Exhibit 96.3

SEC Technical Report Summary

Sal de Vida Lithium Brine Project

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1. EXECUTIVE SUMMARY

1.1 Background

This report discloses the lithium brine mineral resource for Allkem Limited's (Allkem's) Sal de Vida Project (Sal de Vida, SDV or "the Project"). The Project is a planned brine mining and processing facility that has commenced construction of processing infrastructure.

In 2022 the Project embarked on the construction and upgrade of the initial 15,000 tonne per annum (tpa) (SDV Stage 1) Lithium Carbonate Equivalent (LCE) production facility and aims to complete construction in the first half of 2025. The Project further plans a modular 30,000 tpa (15,000 tpa + 15,000 tpa) (SDV Stage 2) expansion which is still in the pre-feasibility study phase. The Project aims to produce 45,000 tpa in total from the planned staged expansions.

This report has been prepared in conformance with the requirements of the Securities and Exchange Commission (SEC) S-K Regulation (Subpart 1300) (the "SK Regulations"). This individual Technical Report is the initial report in support of Allkem's listing on the New York Stock Exchange (NYSE). This report updates project Mineral Resources, cost estimates, and economics as of the report Effective Date (June 30, 2023).

The Stage 1 wellfield, brine distribution, evaporation ponds, waste (wells and ponds) and Stage 1 process plant cost estimates are AACE Class 2 ±10% (with an accuracy of ±10% and contingency less than 10%). Costs for the 30,000 tpa Stage 2 are AACE Class 4 +30% / - 20% (with an accuracy of ±25% and contingency of 15%) with no escalation of costs in the context of long-term product pricing estimates. This report presents separate economics for Stage 1 (15,000 tpa) currently under construction, followed by a combined Stage 1 and Stage 2 (45,000 tpa) economic assessment.

Lithium production has not commenced at the Sal de Vida site as of the Effective Date. As of the Effective Date, SDV Stage 1 construction is approximately 24% complete. Detailed engineering, quantity estimation, contractor pricing, obtained permits, and social aspects are sufficiently progressed to develop this report to feasibility study level estimate for Stage 1 as defined by the SK Regulations.

SDV Stage 2 is sufficiently developed to report on a Pre-Feasibility Study level.

Updated Mineral Resources and Reserves are being reported as production well drilling campaign progression and greater knowledge of the basin and its geologic setting.

Conclusions, 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 Project performance or outcomes and naturally include inherent risk.

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 Property Description and Ownership

Sal de Vida (latitude 25° 24’ 33.71” South, longitude 66° 54’ 44.73” West) is located approximately 200 kilometers (km) south of Olaroz in the high-altitude Puna ecoregion of the Altiplano of northwest Argentina at approximately 4,000 meters (m) above sea level. Sal de Vida is within Salar del Hombre Muerto in the Province of Catamarca.

The main route to the Project site is from the city of San Fernando del Valle de Catamarca via National Route 40 to Belen, and Provincial Route 43 through Antofagasta de la Sierra to the Salar del Hombre Muerto. The road is paved all the way to Antofagasta de la Sierra and continues unpaved for the last 145 km to Salar del Hombre Muerto. The Antofagasta region of Chile is used to export lithium carbonate product and to import key chemicals used in the production of lithium carbonate. The property does not have nearby electrical or natural gas access. The Project will be powered by diesel generators with plans to decarbonize through a combination of natural gas supply and renewable solar power options. Environmental and social permits for the solar power options have been approved.

The climate in Sal de Vida area can be described as typical of a continental, cold, high-altitude desert, with resultant scarce vegetation. The climate allows year around project operation.

Allkem’s mining tenement interests in the Sal de Vida Project are held by Galaxy Lithium (Sal de Vida) S.A., a wholly owned subsidiary of Galaxy Resources Ltd. (Australia) which in turn is 100% owned by Allkem Ltd. since August 2021.

