breaches the mountain range which forms the western limit of the Olaroz basin, sourced from a sub-basin further to the west. This sub-basin is the source for freshwater recharge to the Archibarca alluvial fan.

The Olaroz properties are located in the Olaroz basin, although some properties extend over the range to the west. In the north of the Olaroz basin is the Coyaguaima volcano, which is snow covered in winter. Snowmelt and runoff from the northern part of the basin is the major source of inflow to the Olaroz basin.

The Olaroz Salar consists of four different geomorphic zones that were previously identified as having different characteristics related to halite development, seasonal flooding, and evaporation characteristics. These zones are shown in Figure 6-3.

6.3.3 Geological Units

The stratigraphy of the Olaroz and Cauchari basins has been controlled by syntectonic sedimentation, due to the N-S orientated faults in the basin and the movements of minor fault systems that tilt the basin in a north direction. This results in a variation in the thickness of the sedimentary units, which can vary from 50 - 200 m south of the Archibarca alluvial fan to 300 - 400 m thick to the north in Olaroz.

Lithological information from the drilling (with holes drilled to 650 m depth for the expansion wellfield) has defined the following sedimentary units, which represent the different facies encountered. Lithological units were previously defined by Houston and Gunn (2011) to 200 m depth, with letters A to G. These have now been summarized into hydro stratigraphic units (numbered UH 1 to 5) based on the more recent drilling to 650 m depth.

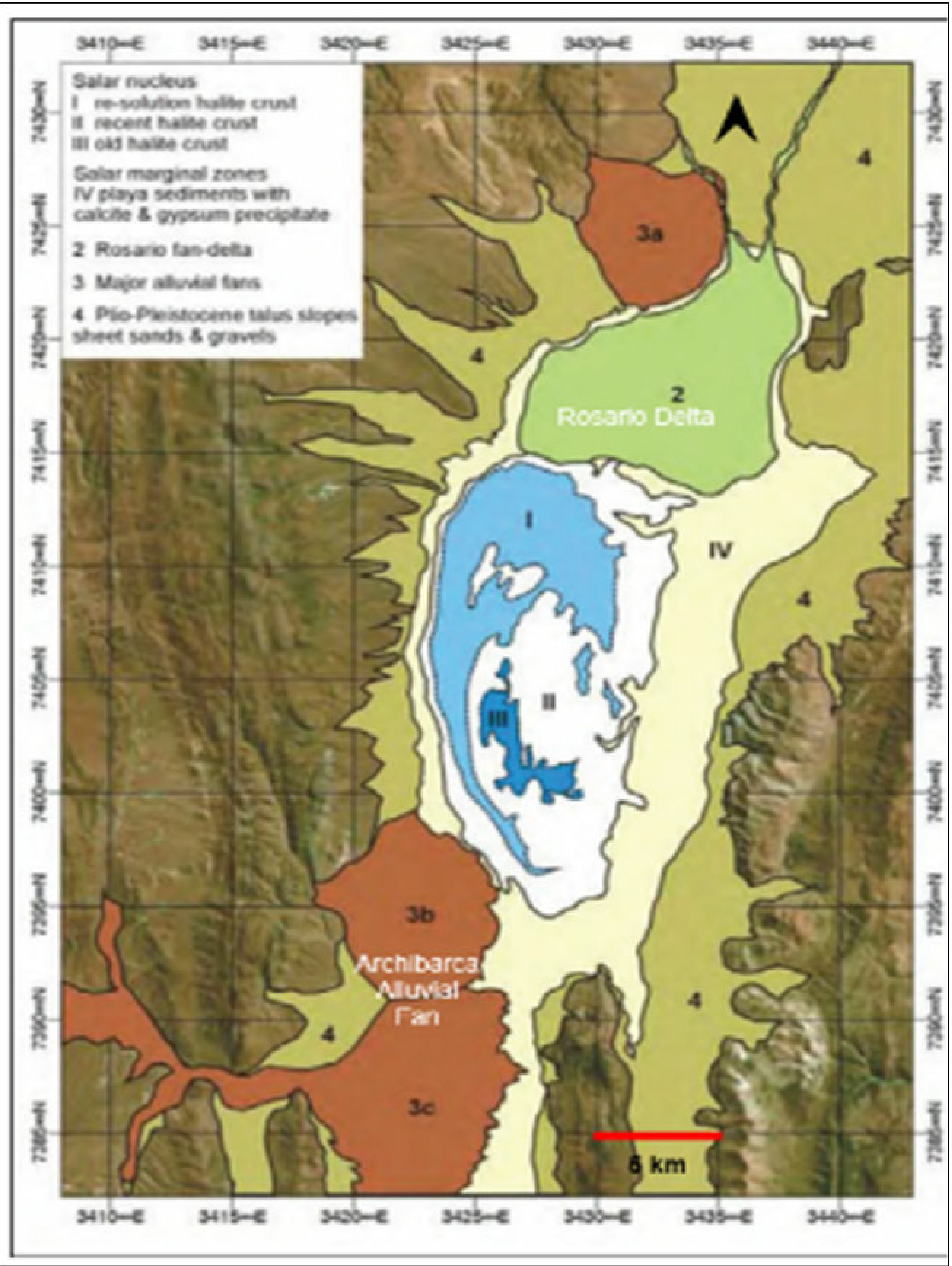


Figure 6-3 - Olaroz basin geomorphic features.

A hydro stratigraphic unit does not generally have the same lithology everywhere, as lithology changes laterally across a salar basin. The hydro stratigraphic units are defined on the basis of geological correlation, continuity, porosity, and permeability - with down hole geophysical logging contributing important information to define the units. The location of cross sections showing hydro stratigraphic units is shown in Figure 6-4, which shows the location of the different lithological enviro. The lateral distribution of the different UH units is shown in Figure 6-5. The cross sections in Figure 6-6 to Figure 6-9 show the different unit in different locations across the salar.

Houston's original (2011) hydrogeological units consisted of the following units, defined to 200 m. superseded by the division into the units shown in Table 6-1:

- Units A, B, C and D: These units are sequentially surficial halite, clay, a thin sand unit and clayey sediments and represent the deposits localized in the Olaroz Salar, with deeper deposits common between Olaroz and Cauchari.
- Unit of sand and gravels in alluvial and deltaic fans: Fd1 through Fd3, F1 and F2 -unconsolidated clastic deposits.
- Unit E: Mixed unit of clay and sand.
- Unit F: Mixed unit of clay, halite, and sand.
- Unit G: Unit with clay containing deep sand intervals.

Table 6-1 - Summary of Olaroz Salar hydro stratigraphic units.

Hydrogeological Unit	Geological Summary	Lithology
UH1	Surficial halite	Lacustrine & evaporative deposits, halite, sulphates, borates - Historical Unit A
UH2	Alluvial gravel fans	Unconsolidated deposits with blocky material, gravels, sands, silts and evaporites - Historical units Fd0 to Fd3, F1 and F2
UH3	Clay and sand unit	Lacustrine & evaporative deposits, predominantly clay and sand - Historical units B, C, D, E, F
UH4	Clay, halite, and sand unit	Lacustrine & evaporative deposits, principally halite, with sand and clay - Historical unit G
UH5	Lower sandy unit	Alluvial deposits related to a deeper transgressive cycle of sedimentation as the basin subsided - not intersected in Historical (2011) drilling

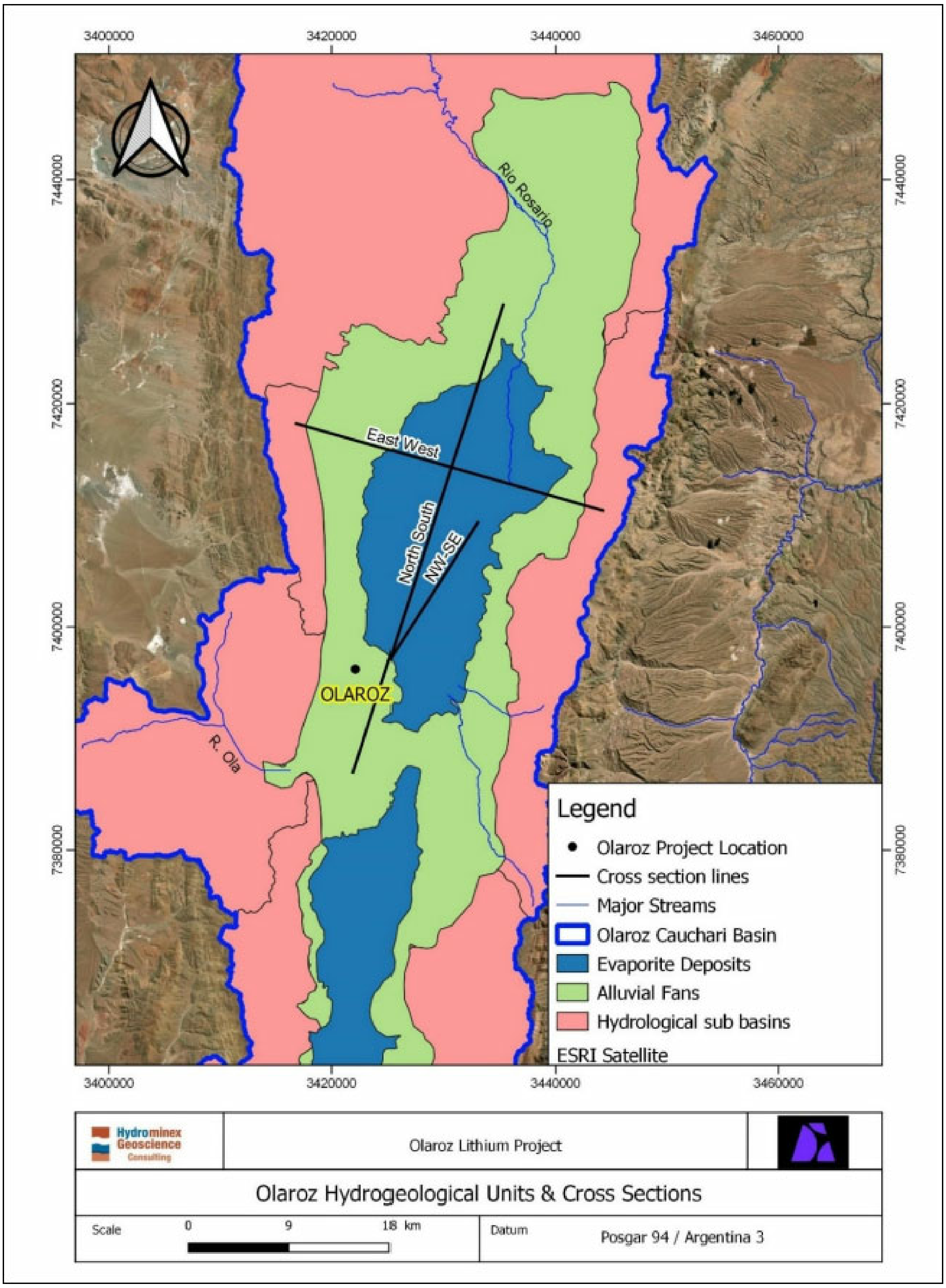


Figure 6-4 - Location of the Salar evaporite deposits, alluvial fans, and surrounding sub basins.

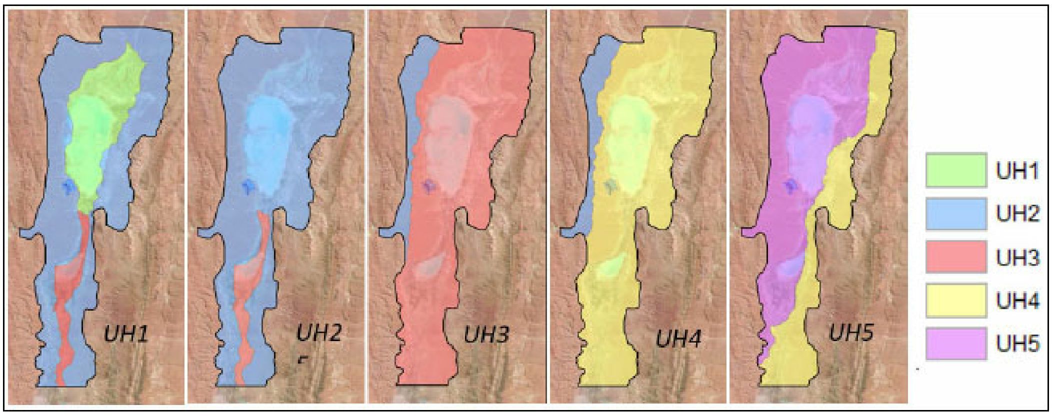


Figure 6-5 - Distribution of the different hydro stratigraphic units in the Olaroz basin.

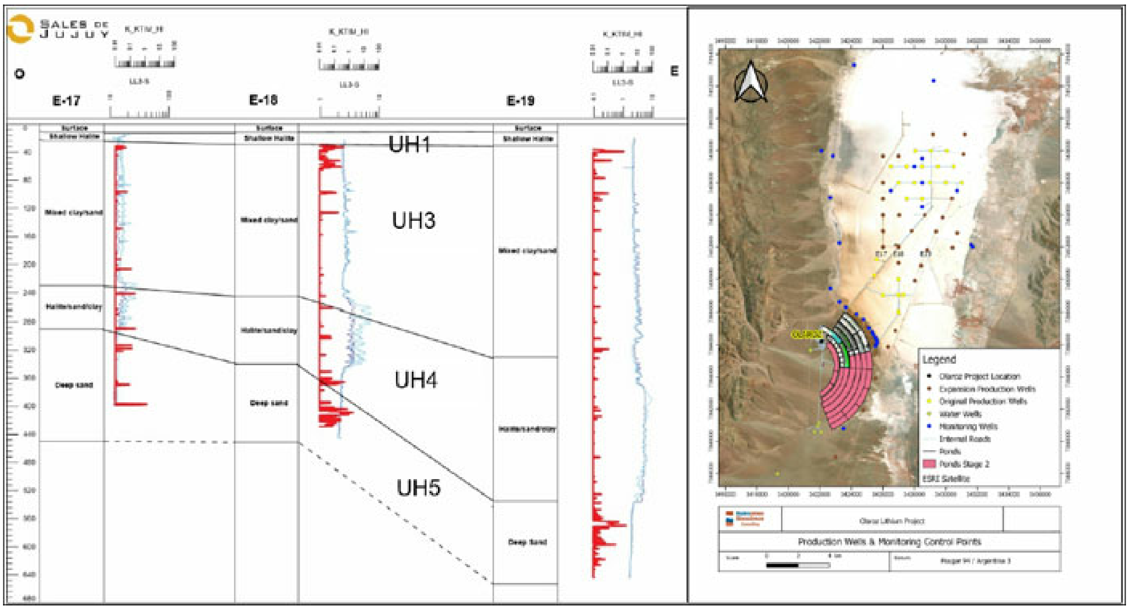


Figure 6-6 - Stratigraphic column and cross section looking north through the salar, showing the distribution of different units in expansion drill holes E17, E18 and E19.

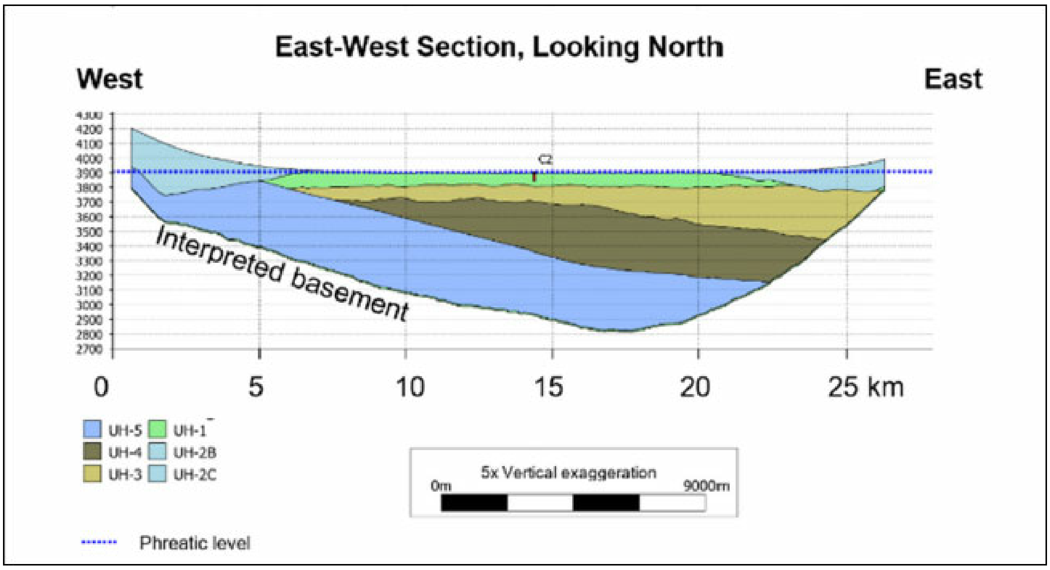


Figure 6-7 - Hydro stratigraphic units defined from more recent drilling at Olaroz.

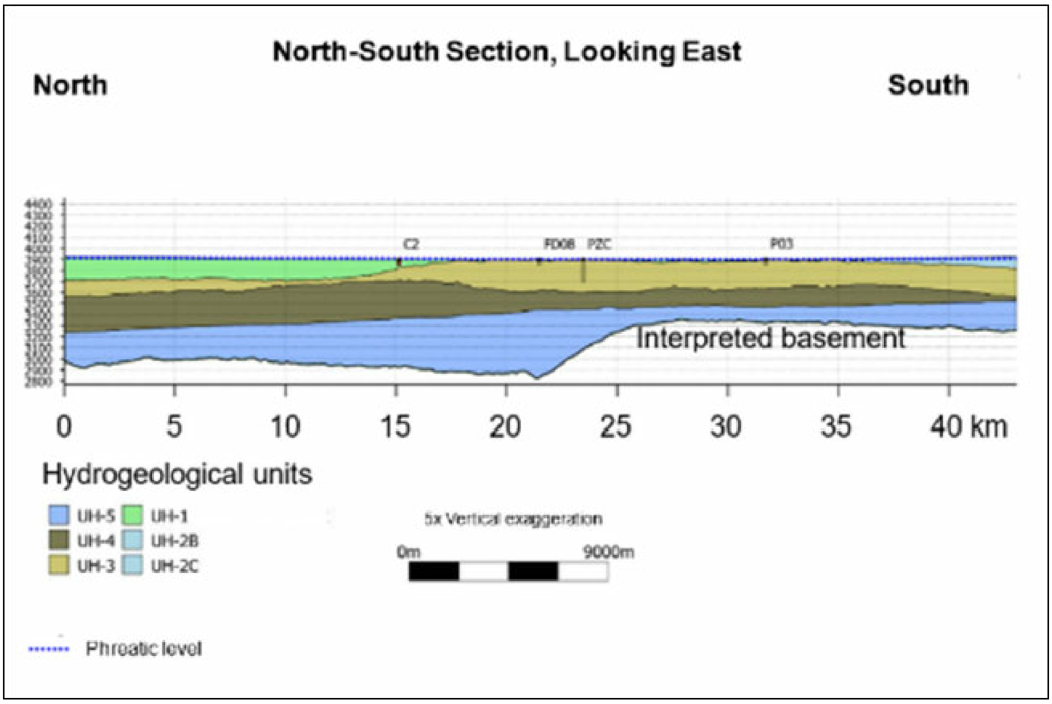


Figure 6-8 - Cross section north to south through Olaroz, showing the hydro stratigraphic units.

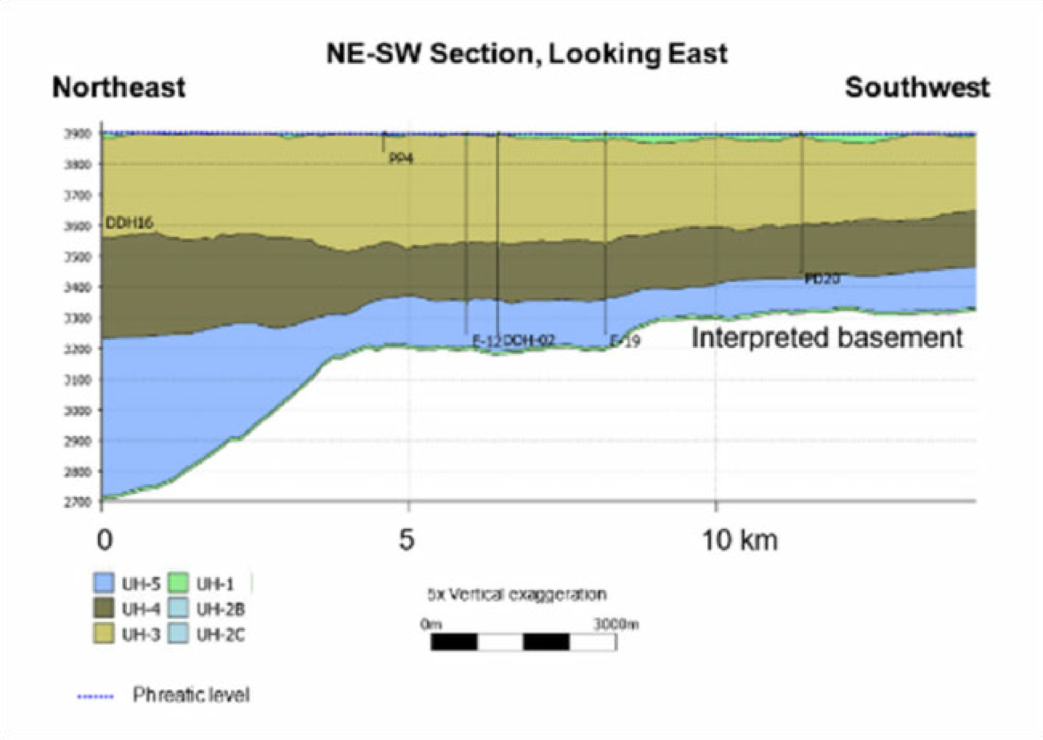


Figure 6-9 - Hydro stratigraphic units, showing drill holes (DDH02 - 650 m deep).

6.3.3.1 Hydro Stratigraphic Unit 1 (UH1)

This includes Unit A defined by Houston and Gunn (Houston & Gunn, 2011). The modern facies of the Olaroz Salar (late Holocene). On the surface, it is made up of a layer of salt that reaches a thickness of up to approximately 18 m (in historical hole C14). It forms a shallow basin with the main depocenter in the central southern part of the salar. It is dominated by halite with over 80% halite in the northwest and 50% in the southwest, and an increasing sand fraction to the southeast (to 15%), and clay fraction to the northeast (to 98%). Rare, thin beds (<20 cm) of ulexite and gypsum occur towards the northeast associated with the clays (Figure 6-10).

Figure 6-10 - Clay material in Unit UH1, showing bioturbated clayey sediments (Houston & Gunn, 2011)

6.3.3.2 Hydro Stratigraphic Unit 2 (UH2)

This unit includes unconsolidated deposits of alluvial, fluvial, and deltaic origin, originating from the alluvial fans located both east and west of the salar and the Rosario Delta developed to the north of the salar. These units correspond to the F1, F2, Fd0, Fd1, Fd2 and Fd3 units defined by Houston and Gunn (Houston & Gunn, 2011). It consists of gravels, breccias, sands and silts, with sandy, clayey and halite groundmass, whose ages are estimated as Pleistocene to the Holocene. This unit includes the active deposits of the Rosario River delta, consisting of carbonates, sands, silts, and clays. It has a variable thickness, with recognized thickness exceeding 150 m in the Archibarca sector and no significant drilling below 50 m depth in the Rosario Delta. These deposits are found interdigitating with shallow evaporite deposits of Unit 1. Distinction between this unit and UH5 is difficult, as it appears UH5 was sourced from the western side of the basin.

6.3.3.3 Hydro Stratigraphic Unit 3 (UH3)

Unit UH3 comprises most of the units defined previously by Houston, combined into this much thicker package. Unit B reaches maximum thicknesses of 36.2 m (in sonic drill hole C05). It is a unit of interbedded sediments dominated by clay (>75%) over the whole salar, with a sand fraction reaching 30% in the northeast, and halite reaching 18% in the central east. The clays are plastic, red-brown, green, or black and organic rich. They are frequently laminated, silty, with thin sand lenses. The sand in the northeast is generally fine grained and silty. Halite is fine grained and mixed with silt and clay.

Unit C is a well-defined sand bed, occurring in all wells throughout the salar and interdigitating with the Rosario fan delta in the north and Archibarca delta in the southwest. Unit C ranges in thickness from 6.6 m (historical well C17) to 0.1 m (in historical well C07), tending to be thicker in the north and south and thinner in the center of the salar. The sand fraction averages 80% and reaches 100%.

Unit D occurs in all wells except those in the northeast. It is likely that Unit D will be replaced by Fd2 in the northeast and F2 in the southwest, associated with the Rosario fan delta and Archibarca fan respectively. The thickness of Unit D increases from 20 m in the central east to over 32 m in the west and northwest. Unit D comprises interbedded sediments dominated by clay and silty clay (>60%), with lesser fractions of sand and thin beds of carbonate (calcrete or travertine). There are rare lenses of halite and ulexite (less than 0.5 m thick) towards the south.

In the extreme north of the salar, Unit D represents the influence of the overflows generated by the deltaic fan of the Rosario River in times of flooding of this river and its superposition towards the nucleus of the Olaroz Salar.

Unit UH3 corresponds to facies associated with a stage of variable climatic conditions, consisting of predominantly clayey sediments with intercalations of very fine sand layers and bands of halite, with a thickness much greater than one hundred meters. These lithofacies suggest they formed during fluvial marsh to lake conditions. Unit UH3 corresponds to the Units B, C D, E and F defined by Houston and Gunn (Houston & Gunn, 2011) and is the predominant unit in which the original Olaroz Northern Wellfield is established in.

The clays are red, brown, or green, sometimes black with entrained organic matter. They are frequently interbedded with silts, sands and even gravel. Carbonates as discrete beds up to 10 m thick (historical hole CD02) are composed of crystalline calcite with an overgrowth of calcite cement. Druses cavities are occasionally present with microcrystalline calcite interiors. They contain some clastic material such as lithics and thin silts beds.

The lithofacies of Unit E suggest mixed fluvio-palustrine and lacustrine conditions, the former prevailing to the north and west, the latter towards the south and east.

6.3.3.4 Hydro Stratigraphic Unit 4 (UH4)

Deeper drilling to 650 m has defined the thickness and extent of the halite dominated unit more effectively, with drilling showing Unit G of Houston and Gunn (Houston & Gunn, 2011) is thickest in the east of the salar, with the thickness increasing south towards Cauchari. The unit consists of halite intercalated with clays, which are distinguished in the geophysical logging based on resistivity and other characteristics.

This unit corresponds to facies associated with a stage of hyperarid climate. The structure and disposition of this unit during its formation, suggests an active subsidence of the basin, with the unit continuing into the Cauchari Salar. This unit is dominated by layers of banded halites and massive halite. The halite crystals that make up the lenses may be corroded or dissolved, resulting in highly porous horizons.

6.3.3.5 Hydro Stratigraphic Unit 5 (UH5)

This corresponds to a unit composed of layers of clay and silt, alternating with massive and laminated fine-grained sand. The grain size of the sand appears to be coarser at greater depth. The mineralogy of the sands indicates a source of volcanic origin. The thickness of this unit is variable, with lesser thickness in the east of the basin and the greatest thickness in the southwest of the basin, where an early version of the Archibarca alluvial fan appears to have been active, shedding coarser grained sediment into the basin and developing important high porosity and permeability units. The base of this unit has not yet been recognized. The 1400 m deep stratigraphic hole drilled in the east of Olaroz encountered coarse gravels at depth, which prevented continuation of the hole. In the south of Olaroz it is difficult to distinguish units UH2 and UH5 in drill cuttings.

This unit is likely to be the lateral equivalent to the deep sand unit encountered in drilling at Cauchari, where sandy material has been sourced from the western side of the basin, as appears to be the case at Olaroz.

6.3.3.6 Basement

The basement rocks have not been intersected in drilling at Olaroz. There may be more extensive units of sand and gravel at the base of the basin than have been intersected in drilling to date. The basement rocks in the central part of the salar are likely to be Cretaceous to Ordovician in age, with younger tertiary sediments around the edges of the salar, although further drilling would be required to confirm the nature of the basement rocks beneath the salar.

6.4 Mineralization

As previously discussed, brine projects differ from hard rock base, precious and industrial mineral projects due to the fluid nature of the mineralization. Therefore, the term ‘mineralization’ should be considered to include the physical and chemical properties dissolved within the fluid (brine), as well as the flow regime controlling fluid flow.

The brines from Olaroz are solutions nearly saturated in sodium chloride with an average concentration of total dissolved solids (TDS) of 290 g/L and average fluid density of 1.20 g/cm^3. In addition to extremely high concentrations of sodium and chloride typical in these salar settings the Olaroz brine also contains significant concentrations of Li, K, Mg, Ca, Cl, SO_4 and B.

The Olaroz Salar is large, and the brine is rather homogeneous, although there are some trends in the concentrations of lithium and other elements through the salar sediments. Brine concentrations are lower close to the margins of the salar and in areas where there is significant recharge by freshwater runoff. The Mg/Li ratio averages 2.3, with the SO_4/Li ratio averaging 23.

Table 6-2 shows a breakdown of the principal chemical constituents in the Olaroz brine including maximum, average, and minimum values, based on brine samples used in the brine resource estimate that were collected from the production wells.

Table 6-2 - Maximum, average, and minimum elemental concentrations of the Olaroz Brine from 2017-2021 pumping data. Brine samples have a constant density of 1.2 g/cc within the wellfields.

Analyte	Li	K	Mg	Na	Ca	B	SO_4	Cl
Units	**mg/l**	**mg/l**	**mg/l**	**mg/l**	**mg/l**	**mg/l**	**mg/l**	**mg/l**
Maximum	1,238	10,311	3,054	138,800	988	2,439	36,149	202,982
Mean	728	5,183	1,668	115,437	453	1,336	16,760	181,805
Minimum	465	1,716	859	101,000	217	673	4,384	149,207
Standard Deviation	124	984	374	3,991	84	190	3,685	6,664

Figures in Section 11 show the kriged distribution of lithium concentrations in the salar. Concentrations of lithium and potassium show a high degree of correlation. As amp-up of KCl fertilizer is not planned as a by-product, only lithium has been included in the estimation. The kriged three-dimensional distribution of lithium concentrations was used in the updated resource model as further described in Section 11.

Brine quality is evaluated through the relationship of the elements of commercial interest lithium and potassium and the consideration of other elements that must be removed to provide a high-quality lithium product. Other components of the brine constitute impurities, including Mg, Ca, B and SO_4. The calculated ratios for the averaged brine chemical composition are presented in Table 6-3.

Table 6-3 - Average values and ratios of key components of the Olaroz brine (mg/L) 2017-2021 pumping data.

Li	K	Mg	Ca	SO_4	B	Mg/Li	K/Li	SO_4/Li
728	5,183	1,668	453	16,760	1,336	2	7	23

The precipitation of salts during evaporation of the brine can be represented on a phase diagram known as the Janecke projection, which considers an aqueous quinary system (Na^+, K^+, Mg^{++}, $SO_4^=$, Cl^-) at 25°C and saturated in sodium chloride. This can be used when adjusted for the presence of lithium in the brines, with the Janecke projection $MgLi_2$-SO_4-K_2 in mol % is used to make this adjustment. The Olaroz brine composition is represented in the Janecke Projection diagram in Figure 6-11 along with the brine compositions from other salars. The Olaroz brine composition is compared with those of Silver Peak, Atacama Salar, Hombre Muerto Salar, Rincon Salar and Uyuni Salar in Table 6-4 below.

Table 6-4 - Comparison of Olaroz and other brine compositions in weight percent, after multiple industry sources.

	Olaroz Salar (Argentina)	Cauchari Salar (Argentina)	Silver Peak (USA)	Atacama Salar (Chile)	Hombre Muerto (Argentina)	Maricunga Salar (Chile)	Rincon Salar (Argentina)	Uyuni Salar (Bolivia)
Li	0.057	0.043	0.023	0.150	0.062	0.094	0.033	0.035
K	0.500	0.370	0.530	1.850	0.617	0.686	0.656	0.720
Mg	0.140	0.110	0.030	0.960	0.085	0.610	0.303	0.650
Ca	0.040	0.040	0.020	0.031	0.053	1.124	0.059	0.046
SO_4	1.530	1.590	0.710	1.650	0.853	0.060	1.015	0.850
Density (g/cm^3)	1.210	1.190	N/A	1.223	1.205	1.200	1.220	1.211
Mg/Li	2.460	2.560	1.430	6.400	1.370	6.550	9.290	18.600
K/Li	8.770	8.600	23.040	12.330	9.950	7.350	20.120	20.570
SO_4/Li	26.800	37.000	30.870	11.000	13.760	0.640	31.130	24.280
SO_4/Mg	10.930	14.450	23.670	1.720	10.040	0.097	3.350	1.308
Ca/Li	0.700	0.930	0.870	0.210	0.860	9.500	1.790	1.314

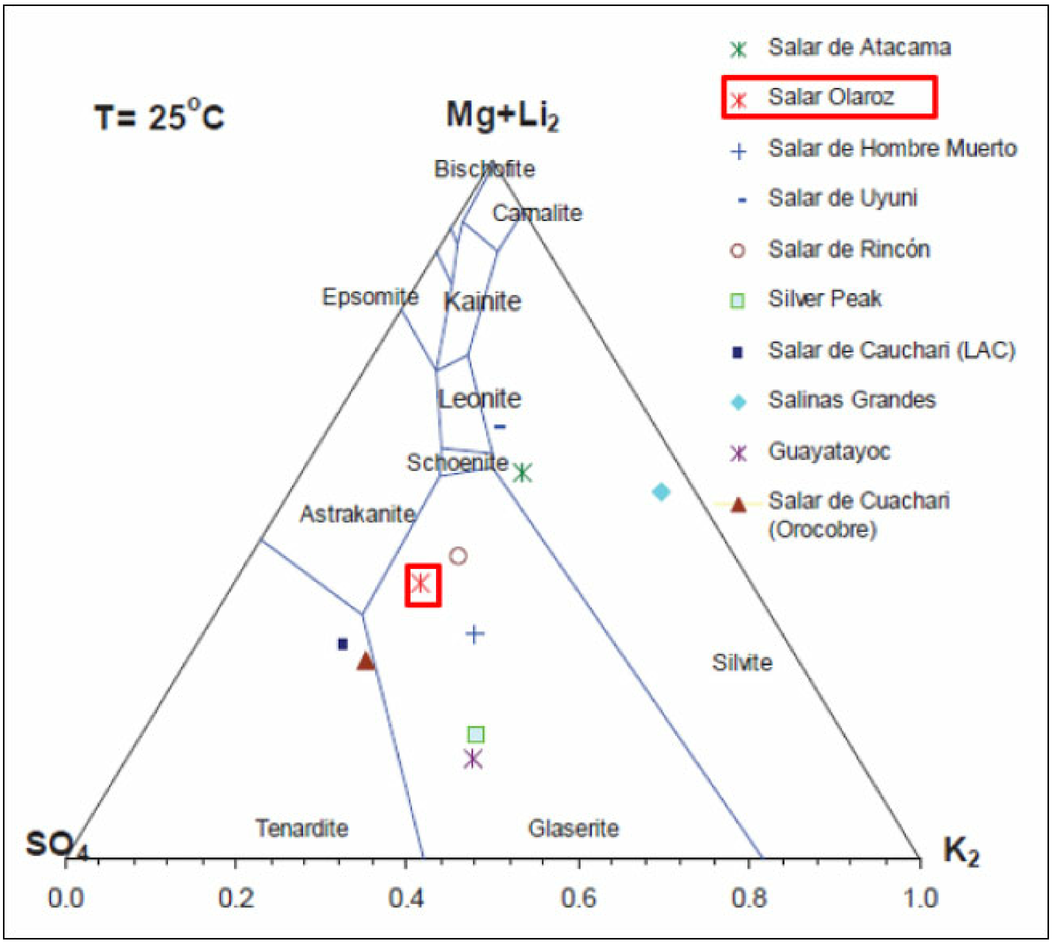


Figure 6-11 - Janecke phase diagram showing the composition of Olaroz relative to other salars. The labelled apexes represent the 100% (proportion of 1) concentration that corresponds to that label.

6.5 Deposit Types

Lithium is found in a number of different geological deposit types. The most common are pegmatite bodies, associated with granitic intrusive rocks, and continental brines in salars.

Pegmatite bodies are found in a diverse range of countries, including Australia, Canada, Congo, Russia, USA, and Zimbabwe, with the largest deposits often located in Archean or Proterozoic rocks. Pegmatites are mined by conventional hard rock mining and the spodumene ore is subsequently processed, generally producing lithium hydroxide. In addition to pegmatites lithium is also found in other settings.

Continental lithium brines in salars settings are found principally in Argentina, Chile, Bolivia, and China, with lithium carbonate or lithium chloride produced from these projects. Lithium is rarely found in continental oilfields, where the accompanying produced water is enriched in lithium, probably deriving lithium from evaporite sequences in the stratigraphy.

Lithium is also found in geothermal systems, rarely at concentrations that may be economic, one example being the Salton Sea geothermal field. A related type of mineralization is lithium present in tuffs or clays in volcanic sequences, where the lithium has likely resulted from geothermal or hydrothermal activity, with examples in the Western USA and Mexico.

Lithium production from salar brines has a number of advantages over hard rock mining of pegmatites and sediments. The principal advantage is the lower operating costs for lithium salar operations, based on the economics of the operating lithium salar producers in Chile and Argentina ((Lagos, 2009); (Yaksic & Tilton, 2009), Wood Mackenzie. (May 2022 report on lithium market dynamics).

6.5.1 Salar Types

Lithium brine projects can also be subdivided into two broad 'deposit types' with different characteristics (shown in Figure 6-12), which consist of:

- Mature Salars (those containing extensive thicknesses - up to hundreds of meters - of halite (salt), such as the Atacama Salar (Chile), and the Livent Hombre Muerto operation (northern Catamarca, Argentina).

- Immature Salars, which are dominated by clastic sediments, with limited thicknesses of halite, such as the Olaroz Salar in Jujuy Argentina and the Silver Peak deposit in Nevada, USA, where brine is extracted from porous volcanic ash units.

Historical development of salar lithium brine projects in Chile and Argentina focused on the development of large mature salars, as these required only shallow drilling and provided excellent brine flow rates from shallow wells. Projects developed at this time (Lithium production from the Atacama Salar, in northern Chile, and from the Hombre Muerto Salar in Argentina dates from 1984 and 1997 respectively) had the most favorable brine chemistry of the mature salars. More recent developments of Salar projects are predominantly immature salars, which are more common, and which can host extractable brine resources to depths of hundreds of meters.

The characteristics of these two different Salar types influence the distribution of the contained brine and brine extraction. It should be noted there may be immature and mature areas within the same Salar basin (such as in the Hombre Muerto Salar in Argentina, where Livent, Posco and Galaxy (now part of the Allkem group) have projects.

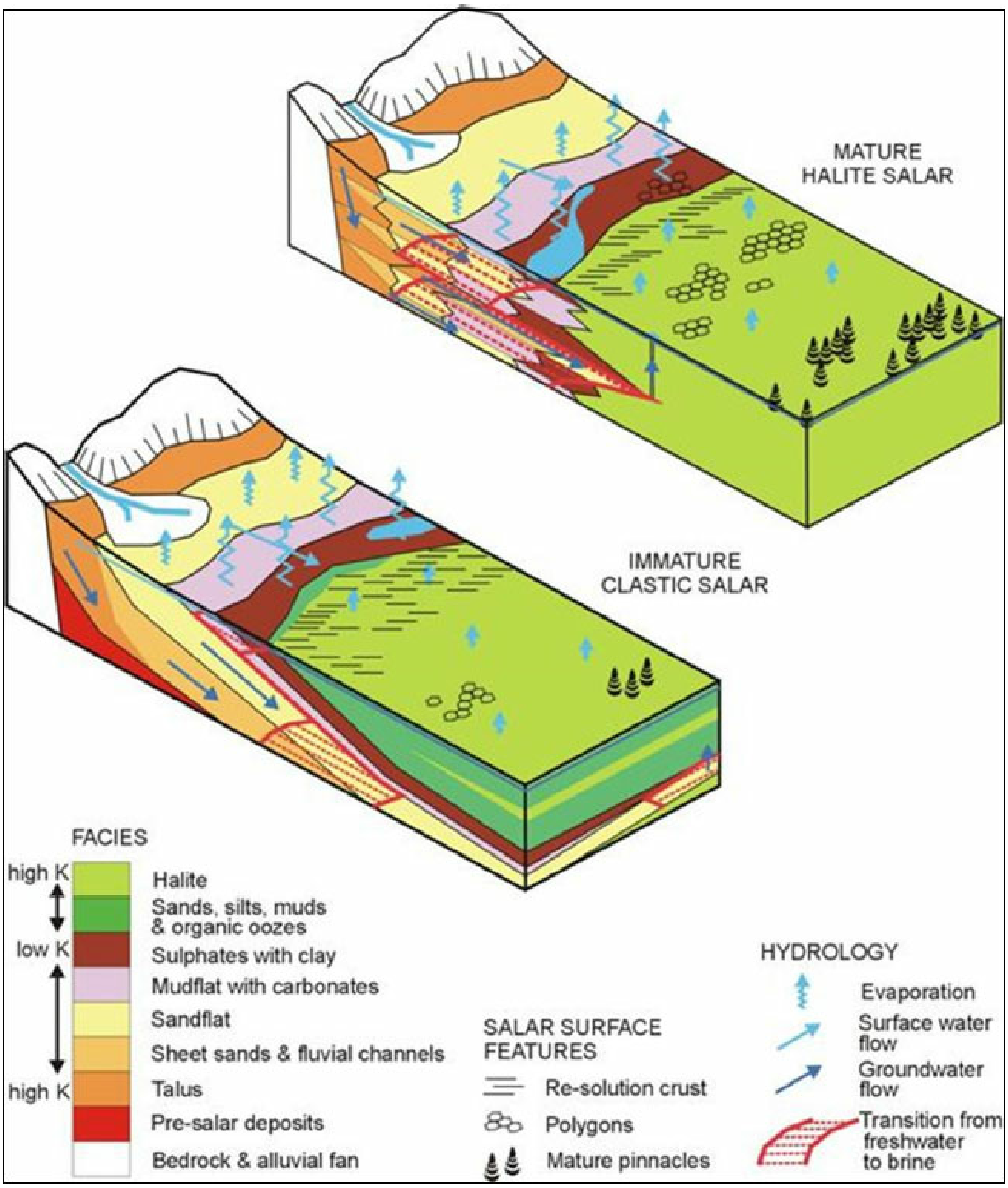


Figure 6-12 - Model showing the difference between mature and immature salars (Houston, Butcher, Ehren, Evans, & Godfrey, 2011).

6.5.2 Mature Salars

Brine in mature salars is hosted in pore spaces, caverns, and fractures within salt (halite) which has been deposited by the evaporation of brines to produce salt through natural evaporation. Mature salt dominated salars (i.e. Atacama Salar) are characterized by having porosities in the 8 to 12% range within the salt units (Houston, Butcher, Ehren, Evans, & Godfrey, 2011), with the porosity and permeability decreasing with depth, such that by a depth of approximately 50 m the specific yield in matures salars has decreased to several percent (Houston, Butcher, Ehren, Evans, & Godfrey, 2011).

In these salars the brine resources are principally contained between surface and 50 m below surface, as below this depth there is reduced permeability in the salt, due to salt recrystallization and cementation of fractures.

6.5.3 Immature Salars

Immature salars conversely have brine hosted in pore spaces controlled by the porosity and permeability associated with individual layers within the salar sequence. A degree of compaction occurs with increasing depth below surface, but unlike in mature samples significant porosity and permeability characteristics may continue to depths of hundreds of meters in these salars (such as the producing Olaroz Salar and the adjacent Cauchari Salar in Northern Argentina and at the Silver Peak lithium brine mine in Nevada).

The porosity and permeability characteristics may be variable between units, and units with low productivity for brine extraction can alternate with more productive units, due to differences between sediments such as sand and gravel and finer grained silts and clays. The presence of different stratigraphic units in clastic salars typically results in differences in the distribution of the contained brine and influences the recovery of brine as reserves from the defined brine resource, with lower resource to reserve conversion ratios than are typical in hard rock mining situations. It is very important to consider the characteristics of the host aquifers in each salar, together with the aquifer geometry and physical properties, particularly specific yield, and specific storage hydrogeological characteristics.

The characteristics of lithium production from the Silver Peak deposit in Nevada are of importance to Salar bine developers, as many salar deposits currently under evaluation are immature salars which face the same challenges as Silver Peak, which has been operating since 1966 (Lagos, 2009).

The typical architecture of Puna Salar basins (Houston, Butcher, Ehren, Evans, & Godfrey, 2011) consists of:

- Coarser grained sediments on the margins of a salar basin, with successive inner shells of finer grained clastic units.
- Where evaporation is highest an inner nucleus of halite occurs in the approximate center of the salar (depending on the salar topography) and is surrounded by deposits of mixed sulphate and carbonate deposits, together with fine grained clastic sediments.

6.5.4 Buried Salars

Salars contain sequences of sedimentary deposits with clastic sediments (clay, silt, sand, gravel) and evaporites (principally salt). These sediments progressively accumulate and the surface of the salar consists of salt or fine sediments such as clays. In some cases, due to changes in climate or tectonic events salars are buried by alluvial fan sediments prograding from the margins of basins. In extreme cases salars may be entirely covered by alluvial fan sediments, such that there is no Salar surface in the middle of a closed drainage basin. However, brine can remain in place in the sequence of Salar or clastic sediments beneath the alluvial fans which will often contain fresh to brackish water.

Olaroz contains buried targets beneath the Archibarca alluvial fan in the southwest of the basin and in the north of the basin, where AMT electrical geophysics suggests the presence of brine beneath the Rosario Delta. These areas off the surface of the salar have not yet been explored at Olaroz but are likely to contain significant volumes of brine in addition to that defined directly below the surface of the salar.

7. EXPLORATION

This section summarizes exploration conducted in support of Olaroz.

From 2008 to 2011 Orocobre undertook exploration at Olaroz that culminated in the definition of a resource to a depth of 200 m across the Salar and the completion of a feasibility study for the construction of a new lithium carbonate project, the first in approximately 20 years, following the early salar developments in South America.

An extensive array of work was undertaken to support Olaroz development and that is outlined below. Subsequent exploration was undertaken in 2014 and from 2019 onward to explore and develop the deeper levels of the Olaroz basin.

A summary of the Orocobre exploration work is provided in the following sections. Activities included:

- Shallow brine pit sampling (2008).
- Shallow diamond drilling (2008), to a maximum depth of 199 m, with all but two holes < 95 m deep.
- Gravity geophysical profiling (26 km in 2009).
- AMT electrical surveying (34 km in 2009).
- Catchment assessment and sampling of surface water (2009 onward).
- Sonic drilling (2010/11) in 18 holes to a maximum depth of 54 m.
- Diamond drilling (2010/11) in six holes to a maximum depth of 200 m.
- Installation of monitoring wells and pumping test wells (2011) and pumping tests on 50 m and 200 m wells.
- Drilling of two production wellfields to 200 m (2012-2014).
- Drilling of two test production wells below 200 m (2014).
- Vertical Electric Sounding (VES) Survey (2016), deepening and installation of new production wells to 450 m.
- Detailed gravity and magnetic survey (2017).
- Installation of shallow monitoring wells (2019).
- Drilling of expansion Olaroz Project production wells (2019-202)
- Preparation of this NI43-101 report.

Other information sources in the area include:

- A NI 43-101 compliant technical report prepared for Advantage Lithium (now 100% owned by Allkem) in 2019.
- A NI 43-101 compliant technical report prepared for Lithium Americas in 2020 and earlier reports dating to 2010.

7.1 Historical Exploration

Historical exploration activities are summarized in Section 5.1, and the following sub-sections detail specific surveying, geophysical, drilling, and sampling activities that have been conducted to support Olaroz.

7.2 Pit Sampling

Shallow pit sampling was carried out across the Olaroz Salar between March and May 2008 and confirmed the elevated concentration of lithium in brine. This consisted of 62 brine samples collected from 60 pits. These initial sampling results were the basis for Allkem acquiring the properties that form Olaroz.

7.3 Logging Historical RC Cuttings

7.3.1 Exploration drilling

Three exploration drilling campaigns were previously carried out at Olaroz.

- Initial drilling consisted of shallow (60 m) diamond drilling in 2008.
- This was followed by the drilling conducted at Olaroz in 2010/11 of 19 holes with a sonic rig drilling holes to 54 m and six diamond holes drilled to 200 m, as this is generally beyond the capacity of sonic drilling.
- A third drilling program in 2014 involved the drilling of two rotary holes that were installed as test production wells to a maximum depth of 323 m.

Sonic drilling conducted in 2011 has the advantage that it is “dry” and does not require drilling lubrication. Other methods of drilling require the use of fluid (in salars brine) for lubrication and to carry drill cuttings to the surface. However, the use of drilling fluid causes difficulties sampling brine and can result in contamination of formation brine during sampling. During the 2011 sonic and diamond drilling brine and specific yield samples were collected every 2 to 3 m and a maximum of every 6 m. For the diamond drill holes to 200 m depth brine and porosity samples were collected approximately every 3 to 6 m, depending on hole conditions. This information was used to develop the 2011 resource estimate to 200 m depth.

7.3.2 Diamond Drilling and Sampling

A limited amount of diamond drilling was completed for this resource update, due to logistical challenges associated with Covid-19 (principally a limitation of on-site accommodation). Three diamond holes were completed along the eastern boundary of the Olaroz properties to a depth of 650 m. The holes were drilled as HQ diameter diamond holes, with HWT size casing accompanying the drilling of the diamond holes, to maintain hole stability and facilitate brine sampling.

Cores were recovered in 1.5 m long lexan polycarbonate tubes, which were pumped from the core barrel with water, to recover the core tube. The lexan tube was capped immediately following recovery of the core and stored in core boxes. Samples of core for the laboratory were cut from the base of core runs using a battery powered angle grinder. The laboratory sub-sample was 30 cm long, retained in the polycarbonate tube, and sealed with plastic caps, which were sealed in place with tape, to minimize seepage of brine from the cores. Cores were labelled with the hole name and depth range and sent by courier to the porosity laboratory.

The location of the recent diamond holes drilled in this program is presented in blue on Figure 7-1, along with the location of production wells. Historical diamond holes are shown on Figure 7-2, with production wells.

Brine samples were collected using a packer system during the drilling of the three diamond holes. The packer device was lowered into place in the sediments and inflated using nitrogen gas to expand the packers against the walls of the hole. The space between the packers and the sampling line to the surface was then purged of brine, with three volumes of the packer and sampling line purged, with increased purging required as sampling progressed to greater depths. Sample parameters were monitored during the purging, to establish when parameters such as total dissolved solids and density stabilized. Samples were taken after different purge times and compared to evaluate how values stabilized.

Once this stage was reached, triplicate samples were collected for laboratory analysis and storage. However, despite these procedures it was not possible to reliably purge the packer space sufficiently to allow inflow of uncontaminated brine from the hole walls. Because diamond drilling uses significant volumes of drilling fluid this fluid infiltrates the walls of the hole and when samples are taken returns to the hole. The fluid used for drilling was surficial brine taken from a trench in the north of the salar, noted to consistently have significantly lower lithium concentrations than historical sampling in the vicinity of the three diamond holes. Consequently, brine samples from these three diamond holes were not used in the resource estimate.

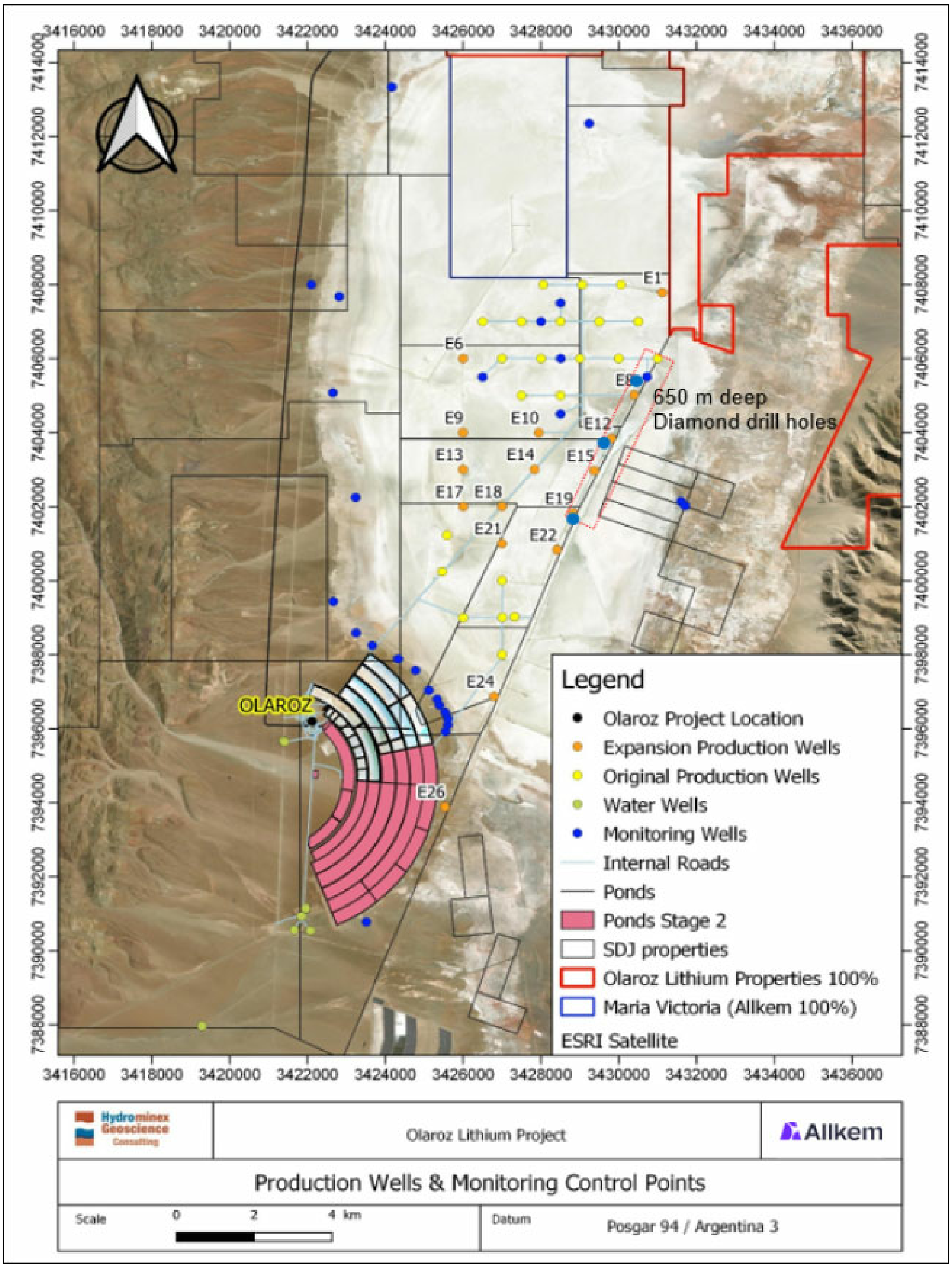


Figure 7-1 - Location of Olaroz expansion drill holes and the northern and southern wellfields.