Allkem currently has mineral rights over 26,253 hectares (ha) at Salar del Hombre Muerto, which are held under 31 mining concessions. Allkem has been granted easements related to water, camps, infrastructure, and services enabling the commencement of Stage 1 construction. The Project is not subject to any known environmental liabilities other than those actions and remedies indicated in the Environmental Impact Study approval process.

1.3 Geology and Mineralization

Mineral exploration began in the Salar del Hombre Muerto with shallow pit campaigns to obtain data on near-surface geology, subsurface water levels, brine chemistry, and physical parameters. Multiple geophysical campaigns also were completed for subsurface interpretations including gravity, vertical electric soundings, and transient electromagnetic surveys.

Historical drilling was conducted in several phases that were divided into Phases 1 through 6, with Phase 1 commencing in 2009, and Phase 6 East Wellfield development during the period 2020 to 2021. A total of 40 brine well, core, and reverse circulation (RC) drill holes (5,570 m) have been completed. Downhole geophysical logging was completed for the Phase 4 to Phase 6 programs and consisted of resistivity and spontaneous-potential surveys, with three wells having in addition magnetic-resonance, spectral gamma ray, and image logs. Recovery percentages of drill core were recorded for each core hole; percent recovery was excellent for most of the samples obtained.

Porosity samples were collected during 2010, 2011, and 2012 from intact HQ and NQ size cores. In addition to the depth-specific brine samples obtained by drive points during coring, brine samples used to support the reliability of the depth-specific samples included analyses of brine centrifuged from core samples, brine obtained from low-flow sampling of the exploration core holes, brine samples obtained near the end of the pumping tests in the exploration wells, and brine samples obtained during reverse-circulation air drilling.

1.4 Status of Exploration Activities

Mineral exploration began in the Salar del Hombre Muerto with shallow pit campaigns to obtain data on near-surface geology, subsurface water levels, brine chemistry, and physical parameters. Multiple geophysical campaigns also were completed for subsurface interpretations including gravity, vertical electric soundings, and transient electromagnetic surveys.

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The exploration activities have been sufficiently progressed to support resource estimation.

1.5 Development and Operations

1.5.1 Recovery Methods

Galaxy conducted a series of internal and external test work programs to determine the feasibility of producing battery-grade (BG) lithium carbonate (>99.5 wt% purity) with qualified third parties contracted to perform ongoing validation.

Pilot testing was conducted during 2020 and 2021 purpose-built pilot ponds and pilot plant to validate laboratory test work and explore operational considerations. Testing included empirical evaporation performance, process liming, softening, and crystallization test work. The pilot program demonstrated that consistent production of battery grade lithium carbonate can be produced with the Sal de Vida process. Piloting also allowed the site team to develop experience in evaporation ponds and process plant operation while testing a variety of equipment and instrumentation for the industrial-scale plant.

Project facilities are divided into four main areas including wellfield and brine distribution, evaporation ponds, the lithium carbonate plant, and waste tailings disposal stockpile.

1.5.2 Process Facility Design

The recovery process of lithium from the brine is summarized below and presented in a flowsheet in Figure 1-1.

The process will commence with brine extracted from wells extending to a depth of up to 280 m into the salar. Brine will be pumped to a series of evaporation ponds, where it will be evaporated and processed at the onsite lithium carbonate plant.

The wellfields will be located directly above the Salar del Hombre Muerto over the salt pan, with minimal infrastructure residing on the surface. The brine distribution systems will traverse the salar to where the evaporation ponds will be located. The production plant will be located adjacent to the evaporation ponds on colluvial sediments. The waste disposal areas will surround the evaporation ponds.

The process facility will be located in an area adjacent to the muriate ponds, and will consist of a lithium carbonate plant, with a liming plant and associated plant infrastructure, such as the power station, fueling, and workshops.

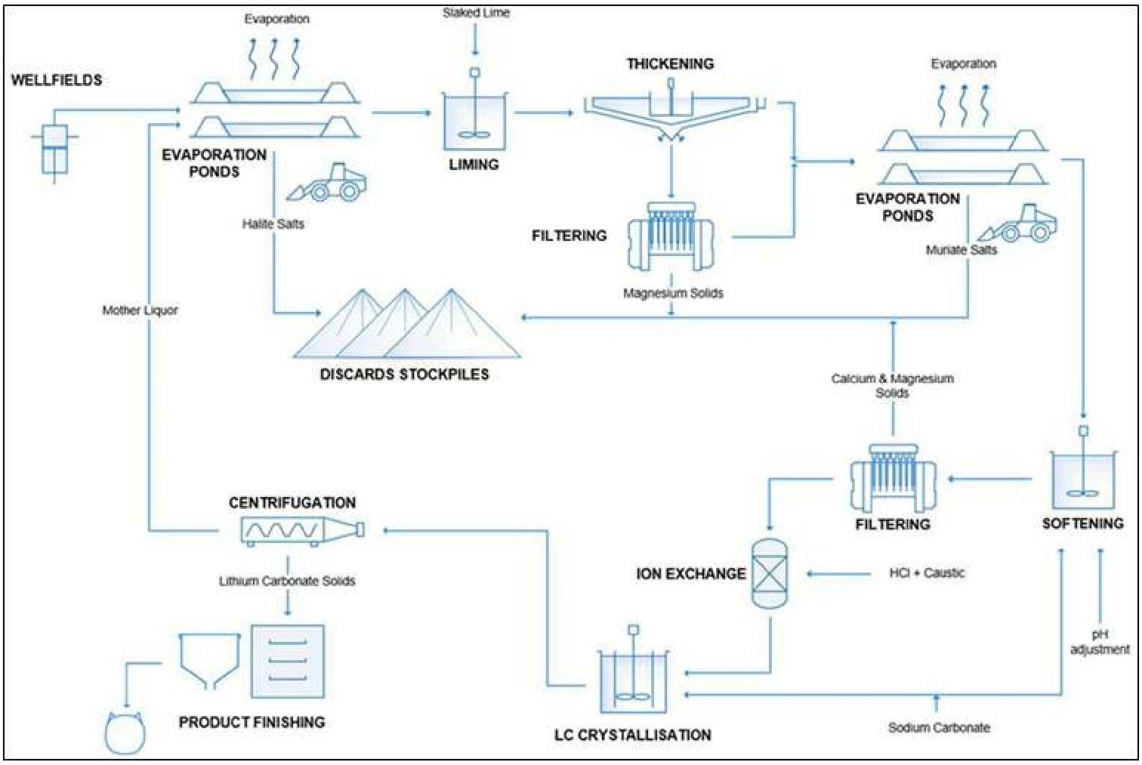

Figure 1-1 - Sal de Vida Simplified Process Flow Diagram (Figure prepared by Galaxy, 2020. LC = lithium Carbonate).

The Life of Mine (LOM) operation, developed in two stages (Figure 1-2), will consist of:

- Wellfield and brine distribution.
- Solar evaporation ponds.
- Production plant (liming and lithium carbonate plant).
- Waste disposal.