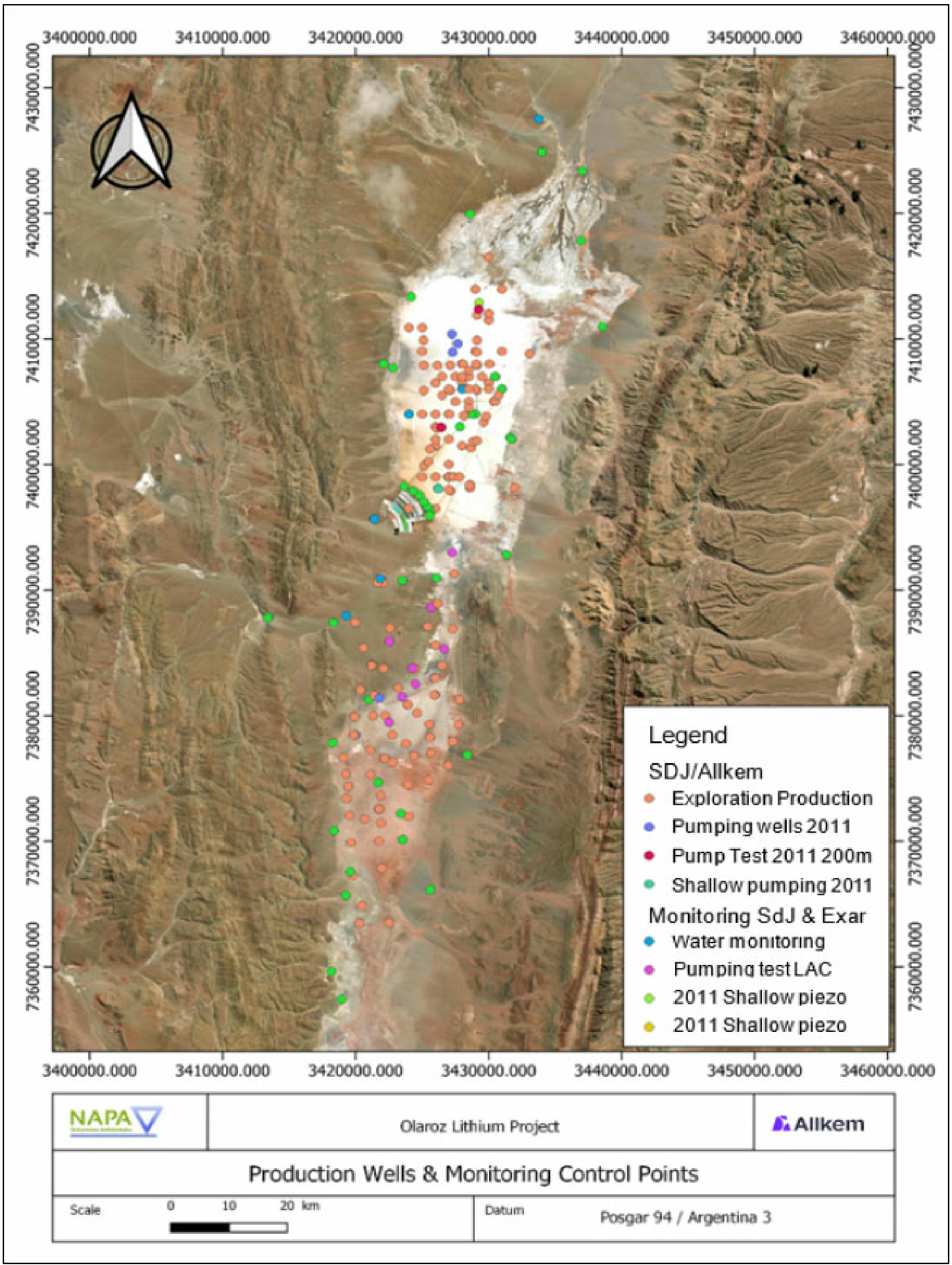


Figure 7-2 - Drilling undertaken in Olaroz and Cauchari by SDJ and other companies.

Core recovery for the three recent diamond drill holes DDH-02, DDH-04 and DDH-17 was between 86.1 % and 88.6 %. This is higher than historical diamond drilling, which covered a larger spatial area and is summarized in the historical exploration section. Lithium concentration is independent of the core recovery, as it is hosted in brine in sediment pores. Porosity from cores is checked against downhole BMR specific yield measurements.

7.3.3 Shallow Drilling, Resource Estimate, and Initial Assessment 2008

Allkem undertook a drilling program between September 4 and December 2, 2008. Twenty-two HQ3 diamond core holes were drilled, totaling 1,496 m. Drillhole locations were based on handheld GPS readings. The initial 16 HQ3 diamond drill holes (core diameter 61 mm) in the program were drilled on a variable grid, to an average depth of 60 m. Two holes in this program were drilled to greater depths of 125 and 199 m. Six further HQ3 holes were drilled as monitoring wells for the hydrogeological test work. Geophysical logs, self-potential, short, and long resistivity, and natural gamma were run in the 7 holes which had been cased to significant depths.

These, together with geological logs of the recovered material provide the basis of the geological interpretation and subsequent maiden resource estimate in 2009. The drill logs were interpreted to show a near-surface halite layer. Beneath the halite unit a zone of mixed clays, sands and silts was defined down to around 45-60 m below the salar surface. For those holes greater than 60 m deep, the underlying units showed a significant change being more consolidated, with higher clay content. Pumping tests were carried out on three of the test holes, with two additional monitoring wells. The pumping was carried out by airlifting.

The maiden inferred resource for Olaroz was estimated in 2009 using the results of diamond drilling and porosity values assigned to sediments based on field observations and literature values (values of specific yield as 0.22 for sand, 0.05 for halite and 0.01 for clay). The Inferred Resource was estimated as 1.5 Mt of lithium carbonate equivalent. Based on the results of this work a Preliminary Economic Assessment (PEA) was prepared for Olaroz.

7.4 Surface Geophysical Exploration

7.4.1 Audio Magneto Telluric Survey AMT Survey 2009

AMT measures temporary variations in the electromagnetic field caused by electrical storms (high frequencies >1 Hz), and the interaction between the solar wind and the terrestrial magnetic field (low frequencies <1 Hz), which allows variations in the electrical subsurface to depths of 2 km or more. The electrical properties of the subsurface depend on Archie's Law. Hence, it is possible to infer the subsurface variations in fluid resistivity and porosity, although it is important to note that once again the problem of a non-unique solution always exists.

Data at a total of 136 AMT stations, spaced at 250 m intervals was acquired using Phoenix Geophysics equipment within a range of 10,000-1 Hz, using up to 7 GPS synchronized receptors. The equipment includes a V8 receptor with 3 electrical channels and 3 magnetic channels that also serves as a radio controller of auxiliary RXU-3E acquisition units. Three magnetic coils of different size and hence frequency is used at each station, and non-polarizable electrodes that improve signal to noise ratios. The natural geomagnetic signal during the acquisition period remained low (the Planetary “A” Index was <= 6 for 90% of the acquisition time) requiring 15-18 hours of recording at each station.

- All stations were surveyed using differential GPS to allow for subsequent topographic corrections. AMT requires a Remote Station, far from the surveyed area, in a low-level noise location to act as a baseline for the acquired data. In Olaroz the remote station had two different locations depending on the sub sector where work was being undertaken. In Olaroz the remote station had two different locations during the Olaroz construction depending on the sub sector where work was being undertaken.
- Processing of the AMT data requires the following stages:
  - Filtering and impedance inversion of each station.
  - 1D inversion for each station.
  - Development of a resistivity pseudo section.
  - 2D profile inversion (including topographic 3D net)

An example of the 2D model results is presented below in Figure 7-3. Assuming that the major controlling factor is the fluid resistivity (or conductivity) it is possible to establish a provisional calibration in terms of the brine to freshwater interface. The calibration is based on a series of surface samples of the electrical conductivity (the reciprocal of resistivity) of the fluid in the northern part of the salar across the Rio Rosario delta. As can be seen, the calibration for the 2D inversion is particularly significant, suggesting the main control on bulk AMT resistivity is fluid resistivity.

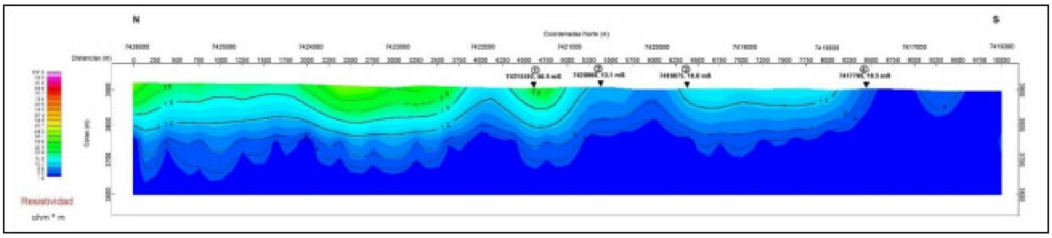


Figure 7-3 - AMT line north south through the Rosario Delta area, looking to the east (salar to the right).

7.4.2 Gravity Survey

Gravity techniques measure the local value of the acceleration, which after correction, can be used to detect variations of the gravitational field on the earth’s surface that may then be attributed to the density distribution in the subsurface. Since different rock types have different densities, it is possible to infer the likely subsurface structure and lithology, although various combinations of thickness and density can result in the same measured density; a problem known as non-uniqueness. Geophysical surveys conducted by Allkem are shown in Figure 7-4.

Data was acquired at a total of 130 gravity stations spaced at 200 m, coupled with high precision GPS survey data. A Scintrex CG-5 gravimeter (the most up-to-date equipment available) was used, and measurements taken over an average 15-minute period in order to minimize seismic noise. A base station was established with readings taken at the beginning and end of each day's activities in order to establish and subsequently eliminate from the data the effects of instrument drift and barometric pressure changes. The daily base stations were referred to the absolute gravity point PF-90N, close to Salta where a relative gravity of 2,149.136 mGal was obtained.

Since this point is distant from the Olaroz Salar, intermediate stations were used to transfer the absolute gravity to Pastos Chicos (on the east of the Olaroz Salar) where a relative gravity base station was established with a value of 1,425.313 mGal.

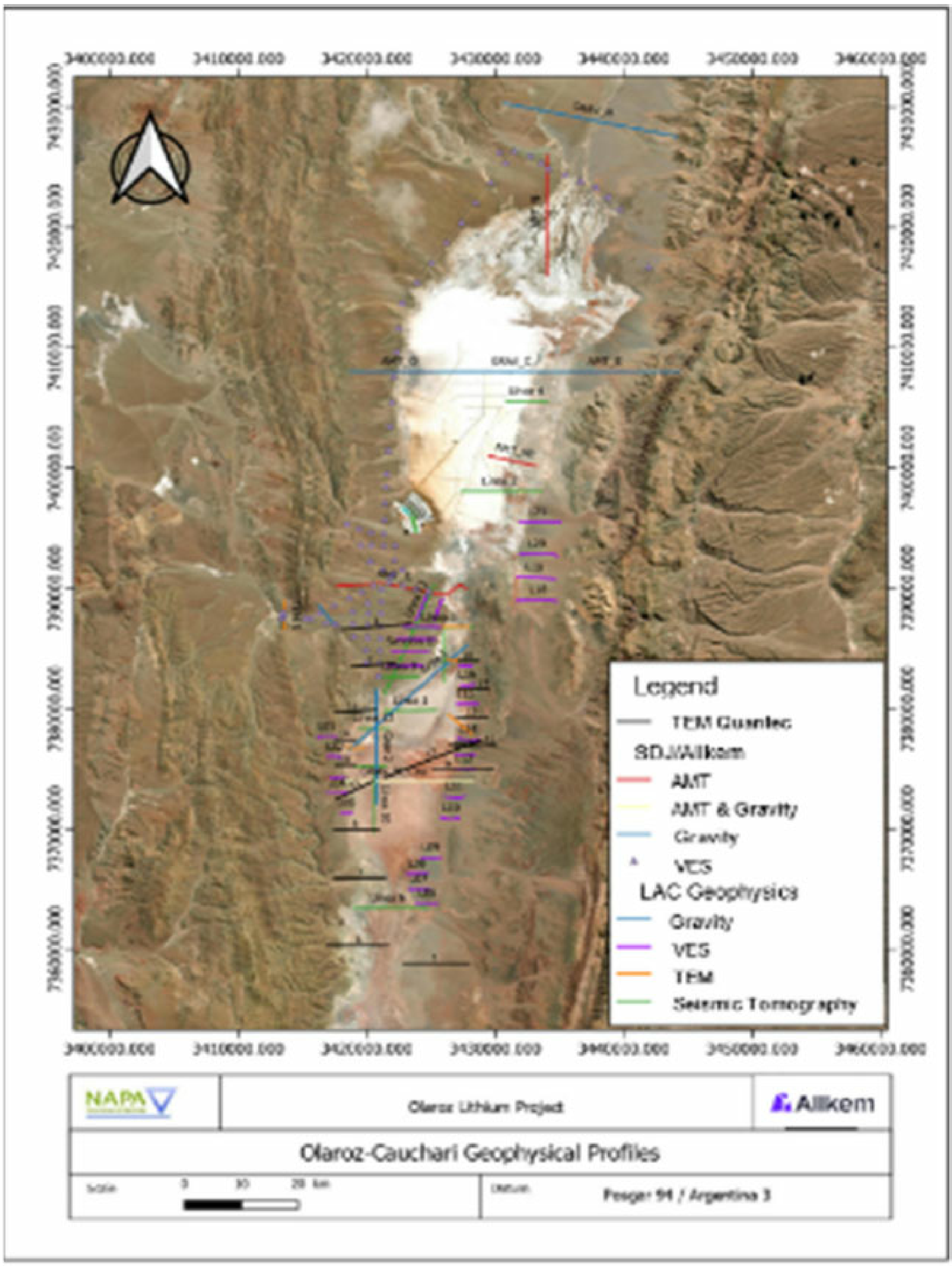


Figure 7-4 - Location of the gravity, AMT and SEV geophysical profiles measured at Olaroz and in Cauchari (after Napa, 2021).

To measure the position and elevation of the stations, a GPS in differential mode was used with post-processing (Trimble 5700). This methodology allows centimeter accuracies, with observation times comparable to or less than the gravity observation. Using a mobile GPS (Rover) the gravity station position data is recorded. Simultaneously, another GPS (Fixed) records variation at a base station located within a radius of 10 to 20 km, to correct the Rover GPS. Both data sets are post-processed to obtain a vertical accuracy of 1 cm.

The raw data was subjected to a tidal correction and corrections for drift, instrument height, ellipsoid, free air, latitude, bouguer and topography.

The Bouguer anomaly can be modelled to represent subsurface geology (Figure 7-5). However, any model is non-unique, and it is essential to consider the known geology and rock density. A four-layer model was developed for the salar based on these original profiles.

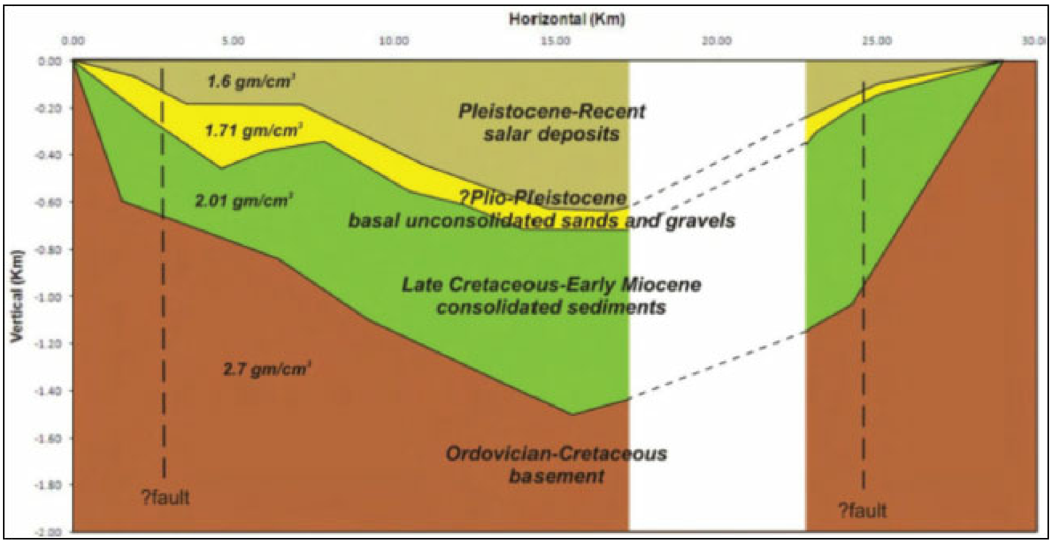


Figure 7-5 - Original Olaroz gravity model. Drilling has shown the unconsolidated salar sediments continue to 1.4 km deep, so the green unit is a continuation of these.

7.4.3 Detailed Gravity and Magnetic Survey 2017

A systematic grid gravity and ground magnetic survey was carried out by personnel from the University of San Juan in 2016-17, to better map the contact of the salar sediments with the underlying bedrock and to better establish the depth to bedrock. This evaluation confirmed that bedrock underlying the Salar is over 1 km deep, and deeper on the eastern side of the salar. The survey provided important additional information on the basin geometry. However, no drill holes have intersected the basement rocks underlying the salar and consequently it was not possible to optimize the model with this information.

Measurement campaigns were carried out in the period from November 14, 2016, to December 21, 2016, acquiring 6205 gravimetric stations georeferenced with post-process DGPS methodology. In addition, 850 km of linear magnetism were processed in the Olaroz Salar (Figure 7-6 & Figure 7-7).

In the acquisition of the regional gravimetric data three geodetic gravimeters were used. These were subjected to drift controls and calibrated before starting the measurements and during the campaign. Detailed measurements were made with two automatic gravimeters with a precision of 0.010 mGal.

For the magnetic determinations, 4 Overhauser magnetometers with 0.02 nT resolution were used, three of them in rover mode and a base magnetometer to record the diurnal variation of the external magnetic field. The magnetic survey provided useful information on probable faults in the bedrock underlying the salar.

Topographic support was performed by differential GPS positioning (post-process), using 4 GPS receivers (2 Trimble 5700 with Recon controller and 2 Topcon Hiper SR receivers with FC500 controller), one of which operated as GPS base station in the Sales de Jujuy plant.

Equipment for the gravity survey consisted of:

- 1 Automatic Gravimeter, Autograv Scintrex, model CG 5, precision 0.005 mGal.
- 1 Automatic Gravimeter, Autograv Scintrex, model CG 3, precision 0.010 mGal.
- Thermostated Gravimeter, LaCoste & Romberg, model G, precision 0.030mGal.

Equipment for the magnetic survey consisted of:

- GEM GSM system, model 19GW V7, Overhauser total field magnetometer. Equipped with console and sensors (Gradiometer), which measure in walking mode (in motion continuous recording) with GPS positioning. Sensitivity 0.02 nT.
- GEM GSM system, model 19 V7, Overhauser total field magnetometer. Equipped with console. One of them registered continuously in base mode. The sensitivity of this equipment is 0.02 nT.

Surveying equipment utilized on Olaroz consisted of:

- Two (2) GPS, Trimble 5700, with Recon controller.
- Two (2) GNSS, Topcon Hiper SR, with FC500 controller.
- Two (2) GPS, Trimble 4400, with TSC1 controller.

Figure 7-6 - Team conducting ground magnetic survey (left), Scintrex CG5 gravity unit and Scintrex CG3 gravity unit.

Figure 7-7 - Installation of the magnetic base station (left) and the GPS base station (right).

7.4.4 Vertical Electrical Soundings 2016

A campaign of vertical electrical sounding (VES) geophysics was undertaken in 2016 across the Archibarca alluvial fan and around the salar by a geophysical contractor (Figure 7-8), to define the interface between surficial fresh water and underlying brine. This survey defined the interface successfully and allowed confirmation of the estimated volume of freshwater resources in the Archibarca fan area. Definition of the fresh water-brine interface provided important additional information for the groundwater model development, for a better understanding of the salar margins and long-term monitoring.

Figure 7-8 - VES geophysical equipment in use in the Archibarca area.

The geoelectric method (Figure 7-9) was used with equipment consisting of simultaneous reading of intensity and potential difference. Two stainless steel current electrodes were used with lengths of 1.20 m, due to the characteristics of the area. In addition, two copper potential electrodes in a saturated solution of copper sulfate were used to improve the ground connection.

Copper current cables of 1,000 m in length were used with two sources of 270 volts each used as the power source, for a total of 540 volts. The geoelectric prospecting was carried out with the VES (Vertical Electrical Sounding) method, which used a Schlumberger tetrapolar electrode arrangement. The lengths between the centers of the soundings and current electrodes were variable, up to maximum distances of 1,000 m. The separations between the potential electrodes varied between 1 and 200 m.

The field curve of each VES was plotted on log-log paper where the abscissa corresponds to the OA values and the ordinate to the apparent resistivity values.

The field curves were interpreted by means of specific computer programs RESIST 92 and IPIWIN 2000. The program carried out as many iterations as were necessary in order to fit the computational curve to the field curve. The final result of the geoelectric prospecting was the interpretation of the VESs that, as a whole, determined the geological - hydrogeological environment in depth of each area under investigation. An example curve through the Archibarca area is shown in Figure 7-10.

Figure 7-9 - The process of converting field resistivity measurements to interpretation of thickness and resistivity.

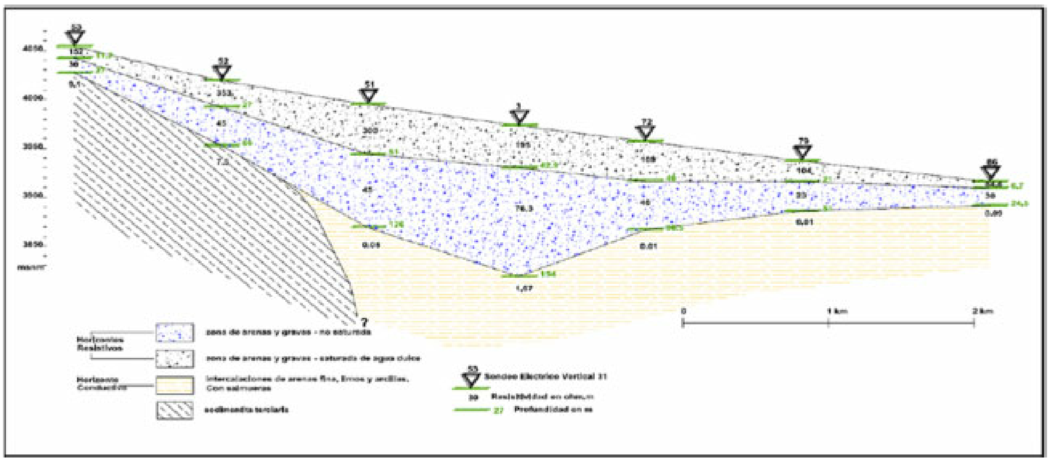


Figure 7-10 - West to east vertical electrical sounding profile, looking north, through the Archibarca alluvial fan, downslope of TEM line5, southwest of the Olaroz plant. The profile shows the upper dry sediments over freshwater in sediments, overlying brackish water to brine.

7.5 Hydrogeology

Salars form in arid environments, with the deposition of chemical sediments, with deposition controlled by the concentration of elements in brine and saturation of brine with respect to different minerals which precipitate progressively. Salars typically have an inner nucleus of halite, that is surrounded by marginal zones on the sides of the salar where sulphates and carbonates are deposited.

Fine grained clastic sediments such as clays and muds are typically deposited in salars, some of which may contain organic material from decomposed vegetation. Coarser grained sediments generally occur on the margins of basins and may prograde into the basins from the sides during wetter periods when coarse sediments were transported further.

Drilling at Olaroz has defined the five major hydrogeological units that are discussed in section seven. The general geological environments at Olaroz that relate to the hydrogeological units are as follows:

7.5.1 Alluvial fans

These are best developed on the western margin of the Olaroz Salar, with the largest being the Archibarca alluvial fan, a composite fan developed from the southeast of the Olaroz basin. This consists of coarse gravel, generally with a sandy matrix, with interbeds of more clayey material between thicker and more massive gravel units. The Archibarca fan progrades into the Olaroz and Cauchari Salars and forms the boundary between the two salars. The alluvial fan receives significant recharge from seasonal rain and snowmelt and hosts a resource of fresh water that is used for Olaroz lithium facility water supply. The freshwater overlies brackish water and brine below the gravels.

Drilling shows that historically the Archibarca alluvial fan deposited sediment into the basin from west to east. Coarser sediment from this source was deposited in unit UH5, which can be correlated across the salar, and which supports the highest pumping rates to date in wells such as P302 and E17. In many salars a lower unit with more sand and gravel clastic material is observed, which is likely to reflect different climatic conditions in the Puna region at that time and coarser sedimentation deposited in the earlier stage of basin development.

7.5.2 Clay and silt

Clay and silt units form much of units UH3 and UH4, with interbedded sand units. These units cover the central part of the salar and are interbedded with coarser sediments from alluvial fans along the western margin of the salar. These units act as thick leaky aquifers, which release brine continuously, but at lower rates than units with thicker sequences of sand and gravel.

7.5.3 Halite

Halite is typically deposited in Salar basins and in Olaroz is developed most consistently in unit UH4, where it forms a thick sequence that is interbedded with clay and silt. The halite (salt) unit is distinct in geophysical logs, as the unit is generally compact and less permeable. However, interbedded coarser grained clastic layers can have higher permeabilities and better production, such as in the southern wellfield.

7.5.4 Drainable Porosity (Specific Yield)

Porosity is highly dependent on the host lithology, with different types of porosity related to the size of pores and how brine (fluid) can be extracted from the pores.

It is important to understand the terminology relating to porosity (Figure 7-11). Total porosity (Pt) relates to the volume of pores contained within a unit volume of aquifer material. Except in well-sorted sands some of the pores are isolated from each other and only the pores that are in mutual contact may be drained. This interconnected porosity is known as the effective porosity (Pe). Assuming the Pe is totally saturated, only part may be drained under gravity during the pumping process. This part of the porosity is known as the specific yield (Sy or the drainable porosity). A portion of the fluid in the pores is retained as a result of adsorption and capillary forces and is known as specific retention (Sr).

Total porosity (Pt) is much higher in finer grained sediments, whereas the reverse is true for Sy, due to the high Sr in these sediments. Lithology is highly variable, with sand-silt-clay mixes spanning the full spectrum of possible porosities. It is only possible to discriminate between the dominant lithology, for example, sand dominant or clay dominant. Consequently, the porosity of sand dominant, or clay dominant lithologies have a wide range with considerable overlap (Table 7-1).

Specific yield analysis was carried out on undisturbed core samples from the partially completed diamond drilling program at Olaroz. Primary samples were analyzed by the Geosystems Analysis laboratory in Tucson, USA. Check samples were analyzed at the DB Stephens laboratory, in Albuquerque, USA. Extensive historical porosity data is also available from porosity sample testing at Olaroz in 2010-11 and from test work conducted at the Cauchari project between 2011 and 2018 in equivalent sediments.

Results of the specific yield (drainable porosity) analysis are summarized in Table 7-1, with results from recent and historical sample analyses.

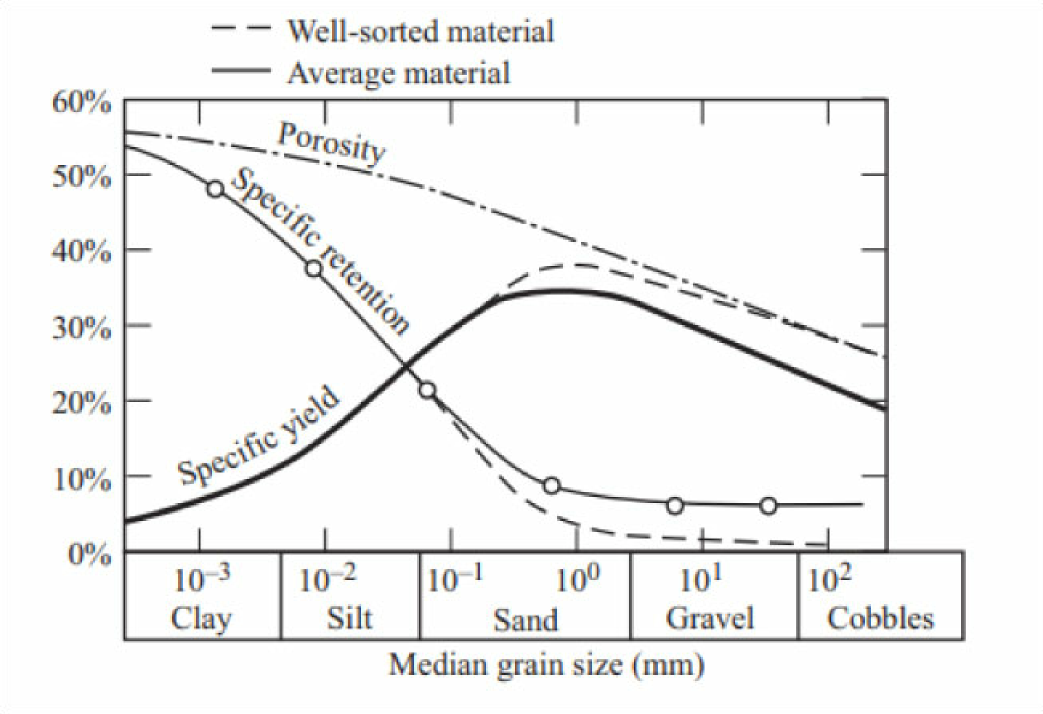


Figure 7-11 - Relationship between total porosity, specific yield, and specific retention for different grain sizes.

Table 7-1 - Porosity results from laboratory test work.

Lithology Type	Total Porosity Pt	Specific Yield Sy
	Olaroz 2021	
Sand Variants	0.20+/-0.12	0.09+/-0.08
Silt Mixes	0.35+/-0.09	0.06+/-0.05
Halite Dominant	0.08+/-0.07	0.04+/-0.02
	Olaroz 2011	
Sand Dominant	0.31 ±0.06	0.13 ±0.07
Silt and Sand-Clay Mix	0.37 ±0.08	0.06 ±0.04
Clay Dominant	0.42 ±0.07	0.02 ±0.02
Halite Dominant	0.27 ±0.14	0.04 ±0.02
	Cauchari 2017-18	
Sand Dominant		0.19 ±0.06
Sand-Clay Mix		0.07 ±0.04
Clay Dominant		0.03 ±0.02
Halite Dominant		0.04 ±0.03

7.5.5 Porosity Sampling 2020

Porosity samples from 2020 diamond holes were previously sent to the Geosystems Analysis laboratory in Tucson, Arizona, USA for porosity testing using the Rapid Brine Release (RBR) test method to measure specific yield (drainable porosity). Check porosity samples were analyzed in the DB Stephens and Associates laboratory in Albuquerque, New Mexico USA.

One of the diamond holes and the majority of the Stage 2 production wells were profiled with geophysical logging tools, including a Borehole Magnetic Resonance (BMR) tool, that provided in-situ measurements of porosity and permeability. The geophysical logging confirms the correlation of individual sub-units across the salar. An analysis of the BMR data, together with laboratory porosity data from recent and historical cores at Olaroz and core samples collected by Allkem in the Cauchari Project to the south, in the southern extension of the Olaroz basin, provided the basis for assignment of porosity values for the resource estimate. No new laboratory porosity data was collected since the April resource.

Laboratory specific yield ([Sy] = drainable porosity) values vary between 9%+/-8% for sandy material, 6%+/-5% for silt mixes, 4%+/-2% for halite and 2%+/-2% for clay dominated material, as determined by laboratory samples. The overall specific yield porosity of sediments to 650 m is lower than in the 2011 resource, due to the presence of the halite dominated unit (UH4) and lesser sand units below the upper 200 m, with the exception of the deeper sand unit.

7.5.6 Permeability Testing

Permeability (hydraulic conductivity) is also highly dependent on lithology. Generally finer grained sediments such as clays have lower permeability than coarser grained sediments such as sands and gravels. Near surface halite is often highly permeable, due to a network of fractures, although halite becomes progressively more compact and less permeable with depth. However, cavities and fracture networks are observed in some deeper halite units. The sequence of sediments in the Olaroz Salar exceeds 650 m thickness. Extraction from below 50 m is from semi-confined to confined aquifers.

Permeability for extraction purposes is best measured by conducting pumping tests and evaluating changes in the water level in the pumped well and observation wells. Pumping tests were carried out on wells installed for the expansion program, with variable rates and constant rate pumping tests conducted over periods of up to 48 hours. The results of the pumping tests are summarized below in Figure 7-12 and Table 7-2.

From the available information the heterogeneity of the mixed clay and sand unit in Olaroz is clear. The highest hydraulic conductivity (K) values are generally related to unconsolidated deposits, in particular the Archibarca alluvial fan. Pumping test results show values of between 3.4 and 67 m/d in this material.

The unconsolidated deposits have a range of storage coefficient in the order of $4x10^{-4}$ to $2x10^{-1}$ related to unconfined to semiconfined parts of the aquifers. The deeper semi-confined to confined units composed of clays, silts and sands have values in the order of $1x10^{-3}$ to $3x10^{-6}$. Permeability values defined for the hydro stratigraphic units are shown in Table 7-2.

The pumping undertaken at Olaroz for brine production constitutes a long-term pumping test that has been monitored throughout the salar and provides extensive information for understanding the response of the aquifers in response to pumping.

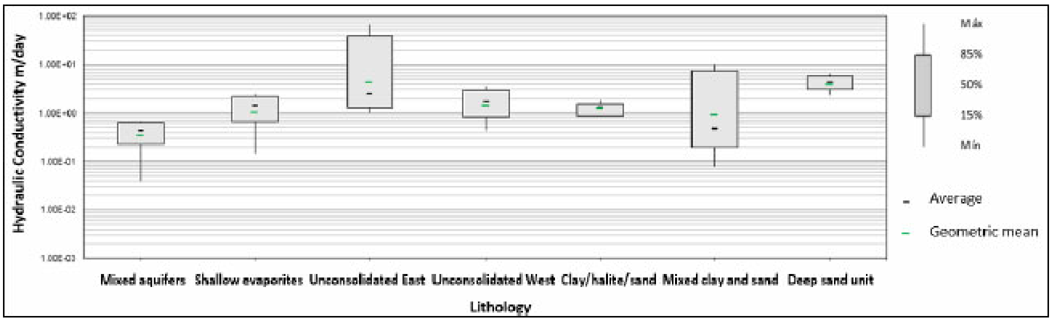


Figure 7-12 - Hydraulic conductivity by sediment type Napa, 2021.

Table 7-2 - Hydraulic parameters by hydro stratigraphic unit.

Unit	Hydraulic Conductivity Range m/d	Storage Coefficient Range
UH1	0.15 - 2.5	10 - 15%
UH2	0.5 - 67	1 - 20%
UH3	0.87 - 1.8	1E-6 to 0.1
UH4	8E-2 to 10	1E-7 to 0.1
UH5	2.4 - 6.3	1E-7 to 0.15

7.6 Sonic Drilling 2010-2011

Boart Longyear was contracted by Allkem to perform the Sonic Drilling program (Figure 7-13) at the Olaroz Salar for the purpose of obtaining continuous geological and brine sampling. The program (C series) involved the drilling and sampling of 20 holes to a depth of 54 m each using a 4” (100 mm) core by 6” (150 mm) casing Sonic sampling system, for a total of 1,080 m drilled. The objective of the sampling was multipurpose: to obtain a near undisturbed sonic core and to obtain uncontaminated brine samples.

Figure 7-13 - Sonic drilling rig operating at Olaroz in 2010.

Sonic technology utilizes high-frequency vibration generated by a highly specialized sonic oscillator, which creates vibration known as "resonance". The resonance is transferred to the drill pipe, which reduces friction and allows the drill bit at the pipe end to penetrate the formation with minimal disturbance. The rig used was a track mounted 300C ATV Sonic Rig with associated support equipment. Drilling involved:

- Setting up sonic rig at each location.
- Sampling the formation sonically using a 4" (100 mm) core barrel with a polycarbonate (lexan) core barrel liner of 1.5-meter length. The retrieved core barrels were capped and sealed with PVC tape at each end on retrieval at the surface (Figure 7-14).
- At the end of each 1.5 m run 6" (150mm) casing was advanced over the core barrel. No drilling fluids were used for the drilling operation.
- A 2" diameter x 12" long (in an 18" long split spoon - SS) was then pushed ahead of the casing. The SS had a plastic liner in the barrel and was capped and sealed at the surface (Figure 7-14).
- A "push ahead" brine sampling tool was be advanced on the drill string to allow for sampling of the brine, from the space left by the withdrawal of the SS sample.
- Once in place, brine was bailed out from within the drill rods using a "bailer" or low flow pump until a representative brine sample was obtained. The sample was identified as in-situ, uncontaminated formation fluid as soon as the fluid being extracted came free of Fluorescein biodegradable dye.

Once the 6” casing was at the targeted depth, the hole was made available to the geophysical contractor to undertake down-hole geophysical logging.

Figure 7-14 - Recovery of the lexan core and split spoon samples on the sonic.

7.7 Diamond Drilling 2010-2011

Major Drilling was contracted to drill the deep CD series wells. The objectives were the same as for the C series wells; to obtain undisturbed samples of formation and fluid. The drill was with a Major-50 diamond drill rig with triple tube coring capacity. Drilling was usually accomplished using only the fluid encountered in the well during drilling. However, some drill fluid additive was used. This drill fluid was based on brine taken from a pit dug immediately adjacent to the well at the surface. Since this may introduce sampling issues for the in-situ formation fluid, extra care was taken with the addition of fluorescein biodegradable dye to all drill fluid used. In addition, core samples taken were spun in a centrifuge at the BGS research laboratories in order to extract the pore fluid, which was subsequently analyzed and checked against the in-situ samples.

A total of six wells were drilled using this method to an average 200 m depth, for a total of 1,204 m drilled. Core recovery was generally poor, due to the poorly consolidated nature of the sediments (as seen in Table 7-3).

Table 7-3 - Recovery for 2021 diamond drill holes and 200 m holes for the 2011 feasibility study.

Well ID	Drilled (m)	No Recovered		Recovered	
		Meters	%	Meters	%
CD-01	195.5	9.54	4.9	185.96	95.1

CD-02	199.7	35.93	18.0	163.77	82.0
CD-03	200.0	48.59	24.3	151.41	75.7
CD-04	200.0	89.65	44.8	110.35	55.2
CD-05	200.0	11.50	5.8	188.50	94.3
CD-06	199.5	74.67	37.4	124.83	62.6
Average 2011 (6 Diamond Drill Holes)					**77.5%**
DDH-02	650.0	72.52	11.2	564.98	88.6
DDH-04	537.5	72.88	13.6	452.62	86.1
DDH-17	650.0	85.55	13.2	552.45	86.6
Average 2021 (3 Diamond Drill Holes)					**87.1%**

In all sonic and diamond drilled wells, Wellfield Services Ltd. were contracted to run wire-line logs from surface to full depth. The logs were run inside temporary steel casing, but this does not present a problem for gamma and other logs that are able to penetrate the casing with their sensors.

The following logs were run caliper, natural gamma, density, and neutron logs. Electronic data is captured on a continuous centimetric basis down the well. Since the logs had to be run inside steel casing because the holes were unstable if not supported, no electrical logs could be run.

The logs are particularly useful to extrapolate lithology and porosity data into the few zones where there was no core recovery. Caliper logs are run to ensure that the drill hole width is constant within the casing so that the other logs may be corrected for drill hole diameter. The caliper log was sufficiently accurate that it was able to identify casing joints throughout the wells.

Natural gamma logs indicate the received gamma ray intensity at the downhole tool. Since gamma rays are emitted by uranium, thorium and potassium minerals in rocks, the log typically responds to clay minerals and volcanic horizons. Evaporitic minerals such as halite and gypsum have a very low radioactive mineral content and can usually be identified by their low count rate. Thus, gamma is a useful tool for identifying certain types of lithology and for correlating beds across multiple wells.

Density logs emit and receive gamma rays and are thus sometimes known as gamma-gamma tools. This technique measures the bulk density of the rock matrix and pores. Since minerals have characteristic densities, the tool is used for lithological identification when coupled with natural gamma logs. Since it also measures the porosity of the formation it can be used quantitatively to determine total porosity. Since the bulk density depends both on the mineralogy and porosity, any porosity determinations must account for the rock mineralogy. In rapidly changing sequences such as the Olaroz Salar, it becomes extremely difficult to correct the log for these changes. Thus, its principal use is in the assessment of lithology.

Neutron logs measure the hydrogen ion content of the formation and pores adjacent to the sondes. Two downhole tools are used with different spacings so that penetration is both “near” and “far”, with respect to the well diameter. Since the hydrogen ion content is largely determined by the fluid (water) content of the pores, the log can be calibrated to determine the in-situ total porosity.

7.8 Test Pumping 2011

Three test production wells were drilled using a conventional rotary rig to depths of 50 m (P and O series). In some cases, it was possible to drill using only formation fluid, but in several cases, drill fluid had to be used to advance the well. The test production wells were not used for sampling for the resource estimation. The wells were drilled at 12” diameter and completed with an 8” slotted PVC screen with gravel pack to full depth. Immediately after completion the wells were developed by airlift surging for periods up to 10 days to ensure that all drill fluid and fines were removed from the well.

At test production well site P1, three observation wells were drilled at nominal radial distances of 7 m and 18 m from the pumped wells toward the north and east. These observation wells were drilled at 8” diameter to full depth and completed with 4” slotted PVC casing and gravel pack. At test production well sites P2 and P3, the same configuration was used, except the observation wells were doubled at each locality and drilled to depths of 28 m and 40 m with screens 0-27 m and 29-39 m (P2), and drilled depths of 13 m and 38 m with screens 0-12 m and 15-38 m.

Two deep test production wells, PD1, adjacent to CD01, and PD2, adjacent to CD06 were also completed at a diameter of 8” and depth of 200 m. Wells CD01 and CD06 were completed with slotted plastic piezometers to enable their use as observation wells during subsequent pumping tests.

Initially, step discharge tests were undertaken with increasing flow rates to determine the well efficiency, which in all cases was above 87%, indicating the development had been effective.

Constant rate tests started on the August 25, 2010, and ran through until January 26, 2011, when they were stopped as a result of surface water flooding throughout the Salar. This represented a period of 154 days, or just over 5 months and provided a high degree of confidence that pumping rates and brine quality can be maintained in the long-term, which has been confirmed by production to date.

7.9 Production Wellfield Installation 2012-2013

Two production wellfields were installed between 2012 and 2013 for the initial project development. The northern wellfield comprised 16 wells and the southern field four wells, all drilled to 200 m with rotary drilling and installed as production wells. Five additional monitoring wells were installed within and around the production wellfields, in addition to monitoring wells installed around the edge of the salar.

7.10 Deeper Test Production Wells 2014

In 2014 it was decided to drill a test production well in the southwest of the salar to evaluate the sediments below 200 m. The initial test production well (P301) was highly productive, and a deeper, larger diameter well (P302) was subsequently drilled at another site to 323 m, resulting in a flow rate of 30 l/s.

These wells were subsequently put into production and the positive results have developed an improved understanding of the salar geology and supported further deeper drilling to supply the expansion. These wells have been in production since 2014 and were drilled with the rotary method. Wells were subject to step tests and constant rate tests prior to entering production.

7.11 Drilling

Drilling is important to provide representative high-quality samples of the sediments hosting brine, to provide representative samples of the brine itself and to provide samples with sufficient spacing to support different levels of resource estimation. Obtaining representative porosity and brine samples presents several challenges. To supplement information from drilling SDJ has a policy of geophysically logging all drill holes, to maximize the amount of information collected. Drilling has been conducted in the Olaroz-Cauchari basin since 2008, with drill holes by SDJ and adjacent property owners (formerly Advantage Lithium) and Lithium Americas Corp/Ganfeng (LAC). In the Olaroz-Cauchari area there have been approximately 165 wells or piezometers installed (Figure 7-15).

7.11.1 Exploration Drilling

Three exploration drilling campaigns were previously carried out at Olaroz. Initial drilling consisted of shallow (60 m) diamond drilling in 2008. This was followed by the drilling conducted at Olaroz in 2010/11 of 19 holes with a sonic rig drilling holes to 54 m and six diamond holes drilled to 200 m, as this is generally beyond the capacity of sonic drilling. A third drilling program in 2014 involved the drilling of two rotary holes that were installed as test production wells to a maximum depth of 323 m.

Sonic drilling conducted in 2011 has the advantage that it is “dry” and does not require drilling lubrication. Other methods of drilling require the use of fluid (in salars brine) for lubrication and to carry drill cuttings to the surface. However, the use of drilling fluid causes difficulties sampling brine and can result in contamination of formation brine during sampling. During the 2011 sonic and diamond drilling brine and specific yield samples were collected every 2 to 3 m and a maximum of every 6 m. For the diamond drill holes to 200 m depth brine and porosity samples were collected approximately every 3 to 6 m, depending on hole conditions. This information was used to develop the 2011 resource estimate to 200 m depth.

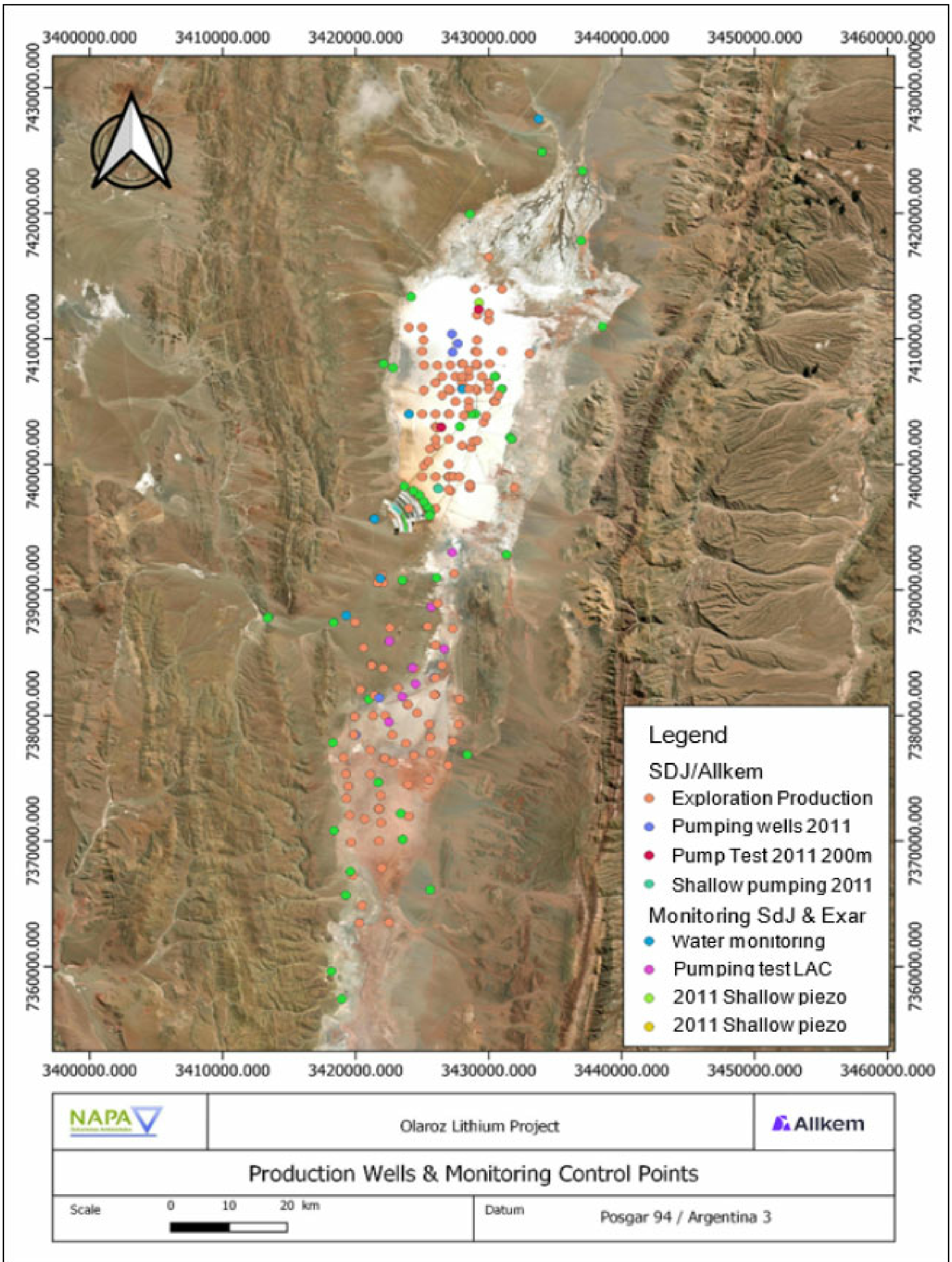


Figure 7-15 - Drilling undertaken in Olaroz and Cauchari by SDJ and other companies.

7.11.2 Production Well Drilling

Production holes have been drilled with rotary drilling equipment, as this method is well suited to the installation of the larger diameter pipes and screens that are required for production wells, compared to the narrow diameters of diamond drill holes used for exploration and obtaining porosity and brine samples. There have been two major drilling programs installing production wells. The first of these was from 2012-2014, with the installation of production wells to 200 m depth, and several holes to greater than 300 m. This drilling was followed by the extension of several 200 m holes to 350 m depth and drilling of another hole to 450 m depth, all with rotary drilling equipment. This was followed by the ongoing expansion drilling program, commencing in 2019 and continuing, with the installation of production wells up to 650 m deep (Figure 7-16).

The Olaroz expansion program was designed to include both installation of production wells and drilling of diamond drill holes, which would then be installed as monitoring wells. Due to the complication of logistics related to Covid-19 distancing and limited site accommodation the planned number of diamond exploration and monitoring wells has not been completed and the installation of production wells was also subject to some delays.

The outcome of this situation is that the geological interpretation and sampling has relied on the installation of the new production wells for deeper information.

Traditionally sampling of brine in salars has relied on collecting samples over discrete intervals (typically with a separation from 3 to 12 m) by packer sampling or using a bailer device to purge fluid from the hole prior to sampling, allowing collection of a representative sample of brine due to inflow of formation brine into the well and sampling device. The complication with this methodology is that significant drilling fluid enters the sediments around the hole and during purging it may not be possible to remove all this fluid prior to collecting a representative brine sample. Fluorescein tracer dye can be used with drilling fluid, so that drilling fluid can be detected by the presence of dye when samples are taken. For the limited diamond drilling completed in the recent diamond drilling Fluorescein has not been used.

The installation of production wells involves widening the initial pilot hole and flushing the hole before the installation of well casing and screens. A gravel pack is added around the well, to minimize the amount of fine material entering the well. The well is then developed by using a jet of high-pressure air against the filters, allowing the gravel pack to settle in place and removing fine material from the well. A swab device is also used to clean the hole and gravel pack. Following use of these devices a pump is installed in the well and pumped to clean fine material from the hole. Once the pumped brine is confirmed to be free of suspended sediments the well is allowed to equilibrate before undergoing pumping tests to confirm the hydraulic characteristics of the well. For individual wells and drilling contractors’ procedures varied for well development.

Figure 7-16 - Installation of filters in a production well at Olaroz.

Screens are typically installed over long vertical intervals in wells, as outside the high permeability sandy units the sediments constitute a “leaky” package of sediments that liberates brine from the thick sequence of sediments. The brine extracted during pumping comes from different depths in a well is an averaged composition, which is influenced by the permeability of the host sediments, with higher permeability sediments contributing relatively higher flows. Brine extracted from wells has shown minimal variation since the start of pumping on Olaroz in 2012, with the variability on the scale of laboratory uncertainties.

Because of delays with diamond drilling and sampling and the difficulties of collecting brine samples in diamond drill holes to 650 m, assays from the pumped wells to 650 m deep, have been used as part of the resource estimate. Historical diamond drilling to 200 m depth showed the coefficient of variation between lithium in brine samples is low, and consequently use of brine results from production wells is considered reasonable, particularly given the history of pumping and production at the site.

7.11.3 Shallow Monitoring Well Installation

Shallow monitoring wells were installed around the borders of the salar to provide information on the depth of and variability in the depth to the water table. These monitoring wells were installed to evaluate seasonal variability (Figure 7-17) in the water table relative to possible long-term changes related to pumping.

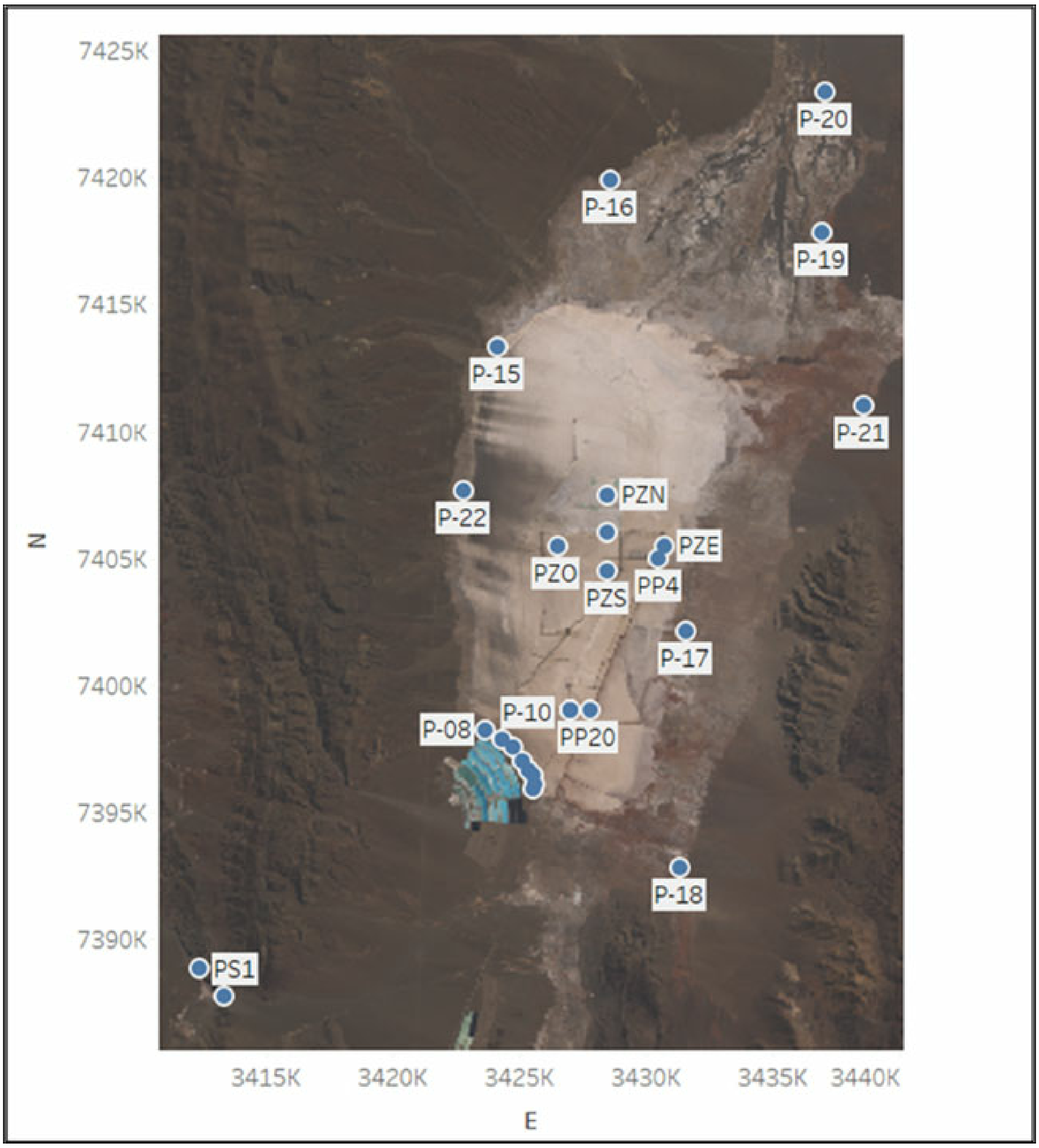


Figure 7-17 - Location of monitoring wells across the Olaroz area. As of June 2023.

7.11.4 Installation of Expansion Wells (2019-2022)

Installation of deeper production wells for Stage 2 commenced in 2019 and was completed in late 2022. These wells were installed to 650 m deep in the east of the salar and 450 m in the center and west of the salar. Wells were installed using rotary drilling. Monitoring wells are being installed in diamond drill holes around these new wells. Details are provided below.

7.11.5 Drilling Density

The original production wellfields have been constructed with a one-kilometer space between drill holes to 200 m depth. The expansion drill holes are filling the area between the two wellfields and extending further to the west and south. These wells are installed on a nominal one kilometer spacing, as a continuation of the historical drilling. These holes are drilled at a closer spacing than that recommended by Houston et. al., 2011, with regards to Indicated and Measured hole spacings of five and three kilometers respectively in immature salars.

7.11.6 Diamond Drilling and Sampling

A limited amount of diamond drilling was completed for this resource update, due to logistical challenges associated with Covid-19 (principally a limitation of on-site accommodation). Three diamond holes were completed along the eastern boundary of the Olaroz properties to a depth of 650 m. The holes were drilled as HQ diameter diamond holes, with HWT size casing accompanying the drilling of the diamond holes, to maintain hole stability and facilitate brine sampling.

Cores were recovered in 1.5 m long lexan polycarbonate tubes, which were pumped from the core barrel with water, to recover the core tube. The lexan tube was capped immediately following recovery of the core and stored in core boxes. Samples of core for the laboratory were cut from the base of core runs using a battery powered angle grinder. The laboratory sub-sample was 30 cm long, retained in the polycarbonate tube, and sealed with plastic caps, which were sealed in place with tape, to minimize seepage of brine from the cores. Cores were labelled with the hole name and depth range and sent by courier to the porosity laboratory.

The location of the recent diamond holes drilled in this program is presented in Figure 7-1, along with the location of production wells. Historical diamond holes are shown on Figure 7-2, with production wells.

Brine samples were collected using a packer system during the drilling of the three diamond holes. The packer device was lowered into place in the sediments and inflated using nitrogen gas to expand the packers against the walls of the hole. The space between the packers and the sampling line to the surface was then purged of brine, with three volumes of the packer and sampling line purged, with increased purging required as sampling progressed to greater depths. Sample parameters were monitored during the purging, to establish when parameters such as total dissolved solids and density stabilized. Samples were taken after different purge times and compared to evaluate how values stabilized.

Once this stage was reached, triplicate samples were collected for laboratory analysis and storage. However, despite these procedures it was not possible to reliably purge the packer space sufficiently to allow inflow of uncontaminated brine from the hole walls. Because diamond drilling uses significant volumes of drilling fluid this fluid infiltrates the walls of the hole and when samples are taken returns to the hole. The fluid used for drilling was surficial brine taken from a trench in the north of the salar, noted to consistently have significantly lower lithium concentrations than historical sampling in the vicinity of the three diamond holes. Consequently, brine samples from these three diamond holes were not used in the resource estimate.

Core recovery for the three recent diamond drill holes DDH-02, DDH-04 and DDH-17 was between 86.1 % and 88.6 %. This is higher than historical diamond drilling, which covered a larger spatial area and is summarized in the historical exploration section. Lithium concentration is independent of the core recovery, as it is hosted in brine in sediment pores. Porosity from cores is checked against downhole BMR specific yield measurements.

7.11.7 Rotary Drilling - Expansion Holes

Rotary drilling was conducted with conventional tricone rotary drilling equipment, with pilot holes typically drilled and subsequently reamed out in one or more passes to allow the installation of casing with screens of 10- or 12-inch internal diameter. Holes were typically installed with multiple screen intervals in the upper section of the hole and blank sections to act as chambers for the submersible pump. Drilling was carried out using brine as drilling fluid, to lift cuttings from the holes. Drilling details are outlined below:

- Pre-collar - typically drilled to 12 m and installed with a diameter of 20 inches.
- Pilot hole - typically 8.5 or 9 7/8 inches.
- Reaming of the hole to progressively larger diameter - typically with 12-, 14.5- and 17-inch tricone bits.
- Installation of casing and screen with a diameter of 10 inches for 650 m deep holes and 12 inches for 450 m deep holes.
- Once holes were reamed to the final diameter they were flushed and cleaned, prior to lowering in the casing and screen installation (Figure 7-18). The location of the screens was selected based on the geological observations from the well cuttings and the geophysical logging of holes, identifying areas of higher porosity and permeability. Wells were installed with Johnson wound wire screens, to maximize the screen area and inflows to the well.
- For the 450 m deep wells gravel pack was installed from surface. For the deeper 650 m deep wells pre-pack filters were part of the well installation, to simplify the process of well completion. Wells 650 m deep are installed with an upper 12-inch diameter section to a depth of 150 to 200 m, with a reduced diameter below these depths.

Figure 7-18 - Installation of filters in a production well at Olaroz.

- Once installed with gravel pack the wells were developed by the use of a swab and jet, to settle the gravel pack and remove fine material from around the gravel pack and in the well over a period of days to weeks. Once cleaning of the well was complete, test pumping and surging of the well was undertaken, to complete the process of cleaning the well. Once the well was cleaned it was allowed to equilibrate before step and constant rate tests were undertaken on the well to determine the hydraulic characteristics and to select the appropriate pump for long term production.

- The original northern and southern production wellfields were installed with a single diameter of 10 inches, to a depth of 200 m.

7.11.8 Comments on the Nature and Quality of the Sampling Methods

Each of the sampling methods has advantages and disadvantages. One of the strengths of Olaroz is that different sampling techniques have been used at different periods of time.

- Sonic drilling has the advantage of not requiring drilling fluid, which ensures samples are not contaminated with drilling fluid. Brine samples were collected with a bailer device from brine inflowing into the bottom of the rods, at the bottom of the hole. Core samples were removed by recovering the core barrel with the porosity samples.
    - Brine sampling from the 2011 drilling is considered high quality for this reason.
    - Porosity samples from the 2011 drilling are also considered to be high quality. However, sonic drilling was only conducted to 54 m, due to the limited capacity of this drilling methodology. Samples were analyzed in the highly reputable British Geological Survey Laboratory.
- Diamond drilling has the advantage of having much greater depth potential than sonic drilling. However, because diamond drilling requires drilling fluid there is the potential for contamination of brine samples by drilling fluid.
    - Diamond drilling brine samples were taken with a bailer in the original 2011 program. Subsequent to this they have been collected with double packer equipment, that is designed to isolate the sample interval and exclude fluid from surrounding areas. These samples are considered moderate to high quality. Samples were reviewed carefully for potential contamination and suspect samples for reasons of changes in brine chemistry and density.
    - Porosity samples were used for specific yield measurements at the Geosystems Analysis laboratory in Arizona. This laboratory has extensive experience analyzing samples for brine explorers.
    - The diamond holes (and all rotary holes) from 2018 onward were geophysically logged. This provides an extensive high quality data set to be used for comparison with the laboratory data set. With reasonable correlation with laboratory data over the geological units. Individual results for samples are more variable. The BMR logging provides information every 2 cm, so provided extensive data for resource estimation.
- Rotary drilling was used to install production wells. These were installed in the Northern and Southern Wellfields prior to the start of brine production in 2013, where holes were drilled to only 200 m. Subsequent rotary drilling for the Stage 2 production was conducted with holes between 400 and 750 m deep, but typically 450 m in the western part of the infill drilling conducted between the Northern and Southern Wellfields. Rotary drilling provides poor quality geological samples. This was compensated for by running BMR geophysical logs, as well as conductivity, resistivity, spectral gamma, caliper, and televiewer logs of these holes, to maximize the information collected.

- This extensive geophysical information allowed confident correlation between drill holes and for the installation of filters for definition of the production zones.
- Brine samples were not collected from these holes over intervals, because the drilling method requires drilling of large diameter holes, which are unsuitable for the use of packer equipment.
- Brine samples were collected as composite samples from brine inflow through the different screen intervals in the holes. Because changes in lithium concentration are generally gradual laterally and vertically within salares the composite brine provides an average for the interval where screens are installed. This concentration is considered sufficiently reflective of the formation in which the wells are installed to allow resource classification based on this information.
- Information from pumping tests conducted on the Stage 2 wells prior to entering production has been reflected in the ongoing production from these wells, some of them since 2019.

In summary, sampling techniques for brine and specific yield are considered to be of generally high quality and suitable for resource estimation.

7.11.9 Geophysical Logging of Holes

Diamond drilling was undertaken with standard diamond drilling equipment. Once drill holes reached their final depth the holes were geophysically logged in the open hole with a number of geophysical tools to maximize the collection of data in each well. Geophysical tools used include natural gamma, and resistivity, useful for distinction of halite and clastic layers, spontaneous potential, conductivity and temperature, ultrasonic caliper (for evaluating washouts in the hole) and borehole magnetic resonance (BMR).

The geophysical tools collect information on a 1 cm to 5 cm spacing, providing extensive information for geological interpretation. The logs provide important information on sections of the hole where core may not be recovered - often the intervals with highest specific yield and permeability.

Gamma rays are emitted by uranium, thorium and potassium minerals in sediments, the log typically responds to clay minerals and volcanic horizons. Evaporitic minerals such as halite and gypsum have a very low radioactive mineral content and can usually be identified by their low count rate. The gamma log is a useful tool for identifying certain types of lithology and for correlating beds across multiple wells. Spectral gamma logs provide greater differentiation, for correlation of units with different mineral content.

The BMR tool was developed by the oil industry for in-situ measurements of porosity and permeability. This technology has been miniaturized for use in diamond drill holes and water wells. The BMR60 tool is a 60 mm diameter tool that was run open hole in the HQ diamond drill holes, along with the other tools. For the larger diameter production wells, the 90 mm diameter BMR90 tool was run in the pilot hole, together with the other tools. From these profiles of the holes the BMR tool provides information on the total porosity, drainable porosity (specific yield) and permeability.

Borehole magnetic resonance is a unique measurement that responds to both the volumes of fluids present in a rock, and the geometry of the pores in which this fluid resides. As such, it is a powerful addition to any drillhole geophysical characterization aimed at evaluating the storage and flow capacity of subsurface formations. A modern BMR tool consists of two major components, a set of permanent magnets that create the static magnetic field, and an antenna that creates the transient electromagnetic field.

The echo decay train measured is a function of the volumes of fluids undergoing relaxation at different rates (T2's) within the volume of rock being investigated. The purpose of BMR data processing is to extract this underlying distribution of the volumes of fluid decaying at the various relaxation rates, known as the T2 distribution. The measured echo decay train is treated as resulting from multiple volumes of fluid, each undergoing relaxation at a particular rate, with the measured decay being the sum of these individual decays. Through the tool calibration, these amplitudes are translated directly into pore volumes. The simplest application of the tool is to use a T2 cut-off to separate bound water (in small pore spaces and held by capillary forces and as clay bound water) and free water, which can be drained by pumping.

The BMR tool allows definition of the total porosity of sediments (Pt), the specific yield porosity (Sy) and a derivation of permeability derived from the porosity data. There are various models for the derivation of permeability, with the Timur-Coates model the most common.

The Borehole Magnetic Resonance tool was designed and built in Australia to operate in highly saline environments like salars. The tools are factory calibrated in Australia and maintained regularly by the service provider.

7.11.9.1 Borehole Magnetic Resonance Data

The BMR tool used for the drilling campaign is purpose built for logging of exploration diameter drill holes. The tools are factory calibrated in Australia and maintained regularly by the service provider. The data acquisition and processing methodology gives information on the total porosity, specific yield (drainable porosity), specific retention and provides a computation of permeability and hydraulic conductivity with a vertical resolution varying from 5-15 cm providing much more information than individual core samples analyzed for porosity every 3 m.

Porosity values from the GSA laboratory sampling were compared to the BMR porosity logs. While some differences are noted the general ranges of porosity values for the different hydro-stratigraphic values are considered comparable.

Salar sediments often display short range vertical variability (within a meter or over meters to 10's of meters) due to changes in the depositional environment over time. This results in vertical and lateral changes in specific yield. BMR drainable porosity (Specific yield) measurements may be lower than corresponding laboratory measurements as cores may be disturbed during sampling and transportation to the laboratory and not reflect the natural in-situ state.

Salar sediments are subject to compaction as they are buried with compaction generally resulting in a decrease in total porosity and specific yield with depth although not all sediments are affected equally by compaction.

Holes drilled for the original feasibility study were logged with a neutron tool as borehole magnetic resonance technology was not available to the lithium industry in 2011. The neutron tool measures the hydrogen index of the formation (solids and brine). Neutron porosity is the result of applying a simple equation using the neutron measurement and two parameters. For the 2011 Resource neutron log data was compared with laboratory data to develop an algorithm for porosity across the resource area. BMR technology is considered more accurate for porosity definition in the salar environment and has now superseded use of neutron logs.

There are some differences observed between porosity measurements made with the neutron and BMR logs through comparable sediments. The specific yield of this updated resource is lower than the 2011 Resource, partly due to differences in depth and geological intervals intersected and partly due to a reduction in comparable porosity values.

It is noted that the original drilling to 200 m intersected only the upper part of the halite layer. The ongoing drilling for Stage 2 has defined the full thickness of the evaporite/halite unit UH4. This unit has a generally lower porosity than overlying and underlying clastic sedimentary units due to the compaction of halite with depth. Similarly clastic units also undergo some compaction with depth and consequently the overall porosity of the newly estimated resource is lower compared to the original resource in the upper 200 m of the salar.

7.11.10 Brine Sampling

Drilling has confirmed the previously defined lateral zoning in brine concentrations broadly continues at depth, and it is likely that brine will continue to the base of the basin. As drilling has progressed towards the south it has confirmed the previous observations of flow rates in this area, with new wells in the south of the properties producing at 70 l/s and 629 mg/l (E26 December 2022 average), 54.7 l/s and 539 mg/l (E24 December 2022 average) and 30.3 l/s and 660 mg/l (E22 December 2022 average). The new production wells are producing at concentrations from 542 mg/l (E09) to 786 mg/l Li (E08) and flow rates from over 10 l/s to over 60 l/s (E09 and E26), providing samples representative of the aquifers intersected by these wells. Brine samples are available from the weekly analysis of samples from the original (PP series) and expansion (E series) production wells and from check samples in external laboratories.

Brine samples from historical exploration drilling were analyzed in a number of commercial laboratories, principally the Alex Stuart laboratory in Mendoza, Argentina. Since construction of Olaroz brine samples have been analyzed in the Olaroz site laboratory, with check samples sent to the Alex Stuart laboratory in Jujuy, Argentina, with analysis of duplicates, standards, and blank samples. Results are considered to be sufficiently robust for resource estimation.

The resource was estimated using historical sonic and diamond drilling, recent diamond drilling and results from production wells, to maximize use of the available information. SDJ has operated production wells installed to depths of between 300 and 450 m for up to 5 years and from 650 m for 3 years. These provide important production history and continuity of brine concentration over this period to support the updated resource estimation to 650 m.

7.11.11 Pumping Tests

7.11.11.1 Variable Rate Tests

Once wells were installed and cleaned pumping tests were undertaken. These consisted of an initial short term variable rate (step) test, to assess the capacity of the well over a period of up to nine hours (Figure 7-19). Once this test was completed the rate for the constant rate test was determined. Wells do not directly have observation wells, as they are part of production wellfields. The monitoring well network will be updated to monitor pumping from the new production wells.

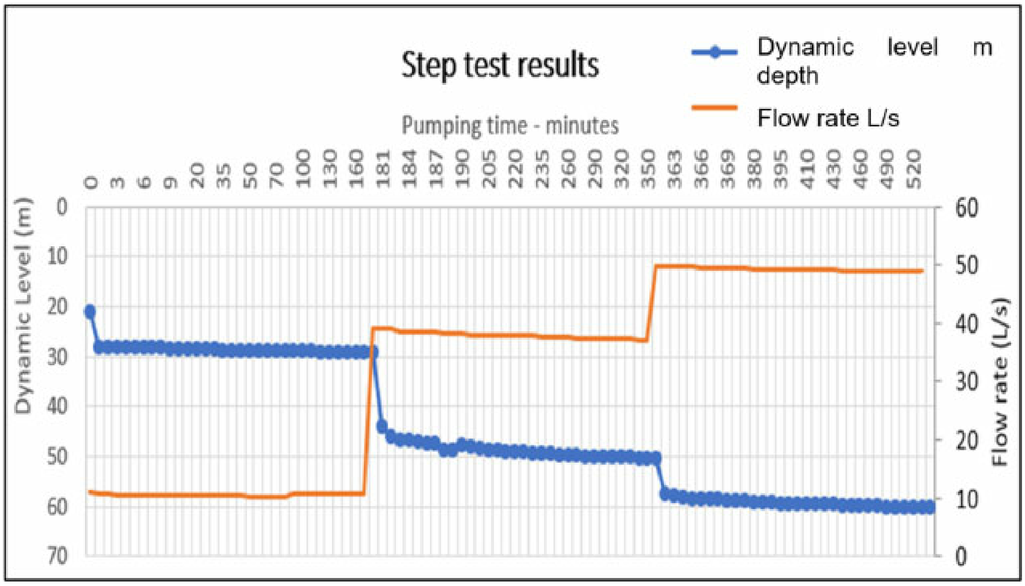


Figure 7-19 - Step test for expansion hole E17, showing pumping rate (right) and drawdown (left).

7.11.11.2 Constant Rate Tests

When the well static water level had recovered the constant rate test was completed for a minimum period of up to 48 hours, pumping. The brine was pumped directly to the initial receiving tanks, with each well connected to the site electrical network.

Pumping test results were analyzed with standard pumping test methodologies (Figure 7-20) and the hydraulic conductivity and transmissivity at the well was calculated using Theis, Neumann, and Jacob methodologies. Hydraulic conductivity, transmissivity and storability are summarized in Table 7-4.

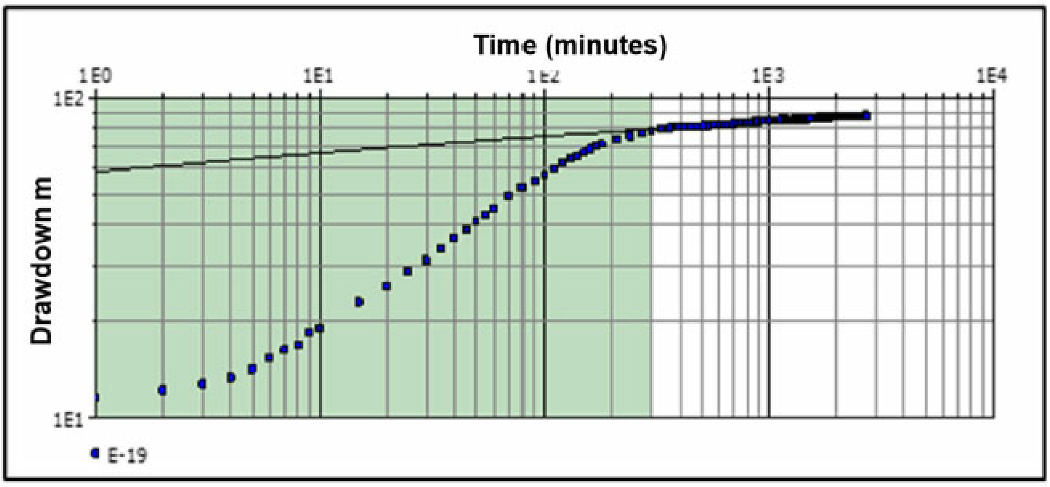


Figure 7-20 - Theis analysis of pumping results from production well E19 from constant rate pumping results.

Table 7-4 - Summary of hydraulic parameters for pumping wells.

Method	Transmissivity (m^2/d)	Hydraulic Conductivity (m/d)	Storage
Pumping Estimate E10			
Theis	8,04E+00	3,94E-02	1,28E-03
Neumann	8,04E+00	3,94E-02	9,74E-01
Pumping Estimate E17			
Theis	1,46E+02	6,26E-01	1,65E-04
Neumann	2,14E+02	6,26E-01	3,70E-02
Pumping Estimate E19			
Theis	5,98E+01	2,16E-01	2,14x10-7
Theis Recovery	5,85E+01		
Neumann	5,68E+01	2,05E-01	2,39x10-5

7.11.11.3 Ground Water Levels

Groundwater levels were measured in initial exploration of the salar, with the water table within 1 meter of surface across the salar surface. Off the salar, the groundwater level in the alluvial fan sediments is deeper, as the topography rises around the salar and where fresh to brackish water is present.

SDJ has established a monitoring well network around and within the salar, from which regular information is collected on changes in water level (Figure 7-21 above). Hydrographs from the monitoring network around the edges of the salar generally show there is seasonal decline in the groundwater level due to discharge to the salar and evaporation, with recharge from seasonal summer rainfall (and possibly snow melt) resulting in a rise in the groundwater level. These dynamic changes will depend on yearly and long-term rainfall and snow patterns and could potentially be influenced by pumping activities.

Within the salar pumping has generated a drawdown cone that is centered around the northern and southern wellfields, which appears to have developed a stabilized drawdown level.

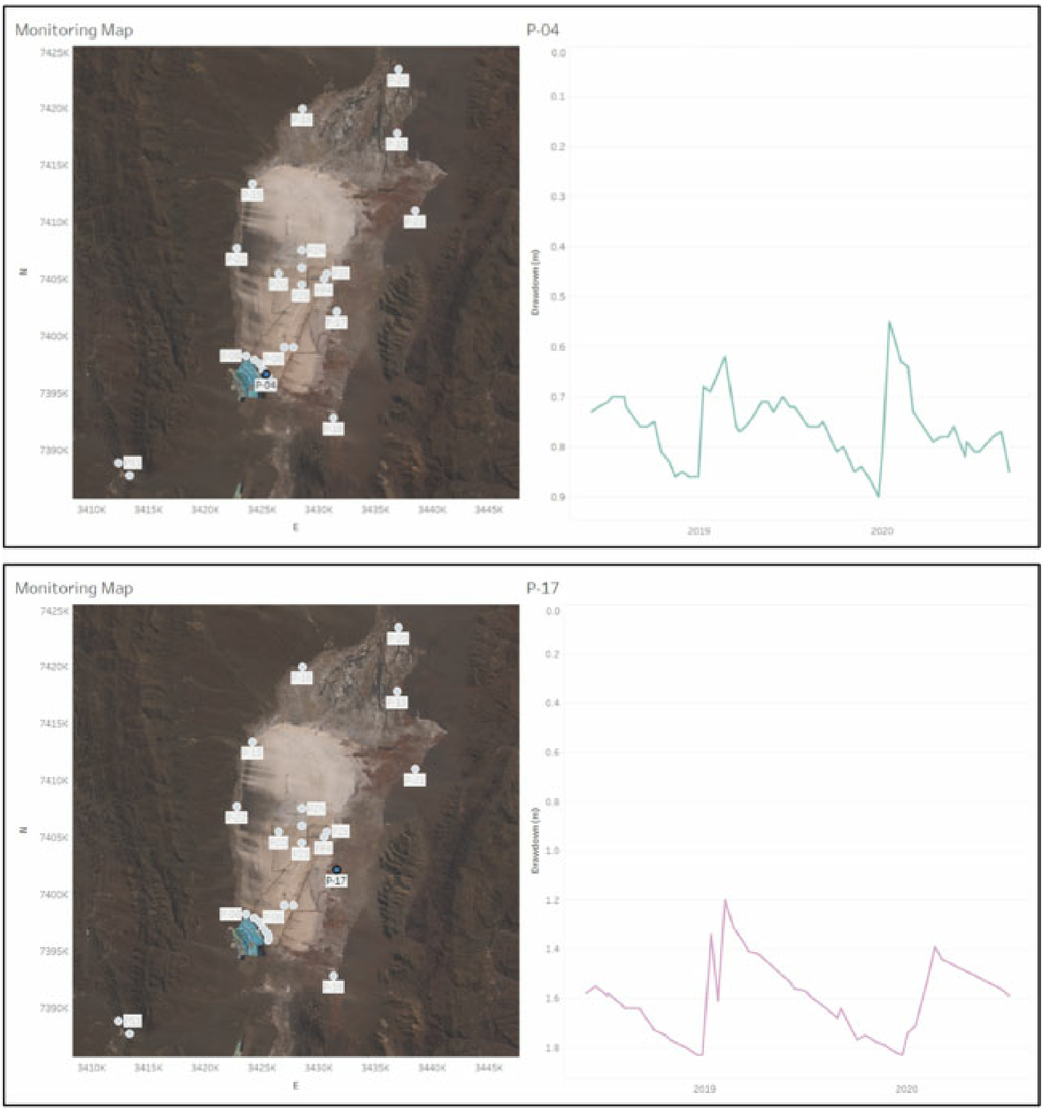


Figure 7-21 - Shallow hydrographs from the Olaroz monitoring network, with P04 in the south at the base of the Archibarca alluvial fan and P17 on the eastern side of the salar.

7.11.11.4 Water Balance

In most enclosed basins, in absence of any major groundwater abstraction, it is assumed the long-term water balance is in equilibrium, with groundwater recharge from precipitation equal to the groundwater discharge and evaporation. Groundwater recharge in high desert basins is generally difficult to quantify, due to scarcity of precipitation measurements (liquid and solid) and the uncertainties in the soil infiltration and potential sublimation rates, and runoff coefficients.

Groundwater recharge was estimated from groundwater inflow into the salar from surrounding sub-basins for which infiltration was calculated through a surface water model developed by consultants NAPA.

Groundwater discharge in enclosed basins takes place through evaporation, which is a function of soil type (grainsize/permeability), depth to the phreatic level, water (brine) density and climatic factors (both seasonal and longer term). Soil evaporation rates were determined as a function of these parameters using evaporation domes and data collection from shallow auger holes in December 2018 in Cauchari.

With this information three evaporation curves were established with respect to depth, for the nucleus, marginal and alluvial zones. This data was applied to equivalent areas of the Olaroz salar by consultants NAPA, in order to estimate the long-term evaporation, there. The evaporation data was then used to estimate the natural water losses from the basin and how they compare with water inputs. The NAPA model has a difference of less than 2% and is considered to adequately represent the basin water balance.

7.11.11.5 Commentary on the Determination of Groundwater Parameters

Surface water information was obtained by gauging the few surface water inflows into the basin in the Rio Rosario in the north of the basin and Rio Ola in the Archibarca alluvial fan in the west of the basin. This was done throughout the year, to establish the variability of flow through periods of different climatic conditions. Surface water physical parameters (pH, EC, TDS, temperature) were measured in the field as well as flow. Samples were sent for analysis in the company laboratory, for the determination of the concentration of different elements.

Groundwater characteristics were evaluated during and after the drilling process. This consisted of measuring the physical parameters (pH, EC, TDS, temperature) from samples taken during sonic and diamond drilling. These samples were sent for analysis in external independent laboratories and for the diamond drilling in 2019 with analysis of samples in the company laboratory (these samples were not used in the resource estimation). Samples from pumping tests and production from the wells were analyzed in the company laboratory, with QA/QC check samples analyzed in an independent certified laboratory (Alex Stuart Laboratories) in Argentina.

The company laboratory uses the Atomic Absorption method to measure lithium concentrations, ICP-OES for the measurement of other elements and different techniques discussed in section 8 for the analysis of anions. The Alex Stuart laboratory used for analyses of brine samples in 2021 and 2022 used the methods outlined in Table 7-5, also using ICP-OES for the analysis of cations, including lithium. Both field duplicates and laboratory prepared standards were used as part of sampling programs. These methods are considered appropriate for the analysis of these elements and interlaboratory correlations are considered to be reasonable and acceptable. Future more extensive use of duplicates and standards and inter-laboratory testing is recommended.

Table 7-5 - Analytes, analytical methods, and detection limits of laboratories.

	Olaroz Laboratory (2014-2021)		Alex Stewart Jujuy (2021)		Alex Stewart Mendoza (2011)	
Analysis	**Methods**	**Detection Limit mg /L**	**Method**	**Detection Limit mg /L**	**Method**	**Detection Limit mg /L**
Conductivity mS /cm	Total Dissolves Solids Dried at 180°C		LMFQ01 Potentiometer	0.05		
pH	Electrometric Method		0002NLMC128 Potentiometer	0.1	H gas electronde .IMA - 05Versión 02:SM -4500-H +-B	
Density	Pycnometer		LMFQ19 Pycnometer	0.001	Piconometry :IMA -28Versión 00	
Boron (B)	ICP -OES	1	LMMT03 ICP -OES	1	ICP -AES USEPA -SW -846Method 200.7	1
Chlorides (Cl)	Automated titration	1	0002NLMCl01 Volumetric analysis	10	Ag titration IMA -17-Versión 3:SM -4500-Cl -B	5
Sulphates (SO_4)	ICP -OES	1	LMCl22 Gravimetric analysis	10	Gravimetric IMA -21-Versión 1:SM -2540-C	10
Sodium (Na)	Atomic Absorption	1	LMMT03 ICP -OES	2	ICP -AES USEPA -SW -846Method 200.7	
Potassium (K)	ICP -OES	1	LMMT03 ICP -OES	2	ICP -AES USEPA -SW -846Method 200.7	2
Lithium (Li)	Atomic Absorption	1	LMMT03 ICP -OES	1	ICP -AES USEPA -SW -846Method 200.7	1
Magnesium (Mg)	ICP -OES	1	LMMT03 ICP -OES	1	ICP -AES USEPA -SW -846Method 200.7	1
Calcium (Ca)	ICP -OES	1	LMMT03 ICP -OES	2	ICP -AES USEPA -SW -846Method 200.7	2

The Olaroz salar sediments are not a classic aquifer sequence. The sediments consist of an upper sequence of interbedded fine-grained sediments (clay, silt) with some sand units and an extensive of halite (common salt) and some evaporite minerals. The sand units within this sequence are highly productive, while the remainder of the sediments act more like a leaky aquitard system than a classical aquifer. The halite units are often massive, compact and produce little flow, unless they are interbedded with sands.

Significantly higher flows are obtained from the UH5 unit, which consists of fine sand units and some gravels, which are classical aquifer materials and highly productive. Low productivity is considered for the halite units.

Groundwater flow was measured by step pumping tests conducted on production wells and by constant rate pumping tests conducted in these wells. Pumping conducted over hours and days is an accepted way of deriving the hydraulic conductivity (the measure of permeability) of the aquifers. With pumping tests conducted with some of the original Northern and Southern well-field production wells and all of the Stage 2 production wells. Pumping tests are considered a more appropriate way of obtaining information on the permeability of the host sediments than samples on core samples, which are representative of local intervals. The pumping tests provide information regarding the productivity of the intervals where screens are installed, which are based on the specific yield and evaluation of the in-situ permeability derived from the BMR geophysical tool.

Flow rates from the step tests and evaluation of the constant rate tests were used to define the flow rates and productive capacity of each well for long term pumping. The recharge rate was evaluated from consideration of long-term rainfall patterns and evaporation in the salar basin. The groundwater model developed for the salar was based on the results of actual pumping data from 2013 to 2021, consequently the model has a vastly larger series of input data than most salar projects and this is considered to add confidence to the modelling and the outcomes.

7.11.12 Exploration Target

It must be stressed that an exploration target is not a mineral resource. However, the resource is open both laterally to the north and south, with lesser potential west of the salar. Further, the gravity survey, used to define the base of the salar, underestimates the thickness of the salar sediments. One deep hole (E1) has been drilled to 1,408 m slightly north of the current Northern wellfield, but to date no Allkem drilling in the Olaroz basin has yet intersected the basement/bedrock.

Laterally, the resource area is defined by the salar surface and property boundaries. Previous limited drilling and geophysical surveys indicate the brine body extends south beneath gravels of the Archibarca alluvial fan to Cauchari (where drilling by Allkem subsidiary South American Salars defined 4.6 Mt of M&I Resources and 1.5 Mt of Inferred Resources in 2019). The gravity survey also supports a large area of >650 m depth in this Northern part of the basin under the Rio Rosario delta and surrounding alluvial fans. Consequently, there is significant potential for future definition of Resources, within the exploration target defined here.

The potential quantity and grade of the exploration target is conceptual in nature, and there has been insufficient exploration to define a Mineral Resource in the volume where the Exploration Target is outlined. It is uncertain if further exploration drilling will result in the determination of a Mineral Resource in this volume.

However, there is a considerable amount of geological knowledge available from drilling, AMT, and gravity geophysics, which gives the company a fair amount of confidence with respect to the exploration target.

The Exploration Target ranges between 14 and 33.6 Mt LCE, depending on the values used for porosity and lithium concentration. Information from third party Lithium Energy Limited, drilling to the northeast of the salar, suggests the stratigraphy defined on the salar continues north beneath the Rosario Delta area, with considerable potential for future brine discovery in the Allkem properties.

The exploration target volume is included within the geological model where the resource is defined, with the same units defined across the model. The model consists of five hydrogeological units overlying the interpreted basement rocks. The Exploration Target is defined around the edges of the model, where there is no or very limited drilling, and consequently much greater uncertainty as to the specific yield conditions of the sediments and the lithium concentration in the sediments. Drilling by Allkem and a third party to the north of the salar has validated the geological model.

The likely range of specific yield porosity and lithium content has been defined based on knowledge of changes in concentration in this and other brine deposits, with concentrations changing gradually horizontally and vertically. The volume of the exploration target has been based on the distribution of the hydrogeological units within the Olaroz basin and the limits of the property boundaries. The lowest values for specific yield and lithium concentration were multiplied with the volume to generate the lowest likely case of contained lithium. Conversely the highest values of specific yield and lithium concentration were multiplied together to define the highest case.

The exploration target is based on the lateral projection of actual exploration results. The exploration completed to date has been semi-systematic and considerable information is available within the more central portion of the salar, where diamond and rotary drill holes have been completed. Proposed exploration activities consist of future drilling of diamond and rotary drill holes, with down hole logging of holes drilled. It is expected that exploration will be completed over a period of several years.

The ranges of tonnage and grade (or quality) of the exploration target could change as the proposed exploration activities are completed and there are no guarantees that any given area or volume of the exploration target can be converted to Resources.

7.12 Conclusions

Exploration on Olaroz has been carried out over an extended period, with drilling on Olaroz commencing in 2009 and the most recent drilling involving the installation of Stage 2 production wells completed in 2022. Over this period drilling depths have evolved from less than 100 m to 650 m depth, with the drilling of one-hole 1,408 m deep.

Exploration has been carried out to a high standard, with a focus on obtaining reliable brine and porosity samples and with the collection of samples with different methods for corroboration of results, where possible. To provide a high-quality data set of specific yield porosity data, down hole geophysics has been used to make measurements of in-situ specific yield, initially with neutron and density logs and more recently with borehole magnetic resonance (BMR) equipment.

Brine samples have been collected by bailer sampling in the upper 200 m, and from pumping tests and production pumping below 200 m. The data collected is considered suitable for estimation of Resources.

8. SAMPLE PREPARATION, ANALYSES AND SECURITY

The following sub-sections detail historical and recent sampling methods that have been conducted to support Olaroz.

8.1 Reverse Circulation Procedures, Sample Preparation, Analyses and Philosophy

Ensuring that samples taken are truly representative of the subsurface conditions in the salar is a key consideration for sampling. Collecting truly representative samples is challenging and consequently multiple sampling methods have been used over the life of Olaroz in order to compare results and check they are consistent.

8.1.1 Sampling and Preparation Procedures

Diamond drilling consisted of HQ or NQ size cores, with lexan polycarbonate tubes used as liners inside the core barrel to facilitate core recovery and to preserve samples with minimum disturbance for laboratory porosity analysis. Cores were recovered at surface by pumping the lexan tube from the core barrel using water, with a plug separating tube and water. Upon release from the core barrel tight fitting caps were applied to both ends of the lexan tube. The tube was then cleaned, dried, and labelled.

The lower 30 cm of the lexan core was cut from the 1.5 m long core tube using a portable angle grinder. This core sub sample was then capped, and tape used to secure the caps in place and minimize any fluid loss during transportation.

8.1.2 GeoSystems Analysis Core Testing

GSA was selected as the primary laboratory for the specific yield (Sy) and other physical parameter analyses conducted on the recent diamond drill cores collected at Olaroz. GSA utilized the Rapid Brine Release method (Yao et al., 2018) to measure specific yield and measured the total porosity with a standard gravimetric technique, drying the saturated sample in the oven.

The Rapid Brine Release (RBR) method is based on the moisture retention characteristics (MRC) method for direct measurement of total porosity (Pt, MOSA Part 4 Ch. 2, 2.3.2.1), specific retention (Sr, MOSA Part 4 Ch3, 3.3.3.5), and specific yield (Sy, Cassel and Nielson, 1986). A simplified Tempe cell design (Modified ASTM D6836-16) was used to test the core samples. Brine release was measured at 120 mbar and 330 mbar of pressure for reference (Nwankwor et al., 1984, Cassel and Nielsen, 1986), which is considered to reflect drainage from coarse- and fine-grained samples respectively.

In addition to specific yield, bulk density and specific gravity were determined on core samples. Table 8-1 provides an overview of the test work carried out by GSA and other laboratories where previous samples and check samples were analyzed. Table 8-2 shows the porosity results by lithology type from recent and historical porosity measurements at Olaroz and the Cauchari properties owned by Allkem.

Table 8-1 - Analytical methods and numbers of samples analyzed at Olaroz and the Cauchari Project owned by Allkem.

Test Type	Sample Type and Number	Test Method	Testing Laboratory	Standard
Physical	64 core samples Olaroz 2021. 292 core samples Cauchari 2017-18	Bulk Density	GSA Laboratory (Tucson, AZ)	ASTM D2937-17e2
	64 core samples Olaroz 2021 160 core samples Cauchari 2017-18	Specific Gravity of Soils	GSA Laboratory (Tucson, AZ)	ASTM D854-14
	64 core samples Cauchari 2017-18	Particle Size Distribution with brine wash	GSA Laboratory (Tucson, AZ)	ASTM D6913-17 / ASTM C 136-14
Hydraulic	64 core samples Olaroz 2021, 292 core samples Cauchari 2017-18	Estimated Total Porosity	GSA Laboratory (Tucson, AZ)	MOSA Part 4 Ch.2, 2.3.21
		Estimated Field Water Capacity		MOSA Part 4 Ch.3, 3.3.32
		Rapid Brine Release (RBR as Specific Yield)		Modified ASTM D6836-16 MOSApart 4 Ch.3, 3.3.3.5
	25 core samples Olaroz 2021	Relative Brine Release Capacity (RBRC as Specific Yield)	Daniel B, Stephens & Associates Inc. (Albuquerque, NM)	Stormontet al., 2011
	30 core samples Cauchari 2017-18	Centrifuge Moisture Equivalent of Soils (Specific yield)	Core Laboratories (Houston, TX)	Modified ASTM D425-171
	543 core samples Olaroz 2010/11	Total porosity measurements (every 2.8 m vertical to 54 m and every 7.1 m 54 to 197 m)	British Geological Survey UK	Modified ASTM D425-17
	205 core samples Olaroz 2010/11, 123 samples Cauchari 2011	Centrifuge Moisture Equivalent of Soils for Sy	British Geological Survey UK	Technique based on evaluation by Lovelock (1972) and Lawrence (1977)

8.1.3 Core Sampling Frequency

Sixty-four core samples were tested from DDH02, DDH04 and DDH17 diamond cores during the most recent drilling program, drilling to 650m deep. Twenty-five of these samples had duplicate core samples analyzed in the DB Stephens laboratory in the USA. A comparison of results between both laboratories is provided in Figure 8-1 and Figure 8-2.

Historically 543 Olaroz samples from 2009 to 2011 were analyzed for total porosity (Pt), with 205 specific yield (Sy) analyses at the BGS research laboratories. Sample frequency with depth for those analyses used in the historical resource estimation averaged 2.8m per sample in the upper 54 m, and 7.1 m per sample in the 54m to 197m interval.

Table 8-2 - Summary of specific yield values by sampling program.

Lithology type	Total Porosity Pt	Specific Yield Sy
Olaroz 2021		
Sand variants	0.20+/-0.12	0.09+/-0.08
Silt mixes	0.35+/-0.09	0.06+/-0.05
Halite dominant	0.08+/-0.07	0.04+/-0.02
Olaroz 2011		
Sand dominant	0.31+0.06	0.13+0.07
Silt and sand -clay mixes	0.37±0.08	0.06+0.04
Clay dominant	0.42±0.07	0.02+0.02
Halite dominant	0.27±0.14	0.04+0.02
Cauchari 2017-18		
Sand dominant		0.19+/-0.06
Sand -clay mixes		0.07+/-0.04
Clay dominant		0.03+/-0.02
Halite dominant		0.04+/-0.03

8.1.4 Laboratories Procedures

Check samples were sent to the DB Stephens laboratory in the USA to determine the specific yield (Sy) for core plugs taken adjacent to those analyzed by GSA. The Stephens laboratory uses the RBRC test methodology (Stormont et. al., 2011), which was developed by the laboratory. This involves application of a vacuum pressure of -0.25 bars to samples over a period of 24 hours, before the samples are oven dried to determine fluid loss. Quality control using the same method was also carried out on the samples previously analyzed on the Cauchari project. In the Cauchari project the Centrifuge Moisture Equivalent of Soils (Centrifuge, ASTM D 6836-16) method was also used by Core Laboratories (Houston, TX) as a check on the primary sample results by GSA.

A total of 25 core plugs were analyzed and compared with the adjacent samples analyzed by GSA, with results shown in Figure 8-1 and Figure 8-2. It should be noted that salar sediments can show rapid vertical changes in total and specific yield, something that is also observed in borehole magnetic profiles of porosity data. The duplicate core plugs, while sampled from as close as possible to the primary sample, also show some natural variation in grain size and hence porosity and are not identical samples to the primary samples.

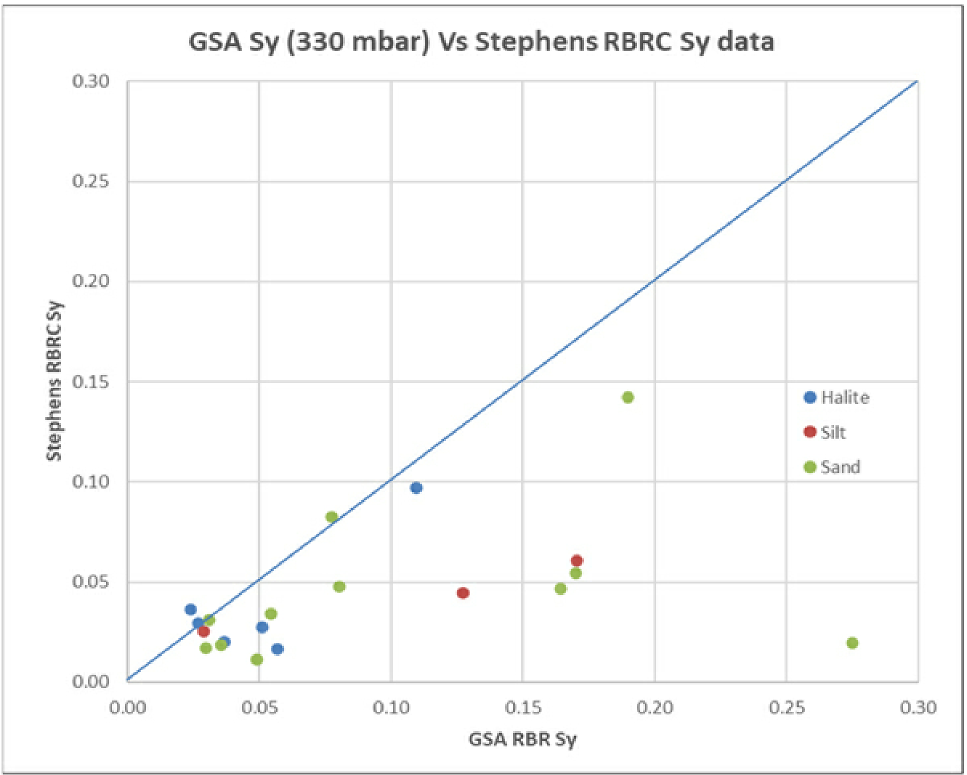


Figure 8-1 - Comparison between the GSA and Stephens sample results.

Some systematic differences are noted between the GSA and Stephens data, with the GSA Sy data measured at 330 mbar showing higher values than the Stephens data on adjacent plugs. Most of the samples tested for Sy fall below the 1:1 line, indicating that GSA measured Sy values are often higher than those for the Stephens lab. The GSA 120 mbar data is more closely correlated with the Stephens data.

The longer time the testing is undertaken at the GSA lab (1 week versus 24 hours at the Stephens lab), together with the slight differences in the pressures used in the tests and the natural variability between adjacent samples is believed to explain the differences in results. The GSA technique is considered to measure brine drainage from easily drained more porous materials (like sands) as well as delayed drainage (as observed in leaky aquifer systems) from finer grained sediments. A statistical comparison of results from the GSA 120 mbar testing and the Stephens RBRC testing is presented in Table 8-3. Note the small number of silt samples is likely to influence the comparison between the sample sets.

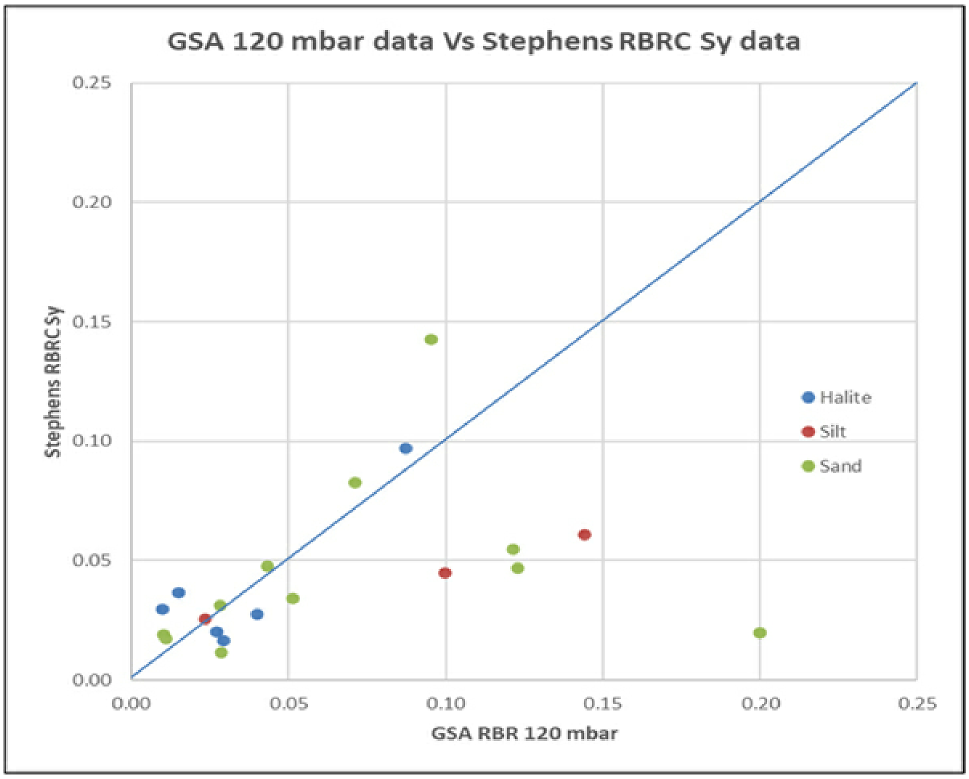


Figure 8-2 - Comparison between the GSA 120 mbar results and Stephens sample results.

Table 8-3 - Comparison of GSA 120 mbar RBR results with Stephens RBRC results.

	Sand dominant		Silt &Mixed		Halite	
	GSA	DBS	GSA	DBS	GSA	DBS
Average	0.07	0.05	0.09	0.04	0.03	0.05
SD	0.06	0.04	0.06	0.02	0.03	0.04
RPD %	33		77		29	
Dup samples	6		3		11	

8.1.5 Brine Sampling Methods

8.1.5.1 Diamond Drilling

In the Olaroz 2010/11 sampling program, when holes were predominantly to 54 m depth, samples for fluid chemistry analysis were taken every 3 m depth interval in all sonic holes and in the 200 m deep diamond drilled holes, where possible. With the original sonic drilling a push-ahead well point with double packers was attached to the base of the rods and inserted into the formation ahead of the well casing advance. The packers sit inside the casing and so affect a seal between the well point and the hole above inside the casing. Bailer tube devices were used for sampling the 200 m deep diamond holes.

Sampling of brine from the recently drilled diamond holes consisted of extracting brine using a packer device that sealed over an interval of 1.5 to 6 m. This sampling was conducted approximately every 12 meters. However, it was not always possible to take samples, due to limitations with the permeability of the sediments.

8.1.5.2 Production Well Sampling

Olaroz has two operating wellfields that were established for Stage 1. Olaroz lithium facility has two operating wellfields that were established for Olaroz Stage 1. Additional wells have been installed for Stage 2, drilled to between 450 and 650 m depth. Samples were collected from the operating wellfield holes and the newly installed Stage 2 wells by collecting bottles of brine from the diversion valve located on each wellhead to allow the regular weekly sampling to be carried out on site. Samples were taken in duplicate and analyzed at the on-site laboratory at Olaroz. Duplicate samples were collected and sent to the Alex Stuart laboratory in Jujuy Argentina for analysis.

Samples were also taken during the constant rate pumping tests conducted on Stage 2 wells when the hydraulic parameters were selected before putting the wells into production. These samples analyzed at the on-site laboratory showed consistent lithium concentrations. Long term pumping of wells from Stage 1 (over a period of up to 7 years) has confirmed the consistent concentration of brine extracted from individual wells over this period.

8.1.5.3 Sampling Protocol

At the wellhead, prior to filling, the two one-liter bottles and their caps were rinsed out with a small amount of sample. The sample was then collected in two bottles. In each case all air was expelled from the bottle, the caps screwed tight and sealed with tape. Each bottle was labelled using a permanent marker with the drillhole number and the depth of the sample.

Samples were transferred from the drill site to the field camp where they were stored out of direct sunlight. Before being sent to the laboratory the bottles of brine were labelled with a unique sample number. The hole number and date of collection were recorded in a spreadsheet control.

8.2 QA / QC Brine Analysis Procedures and results

8.2.1 Analytical methods

The primary laboratory used for analyses following the feasibility study completed in 2011 has been the laboratory that is established at Olaroz. This laboratory is owned and operated by Sales de Jujuy and is used to analyze brine samples from the production wells, evaporation ponds and from the product produced at the plant. The laboratory sends samples to other independent laboratories for periodic verification using round robin methods, to evaluate the performance of Sales de Jujuy analytical techniques and the results. The Olaroz laboratory has been used to analyze all the brine samples from production wells that have been used in the resource estimate. The laboratory also analyzed samples from diamond drill holes. Duplicate samples were analyzed at the Alex Stuart laboratory in Jujuy.

The Alex Stewart laboratory in Jujuy, Argentina was selected as the secondary laboratory to conduct check assaying of brine samples from wells and diamond drill holes collected for the resource estimate. This laboratory is ISO 9001 accredited and operates according to Alex Stewart Group standards consistent with ISO 17025 methods at other laboratories.

The SGS laboratory in Salta, Argentina (SGS) was used along with the Alex Stuart laboratory as part of the independent comparison process by the Olaroz laboratory.

Table 8-4 lists the suite of analyses provided by the Olaroz lab and Alex Stuart, the methods used and detection limits. It is noted that there are some differences in the methods between labs and in particular the Olaroz laboratory uses Atomic Absorption for analysis of lithium and potassium.

Table 8-4 - Analytes, analytical methods, and detection limits of laboratories.

	Olaroz Laboratory (2014-2021)		Alex Stewart Jujuy (2021)		Alex Stewart Mendoza (2011)	
Analysis	**Methods**	**Detection Limit mg /L**	**Method**	**Detection Limit mg /L**	**Method**	**Detection Limit mg /L**
Conductivity mS /cm	Total Dissolves Solids Dried at 180°C		LMFQ01 Potentiometer	0.05		
pH	Electrometric Method		0002NLMC128 Potentiometer	0.1	H gas electronde .IMA - 05Versión 02:SM -4500-H +-B	
Density	Pycnometer		LMFQ19 Pycnometer	0.001	Piconometry :IMA -28Versión 00	
Boron (B)	ICP -OES	1	LMMT03 ICP -OES	1	ICP -AES USEPA -SW -846Method 200.7	1
Chlorides (Cl)	Automated titration	1	0002NLMCl01 Volumetric analysis	10	Ag titration IMA -17-Versión 3:SM -4500-Cl -B	5
Sulphates (SO_4)	ICP -OES	1	LMCl22 Gravimetric analysis	10	Gravimetric IMA -21-Versión 1:SM -2540-C	10
Sodium (Na)	Atomic Absorption	1	LMMT03 ICP -OES	2	ICP -AES USEPA -SW -846Method 200.7	
Potassium (K)	ICP -OES	1	LMMT03 ICP -OES	2	ICP -AES USEPA -SW -846Method 200.7	2
Lithium (Li)	Atomic Absorption	1	LMMT03 ICP -OES	1	ICP -AES USEPA -SW -846Method 200.7	1

	Olaroz Laboratory (2014-2021)		Alex Stewart Jujuy (2021)		Alex Stewart Mendoza (2011)	
Magnesium (Mg)	ICP -OES	1	LMMT03 ICP -OES	1	ICP -AES USEPA -SW -846Method 200.7	1
Calcium (Ca)	ICP -OES	1	LMMT03 ICP -OES	2	ICP -AES USEPA -SW -846Method 200.7	2

8.2.2 Quality Assurance and Quality Control

8.2.2.1 Analytical Controls 2010/11 Diamond Drilling Program

A full QA/QC program for monitoring accuracy, precision and potential contamination of the entire brine sampling and analytical process was implemented in this previous diamond drilling program. Accuracy, the closeness of measurements to the "true" or accepted value, was monitored by the insertion of standards, or reference samples, and by check analysis at an independent secondary laboratory (Alex Stuart in Mendoza, Argentina). The details of the quality control program are provided in the NI43-101 report prepared by Houston and Gunn (2011).

Precision of the sampling and analytical program, which is the ability to consistently reproduce a measurement in similar conditions, was monitored by submitting blind field duplicates to the primary laboratory. Contamination, the transference of material from one sample to another, was measured by inserting blank samples into the sample stream at site.

Blanks were barren samples on which the presence of the main elements undergoing analysis has been confirmed to be below the detection limit.

The results of the analyses of the standards are summarized in the NI43-101 report prepared by Houston and Gunn (2011). Results were within one standard deviation of the standard sample, except for Cl and K, which were marginally outside. Lithium values were 1.5% and 0.4% of the standard values for the two standards used.

8.2.2.2 Analytical Controls 2021 Diamond Drilling Program

A total of 55 primary brine samples were analyzed from the three diamond core holes (DDH02, DDH04, DDH17) drilled as monitoring wells, to a depth of 650 m, as part of the Stage 2 expansion. These holes are in a spatially localized area, drilled along the eastern property boundary. Considering the limited spread of these holes along the eastern property boundary and difficulties obtaining representative brine samples, these drill holes were not used in the resource estimation. Instead, brine samples from the production pumping wells (E-Series) were analyzed and utilized in the resource estimate. The PP series production wells and the expansion E series production wells were sampled upon completion. Analytical controls included:

- Analysis of two different standards 2G and 3G as part of the round robin evaluation of standards (Table 8-5) and as standards submitted with samples from production wells (Table 8-6).
- Duplicates of packer samples from diamond holes analyzed by the SDJ laboratory and external laboratory (Alex Stuart Jujuy).
- Duplicates of samples from pumped production wells analyzed by the SDJ laboratory and external laboratory (Alex Stuart Jujuy).

Table 8-5 - Olaroz standards analyzed in check laboratories.