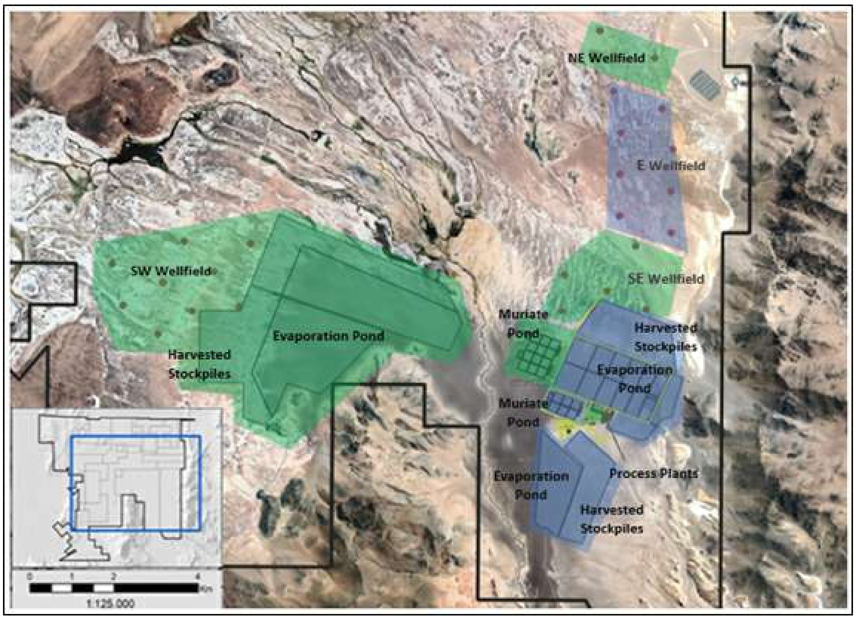

Figure 1-2 - Sal de Vida Project Layout Plan[1].

1.5.3 Project Infrastructure

The construction of the Sal de Vida Stage 1 project is underway. Brine well fields, and evaporation ponds have progressed. The processing plant construction has commenced with early earthworks and concrete.

Site buildings will include the process plant area, reagent preparation, product storage, maintenance and vehicle workshops, gatehouse, first aid, and administration offices. The permanent accommodation camp will house 330 personnel and will be temporarily expanded with up to 600 additional capacities for the construction phase. Accommodation quantities are deemed sufficient for the required construction schedule and related resourcing.

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[1] Figure provided by Allkem, 2023. Blue areas represent Stage 1, green areas planned Stage 2 facilities.

Detailed engineering is near completion, providing confidence in estimated quantities and engineering schedules.

Allkem’s current operations at the Olaroz project are of similar nature and process. Internal company policies, standard operating procedures, management systems, and structures will allow sufficiently rigid establishment of initial operations at the Project site and reduce commissioning and ramp-up risk.

International equipment fabrication, local supply chains, logistics, site access, contractor equipment and performance, and labor relations represent inherent construction schedule risk which has been modeled using quantitative stochiometric methods to best predict and manage schedule risk.

Mobile equipment will be required for plant and pond operations. Some transport services will be supplied to Allkem under contract with local companies; however, in most cases, the equipment will be owned and operated by Allkem. Allkem will provide fuel and servicing for all vehicles, except for reagent supply and product logistic requirements off-site.

1.5.4 Environmental and Social

Allkem Sal de Vida Stage 1 has all permits and authorizations in place to construct, operate, and produce lithium carbonate from the project. Environmental Impact Assessment (EIA) is renewed every two years. Other permit details can be found in Section 17.6.

The Project construction and operation provide new employment opportunities and investment in the region, which is expected to have a positive social impact.

Allkem Sal de Vida has a Community Relations Plan (CRP) in place, which has specified programs to ensure a sustainable operation within the regional and local communities. The programs set out commitments that include timeframes and schedules where appropriate and are aligned with Galaxy’s four-pillar focus for social initiatives and projects within its sustainability framework, such as education and employment, sustainable development and culture, health and well-being, and infrastructure.

Environmental baseline studies were performed in the Sal de Vida Project area during a number of field seasons starting in 1997. Study areas included water quality evaluations of the salar and surface waters, water chemistry, water baseline studies, flora, fauna, limnology, phytoplankton, archaeology, air quality, noise, soils, geology, geomorphology, hydrogeology, hydrology, climate, landscape, ecosystem characterization, and socioeconomic considerations. Required environmental approvals were obtained prior to the commencement of construction. Further production permitting will be sourced prior to the commencement of operation.

Allkem has developed a Final Closure Plan and associated capital allocation to close the mine at the end of the exploitation permit period. An option to renew the exploitation permit is possible.

The SDV Project permitting processes sufficiently addressed environmental, community, and socio-economic issues allowing the granting of the required permits for construction. Further permitting is progressed to support commencing operations upon completion of construction.