	Chloride	Boron	Calcium	Lithium	Magnesium *	Potassium	Sodium	Sulphate *
	mg /L	mg /L	mg /L	mg /L	mg /L	mg /L	mg /L	mg /L
2G*STANDARD								
STANDARD		800	150650	650	2,000	6,000	80,000	8,600
SGS	144,627	777	137	609	2,140	5,950	89,900	8,648
SGS	143,279	786	135	604	2,140	5,930	88,900	8,578
Alex Stewart Jujuy	133,344	813	158	660	2,065	5,589	74,696	8,712
Alex Stewart Jujuy	132,312	813	155	656	2,061	5,519	74,981	8,781
SDJ Olaroz lab		836	139	651	2,006	5,944		7,970
SDJ Olaroz lab		835	140	649	2,038	6,102		8,159
SDJ Olaroz lab		848	141	648	2,020	6,207		8,114
3G*STANDARD								
STANDARD		800	80	800	3,200	6,000	80,000	13,000
SGS	144,130	728	95	758	3,230	5,700	89,000	13,089
SGS	140,085	732	102	770	3,230	5,680	87,400	13,064
Alex Stewart Jujuy	128,965	794	108	819	3,323	5,619	74,997	13,445
Alex Stewart Jujuy	129,357	786	102	814	3,294	5,574	74,916	13,527
SDJ Olaroz lab		853	90	810	3,256	6,302		13,006
SDJ Olaroz lab		824	95	829	3,271	6,368		13,072
SDJ Olaroz lab		820	92	830	3,204	6,259		13,072

* Standards were prepared with different concentrations of magnesium and sulphate, due to availability of chemicals at this time. Consequently, values are different to later use of these standards.

Table 8-6 - Standard results accompanying production well samples.

ALEX STUART STANDARD ANALYSES						
Standard	B	Ca	Li	Mg *	K	S04*
	mg /L	mg /L	mg /L	mg /L	mg /L	mg /L
Standard value	800	150	650	1400	6000	5529
2G	756	148	615	1322	5537	5845
2G	755	142	613	1319	5534	5899
2G	747	140	612	1318	5534	5735
2G	753	143	616	1324	5607	5735

ALEX STUART STANDARD ANALYSES						
Standard	B	Ca	Li	Mg *	K	S04*
	mg /L	mg /L	mg /L	mg /L	mg /L	mg /L
2G	764	141	616	1329	5598	5762
2G	749	140	610	1321	5522	5968
Average	754	142	614	1322	5555	5824
Standard value	800	80	800	2000	6000	7899
3G	747	76	746	1866	5502	8492
3G	758	75	758	1887	5624	8438
3G	742	75	749	1866	5541	8438
3G	739	71	745	1861	5503	8396
3G	751	72	753	1883	5598	8204
3G	739	72	747	1848	5497	8383
Average	746	74	750	1869	5544	8392
SDJ STANDARD ANALYSES						
Standard value	800	150	650	1400	6000	5529
2G	798	139	645	1379	6104	5349
2G	815	140	649	1356	5915	5265
2G	815	143	631	1379	6338	5532
2G	878	158	647	1384	6127	5721
2G	856	152	649	1375	6150	5520
2G	810	133	645	1379	6428	5385
Average	829	144	644	1375	6177	5462
Standard value	800	80	800	2000	6000	7899
3G	803	72	798	2050	6170	7713
3G	785	80	801	1920	6785	7665
3G	816	77	783	1997	6332	7965
3G	871	91	797	1942	6:0.95	8278
3G	866	92	802	1960	6182	7962
3G	798	70	801	1982	6275	7665
Average	823	80	797	1975	6307	7875

8.2.2.3 Analytical Controls - 2021 Stage 2 Production Well Drilling

An additional 14 primary brine samples were analyzed from the rotary holes drilled, to a depth up to 650 m. These E series wells of the Stage 2 wellfield are located in the center of the properties, between the northern and southern wellfields. Brine samples from these production pumping wells were analyzed and utilized in the resource estimate. As part of the QA/QC undertaken some existing PP series holes production wells were sampled and analyzed, in addition to the expansion E series production wells.

8.2.3 Reference Materials Results

8.2.3.1 Standards

Two standards, 2G and 3G, are prepared and used by the SDJ Olaroz laboratory on a regular basis. These were used for external laboratory analyses, where standards are sent to different laboratories to compare results. These standards were sent to the Alex Stuart laboratory in Jujuy, Argentina and the SGS laboratory in Salta, Argentina to check the results of standards. The results of standards from the round robin evaluation between laboratories are presented in Table 8-5 and in Figure 8-3.

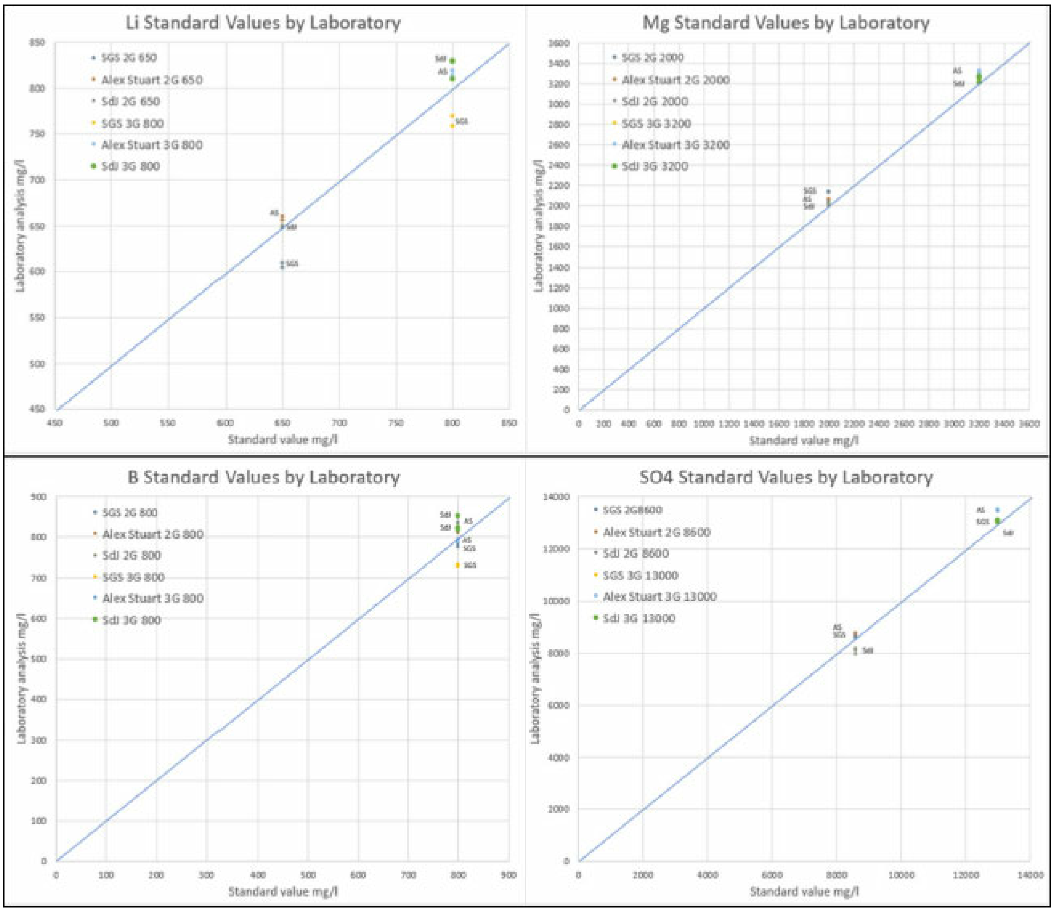


Figure 8-3 - Standard results from the round robin analysis of standards at different laboratories.

Performance of standards is presented in Figure 8-4 and Figure 8-5. The standards were prepared in the Olaroz laboratory and were not independently prepared. It is difficult to obtain independent standards from sources other than the independent laboratories which were used to check results from the Olaroz laboratory, due to tight controls on chemicals in Argentina. Analyses by SGS were generally more variable than those of Alex Stuart.

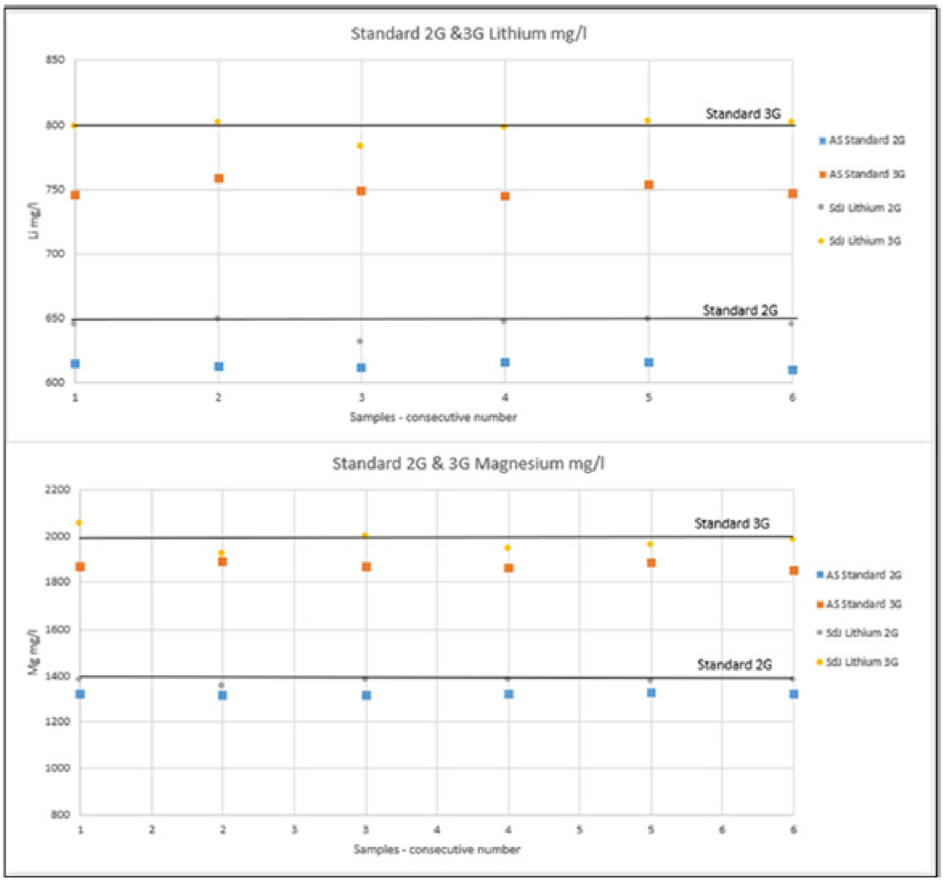


Figure 8-4 - Comparison of standards SDJ and Alex Stuart.

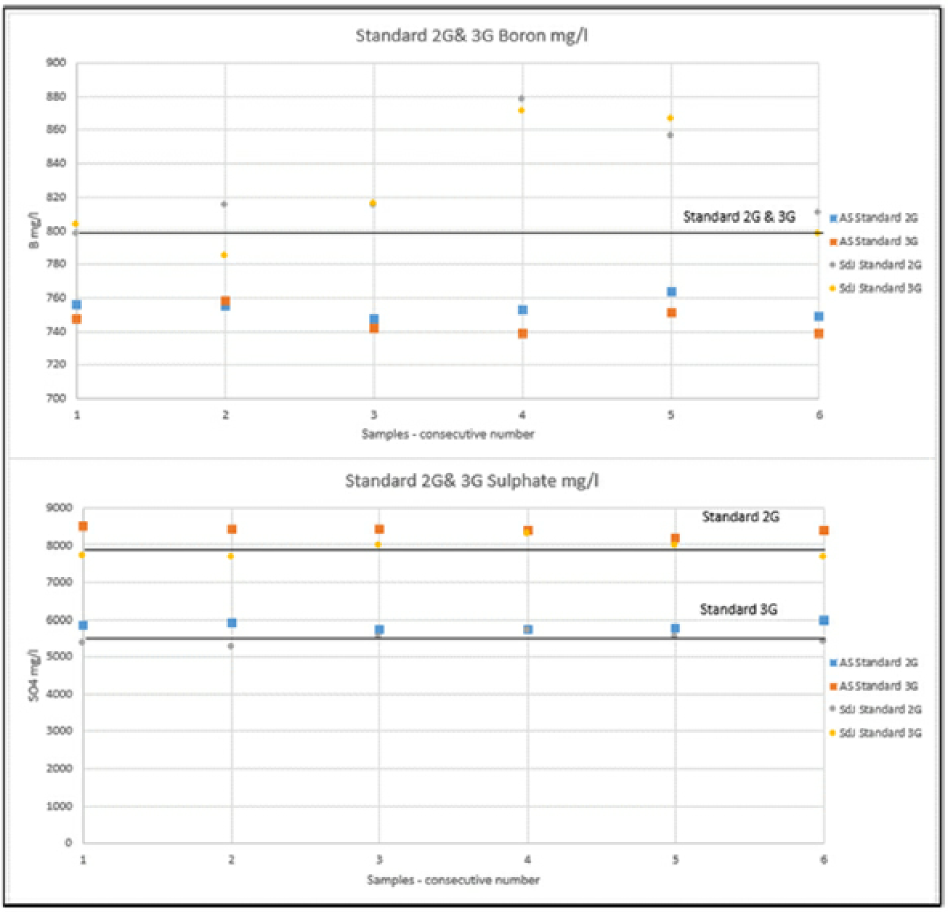


Figure 8-5 - Comparison of standards SDJ and Alex Stuart.

There are limited standard samples analyzed by SGS, which was used as the secondary check laboratory, with Alex Stuart used as the primary check laboratory.

Standards were also included with batches of samples from production wells that were analyzed in the SDJ laboratory on site and the Alex Stuart laboratory in Jujuy. The results of these standards analyses are presented in Table 8-6.

8.2.3.2 Duplicates

Sampling of production wells is undertaken on a weekly basis. Duplicate samples were taken during weekly sampling and analyzed in the Olaroz laboratory. Duplicate sample results from Olaroz wells submitted for analysis by the SDJ and Alex Stuart laboratories are presented in Table 8-7 Below. Interlaboratory duplicates from the production pumping wells are presented in Figure 8-6.

Table 8-7 - Duplicate sample results from a selection of production wells.

Samples mg /l	Li	K	Mg	Na	B	Ca	Sulphate	Chloride	Conductivity	Density	pH
PP15_109	496	4,112	1,100	103,889	1,116	557	12,981	168,946	229	1.197	6.7
PP15_108	499	4,094	1,100	104,520	1,126	569	13,903	166,774	227	1.199	6.7
PP15_109A	497	4,063	1,110	103,883	1,135	570	12,702	168,661	229	1.197	6.7
Average	497	4,090	1,103	104,097	1,126	565	13,195	168,127	228	1	7
Standard dev	2	25	6	366	10	7	629	1,180	1	0	0
RPD %	**0.6**	**1.2**	**0.91**	**0.61**	**1.69**	**2.3**	**9.1**	**1.29**	**0.88**	**0.17**	**0**
E9_98	549	4,440	1,144	112,823	921	486	13,733	180,950	229	1.214	6.3
E9_99	552	4,416	1,164	112,839	925	488	13,678	181,556	229	1.214	6.4
RPD %	**0.54**	**0.54**	**1.73**	**0.01**	**0.43**	**0.41**	**0.4**	**0.33**	**0**	**0**	**1.57**
PP302_112	586	4,592	1,267	113,521	1,031	474	13,599	178,706	232	1.207	6.6
PP302_113	591	4,619	1,277	110,285	1,041	479	12,364	179,312	232	1.206	6.6
RPD %	**0.85**	**0.59**	**0.79**	**2.89**	**0.97**	**1.05**	**9.51**	**0.34**	**0**	**0.08**	**0**

Duplicate samples were collected during a special sampling round, with 29 samples collected, which included 5 duplicate sample pairs analyzed in the Olaroz laboratory. Results are presented in Table 8-8 below.

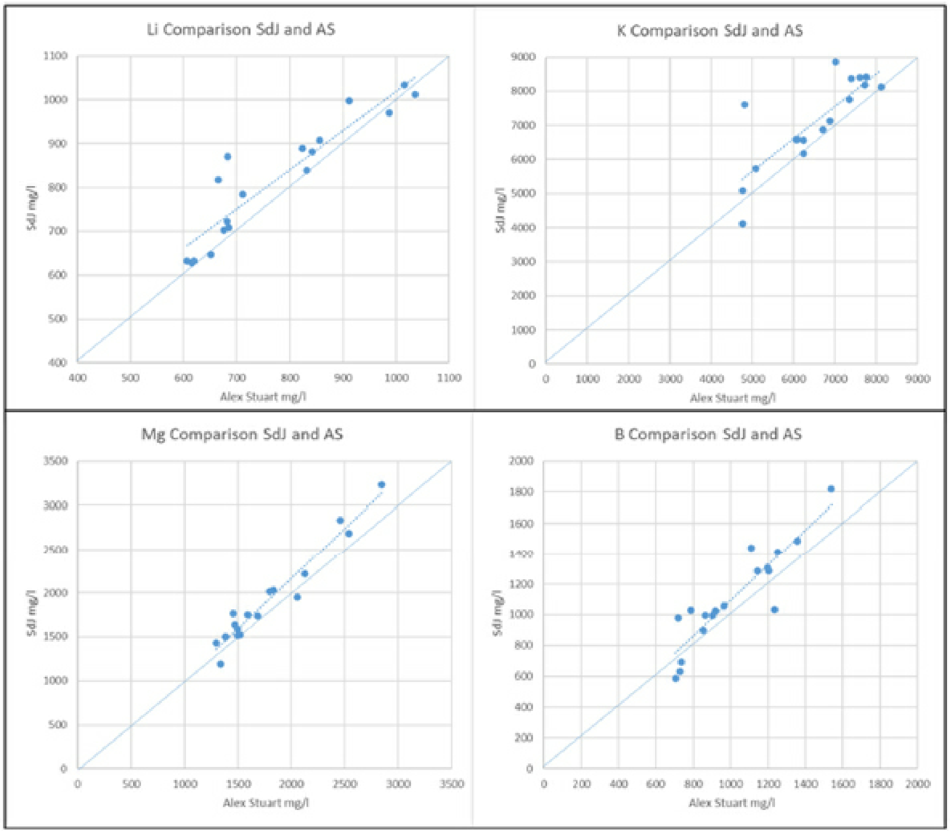


Figure 8-6 - Duplicate analyses between the Olaroz and Alex Stuart Jujuy laboratories from recent diamond holes.

8.2.3.3 Interlaboratory Duplicates

Interlaboratory duplicates from the three diamond drill holes were analyzed in the Alex Stuart laboratory in Jujuy in addition to the primary samples analyzed in the Olaroz laboratory. The results are presented in the following Figure 8-6. These show there is a slight bias between the two laboratories, with higher values for lithium, potassium, magnesium, and boron from the Olaroz lab. The Olaroz laboratory used Atomic Absorption spectroscopy for analyses of lithium and potassium, to minimize interference between different elements, whereas the Alex Stuart laboratory uses ICP-OES. Overall, the comparison is considered acceptable, although the differences between the laboratories are noted and a high portion of QA/QC samples are recommended for future analysis, in addition to more regular analysis in independent external laboratories.

Interlaboratory duplicates consisted of a batch of 24 primary samples, with 5 internal duplicates analyzed at the Sales de Jujuy laboratory. The 24 samples were analyzed in the Sales de Jujuy laboratory and in the Alex Stuart laboratory in Jujuy. The results are presented in the following Figure 8-7. These show there is a slight bias between the two laboratories, with higher values for lithium, potassium, magnesium, and boron from the Olaroz lab.

The Olaroz laboratory used Atomic Absorption spectroscopy for analyses of lithium and potassium, to minimize interference between different elements, whereas the Alex Stuart laboratory uses ICP-OES for all the cations analyzed. The comparison of results is considered to be satisfactory to support resource estimation.

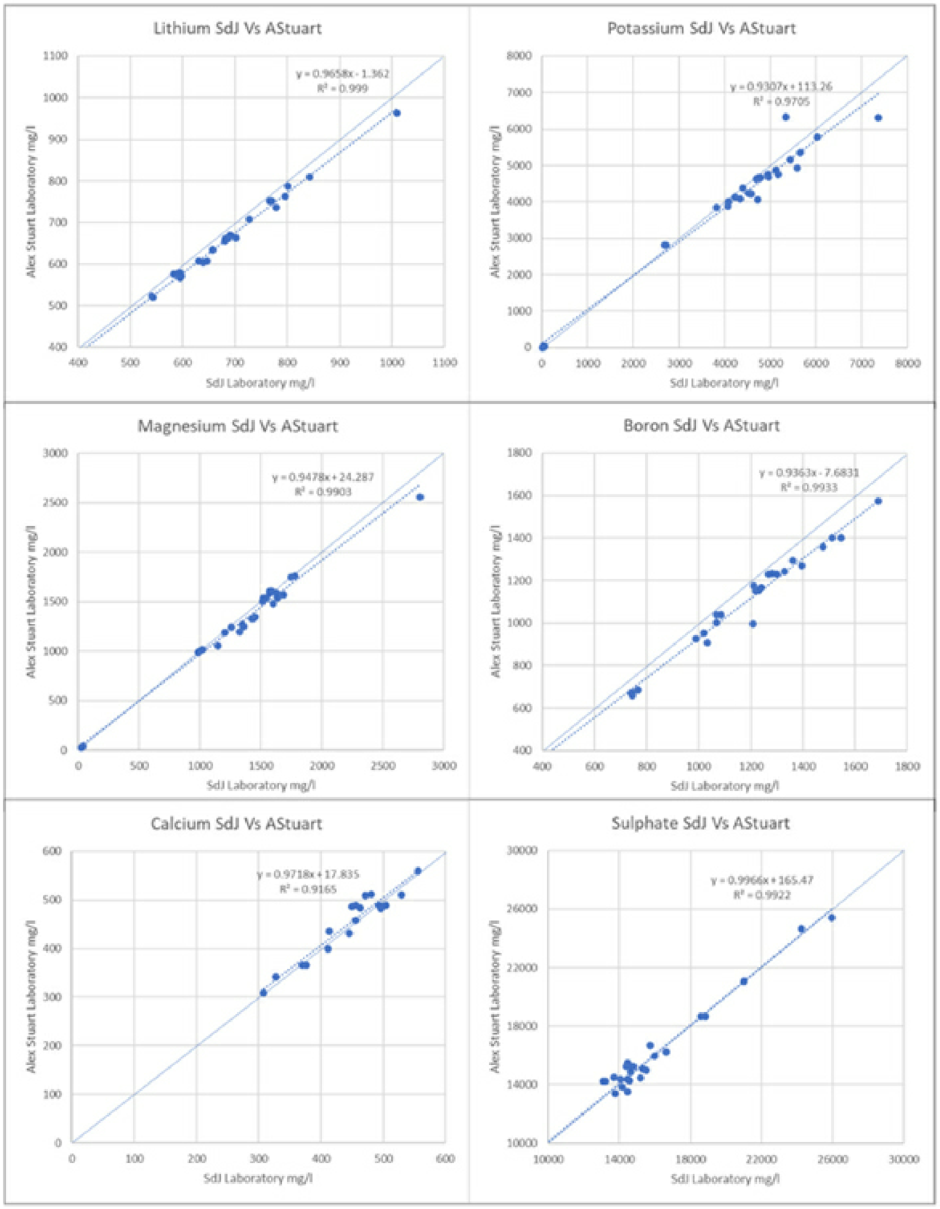


Figure 8-7 - Duplicate analyses comparing the Olaroz and Alex Stuart laboratories for 2022 production wells.

8.2.3.4 Ionic Balance

The ionic balance is a measure of the relative imbalance between anions and cations. The ion balance should ideally be as close to zero as possible, although results of less than 5% are generally considered acceptable. Figure 8-8 shows the Olaroz lab ionic balance over the extended period from 2017 to 2021 has almost all samples below 6%.

Blanks are not routinely used. The difference in concentration between blank and brine with the optimized calibration of the spectrometer makes results from blanks less reliable.

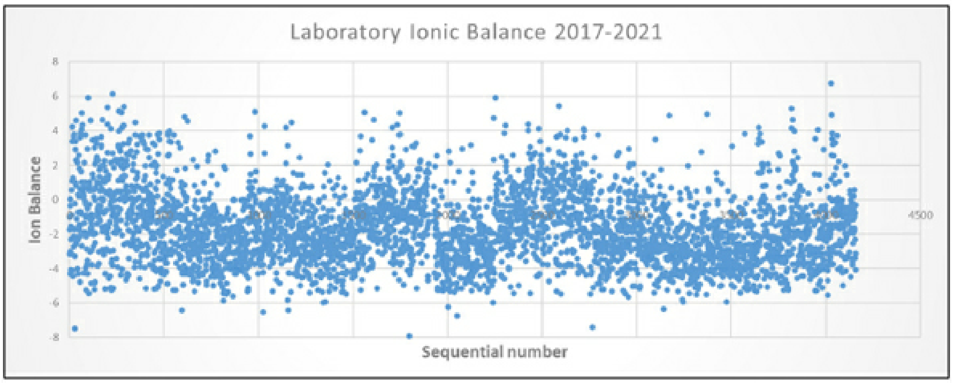


Figure 8-8 - Olaroz laboratory ionic balance record.

Table 8-8 - Sales de Jujuy duplicate samples from batch with interlaboratory analyses.

Sample	Li mg /L	Ca mg /L	Mg mg /L	K mg /L	Na mg /L	B mg /L	SO_4 mg /L	Cl mg /L	pH	Density g /mL	Conductivity mS /cm
E1	589	370	1021	2716	119400	741	13086	191754.5	6.01	1.217	243
E1	582	376	1013	2688	120000	746	13239	191427.5	6.01	1.217	243
RPD between sample analyses	1.2%	1.6%	0.8%	1.0%	0.5%	0.7%	1.2%	0.2%	0.0%	0.0%	0.0%
E17	687	498	1540	4943	116200	1299	14403	195274.2	6.47	1.211	242
E17	682	450	1637	5167	115800	1268	14772	189513	6.54	1.22	241
RPD between sample analyses	0.7%	10.1%	6.1%	4.4%	0.3%	2.4%	2.5%	3.0%	1.1%	0.7%	0.4%
E26	630	504	1586	4792	112800	1085	14440	182110.7	6.45	1.211	241
E26	646	493	1574	4755	110400	1067	14050	182413.6	6.58	1.213	241
RPD between sample analyses	2.5%	2.2%	0.8%	0.8%	2.2%	1.7%	2.7%	0.2%	2.0%	0.2%	0.0%
PP21	767	397	1626	5646	145100	1546	18836	189197.6	6.68	1.213	238
PP21	770	388	1575	5666	121600	1510	18606	189127.9	6.67	1.214	238
RPD between sample analyses	0.4%	2.3%	3.2%	0.4%	17.6%	2.4%	1.2%	0.0%	0.1%	0.1%	0.0%
WSE01	4	55	35	52	381	25	99	530	7.53	1.005	2.7

Sample	Li mg /L	Ca mg /L	Mg mg /L	K mg /L	Na mg /L	B mg /L	SO_4 mg /L	Cl mg /L	pH	Density g /mL	Conductivity mS /cm
WSE01	3	52	30	49	299	20	78	455	7.67	1.001	2.2
RPD between sample analyses	28.6%	5.6%	15.4%	5.9%	24.1%	22.2%	23.7%	15.2%	1.8%	0.4%	20.4%

8.2.3.5 Analytical Controls - Stage 2 Production Wells In 2022

An additional 24 primary brine samples were analyzed from new wells put into production since 2021, earlier E series holes installed for the expansion and some existing PP production holes. These analyses provided a check on the average lithium concentrations for pumping of these holes, that were used for the resource estimate. Samples were selected to include all the E series holes (15 in total) and a selection of PP series holes from the original northern and southern wellfields.

As part of the QA/QC undertaken five field duplicates were included in addition to the 24 primary samples. Four standard samples (2 each of the 2G and 3G standard) were also included. All samples were analyzed in the on-site SDJ laboratory and the independent Alex Stuart commercial laboratory in Jujuy. Results are provided in the figures and tables below.

8.3 Sample Shipment and Security

Brine samples at the exploration stage in 2009 to 2011 were collected by company personnel and transported to the Alex Stuart laboratory in Mendoza by commercial courier companies. The samples were placed in cooler boxes for transportation and were sealed with plastic tape to secure them during transportation and so they were not opened by unauthorized parties. The samples were accompanied by a chain of custody forms, which were also sent by email to the laboratory. The laboratory confirmed reception of the samples to the company. Porosity samples were treated in a similar way but were packed inside PVC tubes to minimize disturbance and packed in boxes with packing materials to minimize disturbance and possible damage to the samples. Samples were accompanied by a sample list. Receipt of the samples was confirmed by the British Geological Survey laboratory who analyzed the samples.

Since the initial exploration program and resource there has been an onsite laboratory operating at Olaroz. The bulk of analyses since 2011 have been transported by company personnel directly to this laboratory, using sequential sample numbers applied to samples in identical plastic bottles. Samples were submitted to the lab as blind samples, without reference to the well number, for evaluation of the brine chemistry.

Results were provided to the Hydrogeology personnel by email. Check sampling rounds have been conducted since this time, with samples sent to the Alex Stuart laboratory in Jujuy, Argentina, delivered by company personnel to the laboratory. Receipt of samples was confirmed, and results were provided by the laboratory in electronic format.

Porosity samples were packed as described above and sent to the GSA laboratory in the USA, where receipt of samples was confirmed, and the sample quality checked to assess whether they were adequate for analysis.

8.4 Core Handling Procedures

The core samples were prepared for specific yield testing by the Geosystems Analysis laboratory (GSA) in Tucson, USA, using a 5 cm subsample cut from the base of the core liner that was sent to the lab. All samples were labelled with the hole number and depth interval. Porosity samples were transferred to the site camp and stored, prior to cutting sub samples for laboratory analysis. Prior to sending each sample was wrapped in bubble plastic to prevent disturbance during transportation. A register of samples was compiled at the Olaroz site to control transportation of samples to the laboratory. Samples were sent by courier to the GSA laboratory.

8.5 Specific Gravity Measurements

GeoSystems Analysis core testing (GSA) was selected as the primary laboratory for the specific yield (Sy) and other physical parameter analyses conducted on the recent diamond drill cores collected at Olaroz. GSA utilized the Rapid Brine Release method (Yao et al., 2018) to measure specific yield and measured the total porosity with a standard gravimetric technique, drying the saturated sample in the oven.

The Rapid Brine Release (RBR) method is based on the moisture retention characteristics (MRC) method for direct measurement of total porosity specific retention (Yao, T., Milczarek, M., Reidel, F., Weber, P.G., Peacock, E., and Brooker, 2018. Proceedings of Mine Water Solutions 2018. June 12-16, 2018, Vancouver, Canada) and specific yield (Sy, Yao et. Al., 2018; Cassel and Nielson, 1986). A simplified Tempe cell design (Modified ASTM D6836-16) was used to test the core samples. Brine release was measured at 120 mbar and 330 mbar of pressure for reference (Nwankwor et al., 1984, Cassel and Nielsen, 1986), which is considered to reflect drainage from coarse- and fine-grained samples respectively.

In addition to specific yield, bulk density and specific gravity were determined on core samples. Table 8-1 provides an overview of the test work carried out by GSA and other laboratories where previous samples and check samples were analyzed.

Table 8-2 shows the porosity results by lithology type from recent and historical porosity measurements at Olaroz and the Cauchari properties owned by Allkem.

8.6 Historic Drill Holes

Specific yield samples were historically (2010/11) tested at the British Geological Survey (BGS) in the UK, with testing of samples at an on-site laboratory in Olaroz for total porosity and testing of duplicates by the BGS. Historically samples from Allkem's Cauchari project were also tested by the BGS in 2011 and more recently in 2017/18 samples were analyzed at the GSA laboratory from the extensive drilling program conducted.

The BGS determined specific yield using a centrifugation technique where samples are saturated with simulated formation brine and weighed. They are then placed in a low speed refrigerated centrifuge with swing out rotor cups and centrifuged at 1,200 rpm for two hours and afterwards weighted a second time. The centrifuge speed is selected to produce suction on the samples equivalent to 3.430 mm H_2O, which was previously defined by Lovelock (1972) and Lawrence (1977) as characteristic of gravitational drainage.

8.7 Comments on Sample preparation analysis and security

Hydrominex Geosience (the QP) considers that samples have been collected in an acceptable manner overall, although QA/QC sampling has been with a low frequency post the exploration program that defined the initial resources. In the 2009-2011 exploration program there was extensive use of QA/QC sampling for brine samples. However, since Olaroz began operations there has been less emphasis on QA/QC sampling and periodic analysis of samples in external independent laboratories.

More emphasis on ongoing QA/QC sampling and analysis, and external independent analysis of brine samples is recommended going forward at the Olaroz operation.

9. DATA VERIFICATION

The company has an ongoing QA/QC program where brine samples are collected from the operating production wells weekly and analyzed for the major brine components in the Olaroz site laboratory. These samples are accompanied by QA/QC samples that comprise field duplicate samples, laboratory prepared standards and distilled water blank samples submitted with each batch.

9.1 Quality Control Program

The results of the QA/QC samples are evaluated by batch and stored in the Olaroz database. If there are any unacceptable results (i.e., greater than 2 standard deviations), from comparison of samples the samples are reanalyzed and if necessary resampled.

Periodic batches of samples are sent externally to the Alex Stuart Laboratory in Jujuy province and the duplicate, triplicate, standard and blank samples are compared with results from the Olaroz laboratory. Results are considered to be acceptable, with recognition of biases between the laboratories, in part related to laboratory methods.

9.2 Verification of QC Program

Mr. Brooker was involved during the original 2010/2011 drilling program at Olaroz, working with the then QP Mr. John Houston. During this period Mr. Brooker reviewed the brine and porosity sample results received and used for the 2011 resource estimate. Mr. Brooker has subsequently verified this assay data for the inclusion in the 2022 updated resource.

QP Mr. Brooker has reviewed the protocols for drilling, sampling, and testing procedures for the Olaroz expansion drilling program. These procedures are essentially the same as for the original 2010/2011 drilling and testing program. Mr. Brooker was previously involved in designing the expansion drilling program and has previously spent a significant amount of time at the Olaroz camp working with the Olaroz team during the implementation and execution of drilling, testing, and sampling protocols.

Due to Covid limitations Mr. Brooker did not visit Olaroz during 2020 and 2021, and was last at Olaroz on November 21, 2022, reviewing drill cuttings from the expansion holes and reviewing QA/QC samples collected for analysis.

Mr. Brooker has reviewed information from the QA/QC programs related to brine sampling and laboratory brine chemistry analysis as well as the laboratory porosity analysis. QA/QC protocols were implemented for the specific yield and brine chemistry analysis programs. Mr. Brooker requested a series of interlaboratory duplicates to be submitted and evaluated as part of data verification procedures.

No significant issues were found with the results of the brine and porosity laboratory analysis. However, in 2022 some samples were recollected and sent to the on-site and external laboratories, as Hydrominex Geosience (the QP) considered the original samples were not adequately labelled, to avoid doubt about their respective sources.

The diamond drilling and production well programs were not implemented in the planned time frame, due to constraints imposed by managing Covid-19.

It is the opinion of Mr. Brooker that the sampling procedures, security, preparation and analytical procedures and the information received and used for the brine resource estimate is adequate for that purpose.

The employee of Gunn Metallurgy, set forth herein, the QP responsible for mineral processing, metallurgical testing and process and recovery methods was involved with and has reviewed historical test work. He has subsequently been involved conducting periodic reviews of Olaroz' performance, since Stage 1 entered production. The employee of Gunn Metallurgy set forth herein has sufficiently validated the data for that purpose.

9.3 Comments on Data Verification

The employee of Hydrominex Geoscience set forth herein (the QP) is of the opinion that the analytical results delivered by the participating laboratories and the digital exploration data are sufficiently reliable for the purpose of the Brine Resource estimate. Recommendations have been made for a modified QA/QC regime going forward.

10. MINERAL PROCESSING AND METALLURGICAL TESTING

10.1 Initial Characterization and Scoping Studies

The following section is a review of the early testing completed for the purposes of the original Olaroz Project feasibility study. In large part operating results have reflected the findings of this early test work. Very little basic testing has been done since for the obvious reason that full scale operations can be more readily measured and analyzed. However, significant information relating to production performance and consequent efficiency improvements have been gained since 2015 by testing and analysis of:

- Magnesium precipitation control with lime.
- The mode of Li losses in the pond system.
- Testing of a range of direct extraction techniques for recovery of Li from raw brine, plant feed, and Li recovery from mother liquor.
- Control of sulphate and borate concentrations using calcium chloride.
- Impurity removal in the polishing area.
- Carbon dioxide recovery from crystallization reactors in the purification circuit.
- Testing of various brine heating and cooling systems.

10.1.1 Overview

The brine resource defined at Olaroz on the Olaroz Salar contains soluble lithium, potash, and boron compounds. The economic value of lithium as battery grade carbonate is by far the largest and was the focus of early process development work. As market growth for lithium for the Li-ion battery segment has evolved, the objective has been to produce battery grade products.

Initial assessment of the brine chemistry in 2008 indicated that it had a low magnesium to lithium ratio, moderate levels of sulphate and was suitable for application of the ‘Silver Peak’ method used at the world’s first lithium brine treatment operation in Nevada, USA since the mid 1960’s. However, the ‘Silver Peak’ process, although generally applicable to the Olaroz brine chemistry, required modification to suit the differences in brine chemistry and the different climatic conditions at Olaroz. The process route also required some enhancement to produce a lithium product to meet the more demanding prevailing specifications.

The process development program sequentially defined the performance of each stage in the process, resulting in a flow sheet capable of producing battery grade lithium carbonate. Test work has been undertaken at SDJ’s facilities at Olaroz site and at commercial and university laboratories.

The process development program resulted in a process route incorporating a number of proprietary innovations. Early work focused on evaporation rate testing to understand the phase chemistry of the brine during a twelve-month weather cycle, this followed by lime addition test work to remove magnesium. Subsequently, the focus of Olaroz test work moved to the removal of boron by multi-stage solvent extraction processing, and then on to the final stage of lithium carbonate purification.

Lithium is present at concentrations that are economic but are low in comparison to the other salts in the brine. Before final purification the other salts must be selectively rejected, and this is done primarily by evaporation, causing the salt concentrations to increase beyond their solubility limits, and by simple and well-established methods of chemical treatment. Based on test work and phase chemistry, over 70% of the lithium was modelled to be recovered in this process to a high specification product, with the majority of the lithium losses incurred by inclusion of brine in the pores of the solid salts formed during the evaporation process.

By September 2010, Allkem was producing its first pilot scale lithium carbonate and on April 8, 2011, Allkem announced that it had successfully produced battery grade specification lithium carbonate at its process development facilities from Olaroz brines. This was considered to be a prerequisite for completion of a Feasibility Study for the production of 100% battery grade material. Analysis showed the material to be of greater than 99.5% purity and to exceed specifications of battery grade material sold by existing producers.

Although the primary focus was development of the high specification lithium carbonate production flow sheet, there was a secondary focus on production of potash and boric acid. Test work showed that potash of commercial grade can be produced by froth flotation of mixed halite and potash (sylvite) salts. The deeper 2010 drilling and more detailed testing program revealed significantly higher levels of sulphate in the expanded resource than had been expected based on the shallower 2008 drilling program results. This higher sulphate level had an impact on expected potash recoveries, due to the formation of glaserite ($Na_2SO_4 \cdot 3K_2SO_4$). The process was then expected to produce approximately 0.6 tonnes of potash per tonne of lithium carbonate or 10,000 tonnes per annum in the Feasibility Study production case.

Allkem undertook additional process development work with the aim of reducing the impact of the increased levels of sulphate and increasing potash production to the level of previous estimates, and even potentially higher levels. This work was completed well in advance of the deadline for finalizing the design and construction of the final potash circuit.

Some test work was successfully undertaken on the potential to recover boron as boric acid. Further test work and process analysis was planned on the alternative strategy of retaining the boron values in the brine through the evaporation process and recovering the boron to a commercial product.

10.2 Metallurgical Test-Work Program

10.2.1 Brine Composition Analysis

The Olaroz has a very large resource base which has the potential to support a very long life of mine. The brine composition throughout the deposit is relatively uniform, which is advantageous for process performance, as only minor brine composition changes are expected due to a small decline in grades over time.

For all the experimental work, well FD-16B was used which was drilled during the 2008 drilling program. Analysis of the brine chemistry of the 2010 drilling data and 2011 resource estimate show FD-16B brine to be representative of the current resource.

The average brine composition is plotted in the Janecke projection (Figure 10-1), which indicates the types of salt that can be expected to crystallize during the solar evaporation process. This diagram indicates the relative concentrations of the major ionic species.

Almost all the salars are saturated in sodium chloride, since they are embedded completely in, or contacted partly with, rock salts (halite). The Olaroz Salar brine is located at the border of the Janecke glaserite ($Na_2SO_4.3K_2SO_4$) field and the ternadite (Na_2SO_4) fields. Low ambient temperatures at the salar will cause the crystallization of sulphate as glauber-salt ($Na_2SO_4.10H_20$) in the evaporation ponds.

The low Mg/Li ratio of the brine makes magnesium removal with slaked lime a feasible process step. The Olaroz brine has a high sulphate content (high SO_4/Mg); hence sodium and potassium sulphate salts are likely to crystallize. As it has a SO_4/Mg ratio higher than 4, there is also enough sulphate available in the brine to precipitate the calcium liberated during the formation of magnesium hydroxide as gypsum. The only disadvantage of the high sulphate level is that it tends to lock up potassium as glaserite, constraining potential potash yields and at higher concentrations of lithium, causing lithium losses as lithium schoenite.

These brine chemistry characteristics shaped the path of all process testing and development.

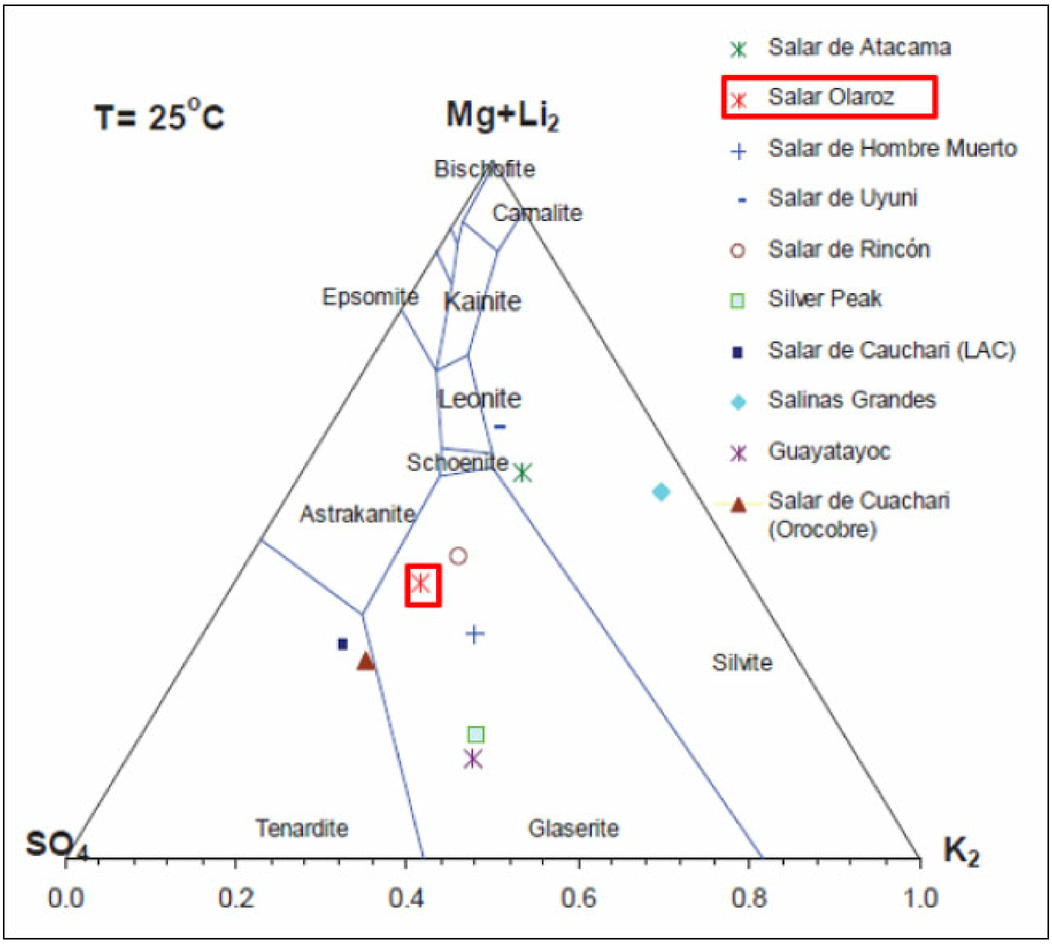


Figure 10-1 - Janecke phase diagram showing the composition of Olaroz relative to other salars.

10.2.2 Solar Evaporation Testing

The evaporation of water from the solar evaporation ponds is a critical factor in the processing of the brines. The feasibility study contains extensive climate data and pan evaporation testing data conducted at the Olaroz site, including comparison of data from tests conducted on water and partly saturated brine in standard Pan A equipment, and the data from concentrated brine evaporation in the pilot plant ponds. The solar radiation levels, ambient temperature, local humidity, and prevailing wind conditions all impact on evaporation rates. These factors were examined in detail in the Feasibility Study, and a summary is presented below.

The evaporation information was coherent in that the pilot scale pond testing on saturated brine provided an annual rate of 1,733 mm which is the value used in the original SKM design criteria (Table 10-1). This is conservative in the context of the Pan A test result of 3,900 mm per year on water and 2,600 mm per year on unsaturated brine.

The actual ponds area was designed based on 1,300 mm of annual evaporation [3.6 mm/day]. This is a reasonable base line in the context of brine activity factors that range from 75 - 80% depending on saturation levels, and industrial scaling factors of 75% applied to small pond data to predict large pond evaporation rates. This also allows a generous margin to compensate for any unusually high rainfall event.

Table 10-1 - SKM Consultants Design criteria - brine evaporation rate.

SKM Design Criteria Brine Evaporation Rate	
Pilot Pond Data	L /m² /day (mm/day)
Annual average	4.75
Summer average	5.85
Winter average	3.65

The most relevant and reliable information was provided by the data gathered from the large number of open evaporation test ponds operating in sequence on the salar. The weather variables needed to be defined to assist with assessing the potential for variance in the pilot plant data.

Evaporation is driven by solar radiation, ambient temperatures, wind impact and humidity, and must consider variable rainfall. The average annual temperature at Olaroz site is approximately 7° C, with extremes of 30° C and -15° C. The coldest months with temperatures below zero correspond to May through August. The solar radiation at the Olaroz Salar is almost as strong as at the Atacama Salar. Solar radiation is the most important factor in evaporation.

Rainfall at the salar is very low and during 2009-2010 no significant rain was registered at the stations. During the summer months (January - March) wind comes frequently from the east with humid air and the rain falls very locally. Summer of 2011 was very wet, and more rain and lower evaporation was registered. At the Atacama Salar and Hombre Muerto Salar normally no more than 100 mm/year is registered. Strong winds are frequent in the Puna, reaching speeds of up to 80 km/hr during warm periods of the dry season.

Figure 10-2 below summarizes the site evaporation data, comparing other sites and showing the pan test data.

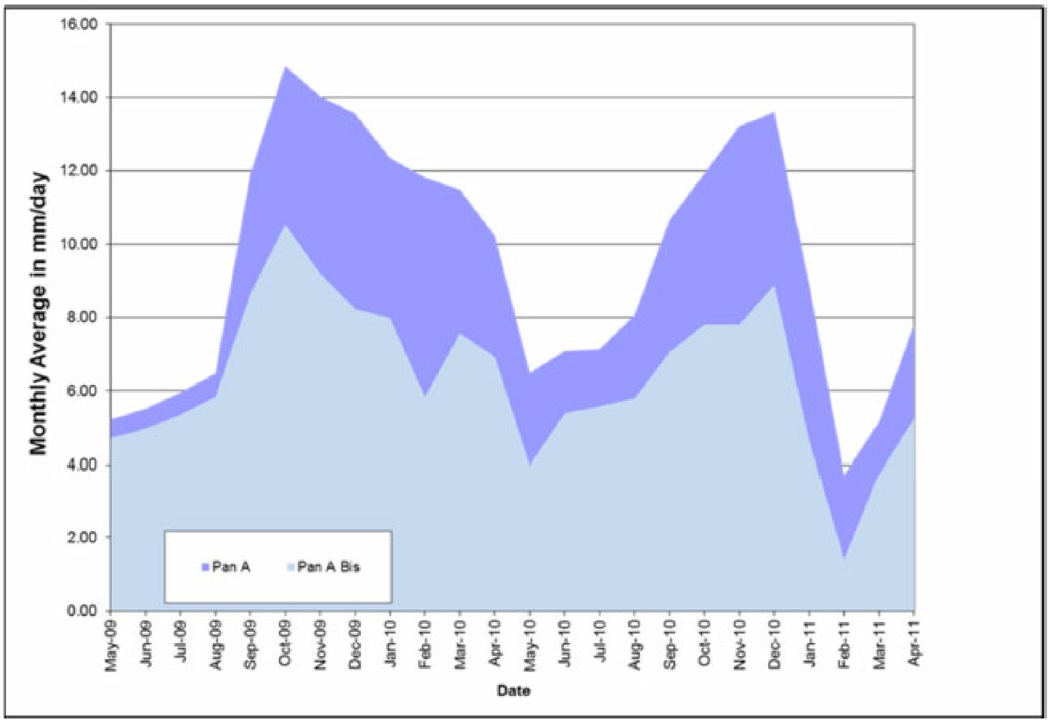


Figure 10-2 - Site Net Evaporation Rate Test Data and other sites.

The significance of the Pan A Bis data is that this was an unsaturated brine test and is compared to Pan A on just water. Pan data is the net evaporation rate, as both precipitation and evaporation are accounted for in the test pan. The rainfall in the operating years 2015 - 2021 was often significantly higher than the early design basis reflects. This contributed to reduced Li concentration in plant feed and so impacted Olaroz production .

Figure 10-3 shows how the brine evaporation rate varies compared to a standard water test as brine concentration increases [represented by Li concentration]. Brine activity is the vapor pressure ratio of brine divided by the vapor pressure of water, and it is a function of brine chemistry independent of ambient conditions. Modelling of pond performance depends on reliable brine activity data and the predictability of climatic conditions.

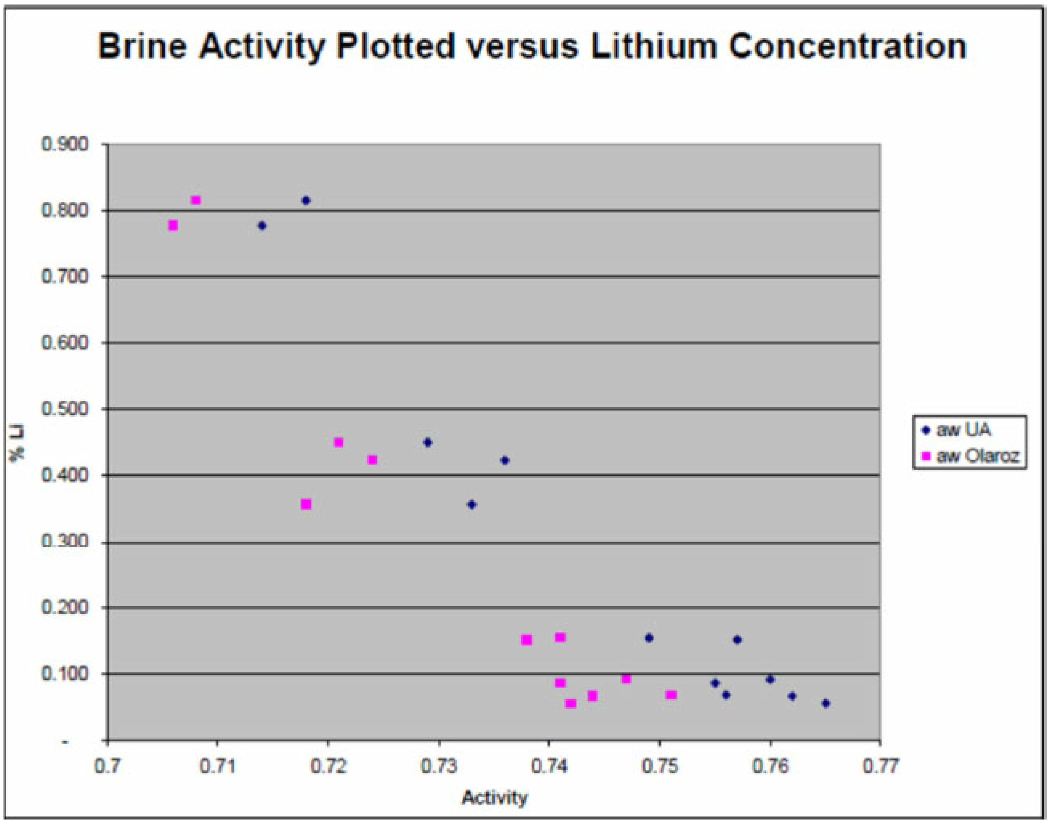


Figure 10-3 - Brine activity plotted versus lithium concentration.

10.3 Metallurgical Results

10.3.1 Evaporation Pond Brine Temperatures

Temperatures in the ponds (Figure 10-4) were manually registered at 09:00 and 16:00 every day. Some ponds had continuous temperature registration using data loggers placed in the ponds.

For brine phase chemistry analysis, the lowest daily brine temperature is an important parameter as it will indicate which salt will precipitate.

Figure 10-4 - Operational ponds L3 and L4 from the test work phase at Olaroz.

10.3.2 Phase Chemistry

The pilot ponds operated under conditions representative of the industrial operation for over one year generating the required phase chemistry data, which defined the amount and types of salts that form as solids in the ponds through the changing ambient temperature, wind, and humidity conditions over time. Enough information was collected for the modelling of the behavior of the evaporation system for the Feasibility Study to enable definition of the brine chemistry in the feed to the lithium carbonate plant, and for detailed engineering of the pond system.

10.3.3 Crystallized Salts

In all the ponds it is mainly sodium chloride (NaCl > 94%) that is crystallized. Other salts that crystallize are glauber salt ($Na_2SO_4.10H_20$: 2-6%) and calcium sulphate ($CaSO_4.2H_20$: 1%). In the most concentrated ponds halite and silvite (KCl) crystallize, with minor concentrations of glaserite ($Na_2SO_4.3K_2SO_4$) and borate salts. Under these alkaline conditions the boron is precipitated as sodium and calcium borate [$Na_2B_4O_7$ and CaB_4O_7], and to assist in the final lithium purification process this precipitation may be encouraged by addition of calcium chloride.

The optimal lithium concentration for the recovery plant was defined by the loss of lithium at concentrations greater than ~0.7% by precipitation of lithium as schoenite [$Li_2SO_4.K_2SO_4$].

10.3.4 Liming Test Work

Initially Allkem was using hydrated lime ($Ca(OH)_2$) from a provider located near Jujuy for its experiments. This was replaced by active or burnt lime (CaO) from the same provider, with the advantage of reducing product and transportation costs. The active lime is of a medium grade and contains 83% active CaO. At pilot scale the lime reacted very well and completely fulfilled the process requirements. Higher quality lime from San Juan has also been tested in recent years, however the transport cost is very high, offsetting the advantages of its superior performance.

Magnesium reacts instantaneously with the slaked lime. Subsequently the liberated calcium starts to react with the available sulphate and some boron reacts early with calcium from the liberated lime. Brine at higher levels of concentration could be treated with lime, but the material handling for the concentrated brine becomes more difficult, and lithium losses increase. Data from the pilot scale trial is shown. Table 10-2 details the test work results.

Table 10-2 - Pond test work results.

Test	Identification	Date	Mg	Ca	Li	SO 4	B	PH	B Loss	Lime Excess	Mg removal
1	W16	22-Nov	0.137	0.04	0.05	1.17	0.06	11.14	15%	131%	99.4%
	W16 -Out		0.001	0.143	0.051	0.578	0.056				
2	W16 -Out	22-Nov	0.141	0.042	0.051	1.160	0.059	11.39	3%	135%	99.4%
	W16		0.001	0.144	0.050	0.694	0.049				
3	L1 -P1	2-Dec	0.200	0.045	0.078	1.587	0.085	10.60	12%	113%	93.6%
	L1 -P1 -Out		0.012	0.126	0.079	0.774	0.077				
4	L1 -P1	3-Dec	0.178	0.042	0.077	1.659	0.081	10.40	20%	115%	100.0%
	L1 -P1 -Out		0.000	0.161	0.076	0.721	0.074				
5	L1 -P2	4-Dec	0.293	0.028	0.112	2.415	0.118	11.40	11%	115%	99.70%
	L1 -P2 -Out		0.001	0.109	0.105	0.946	0.104				

10.3.5 Boric Acid Process

To recover the boron, its behavior in the solar ponds was studied. Several different process options were tested at lab scale to recover the boron. Some tests have been conducted which showed potential for high recovery rates, but this process is still in the preliminary development phase.

Additional testing of solvent extraction has been conducted in recent years, and preliminary tests using calcium chloride to precipitate boron have been conducted.

10.3.6 Potassium Chloride

Preliminary sylvite froth flotation tests were conducted at the University of Jujuy with salts obtained from the pilot ponds. During the test the most important parameters (collector type and addition, liberation, etc) were defined to obtain an acceptable concentration of silvite salts (KCl). Future test work was planned with some additional bench flotation test followed by pilot scale testing.

10.3.7 Lithium Carbonate Process

The pilot plant was operated successfully from the 3rd Quarter of 2010, producing technical grade lithium carbonate.

At the beginning of 2011 the pilot plant testing process included an alternate purification step to achieve battery grade lithium carbonate. Clients were supplied with samples of this >99.5 % lithium grade product (not including moisture and LOI) for analysis.

Extensive testing was undertaken by Ekato in Europe to optimize reactor mixer design and residence time. Solids thickening and final dewatering by filtration was tested by Outotec to define equipment requirements.

10.3.8 Analytical Quality Control

Standardized quality control procedures were adopted and verified for analysis of the various plant streams emerging from the test work program.

These analyses are complicated since the solutions have a high concentration of ions generating interference in the measurements with the analytical equipment. Only a limited number of laboratories have the experience to analyze brines and those laboratories have been selected to do Allkem´s quality control.

The samples from Olaroz Salar were analyzed by Alex Stewart Assayers [ASA] of Mendoza, Argentina, who have extensive experience analyzing lithium bearing brines.

The Alex Stewart laboratory is accredited to ISO 9001 and operates according to Alex Stewart Group (AS) standards consistent with ISO 17025 methods at other laboratories.

Duplicate process samples were sent to:

- University of Antofagasta (UA), Chile.
- ALS-Environment (ALS) laboratory located in Antofagasta, Chile, which is ISO 17025 and ISO 9001:2000 accredited.

Both the University and the ALS laboratory have a long history in brine analysis; however, the university is not certified.

Physical parameters, such as pH, conductivity, density, and total dissolved solids are determined directly upon brine subsamples. Determination of lithium, potassium, calcium, sodium, and magnesium is achieved by fixed dilution of filtered samples and direct aspiration into atomic absorption or inductively coupled plasma analysis systems. In summary,

- ASA analyses show acceptable accuracy and precision with an acceptable anion-cation balance.
- Check samples analyzed at University of Salta display acceptable accuracy and precision, with a high degree of correlation with ASA analyses for K and Li. Mg is biased lower than corresponding analyses at ASA.
- Check samples analyzed at ALS Environment displayed acceptable accuracy and precision, with a high degree of correlation with ASA analyses, but the inorganic analytes (Li, K and Mg) are biased higher than corresponding analyses at ASA.
- Check samples analyzed at University of Antofagasta displayed acceptable accuracy and precision, with a high degree of correlation with ASA analyses, but the inorganic analytes (Li, K and Mg) are also biased higher than corresponding analyses at ASA.
- The lower bias observed in the ALS and UA data is most likely due to calibration differences between the ICP and AA instruments used to analyze the samples.

The quality control systems are well designed and under continuous improvement. Data analysis of the QA results produced by the laboratories is considered to have sufficient accuracy for the purposes of process design. The improved performance of the principal laboratory, ASA, as shown by the improvement in ionic balance over time and the reproducibility of the analytical results is noteworthy and shows the benefit of a close working constructive relationship between SDJ and laboratory.

Future refined quality control with newly designed standards has the objective to improve the accuracy of certain elements for the samples related to lithium carbonate production at pilot scale.

10.4 Recovery

Based on past Olaroz performance, the average Li recovery for the life of mine is estimated to be 62%. Recent recoveries have been trending above this value, so it is possible that the actual recovery will be higher in the future.

10.5 Metallurgical Performance Predictions - QP Commentary

The test work is considered to have been undertaken on representative samples of brine and the process has subsequently been proven at the commercial production stage for approximately 8 years. It is the opinion of the applicable employee of Gunn Metallurgy (a QP) that the mineral processing and metallurgical testing data is adequate for the purposes used in the technical report summary.

Analytical testing of samples was initially conducted at the University of Salta in the very early days of the Stage 1 project, before all samples were analyzed through the Alex Stuart analytical laboratories in Argentina. Samples were principally analyzed in the Mendoza laboratory during the testing program. The Alex Stuart laboratories are ISO 9001 certified and are independent of Allkem.

Results of the test work with evaporation ponds and laboratory testing formed the basis for the process design and optimization, prior to construction of the commercial plant from around 2014.

There are a number of deleterious elements in the brine which were discussed in the sections above. The concentration of these elements has a negative impact on brine processing. However, the concentration of these elements and an efficient way to remove them has been built into the current process.

Heavy rainfall can occur periodically on the ponds, typically in summer. The company has identified a strategy to avoid brine movement following these events, promoting the evaporation of fresh water off the top of the brine.

The applicable employee of Gunn Metallurgy set forth herein (the QP) considers that the data is adequate for the basis of the preparation of the technical report.

11. MINERAL RESOURCE ESTIMATES

As discussed in Section 10 there have been previous reported resource estimates. These estimates are superseded by this June 30, 2023, resource estimate, which is the primary focus of this chapter.

Estimation of a brine resource require definition of:

- The aquifer distribution (limits of the brine body).
- The distribution of specific yield (drainable porosity) values.
- The distribution of elements in the brine from drilling and sampling.
- The external limits (geological or property boundaries) of the resource area.

The resource estimate uses a combination of the aquifer volume, the specific yield (portion of the aquifer volume that is filled by brine that can potentially be drained) and the concentration of elements of interest in the brine. Aquifer geometry and the extent of aquifers has been established by drilling, surface, and down hole geophysics. Drilling provides samples of sediments for porosity measurements and samples of brine for quantification of the contained content of lithium and other elements. Down hole geophysics provides continuous measurements of drainable porosity.

11.1 Data Used for Ore Grade Estimation

There are a number of different types of sample data available, which include:

- Spaced down-hole assays, with the assay spacing dependent on depth of the hole. Sonic holes to 54 m deep have assays at 3 m intervals and 200 m deep diamond holes at 6 m intervals. Minimal data below 200 m.
- Well average assays, with a single homogenized value per hole.
- Laboratory porosity measurements on specific 10 cm intervals of core, at 3 m for sonic and 6 m for diamond drilling above 200 m.
- Continuous down-hole geophysics, with extensive information per hole, with data at cm intervals.

This mixture of continuous and point data presents some issues when combining the two different data types. For the purposes of estimation, the well average assays were applied to the entire length of the screened intervals in production holes, while the porosity interval measurements were assigned a maximum length of six meters in the absence of adjacent samples, with BMR porosity data much more frequent.

11.2 Resource Estimate Methodology, Assumptions and Parameters

11.2.1 Resource Model Domain

The aquifer is comprised of salar sediments with different lateral and vertical characteristics. Drilling and geophysics have provided information to develop a geological model for the salar, based on this information. This information now extends to beyond 650 m depth (with the addition of one hole to 1,400 m depth) and has greatly added to understanding of the basin since the Feasibility Study in 2011.

- The top of the model corresponds to the phreatic surface, which is generally within one meter of surface.
- The outline of Olaroz properties is used to delimit the area of the resource estimate, with adjacent property owner Lithium Americas Corp in the salar to the east and north of the properties owned by Allkem and SDJ. The resource terminates at the salar boundary on the north, west and east of the salar, but extends off the salar to the south following the drilling of E26. There is limited drilling in the alluvial fans and delta environments that surround the salar.
    - The marginal area around the salar, including the delta area in the north, cover ~189 km^2, in addition to the salar, while the Archibarca fan south of the salar covers a further ~50 km^2. Part of the Archibarca area is included in the current estimate, with hole E26 the first deep hole to be drilled south of the salar in the Olaroz properties. Additional resources in the Archibarca area form part of Allkem's Cauchari project and Exar project.
    - The area covered by this resource estimate (147.9 km^2 in the SDJ and combined Allkem 100% properties) is larger than the 2011 Resource area (93 km^2). This June 30, 2023, Upgraded Resource covers some small properties east of and outside the main body of the properties, that were not included in the 2011 resource. The Olaroz lithium properties (Allkem 100%), extend into the marginal zone (area of mixed evaporation surface crust) in the north of the salar, where resource has not been estimated, given the current lack of drilling. However, brine is likely to extend into these additional areas. The Maria Victoria property covers an additional 18 km^2 on the salar, for a total of 147.9 km^2 included in the resource.
    - The brine saturated sediments are known to extend beneath alluvial sediments surrounding the salar. However, to date insufficient drilling has been carried out around the salar and to the north of the salar (noted above) to support resource estimation there, with only part of the southern Archibarca area included in the Olaroz resources for the first time.
    - Within the salar the three-dimensional distributions of the different hydro stratigraphic units (UH1 to 5) were defined using Leapfrog software, with these units based on geological and geophysical logging observations. As the resource is predominantly within the salar boundary, the only location with defined resources where brackish or fresh water overlies brine within the resource area is the area south of the salar, where hole E26 is located. This relationship is also expected to be the case off the salar to the north.

- The resource estimate extends to the base of the basin as Inferred Resources below 650 m depth, as defined by gravity geophysics. These Inferred Resources are defined below the 650 m depth of production wells, as the deep hole drilled in the north of the properties confirmed salar sediments continue to at least 1,400 m depth in this deepest part of the basin and drill holes in the southwest of the salar show the basin depth is underestimated.
  - As Olaroz is pumping from production wells to 650 m depth, in similar sediments to those extending below / interpreted to extend below 650 m, Hydrominex Geoscience (the QP) considers there is sufficient confidence in pumping extraction from this geological environment to classify the deep area of the basin (>650 m) as Inferred Resources, rather than an exploration target.
  - Extraction below 650 m is not planned as part of Stage 2. However, it is likely the resource classification of this deeper brine could be improved with additional drilling.

The resource is defined within the salar boundary, except for the area around hole E26 south of the salar. This is the only area in the updated resource where fresh to brackish water is overlying brine in the resource.

It is noted in hole E14 in the center south of the resource area extends through the interpreted base of the salar, based on the gravity geophysics survey. That the modelled base of the salar is conservative, and extends blow the current interpretation, is confirmed by holes E22, E24 and E26 (Figure 11-1) which all extend through the interpreted basement contact.

Shuttle Radar Topography Mission (SRTM) topography data was used to produce a wireframe of surface topography. Wireframe models developed based on drilling and representing the lithological units were used for the resource estimation. The lithological wireframes define the base of the salar and internal units. For estimation purposes, the salar sediments were divided into two broad domains: Domain 1 is the flat upper part of the salar, while Domain 2 is the lower dipping part of the sequence, where units become progressively deeper to the east. Figure 11-2 shows a cross-section of the various lithological unit wireframes; Domain 1 includes units 1, 2 and 3, while Domain 2 comprises units 4 and 5.

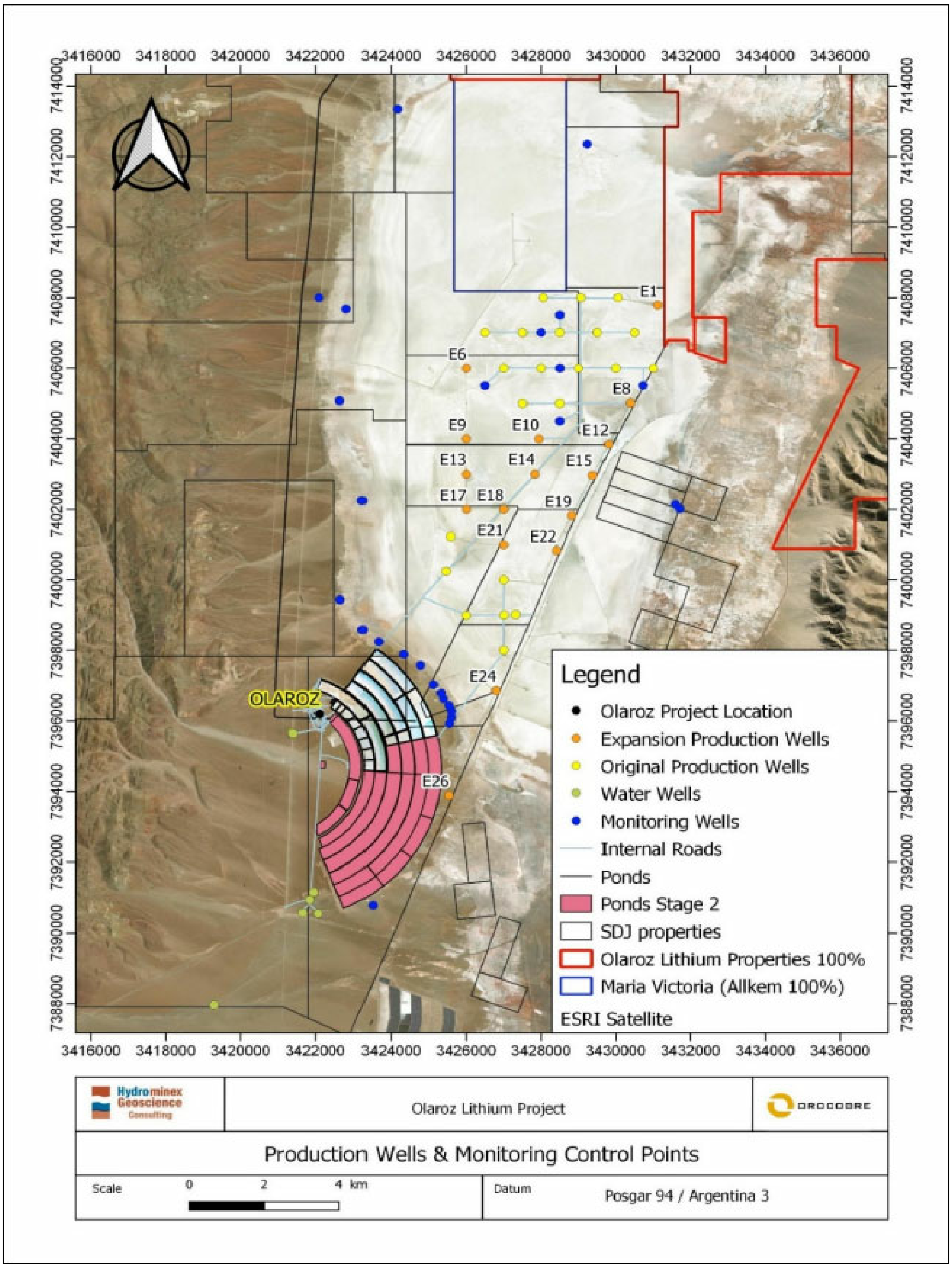


Figure 11-1 - Location of Olaroz expansion drill holes and the northern and southern wellfields.

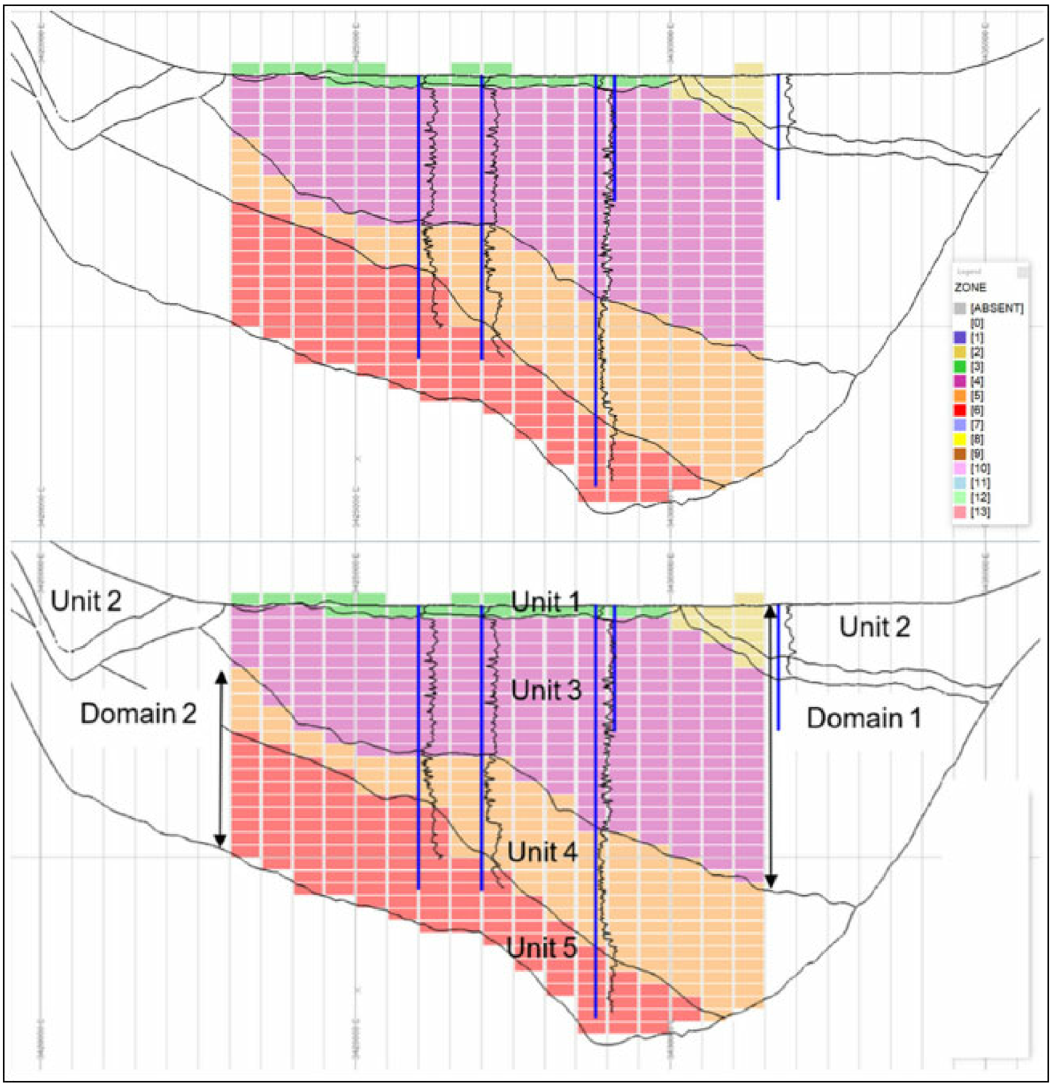


Figure 11-2 - Generic cross section showing lithology units and gamma traces (10x vertical exaggeration, looking North), to the base of the sediments interpreted from the gravity survey. With the block model restricted to the central area of the basin.

11.3 Mineral Grade Estimation

11.3.1 Resource Modelling Methodology

The resource estimate was undertaken by H&S Consulting of Sydney, Australia, under supervision of the employee of Hydrominex Geoscience set forth herein (the QP). Micromine software with variograms was developed for the point samples from the upper 200 m. Estimation was undertaken using ordinary kriging. The ordinary kriging method is the most commonly used kriging method.

The block model was constructed with 500 by 500 by 20 m blocks, with the proportion of blocks only reported inside of the resource area (salar outline) and any portion of the block outside the salar outline excluded:

- Histograms, probability plots and box plots were undertaken as part of the data analysis.
- Variograms were developed for the three orthogonal directions.
- Kriging criteria were defined.
- The resource was estimated using information from the brine and porosity models.

Details of the model are summarized in the Table 11-1.

Table 11-1 - Model dimensions.

Olaroz	X	Y	Z
Origin	3,421,500	7,390,000	2,680
Maximum	3,441,500	7,426,000	3,960
Block Size m	500	500	20
Number of blocks	40	72	64
Length m	20,000	36,000	1,280

11.3.2 Specific Yield

Specific yield (drainable porosity) is the key porosity variable that reflects the brine held in pores in the aquifer which can potentially be extracted. This measurement can be made in a number of ways, consisting of both laboratory and in-situ determinations. In Olaroz (and the neighboring Exar Project owned by Allkem) a total of 765 laboratory measurements of specific yield have been made. This information is primarily available from laboratory sample results in the upper 200 m at Olaroz, where diamond and sonic drilling was conducted. At Cauchari laboratory data is available to depths approaching 600 m, although that was not used in the estimation specific yield values for different lithologies were compared with BMR results used in the estimate.

At Olaroz below 200 m there are limited laboratory measurements, restricted to the eastern property boundary. However, production wells for the expansion were geophysically logged with a borehole magnetic resonance tool (as discussed in the drilling section above). This provides continuous measurements of drainable porosity, showing how this varies on a scale of meters and less. The BMR information has been used for the estimation to supplement the limited laboratory porosity data available below 200 m. The porosity data from the BMR geophysics was used to generate a block model across the salar area applying ordinary kriging to smoothed BMR drainable porosity data. The BMR tool was developed in the oil industry for measurement of drainable porosity and is a well-established tool, considered to be much better suited for use in salars than the equipment previously used.

Geophysical logging in the deeper holes has confirmed generally consistent drainable porosity and permeability characteristics throughout the clastic sediments, with higher porosities and permeabilities associated where thicker more sand dominated intervals of unit UH5.

11.3.3 Brine Concentration

The distribution of lithium and other elements was estimated from point sampling data from the upper 200 m of the model, where samples are typically spaced every 6 m in the 200 m holes and 3 m or less in the 54 m holes. Below the upper 200 m the resource was estimated based on the pumped samples from the production wells, with a single value per hole representing the average pumped value for each hole, applied over the intervals where filters are installed. There is a systematic variation across the salar, and this broadly reflects the pattern presented in the 200 m deep resource drilling results from 2011.

The employee of Hydrominex Geoscience set forth herein (the QP) considers use of the pumped brine samples an acceptable approach, given the level of information available in the Olaroz Salar, continuity between drill holes, comparison between historical interval samples and pumped brine concentrations from the same areas of the salar, and the 8 plus year history of pumping data available.

11.3.4 Search Parameters & Block Model Interpolation

Data analysis of lithium (Li) concentrations involved statistical analysis using histograms, probability plots, contact plots and box plots, and a spatial description using trend analysis. Analysis showed that some variables show significant differences between hydro-stratigraphic units, whereas others show little difference. Data analysis was more limited for the deeper units where brine samples are from the pumped wells and porosity data is derived from the BMR geophysics. Gamma ray data were used as a check on the definition of the hydro-stratigraphic units which are considered reasonable, based on the available geological and geophysical data. Gamma ray data provides information that allows relative assessment of the halite, clay, and sand content.

Ordinary kriging is the most commonly used kriging estimation method. Ordinary kriging re-estimates, at each estimation location, the mean value by only using the data within the search neighborhood.

- A four-pass search strategy was implemented, as outlined in Table 11-2. The first two passes have narrow vertical (Z) radii to reflect the bedded nature of the salar sediments. The second two passes have much larger vertical radii because of the limited amount of data at depth and the need to maintain the lateral trends observed near surface. This was modified in this latest 2023 estimate, which considered public porosity and brine concentration data from the third party Solaroz project, adjacent to Allkem properties north off the salar.
- The BMR geophysical data for specific yield was not used for the estimates of the upper 200 m of the deposit, where the historical and spatial more distributed laboratory porosity data is available.

- There is a soft boundary between Domains 1 and 2 for brine grades, and a hard boundary between Domains 1 and 2 for specific yield.
- The salar boundaries were defined with a block fraction at 50 x 50 m resolution.
- The model was validated in several ways - visual and statistical comparison of block and drill hole grades and examination of grade-tonnage data.
- Visual comparison of block and drill hole grades showed reasonable agreement in all areas examined and no obvious evidence of excessive smearing of higher-grade brine assays. However, some changes were made between March and June 2023 estimates.
- A comparison of average sample and block grades is presented in Table 11-3 shows that block grades inside the salar boundary are broadly comparable to the samples and differences can be explained in terms of the clustering of drill hole samples in the center of the salar.

Table 11-4 shows the area covered by the different property holdings of Sales de Jujuy and Olaroz lithium. Table 11-5 shows the estimated lithium concentration by hydrogeological unit.

Table 11-2 - Estimation search parameters.

Item	Pass 1	Pass 2	Pass 3	Pass 4
X Search	1,200	2,400	8,000	12,000
Y Search	800	1,600	4,000	6,000
Z Search	25	50	800	1,200
Minimum Samples	36	24	12	6
Maximum Samples	48	48	48	24
Number of Octants	8	8	8	4
Max Samples per Octant	6	6	6	6
Max Samples per Hole	12	12	12	12
Min Number of Octants	4	4	0	0

* For the alluvial fan area in the south of the model nearest neighbor estimation was used, with the same radii, but a minimum of 1 x 20 m composite.

Table 11-3 - Comparison of average Sample and Block Grades (excluding the nearest neighbor estimation under gravels south of the salar).

Attribute	Samples		Blocks		% Difference
	Number	Mean	Number	Mean	
Li	6,219	686	29,085	630	-8.15%
Specific Yield	4,552	0.058	29,786	0.061	4.88%
B	3,525	1,037	29,786	1,013	-2.38%
K	5,291	5,289	29,713	4,821	-8.85%
Mg	2,659	1,373	29,786	1,356	-1.27%
Total Porosity	**4,540**	**0.231**	**29,786**	**0.237**	**2.32%**

Table 11-4 - Property area by ownership.

Lease Group	Area (km^2)
Olaroz SDJ JV	120.2
Olaroz Lithium	9.7
La Frontera S.A. (Maria Victoria)	18.0
Total	**147.9**

Table 11-5 - Estimated lithium concentration and specific yield by hydrogeological unit.

Field	Zone	Blocks	Min	Max	Mean	SD	CV
Li	1	608	156	940	611	177	0.29
Li	2	453	239	824	482	109	0.23
Li	3	90	278	584	457	107	0.23
Li	4	9,558	208	1,037	651	139	0.21
Li	5	6,048	295	887	644	117	0.18
Li	6	9,543	297	818	625	91	0.15
SY	1	608	0.02	0.15	0.07	0.03	0.36
SY	2	453	0.04	0.11	0.08	0.01	0.19
SY	3	90	0.03	0.08	0.05	0.01	0.22
SY	4	9,558	0.02	0.16	0.07	0.02	0.32
SY	5	6,048	0.01	0.18	0.04	0.02	0.51
SY	6	9,543	0.01	0.20	0.05	0.03	0.49

11.3.5 Block Model Statistical Validation

All sample data was composited to nominal 2.0 m intervals for analysis and estimation, and determination of summary statistics. Data includes four elements (Li, K, B, Mg) in concentrations of milligrams per liter (mg/l), as well as total porosity specific yield (SpecYld) as percentages and gamma in API units. All attributes have low coefficients of variation (CV=SD/mean), which indicates that ordinary kriging is an appropriate estimation method for these items.

Variograms were generated for these attributes, with some examples presented in Figure 11-3 and variogram parameters provided in Table 11-6. The assays were assumed to be horizontal across the entire salar, while porosity and gamma were divided into the upper and lower domains for both Variography and estimation. The lower domain has a shallow dip to the east. Contact plots of different lithologies are shown in Figure 11-4 and Figure 11-5.

The grade tonnage curve shows essentially no difference in resource tonnage with a cut-off between zero and almost 400 mg/l, due to the large and fairly homogeneous character of the resource. The Resource is stated at a 300 mg/l lithium cut-off, as a result of Allkem's global review of Resources. The Resource is mostly restricted to the salar boundary, except for a small extension south off the salar. Exploration indicates the brine body extends significant distances away from the salar, for example in drilling by Allkem subsidiary South American Salars south of the Olaroz plant and ponds.

The resource around hole E26, south off the salar, lies beneath alluvial gravels and brine does not begin near surface, but is overlain by brackish water, beneath dry sediments from surface. The resource here is trimmed to the brine surface and does not include brackish water overlying the lithium-bearing brine. This is similar to the areas drilled in the west of Cauchari by South American Salars (formerly Advantage Lithium - Allkem 100%).

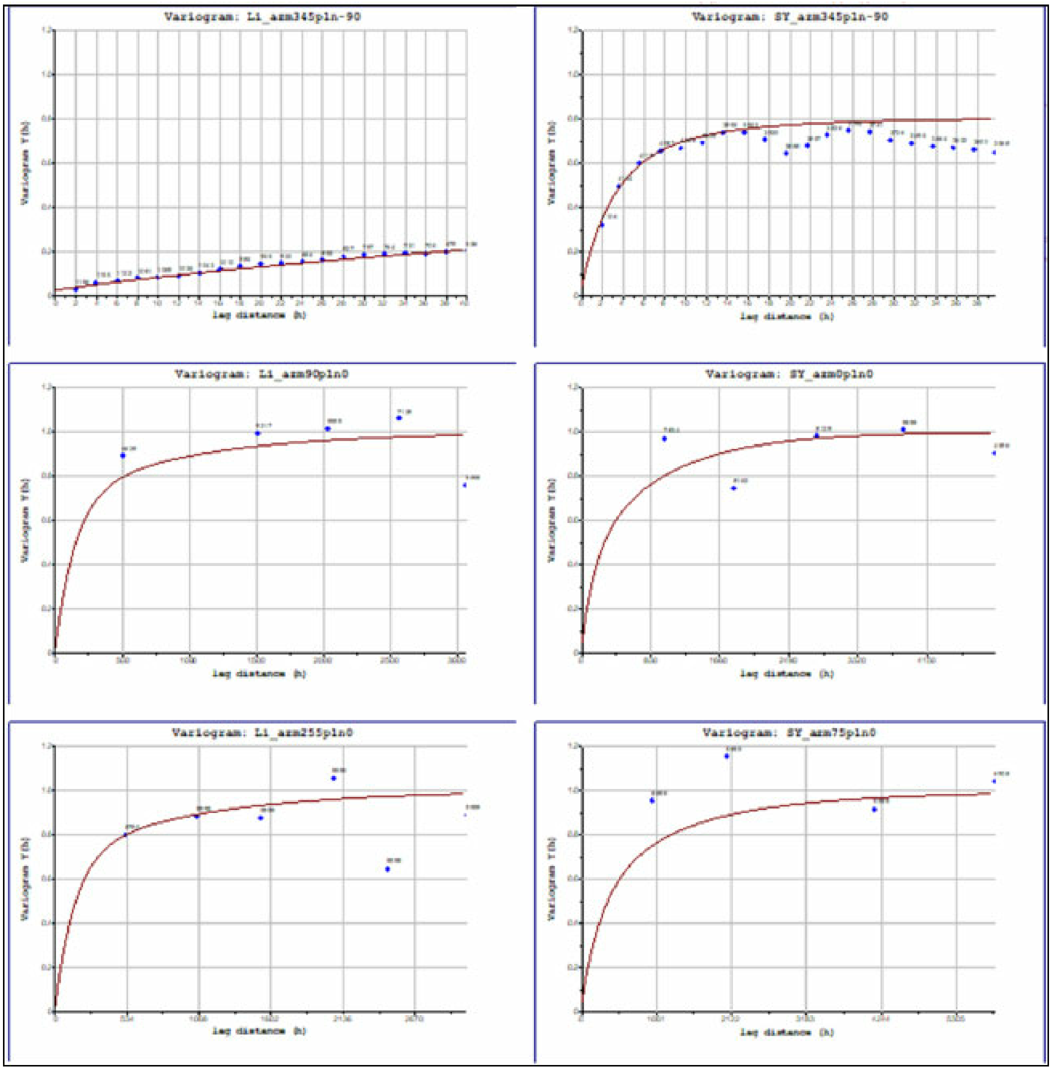


Figure 11-3 - Variograms for Li (left) and Specific Yield - Upper Domain (right).

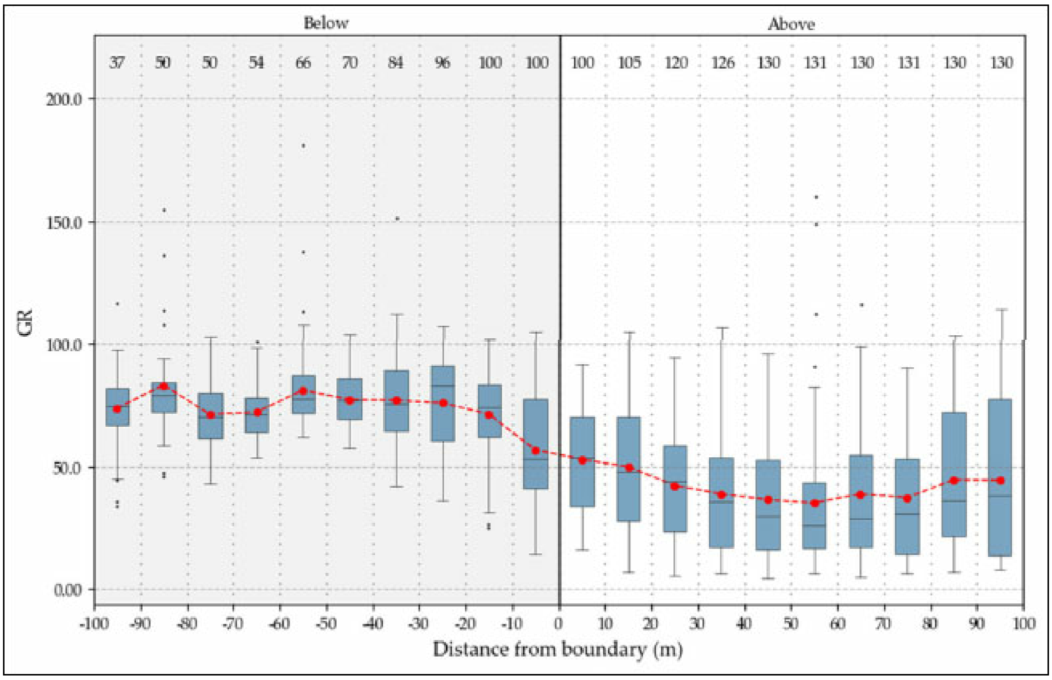


Figure 11-4 - Contact plot, showing the change in gamma ray response across the base of UH4/top UH5.

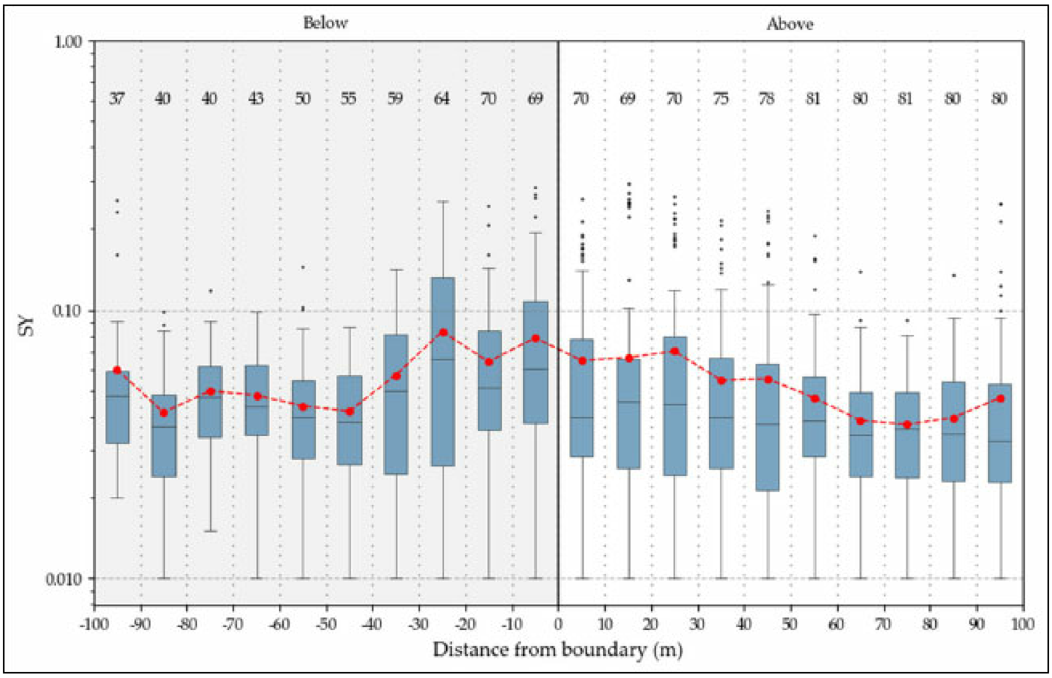


Figure 11-5 - Contact plot showing the specific yield across the base of unit UH4/Top UH5.

Table 11-6 - Variogram model parameters.

Attribute	Structure	Variance	X Range	Y Range	Z Range
Li	Nugget	0.03	-	-	-
	Exp1	0.04	329	250	40
	Exp2	0.64	452	600	610
	Exp3	0.30	3,110	1,895	933
K	Nugget	0.05	-	-	-
	Exp1	0.32	340	265	260
	Exp2	0.34	800	800	800
	Exp3	0.29	3,500	2,500	1,000
B	Nugget	0.01	-	-	-
	Exp1	0.32	340	265	260
	Exp2	0.33	800	800	800
	Exp3	0.34	3,500	2,500	1,000
Mg	Nugget	0.01	-	-	-
	Exp1	0.32	340	265	99
	Exp2	0.33	800	800	195
	Exp3	0.34	3,500	2,500	1,000
SY Upper	Nugget	0.05	-	-	-
	Exp1	0.39	780	500	8
	Exp2	0.34	2,500	2,800	20
	Exp3	0.22	6,400	2,895	1,200
SY Lower	Nugget	0.26	-	-	-
	Exp1	0.28	900	900	3
	Exp2	0.27	3,995	1,500	69
	Exp3	0.19	6,000	6,000	175
TP Upper	Nugget	0.05	-	-	-
	Exp1	0.39	730	510	8
	Exp2	0.34	2,000	2,000	94
	Exp3	0.22	6,000	6,000	2,000
TP Lower	Nugget	0.22	-	-	-
	Exp1	0.22	800	395	4
	Exp2	0.31	3,495	995	125
	Exp3	0.25	4,505	6,000	170
GR Upper	Nugget	0.10	-	-	-
	Exp1	0.33	925	600	5
	Exp2	0.41	5,940	3,005	97
	Exp3	0.16	10,080	5,300	115
GR Lower	Nugget	0.07	-	-	-
	Exp1	0.15	900	915	4
	Exp2	0.41	8,000	1,500	125
	Exp3	0.37	10,000	10,000	670

11.4 Mineral Resource Classification

The resource was estimated using 4 passes with the search strategy (Table 11-2). The results of the first two passes are nominally equated to blocks classified as Measured and Indicated, with the latter two passes equating to blocks classified as Inferred.

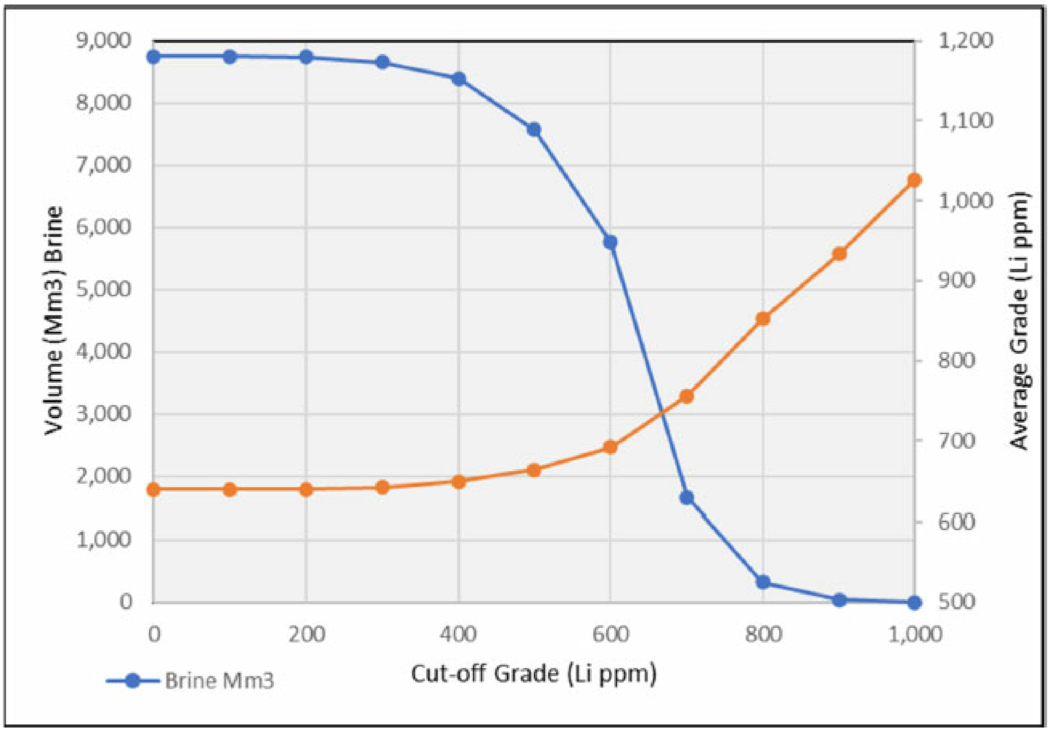


Figure 11-6 - Olaroz grade tonnage curve - all of the salar.

11.4.1 Measured Mineral Resources

A 'Measured Mineral Resource' is that part of a Mineral Resource for which quantity, grade (or quality), 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 is derived from detailed and reliable exploration, sampling and testing gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings, and drill holes, and is sufficient to confirm geological and grade (or quality) continuity between points of observation where data and samples are gathered.

A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proven Reserve category or under certain circumstances to a Probable Reserve category.

The Measured classification is based on reliable geological correlation between drill holes, which show gradual changes in lithology laterally and with depth. Measured Resources were defined to cover the entire salar area to 200 m depth, as exploration drilling was previously conducted across the salar area to 54 m and 200 m depth. The deeper extension of the Measured Resource is defined based on the drill hole depth, with the resource to 650 m depth in the east of the salar and 450 m deep in the west, where drill holes are shallower. Measured Resources are defined to 350 m depth around holes drilled in the Maria Victoria property, in the north of Olaroz, extending below the 200 m depth defined elsewhere in the north of the salar.

Classification is supported by ongoing extraction by pumping of brine from production wells installed to 200 m for a period in excess of eight years the central area of the resource, with 1 km spaced production wells and a drilling density of approximately 1 hole per 2 km^2. Since 2013 production wells to 200 m depth have been installed and operated from depths of 200 m, with wells deeper than 300 m producing from 2014 onward. The original exploration included exploration holes and a pumping well (PD01) in the far north of the area on the salar and another (PD02) in the south of the salar.

An additional area of Measured Resources has been defined around the three diamond drill holes on the easter margin of Olaroz, south of the deep hole E1. An extension of 2.5 km from the property boundary has been applied for definition of this measured resource, consistent with the suggestion of Houston et. al., 2011. This is considered a reasonable basis for extension of the resource to 650 m depth in this area, surrounded by Indicated Resources.

The Measured Resources are almost all within 2.5 km from drill holes across the salar, as suggested by Houston et. al., 2011 as an appropriate drilling spacing for Measured Resources in clastic salars. The drilling spacing of wells and exploration holes is greater than 1 km outside the existing Stage 1 and new Stage 2 wellfields, however geological continuity supports classification as a Measured resource within this 2.5 km radius of drill holes.

11.4.2 Indicated Mineral Resources

An ‘Indicated Mineral Resource’ is that part of a Mineral Resource for which quantity, grade (or quality), densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit.

Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings, and drill holes, and is sufficient to assume geological and grade (or quality) continuity between points of observation where data and samples are gathered.

An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Reserve category.

Geological continuity established by deeper drilling below 200 m, geophysical logging of holes, and gradual changes in lithium concentration provide the basis for classifying the brine beneath the Measured Resource to 650 m depth as Indicated. From 200 to 350 m below surface in the north of the salar (with lesser drilling density), outside the 2.5 km influence of drilling in the Maria Victoria property, and south off the salar around hole E26 are also classified as Indicated.

Laboratory porosity samples are relatively limited below 200 m, however similar sediment intervals are present above 200 m at Olaroz, where porosity characteristics have been established from hundreds of laboratory analyses. Extensive porosity samples from similar sediments are also available from the Allkem Cauchari properties. Ongoing extraction by pumping of brine from wells up to 450 m deep since 2014 and from 650 m depth for approximately 3 years, provides confidence as to the extractability of brine from the resource to this depth.

Additionally, BMR geophysical porosity data has been collected below 200 m depth in holes to 650 m deep. Future drilling below 200 m provides the opportunity to upgrade Indicated Resources to Measured status.

11.4.3 Inferred Mineral Resources

An 'Inferred Mineral Resource' is that part of a Mineral Resource for which quantity and grade (or quality) are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade (or quality) continuity. It is based on exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings, and drill holes.

An Inferred Mineral Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and may not be converted to a Reserve category. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

The Inferred Mineral Resource is defined between 350 m and 650 in the north of the salar where there is less drilling. Within the salar Inferred Resources are defined below 650 m and the base of the basin. The base of the basin is defined by the gravity geophysical survey, with areas significantly deeper than 650 m defined. There are currently 18 production wells installed below 350 m, with production wells for the Olaroz Stage 2 installed between 400 and 650 m deep (E15 to 751 m) between the existing northern and southern wellfields. The deep hole drilled in the north of the salar confirms locally the salar sediments extend to below 1,400 m depth. Drilling has not intersected the base of the salar sediments, where the geophysical estimated basement depth has been reached, suggesting the basin may be deeper than estimated from the gravity survey.

Taking account of the distribution of brine grade and porosity to date (as determined by BMR geophysics) there is a sufficient level of confidence to classify the Resources extending to the bottom of the basin as Inferred Resources. It is likely that additional drilling could convert these to a higher confidence resource classification. It is noted that different geological units may be discovered in the deeper part of the basin, where there is very limited drilling to date.

11.5 Olaroz Mineral Resource Estimates

The resource estimate is outlined in the following tables presenting the lithium and lithium carbonate tonnages. The resource is broken out by property ownership with the bulk of the resource within the Allkem Sales de Jujuy joint venture. Allkem holds additional 100% owned properties, through Olaroz Lithium and La Frontera Minerals, in the north of Olaroz. In the SDJ and Olaroz Lithium properties to the North and south of the Olaroz salar, outside the salar boundary, there are likely to be significant additional volumes of brine that have not yet been explored and quantified.

The Resources are reported at a 300 mg/l lithium cut-off as the entire Olaroz Salar contains brine with an elevated lithium concentration, which based on drilling to date is above the likely minimum concentration for processing of brine. Block model grade and porosity data is shown in Figure 11-7, Figure 11-8, and Figure 11-9. Figure 11-10 to Figure 11-13 show the block model with different characteristics.

The Resource estimate is outlined below, showing the lithium and lithium carbonate tonnages. The resource is presented by resource classification, with 22.6 Mt of Resources within the Olaroz properties, almost all on the salar. Allkem holds additional 100% owned properties, through Olaroz Lithium and La Frontera Minerals, in the north of Olaroz. The SDJ properties contain 13.1 Mt LCE of Measured and Indicated Resources and 4.1 Mt of Inferred Resources. The Olaroz Lithium and La Frontera properties (100% Allkem) contains 2.3 Mt of Measured and Indicated Resources and 3.2 Mt of Inferred Resources.

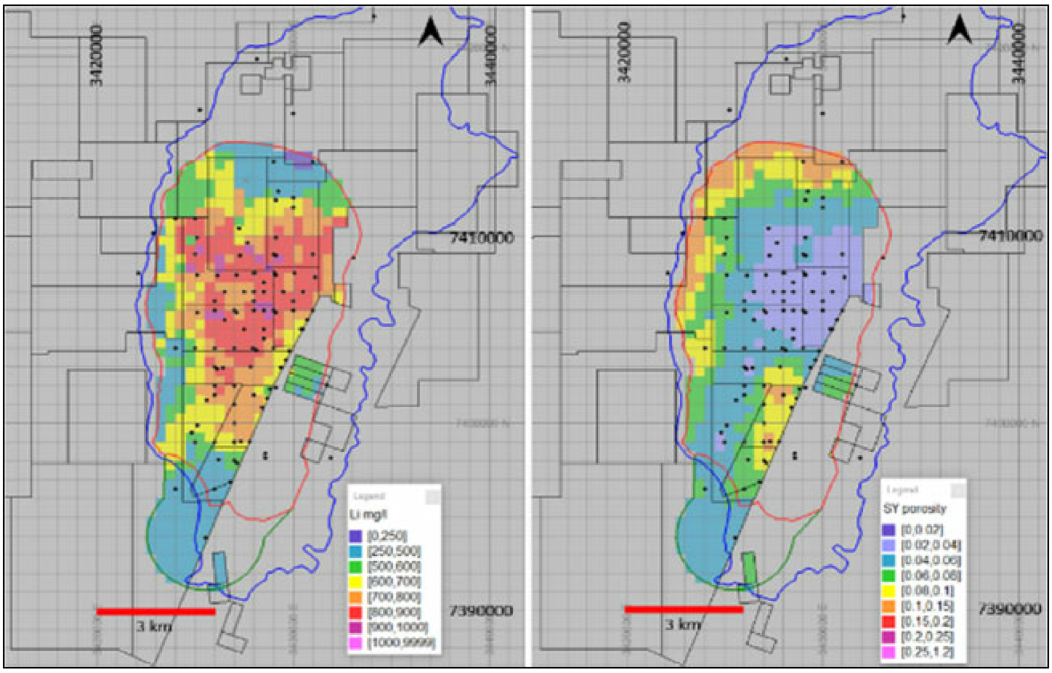


Figure 11-7 - Lithium grades (mg/L) and specific yield (Sy) at surface at Olaroz.

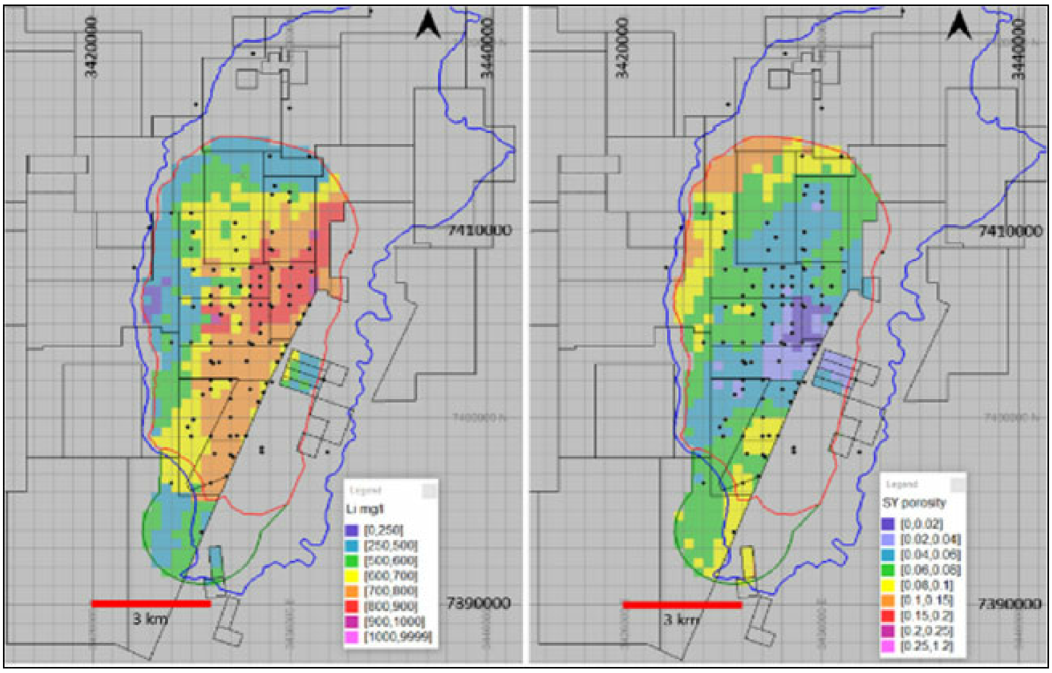


Figure 11-8 - Lithium grades (mg/L) and specific yield (Sy) at 100 m below surface.

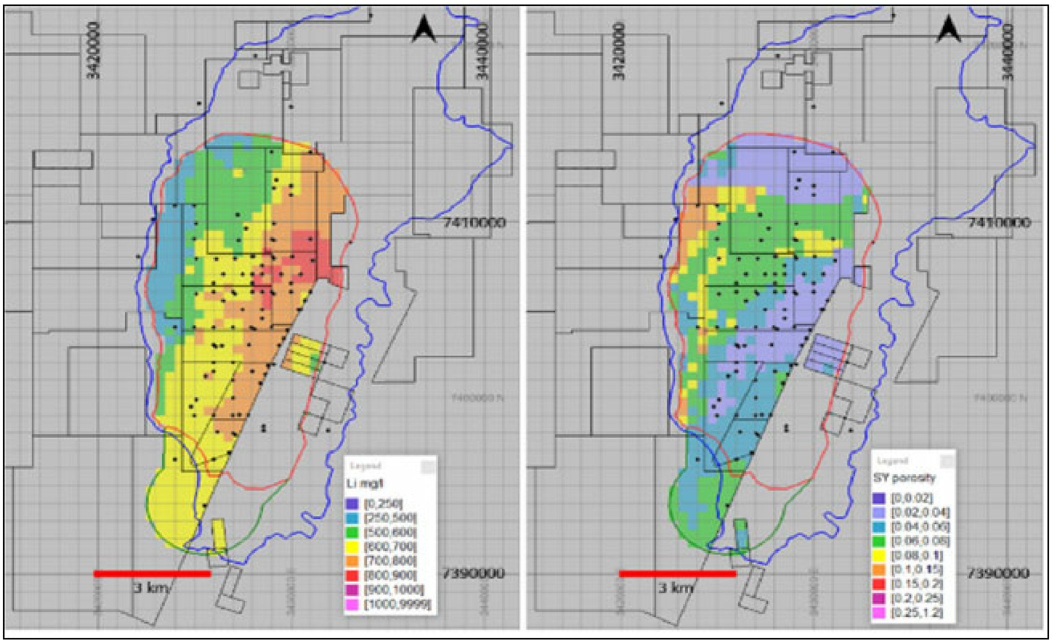


Figure 11-9 - Lithium grades (mg/l) and specific yield (Sy) at 250 m below surface.