1.6 Mineral Resource Estimate

This sub-section contains forward-looking information related to Mineral Resource estimates for the Sal de Vida Project. The material factors that could cause actual results to differ from the estimates or conclusions include any significant differences from one or more of the material aspects or assumptions outlined in this sub-section including geological and brine grade interpretations, as well as controls and assumptions related to establishing reasonable prospects for economic extraction.

Resource estimation methods to characterize in-situ brine deposits must include two key components: characterization of mineral grade dissolved in the brines, and characterization of the host aquifer drainable porosity that contains the mineral to be estimated. To estimate the total amount of lithium in the brine, the basin was first sectioned into polygons based on the location of exploration drilling, a commonly applied method for lithium brine resource estimates. Each polygon block contained one core drill exploration hole that was analyzed for both depth-specific brine chemistry and drainable porosity. Boundaries between polygon blocks were generally equidistant from the core drill holes and the total well depth was used as the base of the polygons. The total area of polygon blocks used for resource estimates is about 160.9 square kilometers (km^2). Within each polygon shown on the surface, the subsurface lithological column was separated into lithologic units. Each interval was assigned a specific thickness and was given a value for drainable porosity and average lithium content based on laboratory analyses of samples collected during exploration drilling. The estimated resource for each polygon was the sum of the products of saturated lithologic unit thickness, polygon area, drainable porosity, and lithium content. The resource estimated for each polygon was independent of adjacent polygons.

The key parameters of brine mineral grade and drainable porosity were analyzed and used to estimate the Measured, Indicated, and Inferred Brine Resources. To classify a polygon as Measured or Indicated, the following factors were considered:

- Level of understanding and reliability of the basin stratigraphy.
- Level of understanding of the local hydrogeologic characteristics of the aquifer system.
- Density of drilling and testing in the salar and general uniformity of results within an area.
- Available pumping test and historical production information.

Based on the current understanding of the hydrogeological system of the Salar de Hombre Muerto, the additional data on brine occurrence and chemistry, the relative consistency of the hydrogeological and chemical data, confidence in the drilling and sampling results achieved to date, and historical production information (east side), there were sufficient grounds to classify certain polygons as Measured Brine Resources.

Table 1-1 presents the Mineral Resources exclusive of Mineral Reserves (Chapter 12). When calculating Mineral Resources exclusive of Mineral Reserves, a direct correlation was assumed between Measured Resources and Proven Reserves as well as Indicated Resources and Probable Reserves. Mineral Resources were estimated on an in-situ basis; Reserves at a point of reference of brine pumped from the wellheads to the evaporation ponds were subtracted from the Resources inclusive of Reserves. A lithium cut-off grade of 300 mg/l was utilized based on a breakeven cut-off grade for a projected lithium carbonate equivalent price of US$20,000 per tonne over the entirety of the LOM and a grade-tonnage curve. Considering the economic value of the brine against production costs, the applied cut-off grade for the resource estimate (300 mg/l) is believed to be conservative in terms of the overall estimated resource. Intervals of the polygons with grades below the 300 mg/l cut-off grade were not considered in the resource estimate; thus, with these assumptions, a reasonable basis has been established for the prospects of eventual economic extraction.

Table 1-1 - Summary of Brine Resources, Exclusive of Mineral Reserves (Effective June 30, 2023).

Category	Lithium (Million Tonnes)	Li_2CO_3 Equivalent (Million Tonnes)	Average Li (mg/l)
Measured	0.58	3.07	745
Indicated	0.18	0.96	730
Total Measured and Indicated	**0.76**	**4.03**	**742**
Inferred	0.12	0.65	556

1. S-K §229.1300 definitions were followed for Mineral Resources and Mineral Reserves.
2. The Qualified Person(s) for these Resource estimates are the employees of Montgomery & Associates for Sal de Vida.
3. Comparison of values may not add up due to rounding or the use of averaging methods.
4. Lithium is converted to lithium carbonate (Li_2CO_3) with a conversion factor of 5.323.
5. 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.
6. The cut-off grade used to report Sal de Vida Mineral Resources and Mineral Reserves is 300 mg/l.
7. 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.