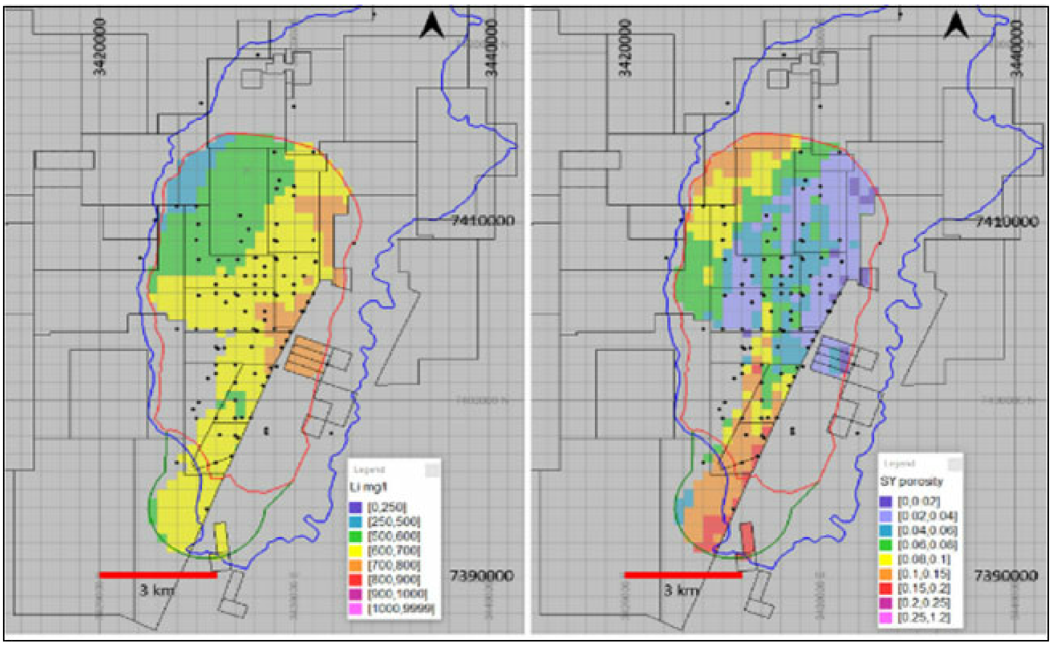


Figure 11-10 - Lithium grades (mg/l) and specific yield (Sy) at 500 m below surface[1].

[1] Note in the SW the basement contact was interpreted by geophysics to be above 500 m, with drilling confirming this is not the case (and hence underestimating the resource in this area).

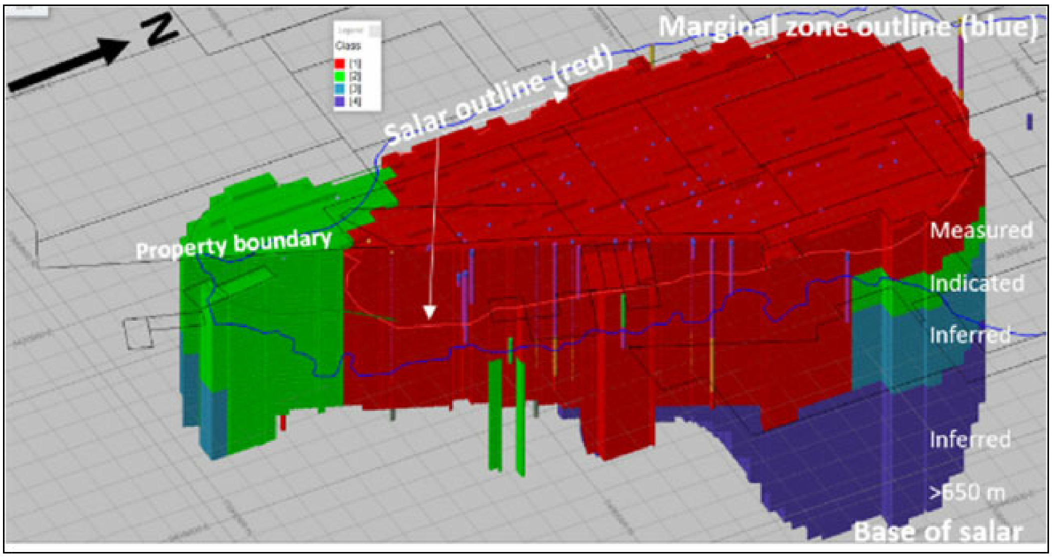


Figure 11-11 - Resource classification, with Measured resources to 650 m (red) in the east, shallowing to 450 m in the west[2].

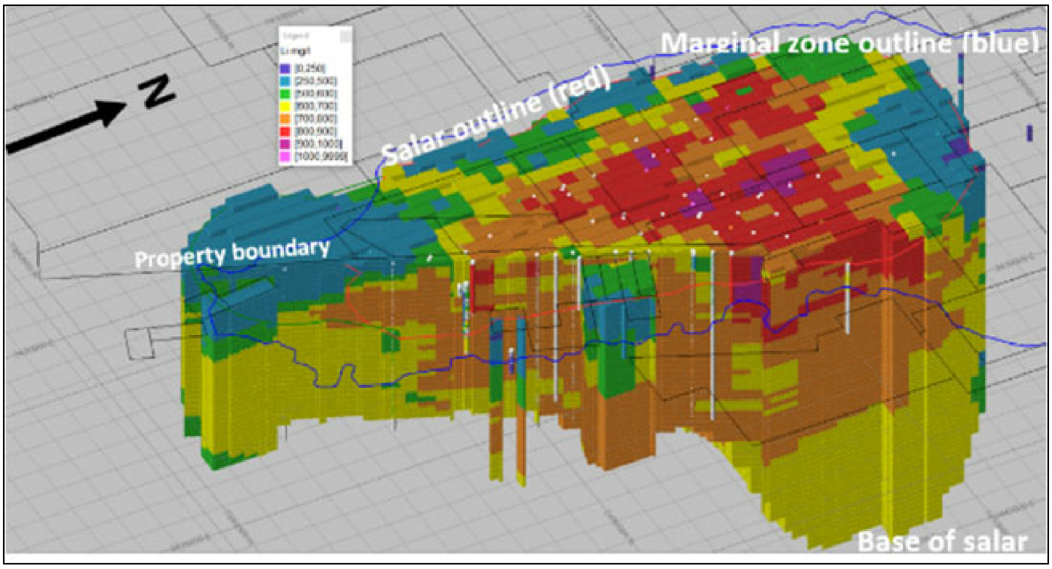


Figure 11-12 - Cut away block model, showing lithium grades in mg/l, with drill holes shown, with screen and sample intervals colored.

[2] Measured Resources to 200 (and 350 m) overlying Indicated Resources in bright green to 350 m in the north and 650 m in the south. Light green Indicated Resources to 350 m depth are underlain by Inferred Resources in cyan to 650 m and Inferred Resources below 650 m (purple). Block model is restricted to the salar, except for the southern extension under gravels around E26. Drill holes shown as points.

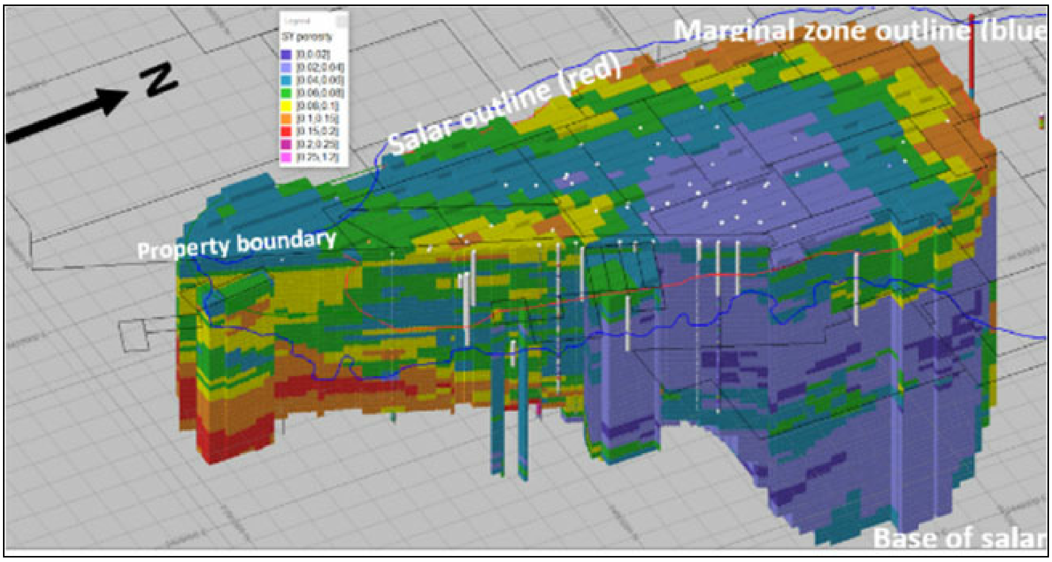


Figure 11-13 - Cut away block model, showing specific yield values[3].

In the SDJ and Olaroz Lithium properties to the North and south of the Olaroz Salar, outside the salar boundary, there are likely to be significant additional volumes of brine that have not yet been explored and quantified.

This June 30, 2023, Resource update is the first reporting of Olaroz resources in the S-K 1300 format and is an update, superseding the JORC Compliant resource announced on March 27, 2023, and earlier resource estimates in 2022 and 2011.

This June 30, 2023, Resource does not discount production to date from within the resource. Approximately 291,292 tonnes of lithium carbonate equivalent have been extracted by pumping between 2013 and June 30, 2023. This is equivalent to approximately 54,724 tonnes of lithium metal.

Table 11-7 presents the Mineral Resources exclusive of historical production. When calculating Mineral Resources exclusive of historical production, a direct correlation was assumed between Measured Resources and Proven Reserves as well as Indicated Resources and Probable Reserves. Reserves at a point of reference of the wellhead, before applying the process recovery factor, were subtracted from the Resources inclusive of Reserves. And it was assumed historical production between wells located in the volume of Measured Resources are excluded in this resource and wells located in the volume of Indicated Resources are excluded in the Indicated Resource.

[3] Note: the higher specific yields towards the north of the basin, around the western and southern margins and at depth.

The Resource is presented below inclusive and exclusive of Reserves. Because no reserve has yet been defined for Olaroz lithium facility, the inclusive and exclusive resource table are alike.

Table 11-7 - Summary of Brine Resources, Exclusive of Mineral Reserves, effective June 30, 2023.

Category	Total Lithium (Million Tonnes) (3)	Total Li_2CO_3 Equivalent (Million Tonnes) (3)	Average Li (mg/L)	Attributable Lithium (Million Tonnes) (4)	Attributable Li_2CO_3 Equivalent (Million Tonnes) (4)
Measured	2.17	11.54	659	1.57	8.33
Indicated	0.72	3.83	592	0.50	2.66
Total Measured and Indicated	2.89	15.38	641	2.06	10.99
Inferred	1.36	7.25	609	1.11	5.88

1. S-K §229.1300 definitions were followed for Mineral Resources.
2. The Qualified Person for these Mineral Resource estimates is the employee of Hydrominex Geoscience set forth herein for Olaroz.
3. Total numbers are representative at 100% basis.
4. Numbers are reported on an attributable basis. Olaroz is managed through the operating joint venture company “SDJ”, which is owned 66.5% by Allkem, 25% by TTC and 8.5% by JEMSE. In addition to its stake in SDJ, Allkem also owns 100% of six properties immediately in the north of Olaroz, these properties are reported on a 100% basis.
5. Comparison of values may not add up due to rounding or the use of averaging methods.
6. Lithium is converted to lithium carbonate (Li_2CO_3) with a conversion factor of 5.323.
7. The estimate is reported in-situ and exclusive of Mineral Reserves, where the lithium mass is representative of what remains in the reservoir after the LOM. To calculate Resources exclusive of Mineral Reserves, a direct correlation was assumed between Proven Reserves and Measured Resources, as well as Probable Reserves and Indicated Resources. Proven Mineral Reserves (from the point of reference of brine pumped to the evaporation ponds) were subtracted from Measured Mineral Resources, and Probable Mineral Reserves (from the point of reference of brine pumped to the evaporation ponds) were subtracted from Indicated Mineral Resources. The average grade for Measured and Indicated Resources exclusive of Mineral Reserves was back calculated based on the remaining brine volume and lithium mass.
8. Note that the resource above has been depleted for the historical well production which is approximately 0.291 million tonnes of lithium carbonate equivalent (LCE). 0.286 million tonnes of LCE were depleted from measured resource and 0.005 million tonnes of LCE was depleted from indicated resource (associated with the accumulative production of well E-26).
9. The cut-off grade used to report Olaroz is 300 mg/l.
10. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability, there is no certainty that any or all of the Mineral Resources can be converted into Mineral Reserves after application of the modifying factors.
11. As of June 30,2023, no estimated Mineral Reserves have been developed for Olaroz in accordance with Item 1302(b)(1) of Regulation S-K.

Table 11-8 - Summary of Brine Resources, Inclusive of Mineral Reserves, effective June 30, 2023.

Category	Total Lithium (Million Tonnes) (3)	Total Li_2CO_3 Equivalent (Million Tonnes) (3)	Average Li (mg/L)	Attributable Lithium (Million Tonnes) (4)	Attributable Li_2CO_3 Equivalent (Million Tonnes) (4)
Measured	**2.17**	**11.54**	**659**	**1.57**	**8.33**
Indicated	**0.72**	**3.83**	**592**	**0.50**	**2.66**
Total Measured and Indicated	**2.89**	**15.38**	**641**	**2.06**	**10.99**
Inferred	**1.36**	**7.25**	**609**	**1.11**	**5.88**

1. S-K §229.1300 definitions were followed for Mineral Resources.
2. The Qualified Person for these Mineral Resource estimates is the employee of Hydrominex Geoscience set forth herein for Olaroz.
3. Total numbers are representative at 100% basis.
4. Numbers are reported on an attributable basis. Olaroz is managed through the operating joint venture company "SDJ", which is owned 66.5% by Allkem, 25% by TTC and 8.5% by JEMSE. In addition to its stake in SDJ, Allkem also owns 100% of six properties immediately in the north of Olaroz, these properties are reported on a 100% basis.
5. Comparison of values may not add up due to rounding or the use of averaging methods.
6. Lithium is converted to lithium carbonate (Li_2CO_3) with a conversion factor of 5.323.
7. Note that the resource above has been depleted for the historical well production which is approximately 0.291 million tonnes of lithium carbonate equivalent (LCE). 0.286 million tonnes of LCE were depleted from measured resource and 0.005 million tonnes of LCE was depleted from indicated resource (associated with the accumulative production of well E-26).
8. The cut-off grade used to report Olaroz is 300 mg/l.
9. Mineral Resources that are not Mineral Reserves do not have demonstrated economic viability, there is no certainty that any or all of the Mineral Resources can be converted into Mineral Reserves after application of the modifying factors.
10. As of June 30,2023, no estimated Mineral Reserves have been developed for Olaroz in accordance with Item 1302(b)(1) of Regulation S-K.

There are a number of differences between the June 30, 2023, and March 27, 2023, resource estimates. These include:

- Use of a 300 mg/l external cut-off, versus a zero cut-off in the March 27 version.
- Incorporation of public specific yield porosity and lithium concentration data from the adjoining Solaroz third party properties, which confirms the northern extension of the Olaroz geological model. This information indicates higher specific yield and lithium concentrations are likely in the north of the salar and north of the salar, compared with those previously modelled by Allkem.
- Modifications to the search radius and orientation, making lithium concentrations more laterally continuous than in previous models. This has resulted in greater horizontal continuity within the model.
- Revision to the area around E26, where the upper 100 m (hosting brackish water) was previously removed from the model.
- Increased specific yield in the north of the model has resulted in an overall increase in tonnage, mostly in the Inferred category.
- The resources have been depleted for the historical production from 2013 to 2023.

11.6 Potential Risks in Developing the Mineral Resource

Some general risk factors are associated with Olaroz. These risks include, but are not limited to:

- Properties: The risk that properties might not be fully granted or maintained, due to administrative errors or failure to make the annual property payments.
- Assays: The risk that assay results are not representative of the fluid present in sediments within the properties, due to the relatively small number of samples taken during deeper drilling, despite consistent results between drill holes.
- Geophysics: Interpretation of the base of the salar is heavily reliant on gravity geophysics, for which multiple interpretations of the data are possible. Definition of the limits of the Olaroz brine body depends on the AMT and VES geophysics. Consequently, there is a risk that the actual geology and thickness of the sediments is different to that interpreted from the geophysical data.
- Fluid sampling: Brine sampling during diamond drilling entails risks of contamination from drilling fluid. Although results from pumping tests on rotary drill holes installed as production wells suggest this is not the case, depth specific brine samples from diamond holes can potentially be contaminated by drilling fluid.

More generally there are risks that:

- Necessary license and permits will not be received from the necessary authorities in a timely manner on acceptable terms or at all.
- Changes in federal or provincial laws and their implementation, impacting activities on the properties.
- Unseasonal rainfall could occur, which could temporarily delay planned exploration.
- Future changes in lithium price, which could affect the economics of lithium production in the event that sufficient lithium was defined in Olaroz area that could potentially be produced economically.
- Economic and political conditions in Argentina could change, such that the country risk profile is different to that which is currently assessed by relevant experts.
- Covid or other pandemics result in delays and changes to activities, due to government requirements, impacts from government requirements, unavailability of people and equipment or sickness.

11.6.1 Discussion of Cut-Off Grade

A lithium cut-off grade of 300 mg/l was conservatively utilized based on a cut-off grade for a projected lithium carbonate equivalent price of US$20,000 per tonne over the entirety of the LOM. Considering the economic value of the brine against production costs, the employee of Hydrominex Geoscience set forth herein (the QP) considers the economic assumptions appropriate for the 300 mg/l cut-off grade assignment to account for potential uncertainties in the projected price and processing considerations (see Chapter 10).

Furthermore, the assigned 300 mg/L cut-off grade is consistent with other lithium brine projects of the same study level, which use a similar processing method.

The cut-off grade is based on the various inputs and formula below:

$$\text{Cutoff Grade} = \frac{\dfrac{(\text{Total Capital Expenditure} + \text{Total Operating Expenditure})}{\text{Total Brine Extracted}}}{(\text{Recovery} * \text{Conversion from Li to LiCO}_3 * \text{Projected LCE Price} * (1 - \text{Export Duties}) * (1 - \text{Royalties}))}$$

Where:

Total Capital Expenditure = US$ 619 million

Total Operating Expenditure = US$ 5,437 million

Cost of Capital = US$ 61.9 million (10 percent of Total Capital)

Total Brine Extracted = 576 Mm^3

Conversion from Li to Li2CO3 = 5.323

Projected LCE Price = US$ 20,000 per metric ton of LCE

Export Duties = 4.5%

Royalties = 3.0%

Calculated Recovery = 62%

Resulting in a calculated cut-off grade of 173 mg/L.

The cut-off grade was elevated to 300 mg/l to increase margin and de-risk the uncertainties around price fluctuations. The cut-off grade is used to determine whether the brine pumped will generate a profit after paying for costs across the value chain.

The resource is relatively homogeneous in grade (as shown in the grade-tonnage curve of Figure 11-6), and the average concentration is well above the cost of production, with brine concentrated in low-cost solar evaporation ponds. It is uncertain whether direct extraction technology will be used to extract brine in the Olaroz Stage 3 development. When this is defined, the cut-off grade will be re-evaluated.

Almost all the mineralization hosted in the mineral resource is within the salar. It does not underline areas of brackish water that could eventually affect extraction, except the area around the southern hole E26 near the evaporation ponds.

The price estimate for Lithium Carbonate is based on information provided by industry consultants Wood Mackenzie, based on their extensive studies of the lithium market. Actual prices are negotiated by Allkem with customers, generally as contracts related to market prices.

The employee of Hydrominex Geoscience set forth herein (the QP) understands the lithium market will likely have a shortfall of supply in the coming few years, which will support higher than inflation-adjusted historical prices. Based on 2022 and 2023 pricing to date, the Wood Mackenzie analysis is considered a reasonable basis for pricing through to 2025. By this time, a new technical report will likely be completed, outlining operations and details for the Stage 3 project.

11.6.2 Uncertainty analysis

All resource estimates are subject to uncertainty. In the case of lithium brine deposits, the deposits are similar to bulk mineral deposits, with premium pricing for the lithium product. There is uncertainty related to sampling, drilling methods, chemical analyses, data processing and handling, geologic modelling, and estimation. Data processing and handling, geological modelling and estimation have been the same for all data. Geochemical analyses are considered to have been sufficiently similar throughout the exploration activities at Olaroz.

As the lithium concentration changes gradually within the salar the major source of uncertainty in resource estimation on the salar is related to the specific yield (porosity which can be extracted). The specific yield changes on a cm level in clastic sediments (sediments that range from clay to gravel) and is generally less variable in halite and evaporite sediments below 50 m. Therefore, controlling variability in specific yield is the key means of reducing uncertainty.

In order to reduce uncertainty in specific yield down hole geophysical logging was undertaken with a borehole magnetic resonance (BMR) tool. This information provided data on specific yield every 2 cm down hole, supplemented by laboratory testing of cores for comparison. The specific yield data from the BMR logging data was estimated across the salar area for the resource estimate.

The resource estimate was checked against the original assay data in holes with interval sampling and pumped brine wells. Visual and statistical comparison of block and drill hole grades and examination of grade-tonnage data were evaluated to assess the estimation and the level of uncertainty.

The degree of uncertainty is reflected in the drilling density, length of production from the area and the resource classification. The Measured Resources are defined to a depth of up to 650 m across the salar and have been subject to brine extraction since 2013 from the upper 200 m of the salar. This area was subject to sonic (54 m) and diamond drilling (200 m) prior to commencing production. Additional diamond drilling was conducted to 650 m along the Eastern property boundary, to provide extra information about lithology and continuity. These areas included discrete interval sampling of brine and porosity sampling. Indicated Resources are defined below the base of Measured Resources beneath 200 to 650 m along the western side of the salar, where they occur more than 2.5 km from or beneath expansion E-series production holes. Indicated Resources are also defined within 2.5 km of the hole E26, south of the salar. Inferred Resources were defined in the northern and (to a lesser extent) southern ends of the salar, where there is little drilling and consequently greater uncertainty. This will be addressed with future drilling, to improve confidence in these areas. Inferred Resources are also defined below 650 m, where information is provided by the deep drill hole E01.

Overall, the uncertainty in the estimate has been addressed with the resource classification and checking of the estimate versus the original data.

11.6.3 Risks and Reasonable Prospects for Eventual Economic Extraction

There is considered to be minimal risk to developing the Mineral Resources, as Olaroz is already in production, having extracted brine since 2013 and sold lithium product from 2015. Lithium has been extracted from depths covering most of the Mineral Resources (down to 650 m) and deeper development would be possible.

There are ‘reasonable prospects for eventual economic extraction’ as extraction activities over a period of approximately 10 years from the central and southern areas of the salar have resulted in a successful brine extraction operation, with continued lithium processing, production, and sales of lithium carbonate product.

Given that brine has been extracted from the deeper UH5 unit of the basin since the initial holes drilled in 2014, the employee of Hydrominex Geoscience set forth herein (the QP) considers there are reasonable prospects for economic extraction of brine from the depths where production holes are currently installed to 650 m.

12. MINERAL RESERVES ESTIMATES

As of June 30, 2023, no estimated Mineral Reserves have been developed for Olaroz in accordance with Item 1302 of Regulation S-K.

13. MINING METHODS

This section describes the wellfields used for brine extraction and the mobile equipment used to support site operations. The numerical modeling used to support mine designs, simulate production rates, and predict mining dilution is discussed in Chapter 12. Chapter 14 outlines the process operations including the booster ponds, evaporation ponds, and the process plant.

13.1 Brine Extraction

Lithium bearing brine hosted in pore spaces within sediments in the salar will be extracted by pumping using a series of production wells to pump brine to evaporation ponds for concentration of the brine. Extraction of brine does not require open pit or underground mining and is the only feasible method to extract brine. Extraction is comparable with groundwater extraction for other uses (I.e., agriculture, although the brine is not suitable for agricultural use). Olaroz currently produces brine from two wellfields with wells installed to 200 m depth, with several other production wells installed to 350 and 450 m deep.

Installation of wells for the Stage 2 expansion of Olaroz has now been completed, with a total of 15 production wells installed between depths of 450 and 650 meters, depending on the location in the salar. The expansion wells fill in the space between the existing northern and southern wellfields in the center of the salar. Wells consist of stainless-steel screen sections and carbon steel casing sections, designed based on geological and geophysical logging to maximize inflow into the wells. Pumps are individually selected for each well, depending on the performance of the well during the variable rate (step) and constant rate tests.

Pipelines for individual wells transport the brine to transfer ponds, from where brine is pumped by high flow pumps through larger pipelines to the evaporation ponds. Overhead electrical power is supplied to each well site to power the submersible pump and controller. The wells are located on elevated platforms, that are connected by elevated roads to the edge of the salar, offices, workshops, and other infrastructure. This ensures that wells operate even when periodic seasonal flooding of the salar takes place in some wet seasons. The evaporation ponds for the Olaroz Stage 2 expansion are located directly south of the plant and stage 1 ponds on the lower slopes of the Archibarca alluvial fan. The distribution of the E series and PP series operational wells and other drill holes is shown in Figure 13-1.

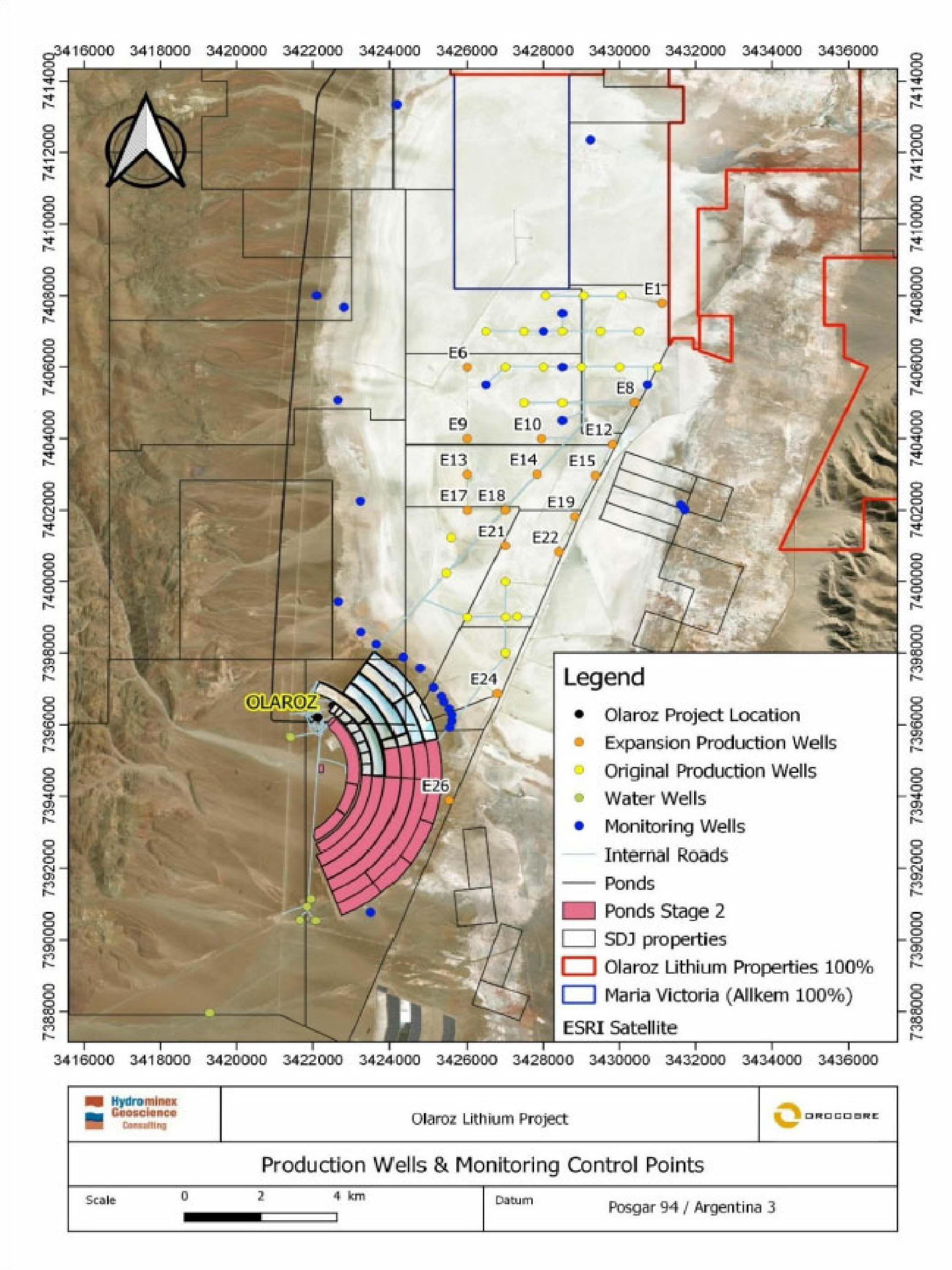


Figure 13-1 - Actual expansion production wells in brown, Stage I production wells in yellow.

Wells are operated 24 hours a day, throughout the year, using submersible pumps with scheduled maintenance periods for wells, allowing wells to be taken out of service periodically for cleaning. The pumping regime for wells is seasonal, with greater pumping during the warmer months of the year, which have higher evaporation and lower pumping rates during the low evaporation winter months. Wells are producing at an average flow rate of greater 28 liters/second, with pumping tests conducted at up to 60 l/s in some wells to date.

Additional details regarding project infrastructure are provided in Chapter 15 Infrastructure.

13.1.1 Production Rates, Expected Mine Life, Dilution and Recovery

The production rates vary between wells, as each well has a different hydrogeology at a detailed scale. The combined production rate for Stages 1 and 2 is in the order of 650 l/s. The brine extraction plan has been developed for Olaroz with a mine life of 40 years (30 years excluding the 10 years of actual production since 2013). As extraction is by pumping there are no mining unit dimensions, unlike hard rock mining. However, holes are generally separated by 1 km and in general the influence of brine extraction will extend beyond that distance from wells over the mine life, within the 147.9 km^2 area of the resource estimate. The reserve estimate includes a simulation of brine dilution over time, which is considered to manifest as a gradual decline in lithium concentration over time, which is less than 10% of the starting concentration. Brine mining does not involve mining units such as in open pit or stoping operations. Each well can be considered a mining unit, with a spacing of 1 km between wells. The recovery factor is influenced by the pre-processing concentration and the recovery in the different stages in the plant. The lithium recovery factor has varied over time but averages approximately 60%.

The annual numerical values and totals for the Life of Mine (LOM) production, including the quantities pumped from the wellfields with associated solution grades, the overall recovery, and final salable product are detailed in the Table 13-1.

Table 13-1 - Annual numerical values and totals of Life of Mine (LOM) production

Item	Units	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Wells	Million l	19,448	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926
Lithium Grade	mg Li/l	633	688	688	689	689	689	689	689	689	690	690	690	690	690	690	690	690
Overall Recovery	%	40%	53%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%
Production	tpa Li2CO3	26,247	36,836	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500

Item	Units	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	LOM
Wells	Million l	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	9,463	-	-	-	576,228
Lithium Grade	mg Li/l	690	690	690	691	691	691	691	691	691	691	691	691	691	-	-	-	687
Overall Recovery	%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	-%	-%	62%
Production	tpa Li2CO3	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	15,087	-	1,310,670

Note: The overall recovery is calculated considering the total lithium units produced relative to the total lithium units pumped out of the wells. It may be affected by the pond inventory and production ramp-up, causing temporary fluctuations. At stable production levels, the overall recovery is approximately 62%.

13.2 Hydrological Considerations

Salars form in arid environments, with the deposition of chemical sediments, with deposition controlled by the concentration of elements in brine and saturation of brine with respect to different minerals which precipitate progressively. Salars typically have an inner nucleus of halite, that is surrounded by marginal zones on the sides of the salar where sulphates and carbonates are deposited.

Fine grained clastic sediments such as clays and muds are typically deposited in Salars, some of which may contain organic material from decomposed vegetation. Coarser grained sediments generally occur on the margins of basins and may prograde into the basins from the sides during wetter periods when coarse sediments were transported further.

Drilling at Olaroz has defined the five major hydrogeological units that are discussed in section seven. The general geological environments at Olaroz that relate to the hydrogeological units are as follows:

13.2.1 Alluvial Fans

These are best developed on the western margin of the Olaroz salar, with the largest being the Archibarca alluvial fan, a composite fan developed from the southeast of the Olaroz basin. This consists of coarse gravel, generally with a sandy matrix, with interbeds of more clayey material between thicker and more massive gravel units. The Archibarca fan prograde into the Olaroz and Cauchari salars and forms the boundary between the two Salars. The alluvial fan receives significant recharge from seasonal rain and snowmelt and hosts a resource of fresh water that is used for Olaroz water supply. The freshwater overlies brackish water and brine below the gravels.

Drilling shows that historically the Archibarca alluvial fan deposited sediment into the basin from west to east. Coarser sediment from this source was deposited in unit UH5, which can be correlated across the salar, and which supports the highest pumping rates to date in wells such as P302 and E17. In many salars a lower unit with more sand and gravel clastic material is observed, which is likely to reflect different climatic conditions in the Puna region at that time and coarser sedimentation deposited in the earlier stage of basin development.

13.2.2 Clay and Silt

Clay and silt units form much of units UH3 and UH4, with interbedded sand units. These units cover the central part of the salar and are interbedded with coarser sediments from alluvial fans along the western margin of the salar. These units act as thick leaky aquifers, which release brine continuously, but at lower rates than units with thicker sequences of sand and gravel.

13.2.3 Halite

Halite is typically deposited in salar basins and in Olaroz is developed most consistently in unit UH4, where it forms a thick sequence that is interbedded with clay and silt. The halite (salt) unit is distinct in geophysical logs, as the unit is generally compact and less permeable. However, interbedded coarser grained clastic layers can have higher permeabilities and better production, such as in the southern wellfield.

13.2.4 Drainable Porosity (Specific Yield)

Porosity is highly dependent on the host lithology, with different types of porosity related to the size of pores and how brine (fluid) can be extracted from the pores.

It is important to understand the terminology relating to porosity (Figure 13-2). Total porosity (Pt) relates to the volume of pores contained within a unit volume of aquifer material. Except in well-sorted sands some of the pores are isolated from each other and only the pores that are in mutual contact may be drained. This interconnected porosity is known as the effective porosity (Pe). Assuming the Pe is totally saturated, only part may be drained under gravity during the pumping process. This part of the porosity is known as the specific yield (Sy or the drainable porosity). A portion of the fluid in the pores is retained as a result of adsorption and capillary forces and is known as specific retention (Sr).

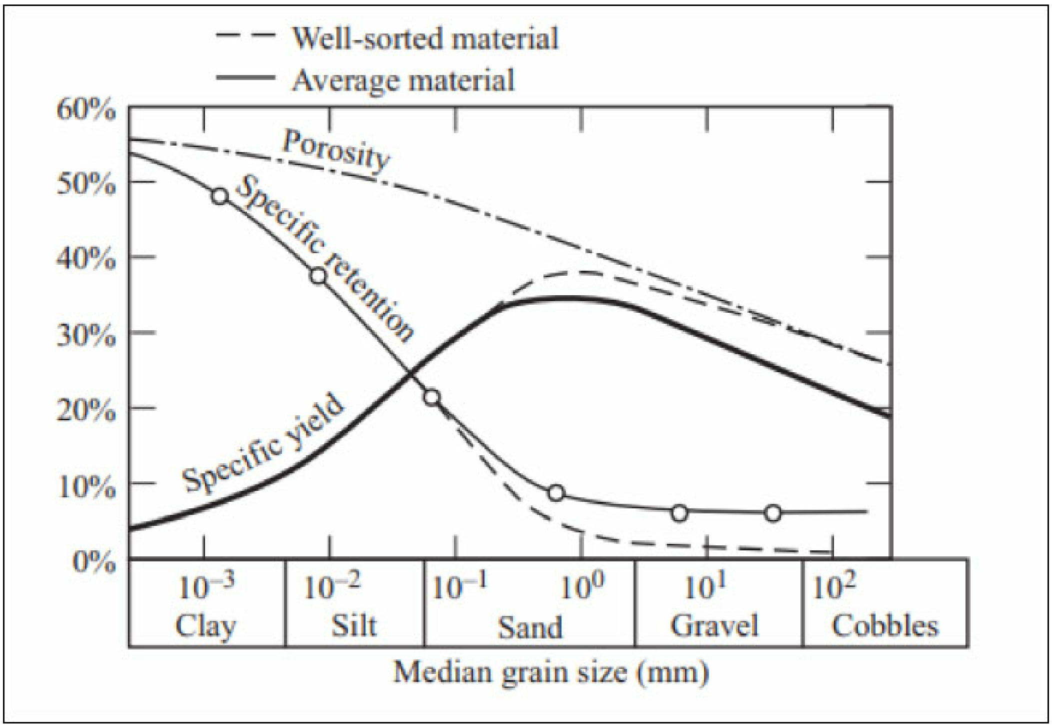


Figure 13-2 - Relationship between total porosity, specific yield, and specific retention for different grain sizes.

Total porosity (Pt) is much higher in finer grained sediments, whereas the reverse is true for Sy, due to the high Sr in these sediments. Lithology is highly variable, with sand-silt-clay mixes spanning the full spectrum of possible porosities. It is only possible to discriminate between the dominant lithology, for example, sand dominant or clay dominant. Consequently, the porosity of sand dominant, or clay dominant lithologies have a wide range with considerable overlap (Table 13-2).

Specific yield analysis was carried out on undisturbed core samples from the partially completed diamond drilling program at Olaroz. Primary samples were analyzed by the Geosystems Analysis laboratory in Tucson, USA. Check samples were analyzed at the DB Stephens laboratory, in Albuquerque, USA.

Extensive historical porosity data is also available from porosity sample testing at Olaroz in 2010-11 and from test work conducted at the Cauchari project between 2011 and 2018 in equivalent sediments.

Results of the specific yield (drainable porosity) analysis are summarized in Table 13-2, with results from recent and historical sample analyses.

Table 13-2 - Porosity results from laboratory test work.

Lithology Type	Total Porosity Pt	Specific Yield Sy
Olaroz 2021		
Sand Variants	0.20+/-0.12	0.09+/-0.08
Silt Mixes	0.35+/-0.09	0.06+/-0.05
Halite Dominant	0.08+/-0.07	0.04+/-0.02
Olaroz 2011		
Sand Dominant	0.31 ±0.06	0.13 ±0.07
Silt and Sand-Clay Mix	0.37 ±0.08	0.06 ±0.04
Clay Dominant	0.42 ±0.07	0.02 ±0.02
Halite Dominant	0.27 ±0.14	0.04 ±0.02
Cauchari 2017-18		
Sand Dominant		0.19 ±0.06
Sand-Clay Mix		0.07 ±0.04
Clay Dominant		0.03 ±0.02
Halite Dominant		0.04 ±0.03

13.2.5 Permeability Testing

Permeability (hydraulic conductivity) is also highly dependent on lithology. Generally finer grained sediments such as clays have lower permeability than coarser grained sediments such as sands and gravels. Near surface halite is often highly permeable, due to a network of fractures, although halite becomes progressively more compact and less permeable with depth. However, cavities and fracture networks are observed in some deeper halite units. The sequence of sediments in the Olaroz Salar exceeds 650 m thickness. Extraction from below 50 m is from semi-confined to confined aquifers.

Permeability for extraction purposes is best measured by conducting pumping tests and evaluating changes in the water level in the pumped well and observation wells. Pumping tests were carried out on wells installed for the expansion program, with variable rates and constant rate pumping tests conducted over periods of up to 48 hours. The results of the pumping tests are summarized in Table 13-3 and Figure 13-3 below.

From the available information the heterogeneity of the mixed clay and sand unit in Olaroz is clear. The highest hydraulic conductivity (K) values are generally related to unconsolidated deposits, in particular the Archibarca alluvial fan. Pumping test results show values of between 3.4 and 67 m/d in this material.

The unconsolidated deposits have a range of storage coefficient in the order of $4x10^{-4}$ to $2x10^{-1}$ related to unconfined to semiconfined parts of the aquifers. The deeper semi-confined to confined units composed of clays, silts and sands have values in the order of $1x10^{-3}$ to $3x10^{-6}$. Permeability values defined for the hydro stratigraphic units are shown in Table 13-3.

The pumping undertaken at Olaroz for brine production constitutes a long-term pumping test that has been monitored throughout the salar and provides extensive information for understanding the response of the aquifers in response to pumping.

Table 13-3 - Hydraulic parameters by hydro stratigraphic unit.

Unit	Hydraulic Conductivity Range m/d	Storage Coefficient Range
UH1	0.15 - 2.5	10 - 15%
UH2	0.5 - 67	1 - 20%
UH3	0.87 - 1.8	1E-6 to 0.1
UH4	8E-2 to 10	1E-7 to 0.1
UH5	2.4 - 6.3	1E-7 to 0.15

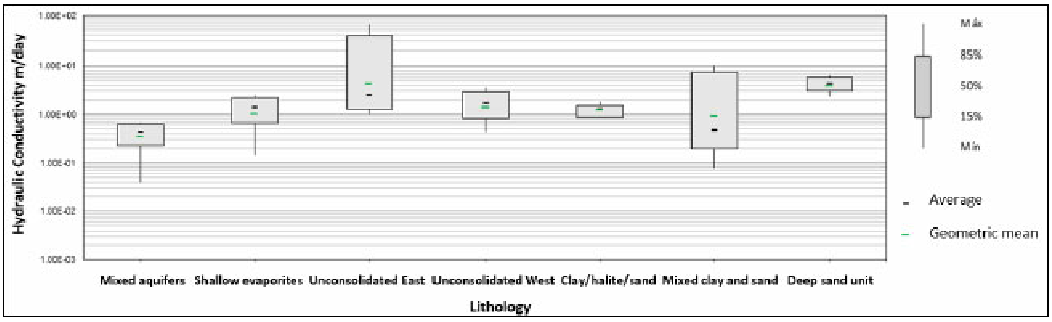


Figure 13-3 - Hydraulic conductivity by sediment type Napa, 2021.

13.3 Conclusion

The described mining method is deemed adequate to support economic brine extraction and has been proven at the Olaroz site since 2015.

14. PROCESSING AND RECOVERY METHODS

This section discusses the processing of lithium containing through the carbonation process to produce salable products. It further discusses required process input and services.

14.1 Process Design Criteria

The process design is based on the test work discussed in Chapter 10, and the numerical modelling in Chapter 12. The selected process for Olaroz II is shown in Figure 14-1. The process is based on the Olaroz I process plant that has been in operation since 2015

The process plant will operate year-round, with a planned plant availability of 8,000 hours per year. The surge capacity of the buffer ponds will allow the plant throughput to remain constant, while the evaporation rate and pond throughput will seasonally vary.

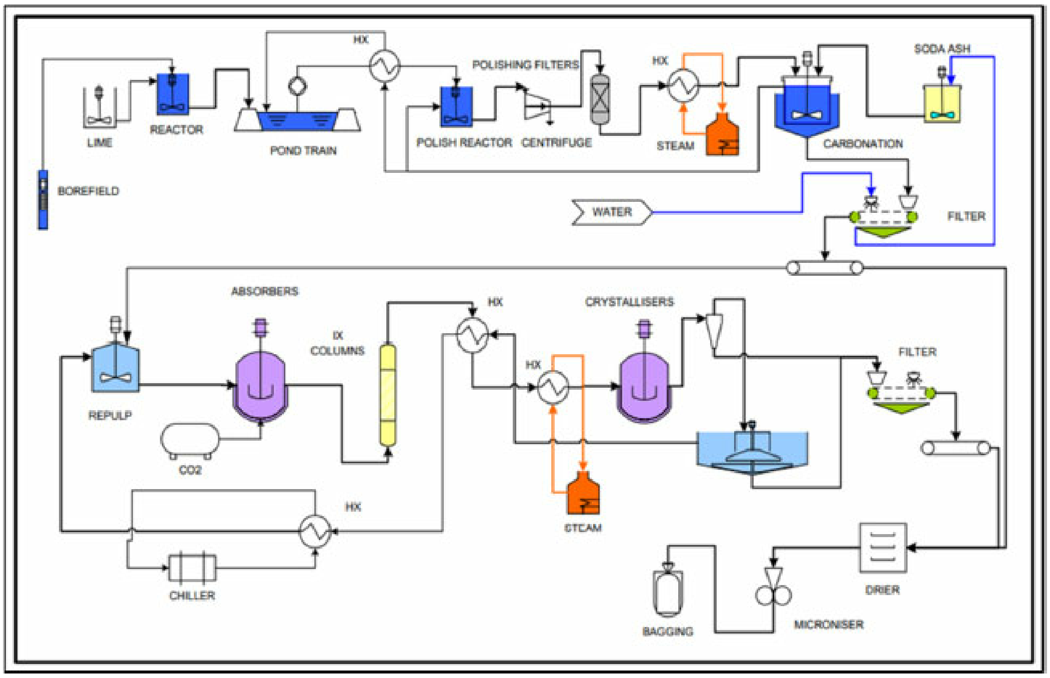


Figure 14-1 - Olaroz simplified process flow diagram (Source: Allkem, 2022).

14.2 Process Flow Description - Stage 2 Expansion

The Olaroz process relies upon:

1. Removal of the bulk of the magnesium content by slaked lime addition to the brine.
2. Increasing the Li concentration by evaporation, removing many different salts along the evaporation path by crystallization.
3. Polishing of the upgraded brine by removal of calcium and magnesium at an intermediate temperature and carbonate concentration.
4. Precipitation of the lithium carbonate product using high temperature and high carbonate additions.

14.2.1 Wellfields

Each of the northern and southern wellfields distributed over the properties on the salar delivers brine from 200 m or >200m depth into intermediate tanks, which are constructed as deep, compact plastic lined ponds. The brine is pumped from the north and south tanks [with several wells close to the pond area pumping directly] to the liming plant reactors. The total flow for Stage 1 is ~240 l/s at a grade ranging from 650 - 700 mg/l Li.

The brine wells drilled for the expansion are deeper and better equipped than Stage 1, using a more advanced geophysical profiling strategy and screening technology to optimize flow. They are generally located between the existing northern and southern wellfields. It is anticipated that with the planned 15 new wells a total flow for Stages 1 and 2 of up to 654 L/sec can be sustained at a minimum Li concentration of 650 mg/L. This has been supported by testing of some of the new wells as they became available since early 2020.

14.2.2 Lime Addition

The objective of liming is to remove magnesium from the brine. Brine will be treated with milk-of-lime, a hydrated (slaked) lime slurry as $Ca(OH)_2$, to precipitate magnesium as $Mg(OH)_2$. Other solids produced will include borate solids and gypsum ($CaSO_4 \cdot 2H_2O$).

Burnt lime [CaO] is delivered to the Olaroz site by tanker truck which pneumatically discharges burnt lime into silos. The burnt lime is slaked with raw water in a small grinding circuit and the slaked lime stored in an ageing tank. From the ageing tank the slurry is added to the brine in twin reactors in series where magnesium hydroxide and calcium sulphate are rapidly precipitated. Control of calcium [Ca] and magnesium [Mg] concentrations in the brine is critical to the recovery of a quality lithium product as they will co-precipitate.

The precipitates are contained within the first evaporation pond for later reclamation and disposal.

14.2.3 Evaporation Ponds - Stage 2Expansion

The Stage 2 expansion has been designed primarily based on the experience gained from 5 years of operating, development, and data analysis from the Stage 1 ponds. Some equipment specific testing was also conducted, mostly the new solid liquid separation steps in the polishing area.

The brine wells drilled for the expansion are deeper and better equipped than Stage 1, using a more advanced geophysical profiling strategy and screening technology to optimize flow. They are generally located between the existing northern and southern wellfields. It is anticipated that with the planned 15 new wells a total flow for Stages 1 and 2 of up to 654 l/sec can be sustained at a minimum Li concentration of 650 mg/l. This has been supported by testing of some of the new wells as they became available since early 2020.

Refer to Figure 14-2. The pond design for stage 2 [pond numbers 15 and up shown below] uses flat bottoms to enable salt harvesting and improved control. These ponds are dimensioned to have overall a greater area ratio to brine feed flow than the stage 1 design.

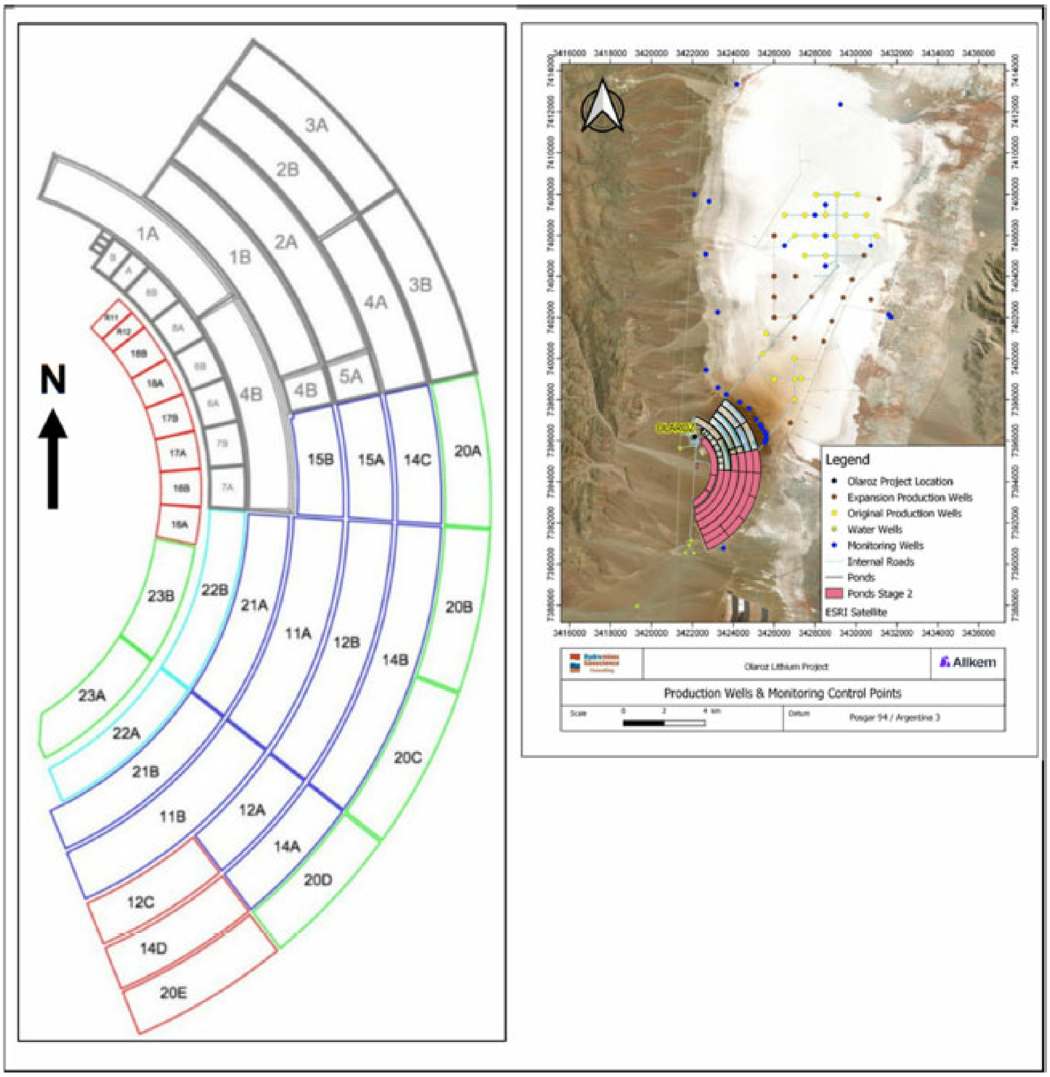


Figure 14-2 - Olaroz I and II pond expansion layout.

14.2.4 Process Plant

Refer to Figure 14-3 for a block flow diagram of the Olaroz Stage 2 process plant.

The Olaroz Stage 2 process plant has been designed primarily based on the experience gained from 5 years of operating development and data analysis from the Stage 1 process plant. Some equipment specific testing was also conducted, mostly on new solid liquid separation steps in the polishing area.

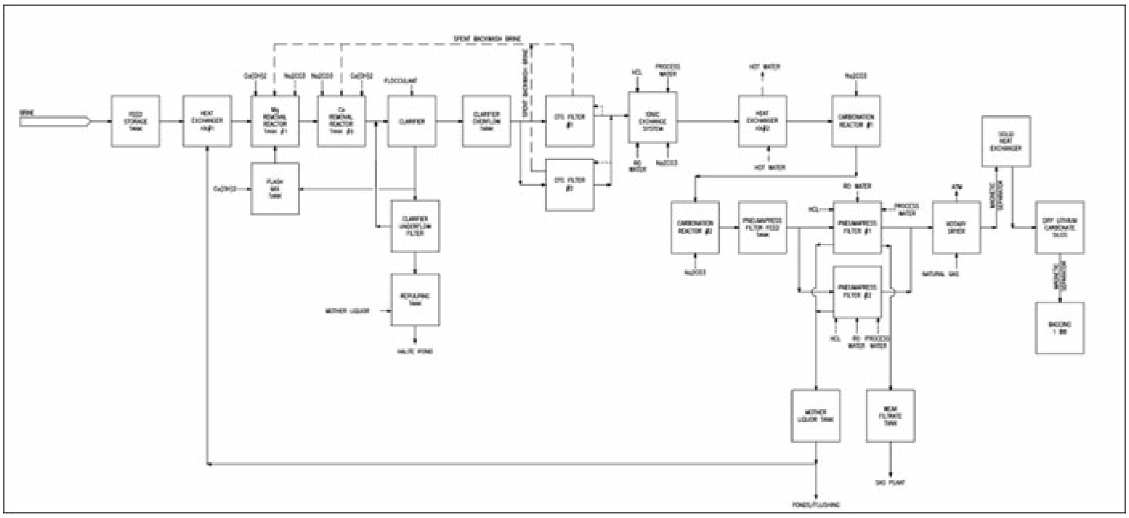


Figure 14-3 - Olaroz Stage 2 process plant block flow diagram (Source: Allkem, 2023).

The Olaroz II plant is similar in its general process flowsheet and chemistry to the Stage 1 plant, however it has been designed to provide higher quality product and improved recovery. This is achieved by:

- Washing of solid precipitates in the polishing circuit to minimize Li loss.
- Inclusion of improved ultra-fine filtration technology in the polishing circuit will contribute to product quality.
- Removal of trace Ca and Mg by ion exchange [IX] processing of carbonation reactor feed will contribute to product quality and an anticipated improvement from technical to battery grade.
- Improved control of washing and filtration of final product using air blown plate and frame filters, also contributing to improved quality by minimizing entrained impurities in the cake moisture.
- Improved process control by enhanced instrumentation and increased process buffer storage.

A gas fired rotary drying kiln has been used in the Olaroz II drying plant, along with additional micronizing capacity. A new soda ash bag storage area and mixing plant with the capability to convert to bulk delivery has been designed. Additional raw water wells in the Archibarca alluvial field and downstream reverse osmosis plant capacity are provided to meet the increased clean water requirements. Extended water supply rights have been obtained in the northern Rosario River alluvial sediments. The required increase in power generating capacity is provided by expansion of the stage 1 gas fired generators and additional boiler capacity for solution heating.

14.2.4.1 Soda Ash Plant

Soda ash is used in the carbonation and filtering process, as well as in the clarification and polishing process. A new soda ash building is being installed where the raw material will be stored in silos and the soda ash solution used in the process of obtaining lithium carbonate will be prepared.

The auxiliary services required for the operation of this plant are:

- Weak filtrate (sourced from existing and new lithium carbonate plants).
- RO water (used to prepare the solution when weak filtrate is not available).
- Hot Water (as a thermic requirement to heat the solution to be prepared).
- Process Water (for emergency showers/eye wash and service stations).

Operational drains from the equipment are sent to an effluent collection chamber through troughs. The collected effluent is then sent to evaporation basin 1A through a vertical pump.

14.2.4.2 Carbonation Plant

The Lithium Carbonate plant is separated into areas:

Area 16250 - Clarification and Polishing: Magnesium and calcium are precipitated to achieve final product specification. Slaked lime ($Ca(OH)_2$) is added to the recycled clarifier underflow, also called the seed recycle (i.e., MaxR® technology). The seed recycle stream is then introduced with fresh brine feed into the first reactor for the precipitation of magnesium. Soda ash solution is added for the precipitation of calcium. pH is monitored and controlled in both reactors by the addition of caustic soda solution.

The resulting slurry is clarified and filtered to produce a purified brine solution for Li_2CO_3 precipitation. Clarifier overflow is sent for polishing with FLSmidth's Granular Media Filter (OTG). Process solution is used to backwash the OTG and returned to the clarifier feed. OTG filtrate, polished brine, is sent to Ion Exchange (IX). A bleed of the clarifier underflow is filtered in a pressure filter. The pressure filter's filtrate is returned to the clarifier feed and the filter cake is repulped and sent to Halite Pond 21A.

The sequence of reactions is indicated in Table 14-1.

Table 14-1 - Sequence of reactions in the clarification and polishing stage.

1st Reaction:	$Ca(OH)_2 + MgCl_2 = CaCl_2 + Mg(OH)_2$ (s)	(Mg Precipitation)
2nd Reaction:	$Ca(OH)_2 + Na_2SO_4 = 2NaOH + CaSO_4$	(Max 600ppm Ca in solution)
3rd Reaction:	$Ca(OH)_2 + Na2SO_4 + 2H_2O = 2NaOH + CaSO_4.2H_2O$ (s)	(Gypsum formation)
4th Reaction:	$Na_2CO_3 + CaCl_2 = CaCO_3(s) + 2NaCl$	(Ca precipitation)
5th Reaction:	$Na_2CO_3(aq) = 2Na+(aq) + CO_3-(aq)$	(Excess Na2CO3)

Area 16230 - Carbonation and Filtration: Lithium is precipitated as Li_2CO_3 from the purified and polished brine solution using soda ash solution. The precipitated slurry is then filtered via FLSmidth's Pneumapress. The filter cake is washed with RO water.

Reaction: $Na_2CO_3 + 2LiCl = Li_2CO_3$ (s) + 2NaCl

Area 16240 - Lithium Carbonate Drying: Wet filter cake, after washing, is dried to remove entrained moisture. Natural gas is burnt to provide the heat required to evaporate entrained water in the filter cake.

14.3 Products and Recoveries

The final product obtained must comply with the following chemical characteristics. The chemical characterization of the final product can be found in Table 14-2.

Table 14-2 - Chemical characterization of the final product.

Parameter	Unit	Value	Min/Max
Li_2CO_3	% p/p	99.2	Min
Ca	ppm	100	Max
Mg	ppm	100	Max
Cl	ppm	100	Max
Na	ppm	800	Max
B	ppm	200	Max
K	ppm	200	Max
SO_4	ppm	800	Max
Fe	Ppm	10	Max
H2O	% p/p	0.3	
RM	ppm	0.3	Max
LOI	%	0.5	Max

14.4 Reagents and Commodities

14.4.1 Energy

The expansion of lithium carbonate production entails an increase in electricity to operate both the process units and services. New generators were installed at the plant to meet the new demand for electricity. The current power plant has 10 generators plus 3 new natural gas-fired generators. A new power plant is installed with 9 new generators and space to install 1 more. Electricity generation is provided by the company Secco, under a contract that includes equipment, materials, instructions and labor for electric power generation and cogeneration at Olaroz II. The generation plant is composed of natural gas generation units. Olaroz has a contract for an electric power generation system for the different operations throughout the mining operation:

- Olaroz I: 13 generator units, 10,45 MW.
- Olaroz II: 9 generator units, 17,18 MW.

The maximum concentrated power loads can be found on Table 14-3.

Table 14-3 - Maximum contracted power loads.

Start Date	Maximum contracted power (MW)
Feb-20	10.45
Jul-20	11.4
Sep-20	12.35
Dec-20	13.3
Feb-21	14.25

Start Date	Maximum contracted power (MW)
Mar-21	15.18
April to June 2023	17.18

14.4.2 Natural gas

Natural gas will be required in the following operations:

- Electrical generation, as described above, where each generator consumes 5,820 Sm^3/d (230 Nm^3/h) of natural gas.
- Hot water circuit: The Lithium Carbonate and soda ash solution preparation plant (SAS Plant) contain plate type heat exchangers, which must be fed with hot water to deliver thermal energy to the fluid to keep the purified brine hot and prevent crystallization of soda ash solution within the process piping, as well as, to heat demineralized water for the process in the Brine Carbonation and Filtration stage.
- This is achieved through a closed hot water circuit that takes advantage of the heat of the fumes produced in the electric generators to heat the water that will be supplied to these plants.
- An auxiliary boiler will be used, which operates in case of system failure, supplying the essential thermal consumption. This boiler operates with natural gas. The equipment consumption is estimated at 8,279 Sm^3/d (327 Nm^3/h).
- Lithium carbonate production: In the lithium carbonate production process, the product is fed to a rotary dryer to remove moisture content from the final product. This equipment operates on natural gas, with an expected consumption of 1,597 Sm^3/d.

The consumption rates of natural gas can be found on Table 14-4.

Table 14-4 - Natural Gas consumptions rates.

Equipment	Flow rate (Sm^3/d)
Electrical Generators (10)	52.380,00
Auxiliary Boiler	8.279,00
Rotary Dryer	1.597,00
Total	**62.256,00**

14.4.3 Water

Water supply is from a 5-hole wellfield in the north of the Archibarca alluvial sediments. This is pumped to the plant for process use and purification by three reverse osmosis plants into clean water for product washing and ablutions requirements. Potable water is transported from Jujuy by truck. A new water supply wellfield is being established in the Rosario Delta area north of the salar, to provide greater long term water supply and security.

14.4.4 Reagent and commodity consumption

Table 14-5 below details the consumption of reagents required for the processing of lithium carbonate:

Table 14-5 - Process plant reagent consumption rates.

DESCRIPTION	Unit	OLAROZ II
PLANT PRODUCTION CAPACITY	tpa	25000
FEED CONCENTRATION	mg/L	630
PLANT CONCENTRATION	mg/L	6500
RECOVERY PRIME/SUPER PRIME	%	74
SODA ASH	t/h	8,70
HYDROCHLORIC ACID	t/h	1,10
SODIUM HYDROXIDE	t/h	13,80
HYDRATED LIME	t/h	0,06
RAW WATER	m^3/h	3,60
RO WATER	m^3/h	33,20
HOT WATER	m^3/h	167,00
NATURAL GAS	Nm^3/h	0,05
COMPRESSED AIR	Nm^3/h	138,80

14.5 Process Plant Personnel

The Olaroz site is managed on a drive-in drive-out basis, with personnel coming from most of the regional centers, primarily Salta and San Salvador de Jujuy. A substantial camp is maintained which undergoes continuous upgrading, including a mess that provides three meals per day and a clinic manned by nurses and a doctor. The Olaroz site is supported with accounting, logistics, HR, and supply functions based in an office in Jujuy.

Currently, 610 people belonging to the company are on site operating both stages I and II in the areas of wells, pools, lime plants, carbonation plant, packaging and dispatch, warehouse, laboratory, processes, quality, and maintenance. 494 people correspond to the previous operation, while 116 are operating wells, pools and plants delivered, and in the process of commissioning the new plant assets. In addition, 18 people are expected to join the Stage 2 operation.

14.6 Conclusion

The described recovery and conversion process design is reasonable and implementable. The process is proven to produce saleable lithium carbonate products from Olaroz 1 plant since 2015 with a similar process considered for Olaroz Stage 2, incorporating operational and process enhancements. The process design is based on conducted test work and reflects the related test work parameters. The ponds and process related equipment are suitably sized and organized to produce the mentioned products at the specified throughput. The reagent and commodity consumption rates are deemed appropriate for the size of plant.

14.7 Recommendations

As of the effective date, Olaroz Stage 2 is currently in the pre-commissioning and commissioning stage. This stage consists of verifications prior to start-up that ensures equipment and construction conformance to safe design. Pre-commissioning and commissioning activities will ensure in order of importance.

- The safety of people, the environment and company assets.
- The integrity and operation of the equipment.
- Efficient execution to reach commissioning without setbacks or delays.

During operations, it will be necessary to monitor and control critical elements in the brine solutions to minimize impurity impact and maximize quality lithium recoveries. For optimization of lithium recovery operations, there are several technologies that should be evaluated as alternatives to ensure the company's long-term future production. In particular, the carbonation plan effluent, called "mother liquor", is recirculated in the process, discharging it again to the evaporation pond circuit. This mother liquor stream still contains some lithium concentration, which is not lost when being recirculated, but at the same time any impurities that this stream may have, are also incorporated to the evaporation pond circuit. In order to improve this recovery process, it is recommended to evaluate alternatives that allow to recover as lithium as possible from this mother liquor stream but leaving the other elements or impurities behind to avoid their recirculation.

15. INFRASTRUCTURE

Olaroz is an established lithium brine evaporation and processing operation that commenced production in 2015. Olaroz has extensive infrastructure and facilities that have been supplemented for Olaroz Stage 2. The Olaroz site is managed on a drive-in drive-out basis, with personnel coming from most of the regional centers, primarily Salta and San Salvador de Jujuy. A substantial camp is maintained which undergoes continuous upgrading, including a mess that provides three meals per day and a clinic manned by nurses and a doctor. The Olaroz site is supported with accounting, logistics, HR, and supply functions based in an office in Jujuy.

Management and administrative personnel work in an office complex that has been incrementally expanded, and more recently office facilities for the maintenance contractors and the Stage 2 expansion contractors have been constructed. Workshops are capable of all basic electrical and mechanical maintenance functions. More complex machines such as centrifuges are maintained on a rotating basis off site. A number of maintenance and construction contractors have their own facilities on site.

The site general facilities include:

- Olaroz camp with capacity for the Stage 1 workforce as well as for the Stage 2 expansion.
- Temporary construction contractor accommodation.
- Evaporation ponds for Stage 1 and 2.
- Liming Plant, with additional liming facilities under construction for the northern and southern brine wellfields, is being supplemented by installation of new wells between the existing wellfields.
- Freshwater production wells located southeast and to the north of the Olaroz site area and reverse osmosis plant on site for high quality water production.
- Gas fueled power generation plant.
- Boiler room for steam generation.
- Lithium processing plant, soda ash storage area, lithium carbonate bagging area and assorted storage areas for reagents and supplies.
- Laboratory, warehouses, refueling and equipment workshop areas.
- Offices and control facilities.
- Dining rooms, sports, and recreation facilities.
- Gate house, weighbridge, transport control and security facility.

The Olaroz workers camp includes a range of facilities which will be interconnected with pedestrian and vehicular access. The main facilities in the camp are:

- Dormitories for the operating and expansion construction phase, with additional construction phase capacity created by temporary dormitories. The dormitories are equipped with heating, power supply, ventilation, sanitary installations, communication networks, fire detection and extinguishing systems.

- The dining room has heating and ventilation systems, sanitary installations, fire detection and extinguishing systems compliant with Argentinian legal requirements.
- There are recreational areas including games room and fitness centers.

15.1 Property Access

Olaroz can be accessed directly via road from nearby population centers where established local airports exist.

15.1.1 Road Access

Olaroz is located in the Puna area of northwest Argentina, within the province of Jujuy. The main road access to Olaroz is from the city of San Salvador de Jujuy, along the Ruta Nacional (RN) 9, which heads northwest for approximately 60 km, and then meets RN 52 below the town of Purmamarca.

Following Route 52 for 50 km leads to the eastern side of the Salinas Grandes salar. The road crosses this salar before ascending further and after the town of Susques continues south along the eastern margin of the Olaroz salar. It then crosses west where the Olaroz and Cauchari Salars meet. The total distance between the city of Jujuy and Olaroz is approximately 180 km, approximately 4 hours driving. This good quality paved road continues on to the Chilean border at the Jama Pass and connects to the major mining center of Calama and the ports of Antofagasta and Mejillones in northern Chile. Driving distance to these ports is approximately 500 km and 570 km, respectively. This road is fully paved, from Jujuy to these Chilean ports. The Olaroz process plant and facilities are located north of Route 52, with the access to Olaroz via a gravel road north along the western side of the Olaroz salar.

Olaroz may also be accessed from the provincial capital of Salta by driving 27 km WSW from Salta to Campo Quijano, then continuing north for approximately 120 km along Route 51, through Quebrada del Toro, to the town of San Antonio de los Cobres, at an altitude of 3,750 masl. This route is paved, with the exception of the lower section through Quebrada del Toro and the upper section leading to San Antonio. From San Antonio de los Cobres, Route 51 leads west to the south of the Cauchari salar, with route RP 70 providing access along the western side of the Cauchari Salar to reach the international road (RN 52). The distance from San Antonio to Olaroz is approximately 140 km entirely on moderate to well-maintained gravel roads.

15.1.2 Flights

Both Jujuy and Salta have regular flights to and from Buenos Aires, Argentina and Sau Paulo, Brazil.

15.1.3 Nearest population centers

There are a number of local villages within 50 kilometers of Olaroz site. These include the villages of Olaroz Chico, El Toro, Catua, and Sey. The regional administrative center of Susques (population around 2000 people) is one hour's drive northeast of Olaroz site.

15.2 Site Roads

A large network of gravel access roads and platforms has been developed throughout the wellfields. Gravel roads are also present around the process and service infrastructure.

15.3 Electrical Power Supply and Distribution, and Fuel

The electrical power for the site is generated on a contract basis in a Secco gas fired generator plant. The gas is also used for drying products, and, via boilers, steam heating process solutions as required. Refer to Chapter 14 for more details.

15.4 Water Supply

The process plant requires industrial and pure water. Industrial water is used directly from the alluvial production wells, and pure water is obtained from the reverse osmosis water treatment plant located near the lithium carbonate plan, raw water.

Industrial or raw water is obtained from production wells installed in the Archibarca alluvial fan area to the south-southeast of the plant. Two new high yield wells have been installed in the Rosario Delta area in addition to the original 5 water wells in the Archibarca area to enable the construction of the expansion ponds and provide the additional process plant demand. This water is used for:

- Moistening of earthwork material for structural fills during construction of ponds and plant platforms (during the construction phase).
- Irrigation and dust control on work fronts during the construction phase.
- Water dilution for transfer pumps is used to transfer brine from one pond to another.
- Feeding the RO plants, and the lithium carbonate and liming plants.

15.4.1 Fire Water

A fire protection system for Olaroz includes industrial water storage tanks feeding the plant´s water network. This system also includes a pump system (electrical and diesel), able to maintain a constant pressure in the network, guaranteeing water supply. The plant will be surrounded by a perimeter closure, which will be constructed with material obtained from the excavation of the area.

15.4.2 Sewage

For the management of sewage or sewage effluents, there is a modular sewage effluent treatment plant with physical, chemical, and bacteriological treatment appropriate to the quality and quantity of the effluent generated by the operation. This plant treats all sewage and wastewater generated in restrooms, bathrooms, and camp kitchens. Industrial waste yards and warehouses are provided for waste separation, destruction, and storage, according to its specifications (hazardous and non-hazardous), and a proportion is transported to an authorized disposal center.

15.5 Construction Materials

Olaroz construction materials can be roughly separated into two different areas. The wellfield and ponds, and the industrial area. The materials of construction are typical industrial materials well known and associated with lithium brine extraction and processing. The materials have been well tested as part of Olaroz I plant.

The brine wells comprise mainly the well casing, its pump, manifold, and its electrical equipment. Brine pipelines are composed of plastic materials (e.g., HDPE). The ponds are constructed through an earthwork platform and associated embankments. Ponds and lined with LLDPE, HDPE materials typically associated with lined ponds.

Bulk materials in the process area typically include concrete foundations and pavements, steel structures and supports, steel and plastic piping, steel cables trays and insulated copper wiring.

Processing equipment such as thickeners, conveyors, cyclones, boilers, compressors, pumps, filters, steel and plastic tanks, agitators, centrifuges, bagging equipment, heat exchangers, are composed of suitable materials specified by the equipment fabricators. Process piping and equipment material and linings are suitable for the associated chemical composition of the contained liquid e.g., acid, hydroxide, and brine. Salt crystallization and deposition in pipelines remain a risk that is partially dealt with through introduction of smooth internal surfaces and minimizing areas where crystal formation can commence e.g., pipe welds. Plastic piping material is preferred, but well-known exotic steels are used where applicable. Most of these materials require certain engineering progress to be specified, and at the same time they are not produced in Argentina, requiring importation.

Backfill materials for roads must comply with a percentage of fines under mesh Nº200 ASTM of no more than 12%. The use of materials containing remains of vegetation, garbage and debris from construction work will not be allowed. Berms constructed between ponds also serve as roads for truck circulation during pond harvesting, and transit for monitoring and maintenance activities. Some berms will be wider and constitute the main service roads for salt harvesting activities.

Within the backfill properties for the backfills, it has been considered to use clean gravelly sand from the excavation of the zone called Type 1, as it is the most economical suitable material available (considering a maximum aggregate size of 4” and a percentage of fines passing the n °200 mesh no greater than 15%). The Type 1 Zone represents a predominant subsoil of gravelly sands with subrounded, subangular, and grooved cobble clasts of alluvial origin in an overall matrix of coarse sand, with medium to high compactness in relation to the depth, of homogeneous structure. If this option is not chosen, backfill materials for roads must comply with having a percentage of fines under mesh nº200 astm of no more than 12%. The use of materials containing remains of vegetation, garbage and debris from construction work will not be allowed.

The superficial thickness of low compactness silty sand will be removed together with bushes and eventual vegetation layer, making an escarpment of approximately 15 cm thick. Next, clean sand will be backfilled in 25 cm thick loose layers, compacted with 6 passes of a 1-ton static vibratory roller, in case it is necessary to reach a certain level. A layer of sandy gravel (gp or gw) of maximum size 1” will be placed on top of this backfill, which will be compacted with 6 passes of vibrating plate for each point, to a thickness of not less than 10 cm.

For compacted fills in the process plant site area, a minimum compaction of 95% of the modified proctor (in case the material passing the n °200 mesh is greater than 12%) or 80% of relative density (in case the material passing the n°200 mesh is less than 12%), as appropriate, will be required. The compaction control of each layer shall be one in situ density per 400 m^2 of compacted fill in large areas or with a minimum of one in situ density per layer in more confined areas. The material should be spread in horizontal layers of uniform thickness and should be homogeneously wetted.

The maximum size of the backfill material shall be such that it does not exceed ¼ of the loose thickness of the layers to be compacted. The moisture content, loose layer thickness and number of passes of the compacting equipment shall be such that the minimum degrees of compaction determined in the tests for the material present in zone type 1 are achieved.

15.6 Communication

Communications are via satellite with good bandwidth, internet and mobile phone coverage. Mobile UHF radios are carried by almost all personnel. A landline telephone network is also available.

15.7 Security

The site has a porter's lodge, whose function is to control the entry and exit of people and vehicles to and from Olaroz. They also perform breathalyzer tests on all vehicle drivers and passengers, in addition to checking for the absence of alcoholic beverages and perishable foodstuffs.

A patrol, a group of people who go around the camp to observe, control and/or report to maintain order and security in the sector, is implemented. These patrols are carried out at random times, both day and night, throughout the Sales de Jujuy area (operations and expansion), on foot or by vehicle, with emphasis on specific points. There are also surveillance cameras on the premises.

15.8 Waste Storage/Disposal

Refer to Chapter 17 for discussion on waste management.

15.9 Conclusion

The Olaroz 1 processing facility and related service infrastructure has been operational since 2015 and has proven effective. The Olaroz 2 expansion includes both processing and service infrastructure of which construction is nearing completion.

A project water supply currently exists in the Archibarca alluvial gravels to the southwest of the plant and ponds. This has been supplemented by additional water supply from north of the salar. Evaluation of water resources indicates there is sufficient water to support the Stages 1 and 2 operations.

Olaroz infrastructure is reflective of the required processing and support infrastructure and deemed adequate to sustain the safe production of lithium carbonate.

16. MARKET STUDIES AND CONTRACTS

The information on the lithium market is provided by Wood McKenzie, a prominent global market research group for the chemical and mining industries. Wood Mackenzie, also known as WoodMac, is a global research and consultancy group supplying data, written analysis, and consultancy advice to the energy, chemicals, renewables, metals, and mining industries.

Supplementary comments are provided by the Allkem internal marketing team based on experience with Olaroz product marketing.

16.1 Overview of the Lithium Industry

Lithium is the lightest and least dense solid element in the periodic table with a standard atomic weight of 6.94. In its metallic form, lithium is a soft silvery-grey metal, with good heat and electric conductivity. Although being the least reactive of the alkali metals, lithium reacts readily with air, burning with a white flame at temperatures above 200°C and at room temperature forming a red-purple coating of lithium nitride. In water, metallic lithium reacts to form lithium hydroxide and hydrogen. As a result of its reactive properties, lithium does not occur naturally in its pure elemental metallic form, instead occurring within minerals and salts.

The crustal abundance of lithium is calculated to be 0.002% (20 ppm), making it the 32nd most abundant crustal element. Typical values of lithium in the main rock types are 1 - 35 ppm in igneous rocks, 8 ppm in carbonate rocks and 70 ppm in shales and clays. The concentration of lithium in seawater is significantly less than the crustal abundance, ranging between 0.14 ppm and 0.25 ppm.

16.1.1 Sources of Lithium

There are five naturally occurring sources of lithium, of which the most developed are lithium pegmatites and continental lithium brines. Other sources of lithium include oilfield brines, geothermal brines, and clays.

16.1.2 Lithium Minerals

- Spodumene [$LiAlSi_2O_6$] is the most commonly mined mineral for lithium, with historical and active deposits exploited in China, Australia, Brazil, the USA, and Russia. The high lithium content of spodumene (8% Li_2O) and well-defined extraction process, along with the fact that spodumene typically occurs in larger pegmatite deposits, makes it an important mineral in the lithium industry.

- Lepidolite [$K(Li,Al)_3(Si,Al)_4O_{10}(OH,F)_2$)]is a monoclinic mica group mineral typically associated with granite pegmatites, containing approximately 7% Li_2O. Historically, lepidolite was the most widely extracted mineral for lithium; however, its significant fluorine content made the mineral unattractive in comparison to other lithium bearing silicates. Lepidolite mineral concentrates are produced largely in China and Portugal, either for direct use in the ceramics industry or conversion to lithium compounds.
- Petalite [$LiAl(Si_4O_{10})$] contains comparatively less lithium than both lepidolite and spodumene, with approximately 4.5% Li_2O. Like the two aforementioned lithium minerals, petalite occurs associated with granite pegmatites and is extracted for processing into downstream lithium products or for direct use in the glass and ceramics industry.

16.1.2.1 Lithium Clays

Lithium clays are formed by the breakdown of lithium-enriched igneous rock which may also be enriched further by hydrothermal/metasomatic alteration. The most significant lithium clays are members of the smectite group, in particular the lithium-magnesium-sodium end member hectorite [$Na0.3(Mg,Li)_3Si_4O_{10}(OH)_2$]. Hectorite ores typically contain lithium concentrations of 0.24%-0.53% Li and form numerous deposits in the USA and northern Mexico. As well as having the potential to be processed into downstream lithium compounds, hectorite is also used directly in aggregate coatings, vitreous enamels, aerosols, adhesives, emulsion paints and grouts.

Lithium-enriched brines occur in three main environments: evaporative saline lakes and salars, geothermal brines and oilfield brines. Evaporative saline lakes and salars are formed as lithium-bearing lithologies which are weathered by meteoric waters forming a dilute lithium solution. Dilute lithium solutions percolate or flow into lakes and basin environments which can be enclosed or have an outflow. If lakes and basins form in locations where the evaporation rate is greater than the input of water, lithium and other solutes are concentrated in the solution, as water is removed via evaporation. Concentrated solutions (saline brines) can be retained subterraneous within porous sediments and evaporites or in surface lakes, accumulating over time to form large deposits of saline brines.

The chemistry of saline brines is unique to each deposit, with brines even changing dramatically in composition within the same salar. The overall brine composition is crucial in determining a processing method to extract lithium, as other soluble ions such as Mg, Na, and K must be removed during processing. Brines with a high lithium concentration and low Li:Mg and Li:K ratios are considered the most economical to process. Brines with lower lithium contents can be exploited economically if evaporation costs or impurities are low. Lithium concentrations at the Atacama Salar in Chile and Hombre Muerto Salar in Argentina are higher than the majority of other locations, although the Zabuye Salar in China has a more favourable Li:Mg ratio.

16.1.3 Lithium Industry Supply Chain

Figure 16-1 below shows a schematic overview of the flow of material through the lithium industry supply chain in 2021. Raw material sources in blue and brown represent the source of refined production and TG mineral products consumed directly in industrial applications. Refined lithium products are distributed into various compounds displayed in green. Refined products may be processed further into specialty lithium products, such as butyllithium or lithium metal displayed in grey. Demand from major end-use applications is shown in orange with the relevant end-use sectors shown in Figure 16-2.

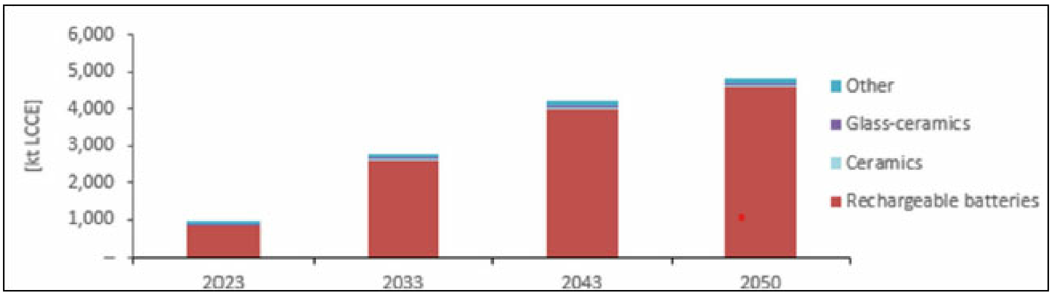


Figure 16-1 - Global Demand for Lithium by End Use, 2023 - 2050 (kt LCE).

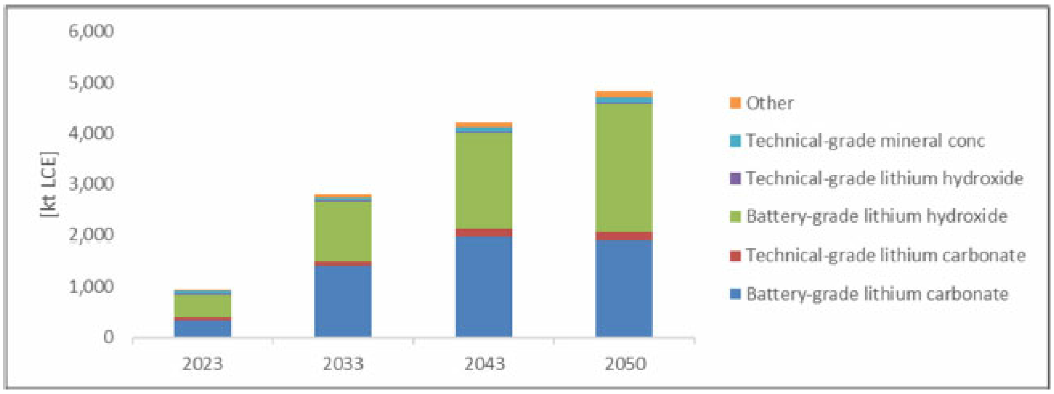


Figure 16-2 - Global Demand for Lithium by Product, 2023 - 2050 (kt LCE) (Source: Wood Mackenzie, Q1 2023 Outlook).

Lithium demand has historically been driven by macro-economic growth, but the increasing use of rechargeable batteries in electrified vehicles over the last several years has been the key driver of global demand. Global demand between 2015 and 2021 has more than doubled, reaching 498.2kt LCE with a CAGR of 16.8% over the period. Adding to this growth, in 2022 global lithium demand is expected to increase by 21.3% to 604.4 kt LCE as demand for rechargeable batteries grows further. Over the next decade, global demand for lithium is expected to grow at a rate of 17.7% CAGR to 2,199 kt in 2032.

16.1.4 Global demand for Lithium

Lithium demand has traditionally been used for applications such as in ceramic glazes and porcelain enamels, glass-ceramics for use in high-temperature applications, lubricating greases and as a catalyst for polymer production. Between 2020 and 2022, demand in these sectors rose steadily by approximately 4% CAGR. Growth in these applications tends to be highly correlated to industrial activity and macro-economic growth. Wood Mackenzie forecasts the combined growth of lithium demand from industrial markets is likely to be maintained at approximately 2% per annum from 2023 to 2050.

Rechargeable batteries represent the dominant application of lithium today, representing more than 80% of global lithium demand in 2022. Within the rechargeable battery segment, 58% was attributed to automotive applications which has grown at 69% annually since 2020. This segment is expected to drive lithium demand growth in future. To illustrate, Wood Mackenzie forecast total lithium demand will grow at 11% CAGR between 2023 and 2033: of this lithium demand attributable to the auto-sector is forecast to increase at 13% CAGR; whilst all other applications are forecast to grow at 7% CAGR. Growth is forecast to slow in the following two decades as the market matures.

Lithium is produced in a variety of chemical compositions which in turn serve as precursors in the manufacturing of its end use products such as rechargeable batteries, polymers, ceramics, and others. For rechargeable batteries, the cathode, an essential component of each battery cell, is the largest consumer of lithium across the battery supply chain. Demand profiles for lithium carbonate and hydroxide is determined by the evolution in cathode chemistries. The automotive industry mainly uses NCM and NCA cathodes, often grouped together as “high nickel”; and LFP cathodes. High nickel cathodes consume lithium in hydroxide form and generally has a higher lithium intensity; whilst LFP cathodes mainly consume lithium in carbonate form and lithium content is lower. LFP cathodes are predominantly manufactured in China.

Lithium in the form of lithium hydroxide and lithium carbonate collectively accounted for 90% of refined lithium demand in 2022. These two forms are expected to remain important sources of lithium in the foreseeable future reflecting the share of the rechargeable battery market in the overall lithium market. The remaining forms of lithium include technical grade mineral concentrate (mainly spodumene, petalite and lepidolite) used in industrial applications accounting for 7% of 2022 demand; and other specialty lithium metal used in industrial and niche applications.

Lithium products are classified as ‘battery-grade’ (“BG”) for use in rechargeable battery applications and ‘technical-grade’ (“TG”) which is primarily used in industrial applications. TG lithium carbonate can also be processed and upgraded to higher purity carbonate or hydroxide products.

Lithium hydroxide is expected to experience exponential growth on the back of high-nickel Li-ion batteries. Demand for BG lithium hydroxide is expected to grow at 10% CAGR 2023-2033 to reach 1,133kt LCE in 2033, up from 450 kt LCE in 2023. Wood Mackenzie predict lithium hydroxide to be the largest product by demand volume in the near term. However, growth of LFP demand beyond China may see BG lithium carbonate reclaim its dominance.

Wood Mackenzie forecast LFP cathodes will increase its share of the cathode market from 28% in 2022 to 43% by 2033. This drives growth in lithium carbonates demand. Wood Mackenzie predicts lithium carbonate demand will grow at 14% CAGR between 2023 and 2033; slowing as the market matures.

16.1.5 Market Balance

The lithium market balance has shown high volatility in recent years. A large supply deficit resulted from historical underinvestment relative to strong demand growth in EVs. The rise in prices over the last few years has incentivized investment in additional supply. However, the ability for supply to meet demand remains uncertain given the persistence of delays and cost increases across both brownfield and greenfield developments.

For BG lithium chemicals, Wood Mackenzie predicts the market will remain in deficit in 2024. In 2025, battery grade chemicals are expected to move into a fragile surplus before falling into a sustained deficit in 2033 and beyond. Notably, technical grade lithium chemicals may be reprocessed into battery grade to reduce the deficit. However, the capacity and ability to do so is yet unclear.

16.2 Lithium Prices

Lithium spot prices have experienced considerable volatility in 2022 and 2023. Prices peaked in 2022, with battery grade products breaching US$80,000 / t. However, spot prices fell significantly during the Q1 2023 before stabilizing in Q2 2023. A combination of factors can explain the price movements including the plateauing EV sales, slowdown of cathode production in China; and destocking through the supply chain, partially attributed to seasonal maintenance activities and national holidays.

Contract prices have traditionally been agreed on a negotiated basis between customer and supplier. However, in recent years there has been an increasing trend towards linking contract prices to those published by an increasing number of price reporting agencies (“PRA”). As such, contracted prices have tended to follow spot pricing trends, albeit with a lag.

16.2.1 Lithium Carbonate

Continued demand growth for LFP cathode batteries will ensure strong demand growth for BG lithium carbonate. This demand is expected to be met predominantly by supply from brine projects. Given the strong pricing environment, a large number of projects have been incentivized to come online steadily over the coming years. Wood Mackenzie forecast prices to decline as additional supply comes online. However, Wood Mackenzie forecasts a sustained deficit in battery-grade lithium chemicals to commence from 2031. Over the longer term, Wood Mackenzie expect prices to settle between US$26,000/t and US$31,000 / t (real US$ 2023 terms).

Notably, the market for BG carbonates is currently deeper and the spot market more liquid than hydroxide due to the size and experience of its main market of China. In addition, BG carbonates are used in a wider variety of batteries beyond the EV end use. TG lithium carbonate demand for industrial applications is forecast to grow in line with economic growth. However, TG lithium carbonate lends itself well to being reprocessed into BG lithium chemicals (either BG carbonate or BG hydroxide). The ability to re-process the product into BG lithium chemicals will ensure that prices will be linked to prices of BG lithium chemicals.

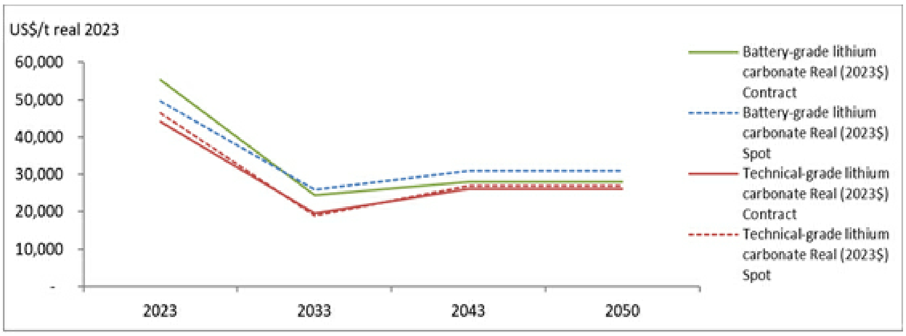


Figure 16-3 - Lithium Carbonate Price Outlook, 2023 - 2050 (Source: Wood Mackenzie, 1Q 2023 Outlook).

16.2.2 Lithium Hydroxide

The market for BG lithium hydroxide is currently small and relatively illiquid compared to the carbonate market. Growth in high nickel cathode chemistries supports a strong demand outlook. Most BG hydroxide is sold under long term contract currently, which is expected to continue. However, contract prices are expected to be linked to spot prices and therefore are likely to follow spot price trends albeit with a lag. Over the longer term, Wood Mackenzie expects hydroxide prices to settle at between US$25,000 and US$35,000 / t (real US$ 2023 terms).

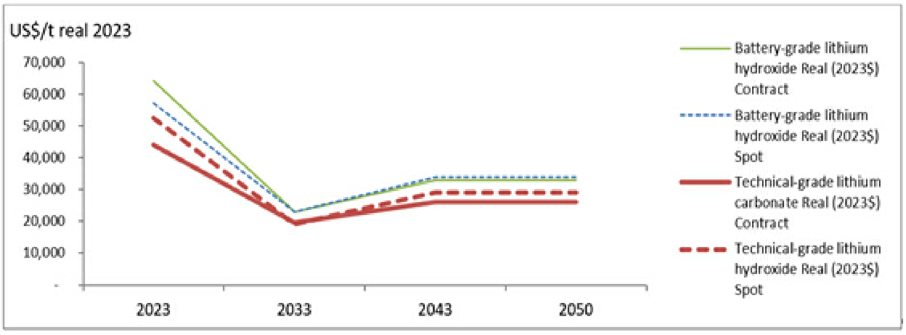


Figure 16-4 - Lithium Hydroxide Price Outlook, 2023 - 2050 (Source: Wood Mackenzie, 1Q 2023 Outlook).

16.2.3 Chemical grade spodumene concentrate.

In 2022, demand from converters showed strong growth resulting in improved prices. After years of underinvestment, new capacity has been incentivized and both brownfield and greenfield projects are underway. Notably, these incremental volumes are observed to be at a higher cost and greater difficulty, raising the pricing hurdles required to maintain supply and extending timelines for delivery.

Wood Mackenzie forecasts a short period of supply volatility in the years to 2030, moving from surplus to deficit, to surplus before entering a sustained deficit beyond 2031. Reflecting this dynamic, prices are expected to be in line with market imbalances. Wood Mackenzie forecasts a long-term price between US$2,000/t and US$3,000/t (real US$2023 terms).

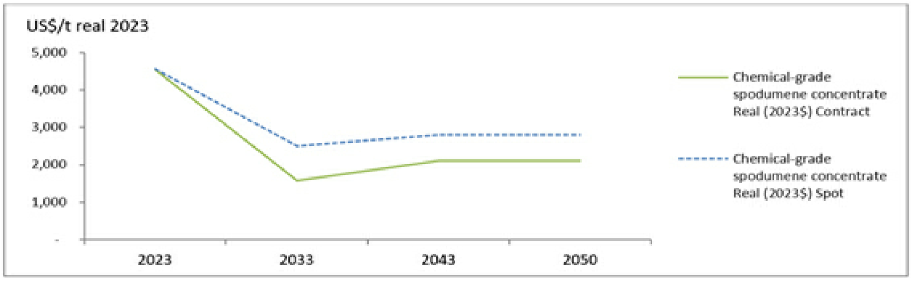


Figure 16-5 - Chemical-grade Spodumene Price Outlook, 2023 - 2050 (Source: Wood Mackenzie, 1Q 2023 Outlook).

16.3 Offtake Agreements

Lithium Carbonate produced by the Olaroz facility is destined for the Naraha refine plant based in Japan. Naraha is jointly owned by Allkem and TTC.

16.4 Market Risk and Opportunities

16.4.1 Price Volatility

Recent pricing history demonstrates the potential for prices to rise and fall significantly in a short space of time. Prices may be influenced by various factors, including global demand and supply dynamics; strategic plans of both competitors and customers; and regulatory developments.

Volatility of prices reduces the ability to accurately predict revenues and therefore cashflows. At present, Allkem's agreements include index-based or floating pricing terms. In a rising market, this results in positive cashflows and revenues. In a falling market the financial position of the company may be adversely impacted. Uncertainty associated with an unpredictable cashflow may increase funding costs both in debt and equity markets and may therefore impact the company's ability to invest in future production. Conversely, a persistently stronger pricing environment may also permit self-funding strategies to be put into place.

16.4.2 Macroeconomic conditions.

Allkem produces lithium products which are supplied to a range of applications including lithium-ion batteries, the majority being used within the automotive sector and energy storage systems; industrial applications such as lubricating greases, glass, and ceramics; and pharmaceutical applications. Demand for these end uses may be impacted by global macroeconomic conditions, as well as climate change and related regulations, which in turn will impact demand for lithium and lithium prices. Macroeconomic conditions are influenced by numerous factors and tend to be cyclical. Such conditions have been experienced in the past and may be experienced again in future.

16.4.3 Technological developments within battery chemistries.

The primary growth driver for lithium chemicals is the automotive battery application, which accounts for more than 60% of demand today. Technology within automotive cathodes and cathode chemistries are continuously evolving to optimize the balance between range, safety, and cost. New "Next Generation" chemistries are announced with regularity, which carries the risk that a significant technology could move the automotive sector away from lithium-ion batteries. On a similar note, new technologies could also increase the intensity of lithium consumption. For example, solid state and lithium metal batteries could require more lithium compared to current lithium-ion battery technology. Despite the potential for technological innovations, the impact to the lithium market over the short-medium term is expected to be limited given the extended commercialization timelines and long automotive investment cycles which are a natural inhibitor to rapid technological change.

16.4.4 Customer concentration

Allkem is currently exposed to a relatively limited number of customers and limited jurisdictions. As such, a sudden significant reduction in orders from a significant customer could have a material adverse effect on our business and operating results in the short term. In the near term, this risk is likely to persist. As the battery supply chain diversifies on the back of supportive government policies seeking to establish localized supply, in particular in North America and Europe, there will be scope to broaden the customer base, however the size of automakers, the concentration in the automobile industry and the expected market growth will entail high-volume and high-revenue supply agreements. This risk is closely monitored and mitigative actions are in place where practicable.

16.4.5 Competitive environment

Allkem competes in both the mining and refining segments of the lithium industry presently. We face global competition from both integrated and non-integrated producers. Competition is based on several factors such as product capacity and scale, reliability, service, proximity to market, product performance and quality, and price. Allkem faces competition from producers with greater scale; downstream exposures (and therefore guaranteed demand for their upstream products); access to technology; market share; and financial resources to fund organic and/or inorganic growth options. Failure to compete effectively could result in a materially adverse impact on Allkem's financial position, operations, and ability to invest in future growth. In addition, Allkem faces an increasing number of competitors: a large number of new suppliers has been incentivized to come online in recent years in response to favorable policy environment as well as higher lithium prices. The strength of recent lithium price increases has also incentivized greater investment by customers into substitution or thrifting activities, which so far have not resulted in any material threat. Recycling will progressively compete with primary supply, particularly supported by regulatory requirements, as well as the number of end-of-life battery stock that will become available over the next decade as electric vehicles or energy storage systems are retired.

16.5 Conclusion

Wood Mackenzie, also known as WoodMac, is a global research and consultancy group supplying data, written analysis, and consultancy advice to the energy, chemicals, renewables, metals, and mining industries. It is the opinion of the employee of Gunn Metallurgy set forth herein (the QP) that the long-term pricing assessment indicated in this section is deemed suitable for economic assessment of Olaroz at the current level of study.

16.6 Recommendations

Market analysis will continue to evolve during the life of mine. It is recommended that Allkem continue with ongoing market analysis and related economic sensitivity analysis.

Risk factors and opportunities in technological advancements, competition and macroeconomic trends should be reviewed for relevancy prior to major capital investment decisions. Remaining abreast of lithium extraction technology advancements, and potential further test work or pilot plant work may provide opportunities to improve Olaroz economics.

17. ENVIRONMENTAL STUDIES, PERMITTING, SOCIAL OR COMMUNITY IMPACTS

The following section describes the updated environmental, permitting, and social contexts of the Olaroz.

It is the responsible QP's opinion that the current plans for environmental compliance, permitting, and social and community factors relating to Allkem subsidiary Sales de Jujuy are adequate and in compliance with all Federal and local regulations for the Olaroz project, and that Sales de Jujuy has taken a proactive approach when dealing with the local communities in social engagement that is adequate.

Environmental Studies have been prepared and submitted prior to and during the life of the project and related to the different stages (I&II). An Environmental monitoring plan is in place and continues to be updated.

The project is approved by local communities and local government authorities. It provides positive social and socio-economic benefits for local communities. Sales de Jujuy provides a range of support services to the local communities, ranging from provision of communications facilities in communities to construction of community buildings. The company has developed a closure and reclamation plan for the project, which has been approved by the relevant mining authorities and which will evolve during the life of the project. The estimated closing and reclamation cost is US$39.3M. The Olaroz project is not a metalliferous mining project. There are no sulfide minerals which could weather and produce acid rock drainage outcomes. The waste products of the project are naturally occurring salts, which are already present at the surface of the salar.

17.1 Corporate Sustainability Principles

Allkem is committed to the transition to net zero emissions by 2035 and is progressively implementing actions across the group to achieve this target. Each project within the group will contribute to this target in a different, but site appropriate manner. Allkem will seek to further decarbonize Olaroz by maximizing this renewable energy source through its life. The design basis and infrastructure could allow Olaroz to move to a 100% photovoltaic energy solution when battery storage technology is certified to work at altitude. A standalone study for Stage 2 will also be undertaken with the intention of replacing all remaining site-based diesel generated power with natural gas.

Allkem has developed, and is in the process of implementing, a sustainability framework based on recognized Good International Industry Practice (GIIP). The corporate approach to sustainability is based on Allkem's corporate values and is supported by five sustainability pillars:

- Health and safety.
- A people focus.
- Social responsibility.
- Economic responsibility and governance.
- Environmental responsibility.

Allkem implements a corporate approach to sustainability through a Health, Safety and Environmental Management System (HSECMS). The HSECMS is the framework within which Allkem and its subsidiary companies, manages its operations in order to meet their legal obligations and is designed in accordance with international frameworks for management systems including AS/NZS 4801 Occupational Health and Safety Management Systems. The system consists of policies which set the overall intent of the company and standards which set the minimum mandatory requirements across specific topics. Allkem is in the process of transitioning to ISO 45001:2018 as the superseded standard for AS/NZS 4801.

Allkem Policies relevant to environmental and social management include:

- Health and Safety Policy.
- Environmental Policy.
- Equal Employment Opportunity and Harassment Policy.
- Human Rights Policy.

Allkem Corporative Standards relevant to environmental and social management are based on recognized GIIP and include:

- Environmental and social impact assessment.
- Biodiversity, flora, and fauna management.
- Landform, soil management and bioremediation.
- Water.
- Tailings.
- Waste (non-process).
- Environmental noise management.
- Air quality management.
- Heritage management.
- Environmental monitoring.
- Rehabilitation and closure.
- Social investment.
- Stakeholder engagement.
- Complaints and grievance mechanism.
- Energy and carbon.

Allkem (ASX|TSX: AKE) produces a Sustainability Report, which is a voluntary disclosure of the company's endeavors to strengthen the sustainability performance and increase transparency, in accordance with the core option of the Global Reporting Initiative (GRI) Standards and that cover the Sal de Vida Project.

17.2 Protected Areas

Olaroz is located in the Olaroz Cauchari Fauna and Flora Reserve (La Reserva de Fauna y Flora Olaroz-Cauchari). The reserve was created in 1981, under provincial law 3820. The reserve is a multi-use area that allows for agricultural and mining activities and scientific investigation programs. The operation of Olaroz is consistent with the multi-use reserve status.

17.3 Permitting

While the Environmental Impact Assessment is the most important permit for any mining activity, each stage of the Olaroz lithium facility has necessarily required other types of permits, such as industrial water concessions issued by the Provincial Directorate of Water Resources (Table 17-1).

Table 17-1 - Permitting resolutions for Olaroz (Source: Allkem, 2023).

<table>
<tr><th>Approval</th><th>Validity</th><th>Mining Property</th><th>Well</th><th>Status</th><th>Flow Rate (l/s)</th><th>Location in Salt Flat</th></tr>
<tr><td rowspan="5">Resolution N° 489/2017 - Decree N° 8769-ISPTyV/2019 (Concession)</td><td rowspan="5">30 years</td><td rowspan="2">Santa Julia</td><td>WSE-02</td><td>Operative</td><td>4</td><td rowspan="5">Archibarca</td></tr>
<tr><td>WSE-03</td><td>Operative</td><td>10</td></tr>
<tr><td rowspan="3">Cateo 1274-O-2009</td><td>WSE-04</td><td>Operative</td><td>16</td></tr>
<tr><td>PSJ-01</td><td>Operative</td><td>5</td></tr>
<tr><td>PSJ-03</td><td>Operative</td><td>35</td></tr>
<tr><td>Resolution N° 011/2019 (Extends flow rate limit to 35 l/s Res. 317-DPRH/2022)</td><td rowspan="7">40 years</td><td rowspan="7">San Miguel II</td><td>WSE-01</td><td>Operative</td><td rowspan="7">160*</td><td rowspan="7">Rosario River</td></tr>
<tr><td rowspan="6">Resolution N° 773/2021 (Extends flow rate and wells of Res. N° 011/19) and Resolution Nº 454-DPRH/2023 (Concession).</td><td>PSJ-04</td><td>Operative</td></tr>
<tr><td>PSJ-05</td><td>Not built</td></tr>
<tr><td>PSJ-06</td><td>Not built (needs authorization from the Community of Susques to start construction work)</td></tr>
<tr><td>PSJ-07</td><td></td></tr>
<tr><td>PSJ-08</td><td>Operative</td></tr>
<tr><td>PSJ-09</td><td>Operative</td></tr>
</table>

*The only well in this sector that can pump water with a maximum limit is WSE-01 (35 l/s), and SDJ must respect the global limit of 160 l/s for the 7 wells indicated.

There are also other types of permits in place and necessary for the operation:

Table 17-2 - Additional permitting for Olaroz (Source: Allkem, 2023).

Approvals & Permits	Status	Authority
Mining Producer Registration	In force	Provincial Mining Direction
Provincial Hazardous Waste Generator Certificate	In force	Environmental Provincial Quality Secretariat
Provincial Hazardous Waste Operator Certificate	In force	Environmental Provincial Quality Secretariat
National Hazardous Waste Generator Certificate	In force	National Registry of Dangerous Hazardous
Provincial Pathogenic Waste Generator Certificate	In force	Environmental Provincial Quality Secretariat

Approvals & Permits	Status	Authority
Medical Service Qualification	In force	Provincial Health Ministry
Commercial Authorization (Administrative Offices)	In force	Municipality of S.S. de Jujuy
Chemicals Products Certificate (Operator/Importer/Exporter/Trader)	In force	National Registry of Chemical Products
National Certificate	In force	National Registry of Foreign Visitors
Municipal Authorization (Plant)	In force	Susques Municipal Commission
Registration in the Mining Investment Law Registry	In force	National Mining Investment Register
Stamp Duty and Gross Income Exemption	In force	Provincial Revenue Direction
Registration of Air Fuel Tanks - Resolution 1102	In force	National Energy Secretary
Registration of Air Fuel Tanks - Resolution 785	In force	National Energy Secretary
Fire Authorization (administrative offices)	In force	Provincial Fire Direction
Aqueduct	In force	Provincial Environmental Quality Secretariat
Pipeline Easement	In force	Administrative Court of Mining
Effluent Discharge Permit	In force	Provincial Hydrogeological Resources Direction
Sand and Gravel Quarry Extraction Permit	In force	Provincial Hydrogeological Resources Direction
Registration in the Single Registry of the Productive Matrix	In force	National Secretary of Industry and Productive Development
Registration in the National Database Registry	In force	National Database Registry

17.4 Environmental Considerations

Olaroz is located in the Olaroz Cauchari Fauna and Flora Reserve, that was created in 1981 under provincial law 3820. The reserve is a multi-use area that allows for agricultural and mining activities and scientific investigation programs. The operation of Olaroz is consistent with the multi-use reserve status.

17.5 Social and Community Considerations

SDJ has been actively involved in community relations since the properties were acquired in 2008. Although there is minimal habitation in the area of the salar, SDJ has consulted extensively with the local aboriginal communities and employs a significant number of members of these communities in the current operations. The Olaroz permitting process addressed community and socio-economic issues. The Olaroz Stage 2 expansion provided new employment opportunities and investment in the region, which is expected to be positive.

Olaroz identifies areas of direct and indirect influence in its Environmental Impact Assessment, however, as a matter of Allkem policy and since its inception in 2008, it has worked with the 10 indigenous communities in the department of Susques: Olaroz Chico, Portico de los Andes Susques, El Toro Rosario, Huáncar, Manantial de Pastos Chicos, Termas de Tuzgle de Puesto Sey, San Juan de Quillaques, Coranzulí, Catua and Paso de Jama.

17.6 Mine Closure and Reclamation Plant

SDJ has submitted two mine closure plans within the Environmental Impact Assessment evaluation processes, the first one on 20/03/2013 and the second one on 07/11/2017.

Both plans approved by the Mining Provincial Directorate include the design and implementation of different measures such as decommissioning, physical, and chemical stabilization, land reclamation or rehabilitation, revegetation and post-closure monitoring measures and actions. From a social perspective, it includes social programs aimed at mine workers and the population of the communities interrelated to the mine. They must be updated in the next renewal of the Environmental Impact Assessment, all in accordance with the provisions of Decree No. 7751/23.

Sales de Jujuy has made provision as described in Section 18 for those expenses that may be incurred to execute the Mine Closure Plans submitted to the authority. This calculation, which was made by an external consultant “WSP - Golder Associates Argentina S.A.” and in accordance with NIC37 standards and the Manual for the Application of IFRS standards in the mining sector, must be made available to the provincial enforcement authority in the next renewal of the Environmental Impact Assessment, as indicated above.

In addition to these specific plans for the closure of Olaroz, SDJ has an Environmental Contingency Plan that establishes the policies, objectives, plans, actions, procedures, and indicators necessary for the development of its operations in an environmentally compatible manner and in compliance with applicable national, provincial, and municipal environmental legal requirements. In addition to these specific plans for the closure of Olaroz , Allkem has an Environmental Contingency Plan that establishes the policies, objectives, plans, actions, procedures, and indicators necessary for the development of its operations in an environmentally compatible manner and in compliance with applicable national, provincial, and municipal environmental legal requirements. This Plan is the minimum standard to be met by all personnel associated with the activities carried out at the mine (own personnel, contractors, service providers, auditors, inspectors and/or visitors) and at all sites of the mining operation and is submitted together with the Environmental Impact Assessment and updated with each renewal.

Finally, Allkem carries out participatory and quarterly environmental monitoring campaigns, sampling almost 50 representative points of fauna, flora, soil, climate, water, effluents, limnology, air quality, noise, limnology, landscape characteristics and ecosystem characterization, etc. Then, the reports of the results of these points are submitted to the Provincial Directorate of Mining, which evaluates them according to emission and legal conservation parameters and issues the corresponding approval.

Of the staff employed from Jujuy province, approximately 52% are from nearby communities: Coranzulí, El Toro, Huancar, Jama, Olaroz Chico, Puesto Sey, San Juan de Quillaques, Susques and Catua. For the 2022/2023 period, 186 people were incorporated.

17.7 Conclusion

Olaroz has commenced operations since 2013. Olaroz received approvals for the construction of Stage 1 and Stage 2 from the relevant provincial and federal agencies and operates with a series of permits and approvals that cover operations, registration with authorities, use of chemicals and fuels, waste generation and disposal construction and operation of the water pipelines, disposal of effluents, and extraction of gravels as examples of the permits.

Olaroz has fulfilled the required environmental and social assessments. Olaroz is fully permitted by the provincial mining authorities and has provincial and federal permits, to allow operations for an initial forty (40) year mine life, with renewable options in 2035.

The operation reflects positive social and socio-economic benefits for local communities.

The Olaroz lithium facility has established relationships with the surrounding communities, from where an important portion of the operations workforce is drawn. The operation has a policy of preferentially sourcing goods and services from the local community and from within the province. The operation also operates a number of schemes providing grants to the local community in order to start new businesses in the area and to improve the lives of the local community residents. Such schemes include construction of sports and other facilities in the nearby local villages in what is overall a very sparsely populated area.

17.8 Recommendations

Ongoing social development will enhance the importance of the lithium industry in the area. The lithium production industry is seeing increased extraction development with competing mines establishing in close proximity. Enhanced engagement between such mines can ensure alignment of social development plans that will best benefit the incumbent communities.

Continual engagement with local authorities is recommended to ensure changes in legislation, administrative errors or omissions and changes in political office holders are proactively managed and issues addressed. Continual environmental monitoring, reporting and compliance is best managed proactively toward bi-annual license renewals to minimize any potential delays.

18. CAPITAL AND OPERATING COSTS

This chapter outlines the capital and operational costs for the Olaroz lithium facility. Every cost forecast is delineated on a yearly basis for the Olaroz life of mine. Olaroz stands as an operating mine, and the capital cost does not consider expenditures that have already been absorbed by Allkem in the prior development phases, also called sunk costs.

All estimates outlined herein are expressed in FY2024 prices. All projections are estimated in real terms, they do not incorporate allocations for inflation, financial expenses, and all financial assessments are expressed in US dollars.