Mineral Resources are also reported inclusive of Mineral Reserves. The current Mineral Resource estimate, inclusive of Mineral Reserves, for the Sal de Vida Project is summarized in Table 1-2.

Table 1-2 - Summary of Brine Resources, Inclusive of Mineral Reserves (Effective June 30, 2023)

Category	Lithium (Million Tonnes)	Li_2CO_3 Equivalent (Million Tonnes)	Average Li (mg/l)
Measured	0.66	3.52	752
Indicated	0.56	3.00	742
Total Measured and Indicated	**1.22**	**6.52**	**747**
Inferred	0.12	0.65	556

1. S-K §229.1300 definitions were followed for Mineral Resources and Mineral Reserves.
2. The Qualified Person(s) for these Resource estimates are the employees of Montgomery & Associates for Sal de Vida.
3. Comparison of values may not add up due to rounding or the use of averaging methods.
4. Lithium is converted to lithium carbonate (Li_2CO_3) with a conversion factor of 5.323.
5. The cut-off grade used to report Sal de Vida Mineral Resources and Mineral Reserves is 300 mg/l.
6. 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.

Factors that may affect the Brine Resource estimate include: locations of aquifer boundaries; lateral continuity of key aquifer zones; presence of fresh and brackish water which have the potential to dilute the brine in the wellfield area; the uniformity of aquifer parameters within specific aquifer units; commodity price assumptions; changes to hydrogeological, metallurgical recovery, and extraction assumptions; density assignments; and input factors used to assess reasonable prospects for eventual economic extraction. Currently, the QPs do not know of any environmental, legal, title, taxation, socio-economic, marketing, political, or other factors that would materially affect the current Resource estimate.

1.7 Mineral Reserve Estimate

This sub-section contains forward-looking information related to Mineral Reserve estimates for the Sal de Vida Project. The material factors that could cause actual results to differ from the estimates or conclusions include any significant differences from one or more of the material aspects or assumptions set forth in this sub-section.

The Mineral Reserve was estimated based on physical pumping of the brine that flows during wellfield pumping using a calibrated numerical model that simulates groundwater flow and solute transport. The method considers modifying factors for converting Mineral Resources to Mineral Reserves in brine deposits, including allowable well field pumping and dilution of brine during pumping, among others.

A 3D numerical model was constructed using the Groundwater Vistas Version 7 interface and Modflow USG-Transport was utilized to simulate variable-density flow and transport. The active model domain encompasses the clastic sediments and evaporite deposits that comprise the Salar del Hombre Muerto as well as the upgradient alluvial deposits and the Río de los Patos sub-basin. Vertically, the domain was divided into 12 model layers, and the base of the active model domain was set based on the current depth to basement interpretation. The numerical model boundary conditions were designed to be consistent with the conceptual baseline water balance and hydraulic properties were assigned based on the hydrogeological unit and adjusted throughout the calibration process.

Prior to the simulation of future brine production, the numerical model was calibrated to verify assigned model parameters such as hydraulic conductivity and specific storage. The numerical groundwater model was initially calibrated to average, steady-state conditions using the available average on-site field measurements of water levels in observation wells. A transient model calibration to two long-term pumping tests in the East and Southwest Wellfields was conducted to better represent the aquifer’s response to pumping. Furthermore, a model verification period was analyzed with respect to real extracted lithium grades. Total dissolved solids (TDS) in the brine and freshwater were defined as the only solute components in the numerical model to represent the concentration-water density relationship and freshwater-brine interface. The linear relationships with TDS were used to estimate concentrations in pumped brine from the wellfield simulation due to its good correlation with water density.

Projected production locations were based on the Measured Resource zones and were configured to reduce well interference during pumping. The Stage 1 pumping from the East Wellfield is expected to produce 15,000 t of LCE per year (assuming processing losses) while Stage 1 and Stage 2 will generate a total of 45,000 t of LCE per year (assuming processing losses), with active pumping from the southwest and eastern portions of the mine concessions. Due to seasonal changes in pond evaporation and maintaining the lithium carbonate target for each stage, the modeled production pumping rates are time-variable on monthly and annual timeframes.