The ongoing and proven lithium carbonate production at Olaroz 1, the advanced stage of Olaroz 2 construction and commissioning, and recent market information provide Allkem with sufficiently accurate estimation rigor to develop this report to a suitable level where both capital and operating cost accuracy is ±15% and contingency is less than or equal to 10% as defined by the SK Regulations, with remaining uncertainty associated with an expected 40-year life-of-mine.

18.1 Estimate Basis

The Olaroz Stage 2 expansion project overall construction progress reached 99.5% completion in June 2023. As of July 2023, the project achieved Mechanical Completion and is progressing towards commissioning of the Carbonation Plant, with block wet commissioning underway and production ramp up anticipated in the following months. Olaroz' commissioning schedule included commissioning of different areas including wells, ponds, liming plants, and most of the Balance of Plant (BOP). The Capital expenditures for Olaroz Stage 2 were estimated for a plant capacity of 25,000 tonnes of lithium carbonate per year.

The capital cost estimate shown here was prepared by Worley Argentina S.A. (Collectively, Worley) in collaboration with Allkem. The estimate includes capital cost estimation data developed and provided by Worley, Allkem and other third-party contractors in accordance with individual scope allocations.

The capital cost was broken into direct and indirect costs.

18.2 Direct costs

This encompasses costs that can be directly attributed to a specific direct facility, including the costs for labor, equipment, and materials. This includes items such as plant equipment, bulk materials, specialty contractor's all-in costs for labor, contractor direct costs, construction, materials, and labor costs for facility construction or installation.

18.3 Indirect costs

Costs that support the purchase and installation of the direct costs, including temporary buildings and infrastructure; temporary roads, manual labor training and testing; soil and other testing; survey, engineering, procurement, construction, and project management costs (EPCM); costs associated with insurance, travel, accommodation, and overheads, third party consultants, Owner's costs, and contingency.

18.4 Quantity Estimation

Quantity development was based on a combination of:

- Detailed engineering (including material take-offs from approved-for-construction drawings, material take-offs from general arrangement drawings, approved-for-construction drawings and engineering modelling that includes earthworks, structural steel, and concrete).
- Basic design (engineered conceptual designs).
- Estimates from plot plans, general arrangements or previous experience, and order of magnitude allowances.
- Experience based on Olaroz construction and operation.

Estimate pricing was derived from a combination of:

- Budget pricing that included an extensive budget quotation process for general and bulk commodities.
- Fixed quotations for major equipment, and budget quotations for all other mechanical equipment.
- Historical pricing from the Olaroz operation.
- Estimated or built-up rates and allowances.
- Labor hourly costs based on the current Olaroz operation site. Please refer to the quarterly activities report.

The estimate considers execution under an EPC approach.

The construction working hours are based on a 2:1 rotation arrangement, i.e.: 14 (or 20) consecutive working days and 7 (or 10) days off. The regular working hours at 9.5 hours per day but could be extended up to 12 hours of overtime. Whilst an agreement will need to be reached with the relevant trade unions, this roster cycle is allowed under Argentinian law and has been used for similar projects. Labor at the wellfields, ponds, process plant, and pipelines areas will be housed in construction camps, with camp operation, maintenance, and catering included in the indirect cost estimate. A productivity factor of 1.35 was estimated, considering the Project/site-specific conditions.

Sustaining capital is based on the current sustaining capex and considers some operational improvements such as continuous pond harvesting. Engineering, management, and Owner's costs were developed from first principles. The Owner's cost estimate includes:

- Home office costs and site staffing.

- Engineering and other sub-consultants.
- Office consumables, equipment.
- Insurance.
- Exploration.
- Pilot plant activities and associated project travel.

The estimate for engineering, management and Owner's costs was based on a preliminary manning schedule for anticipated Project deliverables and Project schedule. Engineering design of the estimate for the home office is based on calculation of required deliverables and manning levels to complete the Project.

18.5 Summary of Capital Cost Estimate

Capital investment for Olaroz Stage 2, including equipment, materials, indirect costs, and contingencies during the construction period was estimated to be US$ 425 million. Out of this total Direct Project Costs represent US$ 393 million; Indirect Project Costs represent US$ 31.6 million. All budget costs have been expensed as of 30th June 2023 when the project achieved mechanical completion. Commissioning costs are outside of the Capex scope. The Table 18-1 details the Capital Cost, as per the list below.

- Brine production wellfields
- Evaporation ponds.
- Liming Plant.
- Lithium Carbonate Plant & Soda Ash System.
- Balance of Plant.
- Camps.
- EPCM.
- Owner Costs.

The total sustaining and enhancement capital expenditures for Olaroz over the total Life of Mine (LOM) period are shown in the Table 18-2.

Table 18-1 - Capital Expenditure.

Description	Capital Intensity (US$ / t Li_2CO_3)	CAPEX Breakdown US$ m
Wells	1,061	27
Brine Handling	1,068	27
Evaporation Ponds	3,907	98
Liming Plants	1,126	28
LCP & SAS	6,163	154
BOP	1,308	33

Description	Capital Intensity (US$ / t Li_2CO_3)	CAPEX Breakdown US$ m
Camps	1,104	28
Total Direct Cost	**15,737**	**393**
EPCM	830	**21**
Owner Costs	433	**11**
TOTAL CAPEX	**17,000**	**425**

Table 18-2 - Sustaining and Enhancement CAPEX.

Description	US$ / t Li_2CO_3 (LOM)	Total LOM US$ m	Total Year* US$ m
Enhancement CAPEX	85	111	-
Sustaining CAPEX	388	508	16
Total	**472**	**619**	**16**

* Long Term estimated cost per year

18.6 Operating Costs Basis of Estimate

The operating costs estimate for Olaroz was updated by Allkem's management team. The cost estimate excludes indirect costs such as corporate costs, overhead, management fees, marketing and sales, and other centralized corporate services. The operating cost also does not include royalties, and export taxes to the company.

Most of these costs are based on labor and consumables which have been developed at the Olaroz operation since 2015.

18.7 Basis Of Operating Cost Estimates

Reagent consumption rates were obtained from the plant mass balance that is based on actual plant performance and consumptions. Prices for the main reagent supplies were obtained from costs prevailing for FY 2024 Budget and were based on delivery to site.

A maintenance factor based on industry norms and established practice at Olaroz was applied to each area to calculate the consumables and materials costs.

Annual general and administrative (G&A) costs include the on-site accommodation camp, miscellaneous office costs and expenditure on corporate social responsibility.

18.7.1 Taxes, Royalties, and Other Agreements

The Provincial Mining royalty is limited to 3% of the mine head value of the extracted ore, calculated as the sales price less direct cash costs related to exploitation and excluding fixed asset depreciation. In addition, pursuant to Federal Argentine regulation Decree Nr. 1060/20, a 4.5% export duty on the FOB price is to be paid when exporting lithium products. Further, JEMSE, the Jujuy provincial mining body, holds an 8.5% interest in SDJ.

18.7.2 Employee Benefit Expenses

Olaroz is managed on a drive-in/drive-out basis, with personnel coming from the regional centers, primarily Salta and San Salvador de Jujuy. A substantial camp is maintained that provides accommodation, recreation, meals, and a manned clinic. Olaroz is supported with accounting, logistics, human resources, and supply functions based in an office in Jujuy.

The work rotation as currently practiced at Olaroz, for the two operational areas, is as follows.

- This consists of a 14 by 14 days rotation: based on fourteen days on duty and fourteen days off-duty, with 12-hour shifts per workday, applicable for staff at site.
- A 5 by 2-day rotation: based on a Monday-to-Friday schedule, 40 hours per week, and would be applicable only to personnel at the Jujuy city office.

18.7.3 Operation Transports

Olaroz is located in the province of Jujuy at 3,900 m altitude, adjacent to the paved international highway (RN52) that links the Jujuy Provincial capital, San Salvador de Jujuy, with ports in the Antofagasta region of Chile that are used to export the lithium carbonate product and to import key chemicals, equipment and other materials used in the production of lithium carbonate. In addition, both Jujuy and Salta have regular flights to and from Buenos Aires.

The logistics cost to ship products out of site is included in the relevant Operating Cost breakdown. Reagents cost includes delivery-at-site prices.

Pricing for transportation and port costs were based on the current Olaroz operations. The estimate includes freight, handling, depot, and customs clearance to deliver lithium carbonate either Freight on Board (FOB) Angamos Chile or Campana in Argentina.

Approximately 100 to 150 tonnes of lithium carbonate will be trucked to port each day from the Olaroz site, equivalent to 6 trucks per day.

18.7.4 Energy

Natural gas is used to fuel the generators for the on-site power and boilers for the process heating. Olaroz is connected to the GAS ATACAMA gas pipeline at the Rosario Compressor Station, located between Susques and Paso de Jama (border with Chile). The Atacama pipeline is of Ø 20" and connects Cornejo (Salta) to Mejillones (Chile) with a length of approximately 950 km, of which 520 km is in Argentine territory. The interconnection to the SDJ gas pipeline is at approximately km 470 (Rosario Compressor Station).

Key details of the gas supply are outlined below:

- Transportation Capacity: 240,000 m^3/day.
- Current gas transport: 50,000 m^3/day
- Gas transport Expansion Project: 150,000 m^3/day.
- Total current + Expansion: 200,000 m^3/day.

The electrical load was developed by Allkem, using typical mechanical and electrical efficiency factors for each piece of equipment.

18.8 Summary of Operating Cost Estimate

The Table 18-3 provides a summary of the estimated cost by category for a nominal year of operation. No inflation or escalation provisions were included. Subject to the exceptions and exclusions set forth in this Report, the aggregate average annual Operating Cost for Olaroz are summarized in the following Table 18-4:

Table 18-3 - Operation Cost: Summary.

Description	US$ / t Li_2CO_3 (LOM)	Total LOM US$ m	Total Year* US$ m
Variable Cost	2,467	3,233	100
Fixed Cost	1,682	2,205	69
Total Operating Cost	**4,149**	**5,438**	**169**

* Long Term estimated cost per year

Table 18-4 - Estimated Operating Cost by Category.

Description	Per Tonne LOM (US$ / t Li_2CO_3)	Total LOM (US$ m)	Total Year* (US$ m)
Reagents	2,280	2,988	96
Labor	816	1,069	33
Energy	98	128	4

Description	Per Tonne LOM (US$ / t Li_2CO_3)	Total LOM (US$ m)	Total Year* (US$ m)
General & Administration	687	900	24
Consumables & Materials	240	315	10
SITE CASH COSTS	**4,121**	**5,401**	**167**
Transport & Port	28	37	1
FOB CASH OPERATING COSTS	**4,149**	**5,438**	**169**

* Long Term estimated cost per year

18.8.1 Variable Operating Costs

Consumable chemical reagents are the main operating cost. Reagents represent the largest operating cost category, then labor followed by operations and maintenance. The Table 18-5 details the variable costs.

Soda ash is used to precipitate the final lithium carbonate product from the brine and residual values are used to remove impurities. Lime is used to remove magnesium, borates and sulphates from the brine, and carbon dioxide is used to redissolve lithium carbonate for purification when required in stage 1. The process consumable functions and usages are discussed in Chapter 14.

Table 18-5 - Operation Cost: Variable.

Description	US$ / t Li_2CO_3 (LOM)	Total LOM US$ m	Total Year* US$ m
Soda Ash	1,333	1,748	56
Lime	605	794	27
Carbon Dioxide	34	44	1
Natural Gas	194	254	8
Other Reagents	113	148	5
REAGENTS COSTS	**2,280**	**2,988**	**96**
Logistics	28	37	1
Packaging	58	76	2
Others	101	133	-
VARIABLE COSTS	**2,467**	**3,233**	**100**

* Long Term estimated cost per year

18.8.2 Fixed Operating Costs

From a fixed operating costs perspective, labor, operations, and maintenance are the main contributors to the total Operating Cost, as described in the Table 18-6.

Table 18-6 - Operation Cost: Fixed.

Description	US$ / t Li_2CO_3 (LOM)	Total LOM US$ m	Total Year* US$ m
Labor	687	900	28
Operations	241	316	10
Maintenance	183	239	7
Camp Admin	170	223	7
Support Services	150	196	6
Energy	98	128	4
Others	154	202	6
Fixed Costs	**1,682**	**2,205**	**69**

18.8.3 Overhead and Sales Taxes

The remaining cost components include Sales Taxes and Overhead. The Sales Taxes encompass the Government Royalty and Export Duties as addressed in previous sections.

19. ECONOMIC INPUTS AND ASSUMPTIONS

This section analyzes Olaroz economic feasibility. Certain information and statements contained in this section and in the report are forward-looking in nature. Actual events and results may differ significantly from these forward-looking statements due to various risks, uncertainties, and contingencies, including factors related to business, economics, politics, competition, and society.

Forward-looking statements cover a wide range of aspects, such as project economic and study parameters, estimates of Brine Resource and Brine Reserves (including geological interpretation, grades, extraction and mining recovery rates, hydrological and hydrogeological assumptions), project development cost and timing, dilution and extraction recoveries, processing methods and production rates, metallurgical recovery rate estimates, infrastructure requirements, capital, operating and sustaining cost estimates, estimated mine life, and other project attributes. Additionally, it includes the assessment of net present value (NPV) and internal rate of return (IRR), payback period of capital, commodity prices, environmental assessment process timing, potential changes in project configuration due to stakeholder or government input, government regulations, permitting timelines, estimates of reclamation obligations, requirements for additional capital, and environmental risks.

All forward-looking statements in this Report are necessarily based on opinions and estimates made as of the date such statements are made and are subject to important risk factors and uncertainties, many of which cannot be controlled or predicted. Material assumptions regarding forward-looking statements are discussed in this Report, where applicable. In addition to, and subject to, such specific assumptions discussed in more detail elsewhere in this Report, the forward-looking statements in this report are subject to the following general assumptions:

- No significant disruptions affecting the project's development and operation timelines.
- The availability of consumables and services at prices consistent with existing operations.
- Labor and materials costs consistent with those for existing operations.
- Permitting and stakeholder arrangements consistent with current expectations.
- Obtaining all required environmental approvals, permits, licenses, and authorizations within expected timelines.
- No significant changes in applicable royalties, foreign exchange rates, or tax rates related to the project.

To conduct the economic evaluation of the project, Allkem's team employed a cash flow model that allows for both before and after-tax analysis. The main inputs for this model include the capital and operating cost estimates presented in the previous chapters, along with an assumed brine production plan, plant performance capability and the pricing forecast outlined in Chapter 16.

Using the cash flow model, the key project indicators have been calculated, including a sensitivity analysis on the most critical revenue and cost variables to assess their impact on the project's financial metrics.

19.1 Evaluation Criteria

For the economic analysis, the Discounted Cash Flow (DCF) method was adopted to estimate the project's return based on expected future revenues, costs, and investments. DCF involves discounting all future cash flows to their present value using a discount rate determined by the company. This approach facilitates critical business decisions, such Merger & Acquisition (M&A) activities, growth project investments, optimizing investment portfolios, and ensuring efficient capital allocation for the company.

Key points about the Discounted Cash Flow method:

- The discount rate is based on the weighted average cost of capital (WACC), incorporating the rate of return expected by shareholders.
- All capital expenditure incurred to date for Olaroz was considered as sunk costs and excluded from the present value calculations.

The DCF approach involves estimating net annual free cash flows by forecasting yearly revenues and deducting yearly cash outflows, including operating costs (production and G&A costs), initial and sustaining capital costs, taxes, and royalties. These net cash flows are then discounted back to the valuation date using a real, after-tax discount rate of 10%, reflecting Allkem's estimated cost of capital.

The DCF model is constructed on a real basis without escalation or inflation of any inputs or variables. The primary outputs of the analysis, on a 100% basis, include:

- NPV at a discount rate of 10%.
- Internal rate of return (IRR), when applicable.
- Payback period, when applicable.
- Annual earnings before interest, taxes, depreciation, and amortization (EBITDA).
- Annual free cash flow (FCF).

19.2 Financial Model Parameters

19.2.1 Overview

The financial model is based on several key assumptions, including:

- Production schedule, including key parameters such as annual brine production, pond evaporation rates, process plant production, and the ramp-up schedule.
- Plant recoveries and lithium grades.
- Operating, capital, and closure costs for the remaining 32 years of operating life according to current state of permits.

- Operating costs related to wellfields, evaporation ponds, process plant, waste removal, site-wide maintenance and sustaining costs, environmental costs, onsite infrastructure and service costs, and labor costs (including contractors).
- Product sales assumed to be Free on Board (FOB) South America.

19.2.2 Production Rate

The Olaroz nominal capacity of annual lithium carbonate is estimated to be 42,500 t/year as described in Chapter 14. This is divided into 17,500 t/year of lithium carbonate from the Stage 1 system which has been operating since 2014, and the anticipated 25,000 t/year of lithium carbonate from the Stage 2 expansion which is approaching hot commissioning and ramp up.

The Table 19-1 summarizes the production quantities, grades, overall recovery, average sale prices, revenues, investments, operating costs, royalties, taxes, depreciation/amortization, and free cash flows on an annual basis with LOM totals, among other things.

Table 19- 1 - Annual economic analysis

Item	Units	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040
Wells	Million l	19,448	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926
Lithium Grade	mg Li/l	633	688	688	689	689	689	689	689	689	690	690	690	690	690	690	690	690
Overall Recovery	%	40%	53%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%
Production	tpa Li2CO3	26,247	36,836	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500
Average Sale Price	US$/t Li2CO3	28,424	28,420	26,406	26,784	24,739	23,464	22,642	21,789	20,990	20,118	21,086	23,979	25,346	25,346	25,346	25,346	25,346
Revenues	US$M	746	1,047	1,122	1,138	1,051	997	962	926	892	855	896	1,019	1,077	1,077	1,077	1,077	1,077
Operating Costs	US$M	(161)	(182)	(170)	(169)	(169)	(169)	(169)	(169)	(169)	(169)	(169)	(169)	(169)	(169)	(169)	(169)	(169)
Royalties and Export duties	US$M	(61)	(84)	(89)	(90)	(84)	(80)	(77)	(75)	(72)	(69)	(72)	(81)	(86)	(86)	(86)	(86)	(86)
G&A	US$M	(25)	(29)	(30)	(30)	(29)	(28)	(28)	(27)	(27)	(26)	(27)	(29)	(30)	(30)	(30)	(30)	(30)
EBITDA	**US$M**	**499**	**752**	**832**	**849**	**770**	**720**	**689**	**656**	**625**	**591**	**628**	**740**	**793**	**793**	**793**	**793**	**793**
Depreciation and Amortization	US$M	(20)	(21)	(23)	(23)	(23)	(23)	(23)	(23)	(23)	(22)	(22)	(22)	(22)	(22)	(22)	(21)	(21)
Taxes	US$M	(97)	(256)	(283)	(289)	(261)	(244)	(233)	(222)	(211)	(199)	(212)	(251)	(270)	(270)	(270)	(270)	(270)
Change in Working Capital	US$M	(49)	(64)	(14)	(3)	15	8	6	6	6	6	(7)	(20)	(9)	(0)	(0)	(0)	0
Pre-tax Operating Cash Flow	**US$M**	**450**	**689**	**818**	**846**	**784**	**729**	**694**	**662**	**631**	**597**	**622**	**720**	**784**	**793**	**793**	**793**	**794**
Post-tax Operating Cash Flow	**US$M**	**354**	**433**	**535**	**557**	**523**	**485**	**461**	**440**	**420**	**398**	**409**	**469**	**514**	**523**	**523**	**523**	**523**
Growth CAPEX	US$M	(36)	(79)	(20)	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sustaining Capital	US$M	(34)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)
Investment Cash Flow	**US$M**	**(70)**	**(95)**	**(35)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**
Closing Costs[5]	US$M	(39)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-tax Free Cash Flow	**US$M**	**380**	**594**	**783**	**830**	**769**	**713**	**679**	**646**	**615**	**581**	**606**	**704**	**768**	**777**	**778**	**778**	**778**
Post-tax Free Cash Flow	**US$M**	**284**	**338**	**499**	**541**	**508**	**469**	**446**	**424**	**404**	**382**	**394**	**453**	**498**	**507**	**507**	**507**	**508**

Item	Units	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	LOM
Wells	Million l	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	18,926	9,463	-	-	-	576,228
Lithium Grade	mg Li/l	690	690	690	691	691	691	691	691	691	691	691	691	691	-	-	-	687
Overall Recovery	%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	61%	-%	-%	-%	62%
Production	tpa Li2CO3	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	42,500	15,087	-	1,310,670
Average Sale Price	US$/t Li2CO3	25,346	25,346	25,346	25,346	25,346	25,346	25,346	25,346	25,346	25,346	25,346	25,346	25,346	25,346	25,346	-	24,798
Revenues	US$M	1,077	1,077	1,077	1,077	1,077	1,077	1,077	1,077	1,077	1,077	1,077	1,077	1,077	1,077	382	-	32,502
Operating Costs	US$M	(169)	(169)	(169)	(169)	(169)	(169)	(169)	(169)	(169)	(169)	(169)	(169)	(274)	(196)	(70)	-	(5,438)
Royalties and Export duties	US$M	(86)	(86)	(86)	(86)	(86)	(86)	(86)	(86)	(86)	(86)	(86)	(86)	(89)	(87)	(31)	-	(2,601)
G&A	US$M	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(30)	(10)	-	(906)
EBITDA	**US$M**	**793**	**793**	**793**	**793**	**793**	**793**	**793**	**793**	**793**	**793**	**793**	**793**	**685**	**765**	**272**	**-**	**23,557**
Depreciation and Amortization	US$M	(21)	(21)	(21)	(21)	(21)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(20)	(19)	(19)	(821)
Taxes	US$M	(270)	(270)	(270)	(270)	(270)	(270)	(270)	(271)	(271)	(271)	(271)	(271)	(233)	(261)	(88)	-	(7,936)
Change in Working Capital	US$M	(0)	(0)	(0)	0	(0)	(0)	(0)	0	(0)	(0)	(0)	0	117	53	125	58	233
Pre-tax Operating Cash Flow	**US$M**	**793**	**793**	**793**	**794**	**793**	**793**	**793**	**794**	**793**	**793**	**793**	**794**	**802**	**818**	**397**	**58**	**23,791**
Post-tax Operating Cash Flow	**US$M**	**523**	**523**	**523**	**523**	**522**	**523**	**523**	**523**	**522**	**523**	**523**	**523**	**569**	**557**	**308**	**58**	**15,855**
Growth CAPEX	US$M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(135)
Sustaining Capex	US$M	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(16)	(6)	-	(508)
Investment Cash Flow	**US$M**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(16)**	**(6)**	**-**	**(643)**
Closing Costs[4]	US$M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(39)
Pre-tax Free Cash Flow	**US$M**	**777**	**778**	**778**	**778**	**777**	**778**	**778**	**778**	**777**	**778**	**778**	**778**	**786**	**802**	**391**	**58**	**23,148**
Post-tax Free Cash Flow	**US$M**	**507**	**507**	**507**	**508**	**507**	**507**	**507**	**507**	**507**	**507**	**507**	**507**	**553**	**541**	**303**	**58**	**15,212**

Note: The overall recovery is calculated considering the total lithium units produced relative to the total lithium units pumped out of the wells. It may be affected by the pond inventory and production ramp-up, causing temporary fluctuations. At stable production levels, the overall recovery is approximately 62%.

[4] Reclamation and closure costs are calculated at Present Value at US$ 39 M and hence is not disclosed as a cashflow.

19.2.3 Process Recoveries

The basis for the process recoveries is included in Chapter 10, and the process design is outlined in Chapter 14. The recovery used in these calculations is 60% of the lithium contained in the brine feeding the pond system. This allows for lithium entrainment losses in the ponds, losses in the polishing area, and to mother liquor after the precipitation of lithium carbonate.

19.2.4 Commodity Prices

Wood Mackenzie provided near and long-term price outlooks for all products in Q1 2023. As per the detailed exposition in Chapter 16, lithium spot prices have experienced considerable volatility in 2022 and 2023.

19.2.5 Capital and Operating Costs

The capital and operating cost estimates are detailed in Chapter 18.

19.2.6 Taxes

Taxes in Argentina are calculated in pesos, as opposed to U.S. Dollars, which Allkem uses to report its results. Pursuant to recent changes in Argentine tax legislation, the corporate tax rate for the top tax bracket was increased from 30% to 35% effective January 1, 2021. For the purpose of this report, the Corporate Rate was 35%.

19.2.7 Closure Costs and Salvage Value

Allkem currently estimates US$39.3 million rehabilitation cost for the closure cost, and it is outlined in Chapter 17.

19.2.8 Financing

The economic analysis assumes 100% equity financing and is reported on a 100% ownership basis.

19.2.9 Inflation

All estimates outlined herein are expressed in FY2024 prices. All projections are estimated in real terms, and they do not incorporate allocations for inflation, financial expenses and all financial assessments are expressed in US dollars.

19.3 Economic Evaluation Results

The key metrics for Olaroz are summarized in the Table 19-2.

Table 19-2 - Main Economic Results (100% attributable basis).

Summary Economics		
Production		
LOM	yrs	32
First Production Stage 2	Date	Q3 CY23
Full Production Stage 2	Date	2024
Capacity Stage 1 + 2 (Stage 2)	tpa	42,500
Investment		
Capital Investment Stage 2 (Initial)	US$m	425
Sustaining Investment Stage 1 + 2 (LOM)	US$m	508
Development Capital Intensity (Stage 2)	US$/tpa Cap	17,000
Cash Flow		
LOM Operating Costs	US$/t LCE	4,149
Avg Sale Price	US$/t LCE	24,798
Financial Metrics		
NPV @ 10% (Pre-Tax)	US$m	7,145

Summary Economics		
NPV @ 10% (Post-Tax)	US$m	4,644
NPV @ 8% (Post-Tax)	US$m	5,546
IRR (Pre-Tax)	%	NA
IRR (Post-Tax)	%	NA
Payback After Tax (production start)	yrs	NA
Tax Rate	%	35

19.4 Indicative Economics and Sensitivity Analysis

To assess the robustness of the project's financial results, a sensitivity analysis was conducted in a range of +/- 25% on the key variables that impact the Olaroz's after-tax net present value (NPV). The sensitivity analysis explores the potential effects of changes in relevant variables, such as:

- Revenue variables:
    - Lithium carbonate prices.
    - Production levels.
- Cost variables:
    - Capital expenditure (CAPEX).
    - Operating expenses (OPEX).

The results are graphically summarized in the Table 19-2 and Figure 19-1.

19.5 Olaroz Sensitivity Analysis

The sensitivity analysis examined the impact of variations in commodity prices, production levels, capital costs, and operating costs on the project's NPV at a discount rate of 10%. The aim is to illustrate how changes in these crucial variables affect the project's financial viability.

The following Table 19-3 and Figure 19-1 provide the insights into the NPV@10% associated with the fluctuations in the key variables.

From the analysis, the commodity price has the most significant impact on the Olaroz's NPV, followed by production levels, OPEX, and CAPEX. Even under adverse market conditions, such as unfavorable price levels, increased costs, and investment challenges, Olaroz remains economically viable.

The sensitivity analysis focused on individual variable changes, and the combined effects of multiple variable variations were not explicitly modeled in this analysis.

Table 19-3 - Sensitivity Analysis NPV.

Driver Variable	Base Case Values		Project NPV@10% (US$m)				
			Percent of Base Case Value				
			-25%	-10%	Base Case	10%	25%
Production	Tonne/yr	42,500	3,043	4,004	4,644	5,285	6,246
Price	US$/tonne	24,798	3,043	4,004	4,644	5,285	6,246
CAPEX*	US$m	619	4,669	4,654	4,644	4,634	4,619
OPEX	US$/tonne	4,149	4,991	4,783	4,644	4,506	4,297

* Capital + Enhancement + Sustaining

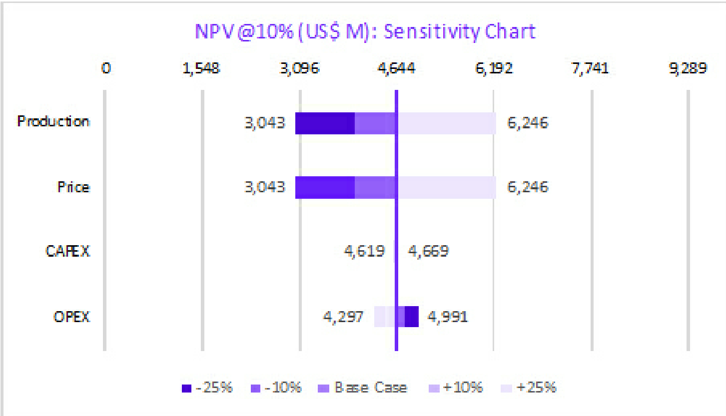


Figure 19-1 - Sensitivity Chart.

19.6 Comments on Economic Analysis

Based on the assumptions detailed in this report, the economic analysis of Olaroz demonstrates positive financial outcomes. The sensitivity analysis further strengthens its viability, as it indicates resilience to market fluctuations and cost changes. The sensitivity analysis indicates that the greatest project risk is the lithium carbonate price despite the favorable price history of the last two years. Further, unlike production targets, this price risk is not within the control of Allkem.

By conducting this sensitivity analysis, it provides a comprehensive understanding of the project's financial risks and opportunities. This approach allows for informed decision-making and a clear assessment of Olaroz 's potential performance under various economic.

20. ADJACENT PROPERTIES

20.1 General Comments

Olaroz is located directly adjacent to two other lithium Projects, the Cauchari Lithium Project (100% owned by Allkem) is located to the south. The Minera Exar Cauchari Olaroz development Project, owned by Lithium Americas Corp, in joint venture with major Chinese lithium producer Ganfeng, is located to the east and south of SDJ properties.

The employee of Hydrominex Geoscience set forth herein (the QP) has been unable to verify the information from the adjacent Lithium Americas Corp properties and the information is not necessarily indicative of the mineralization on the property that is the subject of the technical report and summary. The employee of Hydrominex Geoscience set forth herein (the principal author) was involved with the evaluation of the South American Salars properties in 2018 and 2019.

20.2 South American Salars

The Cauchari Project was explored by Advantage Lithium (Advantage), a Canadian listed company. Advantage undertook an extensive drilling program on the Cauchari properties in joint venture with then Orocobre, on properties owned by Orocobre subsidiary company South American Salars. Information is available from the October 2019 PFS study by that company. Exploration included drilling 29 mostly HQ diamond holes, with the installation of 5 test production wells and additional monitoring wells, to further evaluate sub-surface conditions and undertake pumping tests to determine the hydraulic parameters of the aquifers in the Project. Electrical geophysics was undertaken around the margins of the Cauchari Salar to define the interface between brine and fresh to brackish water in alluvial fans. Pumping tests were undertaken in the five test production wells, establishing the likely extraction rates in different areas of the salar.

A Mineral Resource estimate was undertaken for the Cauchari Project, which assessed that the Cauchari Project contains 4.8 Mt of lithium carbonate as Measured and Indicated Resources and 1.5 Mt of lithium carbonate as Inferred resources. These resources are included in the western and eastern properties directly south of Olaroz.

A reserve was subsequently defined for the Cauchari Project, following the development of a groundwater model for the Project. This was calibrated in steady state mode and in transient mode, using data from the pumping tests conducted in different areas of the salar. The reserve is 1 Mt of lithium carbonate, to be extracted over a 31-year mine life from the Western and Eastern properties in Cauchari. The reserve does not account for losses in evaporation ponds and in the production plant. More detail can be found within the Technical Resource Summary for the Cauchari Project.

20.3 Lithium Americas (LAC) - Ganfeng

Lithium Americas Corp (TSX: LAC) owns mineral properties immediately adjacent to the Cauchari mineral properties held by Allkem. In 2018 LAC announced a strategic investment and increased ownership by Ganfeng to advance its Cauchari-Olaroz Project (Exar Project). Ganfeng and LAC currently have ownership in the Exar Project of 44.8% LAC, and 46.7% Ganfeng Lithium, with 8.5% held by JEMSE. An October 2020 NI 43-101 report was released with details of the planned project.

Construction is continuing on the Exar Project with initial planned production and ramp up to production of 40,000 tpa of LCE expected to commence in late 2023. On June 12, 2023, LAC announced production of the first lithium as part of commissioning the plant. On May 7, 2019, LAC announced an expansion of Measured and Indicated Resources to 19.9 Mt (LCE), with an additional 4.7 Mt (LCE) of Inferred resource. Probable and Proven Reserves are estimated at approximately 1.95 Mt of LCE, taking account of a processing efficiency of 53.7%.

Table 20-1 - Lithium Americas/Ganfeng Cauchari Resources.

Category	Average Lithium Grade (mg /l)	Brine (m³)	Lithium Metal (Tonnes)	LCE (Tonnes)
Measured	591	1.1×10^9	667,800	3,554,700
Indicated	592	5.2×10^9	3,061,900	16,298,000
Measured and indicated	592	6.3×10^9	3,729,700	19,852,700
Inferred	592	1.5×10^9	887,300	4,772,700

Notes
1. The mineral resource estimate has an effective date of May 7, 2019, and is expressed relative to the resource evaluation area and a lithium grade cut-off greater than or equal to 300mg/l.
2. LCE is calculated using mass of LCE = 5.322785 multiplied by the mass of lithium metal.
3. Calculated brine volume only include measured, indicated, and inferred mineral resource volumes above cut-off grade.
4. The mineral resource estimate has been classified in accordance with CIM mineral resource definitions and best practices guidelines.
5. Comparisons of values may not be added due to rounding numbers and the differences caused by the use of averaging methods.

Table 20-2 - Lithium Americas/Ganfeng Cauchari Mineral Reserves.

				With out Process Efficiency		Assuming 53% Processing Efficiency	
Category	Years	Average Lithium Grade (mg /l)	Brine (m³)	Lithium Metal (Tonnes)	LCE (Tonnes)	Lithium Metal (Tonnes)	LCE (Tonnes)
Proven	1 - 5	616	1.6×10^7	96,650	514,450	51,900	276,250
Probable	6 - 40	606	9.6×10^8	586,270	3,120,590	314,830	1,675,770
Total	**40**	**607**	$\mathbf{1.1 \times 10^9}$	**682,920**	**3,635,040**	**366,730**	**1,952,020**

Note
The information above is taken from the company's technical report entitled "Updated Feasibility study and Mineral reserve Estimation to Support 40,000 tpa Lithium Carbonate Production at the Cauchari - Olaroz Salars, Jujuy Province, Argentina" dated effective September 30th, 2020, and filed on SEDAR on October 19th, 2020.

As noted above, the SDJ Olaroz properties adjoin properties owned by LAC/Ganfeng in the east of Olaroz and in Cauchari, with additional properties in Cauchari also owned by Allkem (through South American Salars). The Mineral Resources and Reserves to be exploited are in brine, which is mobile and reacts to pumping from the host sediments. It is highly likely that wells located near the borders of properties will extract brine across these borders. This creates the potential for disagreements between the companies which share the mineral resources contained in the continuous aquifer beneath the Olaroz and Cauchari Salars.

The challenge of adjoining mineral properties with mobile resources beneath them often occurs in oil and gas production, where it is solved via “unitization agreements” among the area concessionaries. Unitization agreements are widespread in the oil and gas industry, including in Argentina. As part of the exploitation of lithium brine in the Olaroz-Cauchari Salars it may become necessary for the companies involved to establish an agreement of this type to manage extraction.

20.4 Lithium Energy Limited

Australian company Lithium Energy Limited (ASX:LEL) is exploring the Solaroz project to the northwest of the Olaroz Salar. The project is adjacent to Allkem properties and covers extensive areas of gravels.

Initial drilling on the project has confirmed that lithium-bearing brine extends off the salar into the Solaroz project. LEL has identified a halite unit in their drilling, which is interpreted to be the same halite unit further south in the Olaroz Salar. LEL also encountered sandy material below the halite unit, which is very significant and extremely positive for the prospectivity of the Allkem properties north of the salar and adjacent to LEL.

The results from LEL, together with the gravity geophysical survey, which indicates a thick sequence of basin sediments extending through these northern Allkem properties, makes this area highly prospective and the target of planned Allkem exploration.

21. OTHER RELEVANT DATA AND INFORMATION

The QPs are not aware of other data to disclose.

22. INTERPRETATION AND CONCLUSIONS

22.1 Conclusions

Olaroz hosts a large lithium resource to support Stages 1 and 2 of the projects. Additional exploration is likely to define additional resources north and south of the existing resources. The project has an operating history from 2013 and a proven lithium production process. There is potential for the expansion of the project and improvement of efficiencies and synergies with expansion and this is currently under evaluation to meet rising market demand.

The study concludes that the operating Olaroz 1 and Olaroz 2 expansion represents economic feasibility. The Olaroz 1 plant has proven effective process design and saleable product quality to support the economic evaluation.

The collected data and models are deemed reliable and adequate to support the mineral resource estimate, cost estimates and the indicated level of study.

22.1.1 Geology and Resources

Deeper drilling to support the Stage 2 Olaroz expansion has been completed to depths between 400 and 650 m, depending on location within the basin. This deeper drilling has confirmed that deposition of coarser grained higher porosity and permeability sediments has been principally from the western side of the basin.

The deep drill hole has confirmed the Olaroz Basin extends to greater than 1,400 m in the deeper part of the basin. Drilling to date has not intersected the underlying basement rocks in the basin, confirming the extensive volume of brine saturated sediments present.

Drilling has confirmed that a simplified five-unit hydro stratigraphic model is sufficient to represent the sediments in the salar to the depths currently explored. The lower unit contains a higher sandy content and supports high flow rates, which have been confirmed by pumping since 2016 and in more recent deeper wells. There are no significant changes in brine chemistry identified in the deeper drilling, with similar lithium and other element concentrations and key chemical ratios. Completion of the Stage 2 expansion well program has confirmed high flows and similar brine chemistry to earlier holes in this unit.

An extensive area north of the current day salar surface, beneath alluvial sediments around the side of the basin and the Rosario Delta sediments, is highly prospective for the definition of additional brine resources. However, no drilling (beyond several 54 m deep sonic holes) has been drilled in this area, which will be a future focus of exploration.

22.1.2 Resources

Despite the limited diamond drilling and brine interval sampling below 200 m depth, pumping wells installed to depths up to 650 m and pumping since 2016 confirm the brine quality and flow rates in the deeper parts of the salar. Drilling for the Stage 2 expansion has been between 450 and 650 m depth. These holes were geologically and geophysically logged and a robust stratigraphy has been established for the basin.

The resource was estimated based on a combination of the interval sampling in the upper 200 m and the pumping well data below this depth.

The Qualified Persons consider the salar geometry and geology, brine quality and sediment specific yield have been defined sufficiently to support the classification of the resource as Measured, Indicated, and Inferred resources.

22.1.3 Metallurgy and Processing

The described recovery and conversion process design is reasonable and implementable. The process has been proven to produce saleable lithium carbonate products from Olaroz 1 plant since 2015 with a similar process considered for Olaroz 2, incorporating operational and process enhancements. The process design is based on conducted test work and reflects the related test work parameters. The ponds and process related equipment are suitably sized and organized to produce the mentioned products at the specified throughput. The reagent and commodity consumption rates are deemed appropriate for the size of plant.

22.1.4 Infrastructure and Water Management

The Olaroz 1 processing facility and related service infrastructure has been operational since 2015 and has proven effective. The Olaroz 2 expansion includes both processing and service infrastructure of which construction is nearing completion.

A project water supply currently exists in the Archibarca alluvial gravels to the southwest of the plant and ponds. This is being supplemented by additional water supply from north of the salar. Evaluation of water resources indicates there is sufficient water to support the Stages 1 and 2 operations.

The project infrastructure is reflective of the required processing and support service infrastructure. The infrastructure is deemed adequate to sustain the safe production of lithium carbonate for both Stages 1 and 2.

22.1.5 Market Studies

The Project is relying on third party specialist consultants Wood Mackenzie, a global research and consultancy group supplying data, written analysis, and consultancy advice to the energy, chemicals, renewables, metals, and mining industries. The long-term pricing assessment is deemed suitable for economic evaluation of the Project at the current level of study.

22.1.6 Environmental and Social Issues

Olaroz is an operating project since 2013. The project received approvals for the construction of Stage 1 and Stage 2 of the project from the relevant provincial and federal agencies and operates with a series of permits and approvals that cover operations, registration with authorities, use of chemicals and fuels, waste generation and disposal construction and operation of the water pipelines, disposal of effluents, and extraction of gravels as examples of the permits.

The project has fulfilled the required environmental and social assessments. The project is fully permitted by the provincial mining authorities and has provincial and federal permits, to allow operations for an initial forty (40) year mine life, with renewable options in 2035. The project reflects positive social and socio-economic benefits for local communities.

The Project has established relationships with the surrounding communities, from where an important portion of the project workforce is drawn. The Project has a policy of preferentially sourcing goods and services from the local community and from within the province. The Project also operates several schemes providing grants to the local community in order to start new businesses in the area and to improve the lives of the local community residents. Such schemes include construction of sports and other facilities in the nearby local villages in what is overall a very sparsely populated area.

22.1.7 Project Costs and Financial Evaluation

The high level of construction completion for the Olaroz 2 facility relays a high level of confidence in the related capital cost. The operational costs are based on real pricing as part of the operational readiness and ramp-up process currently under way at the project site.

The indicated capital and operational costs accurately reflect the incurred and future expected costs for the Olaroz 2 project and can be utilized for economic analysis.

Based on the detailed assumptions, the economic analysis of Olaroz 2 and combined Olaroz 1 and 2 demonstrates positive economic outcomes. The sensitivity analysis further indicates economic resilience to market and cost fluctuations.

The financial model incorporates and reflects the main input parameters outlined throughout this report. The financial model reflects the positive potential economic extraction of the resource.

22.2 Environmental Baseline Studies

Allkem has successfully completed various environmental studies required to support exploration and development programs between 2008 and the present.

As indicated above, the Environmental Impact Assessment is submitted at its baseline, depending on the stage of the project, whether exploration and/or exploitation, and is renewed biannually to keep the permit in force. This is regulated by Provincial Decree N° 5.771/2023 (previous Decree N° 5772/2010).

In the case of Olaroz, there are two baselines, one for exploration and other for exploitation. The exploitation baseline (Table 22-1) has been updated on several occasions and is the one that remains in force, including Phase II of the Project.

Table 22-1 - Baseline studies for Olaroz (Source: Allkem, 2023).

<table>
<tr><th colspan="2">Environmental Impact Assessment</th><th>Year</th><th>Approval</th></tr>
<tr><td>Exploration</td><td>Base Line</td><td>2009</td><td>Resolution N° 026-DMYRE/09 (02/09/09)</td></tr>
<tr><td rowspan="7">Exploitation/ Production</td><td>Base Line</td><td>2010</td><td>Resolution N° 007-DMYRE/10 (29/12/2010) and N° 020-DMYRE/12 (06/07/12)</td></tr>
<tr><td rowspan="6">Renewal</td><td>2012</td><td rowspan="2">Resolution N° 044-DMYRE/16 (29/12/16)</td></tr>
<tr><td>2014</td></tr>
<tr><td>2016</td><td>Resolution N° 009-DMYRE/17 (05/10/17) and N° 012-DMYRE/17 (07/11/17)</td></tr>
<tr><td>2018</td><td>Resolution N° 005-DMYRE/20 (30/01/20)</td></tr>
<tr><td>2020</td><td>Resolution N° 032-DPM/23 (30/03/23)</td></tr>
<tr><td>2022</td><td>Under evaluation (Issued December 2022)</td></tr>
</table>

All the Environmental Impact Assessment are submitted to the Provincial Mining Directorate and subject to a participatory evaluation and administrative process with provincial authorities (Indigenous People Secretariat, Water Resources Directorate, Environmental Ministry, Economy, and Production Ministry, among others) and communities of influence, until the final approval resolution is obtained. In the case of Sales de Jujuy, and since 2009, the evaluation process is carried out with the participation and dialogue of the 10 indigenous communities of the department of Susques.

22.2.1 Mineral Resource

- Interpretation of the base of the salar is heavily reliant on gravity geophysics, for which multiple interpretations of the data are possible. Definition of the limits of the Olaroz brine body depends on the AMT and VES geophysics. Consequently, there is a risk that the actual geology and thickness of the sediments is different to that interpreted from the geophysical data.
- Brine sampling during diamond drilling entails risks of contamination from drilling fluid. Although results from pumping tests on rotary drill holes installed as production wells suggest this is not the case, depth specific brine samples from diamond holes can potentially be contaminated by drilling fluid.
- The risk that assays results are not representative of the fluid present in sediments within the properties, due to the relatively small number of samples taken during deeper drilling, despite consistent results between drill holes.

22.2.2 Metallurgy and Mineral Processing

- The fluid nature of the salar, coupled with evaporation performance and processing fluctuations may not produce the estimated recoveries. Current designs are based on test work and historical data averages. Weather and salar related factors remain risk components.
- Unseasonal rainfall could occur, which could temporarily impact production / evaporation projections.

22.2.3 Operating Permits and Environment

- The risk that properties might not be fully granted or maintained, due to administrative errors or failure to make the annual property payments.
- Necessary licenses and permit renewals may not be received from the designated authorities in a timely manner on acceptable terms.
- Changes in federal or provincial laws and their implementation, impacting activities on the properties.
- Changes in community relations and local political perceptions may impact the periodic or long-term operation over the life-of-mine.

22.2.4 Cost and Economic Analysis

- Future changes in lithium price could affect the economics of lithium production or enough lithium required to justify economic extraction.
- Input costs related to labor and reagents, or availability of supply, could affect the project economics periodically or permanently.
- Economic and political conditions in Argentina could change, such that the country risk profile is different to that which is currently assessed for feasible economic extraction.

23. RECOMMENDATIONS

23.1 Geology and Resources

The authors recommend the planned diamond and rotary drilling program is implemented and monitoring wells are installed across the salar for ongoing monitoring of brine levels and brine concentrations prior to Stage 3 expansion.

All drill holes should be geophysical logged to obtain the maximum possible information from drilling and to assist geological correlation. Physical porosity samples should continue to be taken for comparison with BMR geophysical logs. Monitoring well installation should include installation of wells at different depths, to improve the understanding of the distribution of piezometric heads across and around the salar.

Once additional exploration drilling has been completed the geological model should be updated to reflect the improved understanding from this additional drilling. The Olaroz resource should also be updated at this point, to reclassify additional resources as Measured and Indicated or Inferred, based on increased geological confidence.

Additional pumping test wells should be installed in the area of expanded exploration drilling, to provide information on aquifer conditions. Once pumping tests and the resource model are updated the Olaroz groundwater model should be re-calibrated with the additional data and used to define an updated mineral reserve and the Olaroz production schedule should be updated.

Regular analyses of brine samples should be undertaken using independent external laboratories, to complement the laboratory analyses carried out by the Olaroz laboratory.

Ongoing water level monitoring should establish the changes of the commencement and ongoing operation of pumping by the Exar Project.

23.2 Metallurgy and Processing

As of the Effective Date, Olaroz 2 is currently in the pre-commissioning and commissioning stage. This stage consists of verifications prior to start-up that ensures equipment and construction conformance to safe design. Pre-commissioning and commissioning activities will ensue in order of importance:

- The safety of people, the environment and company assets.
- The integrity and operation of the equipment.
- Efficient execution to reach commissioning without setbacks or delays.

During operations, it will be necessary to monitor and control critical elements in the brine solutions to minimize impurity impact and maximize quality Lithium recoveries.

Operation of the ponds and plant should be monitored, and data analyzed to optimize operations and minimize use of chemical reagents, while optimizing lithium recovery. Use of freshwater in the production process must be monitored and optimized, to allow continuous improvement and reduction in consumption per tonne of lithium product.

For optimization of lithium recovery operations, there are several technologies that should be evaluated as alternatives to ensure the company's long-term future production. In particular, the carbonation plan effluent, called "mother liquor", is recirculated in the process, discharging it again to the evaporation pond circuit. This mother liquor stream still contains some lithium concentration, which is not lost when being recirculated, but at the same time any impurities that this stream may have, are also incorporated to the evaporation pond circuit. In order to improve this recovery process, it is recommended to evaluate alternatives that allow to recover as lithium as possible from this mother liquor stream but leaving the other elements or impurities behind to avoid their recirculation.

23.3 Market Studies

Market analysis will continue to evolve during the project development phase. It is recommended that Allkem continue with ongoing market analysis and related economic sensitivity analysis.

Risk factors and opportunities in technological advancements, competition and macroeconomic trends should be reviewed for relevancy prior to major capital investment decisions. Remaining abreast of lithium extraction technology advancements, and potential further test work or pilot plant work may provide opportunities to improve the Project economics.

23.4 Environmental and Social Recommendations

Ongoing social development will enhance the importance of the lithium industry in the area. The lithium production industry is seeing increased extraction development with competing mines establishing in close proximity. Enhanced engagement between such mines can ensure alignment of social development plans that will best benefit the incumbent communities.

Continual engagement with local authorities is recommended to ensure changes in legislation, administrative errors or omissions and changes in political office holders are proactively managed and issues addressed. Continual environmental monitoring, reporting and compliance is best managed proactively toward bi-annual license renewals to minimize any potential delays.

23.5 Project Costs and Financial Evaluation

The Olaroz Stage 2 is nearing completion with most capital costs committed and confirmed. Commissioning and ramp up has been modelled as part of the economics and are deemed realistic and achievable in the opinion of the QPs.

The risk of changes to government acts, regulations, tax regimes or foreign exchange regulation remains and must be reviewed upon enactment. Related risk and change management must be accurately reflected in the Project contingencies or expected economic performance.

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25. RELIANCE ON INFORMATION PROVIDED BY THE REGISTRANT

The QPs have relied on information provided by Allkem (the registrant), including expert reports, in preparing its findings and conclusions with respect to this report.

The QPs consider it reasonable to rely on Allkem for this information as Allkem has obtained opinions from appropriate experts with regard to such information.

The QPs have relied upon the following categories of information derived from Allkem and legal experts retained by Allkem and have listed the sections of this report where such information was relied upon:

- Ownership of the Project area and any underlying mineral tenure, surface rights, or royalties. (Section 3.1, 3.2)
- Baseline survey data collected related to social and economic impacts. (Section 22.2)
- Social and community impacts assessments for the operation. (Section 17.5)
- Marketing considerations and commodity price assumptions relevant to the operation. (Section 16.1.4, 16.2)
- Taxation considerations relevant to the operation. (Section 18.7.1, 19.2.6)

26. SIGNATURE PAGE

CERTIFICATE OF AUTHOR

I, Murray Brooker, Geologist, M.Sc., Geol., M.Sc. Hydro, do hereby certify that:

1. I am currently employed as a consultant with Hydrominex Geoscience, located in 63 Carlotta St, Greenwich, NSW, 2065, Australia.
2. This certificate applies to the Technical Report titled "SEC Technical Report Summary, Olaroz Lithium Facility" (the "Technical Report")" (the "Technical Report") prepared for Allkem Limited ("the Issuer"), which has an effective date of June 30, 2023, the date of the most recent technical information.
3. Allkem Limited, the registrant, engaged the services of Hydrominex Geoscience, to prepare the individual Technical Report Summary at the AACE Class IV (FS) level on their property using data gathered by the Qualified Persons ("QPs") to the disclosure requirements for mining registrants promulgated by the United States Securities and Exchange Commission (SEC), in accordance with the requirements contained in the S-K §229.1300 to S-K §229.1305 regulations. The property is considered material to Allkem Ltd.
4. This report has an effective as-of date of June 30, 2023. The valuable material will be mined through brine extraction mining methods by the proprietor, Allkem Ltd.
5. I am a graduate of the Victoria University of Wellington, New Zealand in 1988 BSc (Honours); MSc. in Geology from James Cook University of North Queensland, Australia, in 1992; M.Sc. in Hydrogeology from the University of Technology, Sydney, Australia, in 2002. I am a professional in the discipline of hydrogeology and am a registered professional of the Australian Institute of Geoscientists (MAIG). I have practiced my profession continuously since 1992. I have read the definition of "qualified person" set out in S-K §229.1300 and certify that by reason of my education, affiliation with a professional association (as defined in S-K §229.1300), and past relevant work experience, I fulfill the requirements to be a "qualified person" for the purposes of S-K §229.1300 reporting.
6. I completed a personal inspection of the Property on November 21st, 2022, and have visited the property many times since March 2010.
7. I am responsible for sections pertaining thereto in Chapter 1 (shared), Chapter 2, Chapter 3, Chapter 4, Chapter 5, Chapter 6, Chapter 7, Chapter 8, Chapter 9, Chapter 11, Chapter 13, Chapter 17, Chapter 20, Chapter 21, Chapter 22 (shared), Chapter 23(shared), Chapter 24, Chapter 25 (shared).
8. I am independent of the Issuer and related companies applying all of the sections of the S-K §229.1300.
9. I have had prior involvement with the property.
10. As of the effective date of the Technical Report Summary and the date of this certificate, to the best of my knowledge, information, and belief, this Technical Report Summary contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signing Date: November 15, 2023.

/s/ Murray Brooker
Murray Brooker,
Consulting Hydrogeologist, Hydrominex Geoscience.
Member AIG 3503, RPGeo 10086

CERTIFICATE OF AUTHOR

I, Michael John Gunn, Metallurgical Engineer, Principal of Gunn Metallurgy, do hereby certify that:

1. I am currently employed as Principal of Gunn Metallurgy located in 58 Deerhurst Rd, Brookfield 4069 Australia.
2. This certificate applies to the Technical Report titled “SEC Technical Report Summary, Olaroz Lithium Facility” (the “Technical Report”)” (the “Technical Report”) prepared for Allkem Limited (“the Issuer”), which has an effective date of June 30, 2023, the date of the most recent technical information.
3. Allkem Limited, the registrant, engaged the services of Gunn Metallurgy, to prepare the individual Technical Report Summary at the AACE Class IV (FS) level on their property using data gathered by the Qualified Persons (“QPs”) to the disclosure requirements for mining registrants promulgated by the United States Securities and Exchange Commission (SEC), in accordance with the requirements contained in the S-K §229.1300 to S-K §229.1305 regulations. The property is considered material to Allkem Ltd.
4. This report has an effective as-of date of June 30, 2023. The valuable material will be mined through brine extraction mining methods by the proprietor, Allkem Ltd.
5. I am a graduate of the University of New South Wales (B. App. Sc. Metallurgy). I am a professional in the discipline of Metallurgical Engineering and am a registered Fellow of the Australasian Institute of Mining and Metallurgy. I have practiced my profession continuously since 1975. I have read the definition of “qualified person” set out in S-K §229.1300 and certify that by reason of my education, affiliation with a professional association), and past relevant work experience, I fulfill the requirements to be a “qualified person” for the purposes of S-K §229.1300 reporting.
6. I completed a personal inspection of the Property in 2023.
7. I am responsible for sections pertaining thereto in Items: Chapter1 (shared), Chapter 10, Chapter 14, Chapter 15, Chapter 16, Chapter 18, Chapter 19, Chapter 22 (shared), Chapter 23 (shared), Chapter 25 (shared).
8. I am independent of the Issuer and related companies applying all of the sections of the S-K §229.1300.
9. I have had prior involvement with the Olaroz [Jujuy Argentina] property.
10. As of the effective date of the Technical Report Summary and the date of this certificate, to the best of my knowledge, information, and belief, this Technical Report Summary contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.

Signing Date: November 15, 2023.

/s/ Michael J. Gunn
Michael J. Gunn
Metallurgical Engineer of Gunn Metallurgy
Fellow of the Australasian Institute for Mining and Metallurgy R# 101634

This report titled "SEC Technical Report Summary, Olaroz Lithium Facility" with an effective date of June 30, 2023, was prepared and signed by:

/s/ Murray Brooker
Hydrominex Geoscience

By: Murray Brooker

/s/ Michael J Gunn
Gunn Metallurgy

By: Michael J. Gunn