The total lithium to be extracted from the proposed East and Stage 2 Expansion Wellfields was calculated for a total period of 40 years. The model projections used to determine the Brine Reserve, which assumed increasing pumping from both wellfields, indicate that the proposed wellfields should be able to produce a reliable quantity of brine at an average annual rate of approximately 315 l/s in the case of production wells in the eastern portion of the mining concessions and about 191 l/s in the case of the southwest.

Table 1-3 gives results of the Proven and Probable Brine Reserves at the point of reference of brine pumped to the evaporation ponds. A lithium cut-off grade of 300 mg/l was conservatively utilized based on a breakeven cut-off grade for a projected lithium carbonate equivalent price of US$20,000 per tonne over the entirety of the LOM. The average lithium grade of the Proven and Probable Reserves corresponds to 757 mg/l and represents the flux-weighted composite brine collected as brine is routed to the evaporation ponds. Extracted grades at individual production wells and the average Proven and Probable reserve concentration are well above the 300 mg/l cut-off grade, demonstrating that production is economically viable.

Table 1-3 - Summary of Estimated Proven and Probable Brine Reserves (Effective June 30, 2023).

Reserve Category	Wellfield	Time Period	Average Lithium Grade (mg/l)	Lithium (Million Tonnes)	Li_2CO_3 Equivalent (Million Tonnes)
Proven	Stage 1 East	1-7	785	0.031	0.163
Proven	Stage 2 Expansion	3-9	807	0.053	0.282
Total Proven			**799**	**0.084**	**0.445**
Probable	Stage 1 East	8-40	726	0.147	0.780
Probable	Stage 2 Expansion	10-40	763	0.237	1.261
Total Probable			**748**	**0.383**	**2.041**
Total Proven and Probable			**757**	**0.467**	**2.486**

1. S-K §229.1300 definitions were followed for Mineral Resources and Mineral Reserves.
2. The Qualified Person(s) for these mineral resource estimates are the employees of Montgomery & Associates for Sal de Vida.
3. Comparison of values may not add up due to rounding or the use of averaging methods.
4. Lithium is converted to lithium carbonate (Li_2CO_3) with a conversion factor of 5.323.
5. The cut-off grade used to report Sal de Vida Mineral Resources and Mineral Reserves is 300 mg/l.

During the evaporation and concentration process of the brine, there will be anticipated losses of lithium. Based on the Chapter 10 breakdown of recoveries and current processing method, the amount of recoverable lithium in the evaporation ponds and plant is calculated to be 70% of the total brine pumped to the ponds. This applies to the current processing method which may be subject to improvements at a later date.

The Mineral Reserve was classified according to industry standards for brine projects, as well as the confidence of the numerical model predictions and potential factors that could affect the estimation. Projected production wells were placed in Measured Resource areas. The Qualified Persons (QPs) believe that the Proven and Probable Mineral Reserves were adequately categorized, as described below:

- Proven Reserves were specified for the first 7 years of operation (years 1-7) in the East Wellfield (Stage 1) and years 3-9 for the Stage 2 Expansion Wellfield given that short-term results have higher confidence due to the current model calibration and also the initial portion of the projected LOM has higher confidence due to less expected short-term changes in extraction, water balance components, and hydraulic parameters.
- Probable Reserves were conservatively assigned after 7 years of operation (years 8-40 in the East Wellfield and years 10-40 for the Stage 2 Expansion Wellfield because the numerical model will be recalibrated and improved in the future due to potential changes in neighboring extraction, water balance components, and hydraulic parameters.

Regarding risk factors, the Brine Reserve estimate may be affected by the following:

- Assumptions regarding aquifer parameters and total dissolved solids used in the groundwater model for areas where empirical data does not exist.

- Estimated vertical hydraulic conductivity values partially control the amount of anticipated future dilution in areas where fresh water overlies brine.

Regardless of these sources of uncertainty, each phase of the Project was conducted in a logical manner, and results were supportable using standard analytical methodologies. In addition, calibration of the numerical model against long-term pumping tests provides solid support for the conceptual hydrogeologic model developed for the Project. Thus, there is a reasonably high-level confidence in the ability of the aquifer system to yield the quantities and grade of brine estimated as Proven and Probable Mineral Reserves. To the extent known by the QPs, there are no known environmental, permitting, legal, title, taxation, socioeconomic, marketing, political or other relevant factors that could affect the Mineral Reserve estimate which are not discussed in this Report.

1.8 Capital and Operating Cost Estimates

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.

The SDV Project Stage 1 is a greenfield project currently in initial stages of construction following sufficient progression of detailed engineering and securing required permitting, and the capital cost does not consider expenditures that have already been absorbed by Allkem in the prior development phases, which are considered to be sunk costs.

1.8.1 Capital Cost Estimate

The Sal de Vida Project overall construction progress reached 24% completion in June 2023. The estimate includes capital cost estimation data developed and provided by Worley, Allkem, and current estimates for completion for Stage 1.

A summary of the estimated direct and indirect capital costs by area is presented in Table 1-4. The capital costs are expressed in an effective exchange rate shown as Allkem's actual expense. The capital costs tabled are up to mechanical completion and exclusive of commissioning, pre-operating costs, working capital, and first fill or brine inventory.

Table 1-4 - Capital Expenditures by Area: Stage 1.

Description	Capital Intensity (US$ / t Li_2CO_3)	CAPEX Breakdown (US$ m)
Direct Costs		
General Engineering & Studies	746	11
Wellfields & Brine Distribution	839	13
Evaporation Ponds, Waste & Tailings	4,555	68
LiCO Plant & Reagents	12,133	182
Utilities	587	9
Infrastructure	1,533	23
Total Direct Cost	**20,392**	**306**
Owner Costs + Contingency	4,567	69
TOTAL CAPEX	**24,959**	**374**

The total sustaining and enhancement capital expenditures for Sal de Vida Project over the total Life of Mine (LOM) period are shown in Table 1-5.

Table 1-5 - Sustaining CAPEX.

Description	Total Year* (US$ m)	Total LOM (US$ m)
Sustaining CAPEX	11	434

* Long Term estimated cost per year

1.8.2 Operating Cost Estimate

The operating cost estimate for Sal de Vida Project was prepared by Allkem’s management team. The cost estimate excludes indirect costs such as corporate head office, marketing and sales, exploration, project and technical developments, and other centralized corporate services. The operating cost also does not include royalties, and export taxes to the company.

Table 1-6 provides a summary of the estimated cost for a nominal year of operation. No inflation or escalation provisions were included. Subject to the exceptions and exclusions set forth in this Report.

Table 1-6 - Operating Cost: Summary.

Operating Cost	Per Tonne LOM (US$ / t Li_2CO_3)	Total LOM (US$ m)	Total Year* (US$ m)
Variable Cost	2,161	1,259	32
Fixed Cost	2,367	1,380	34
TOTAL OPERATING COST	**4,529**	**2,639**	**66**

* Long Term estimated cost per year

1.8.3 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 Project.

1.8.4 Contracts

As of the date of this Technical Report, Allkem has no existing commercial offtake agreements in place for the sale of lithium carbonate from the Sal de Vida Project.

Allkem is having discussions with potential customers for the Sal de Vida Project. In line with the Sal de Vida Project execution schedule, these discussions are expected to advance to negotiations throughout the course of the Sal de Vida Project.

Orocobre Ltd. and Galaxy Resources Ltd. (now Allkem) have been active participants in lithium markets since 2012 and have been a seller in both lithium concentrate (“concentrate” or “spodumene”) and lithium chemicals markets due to past and present operations. Allkem produces lithium carbonate and concentrate which is sold to various customers in Asia. At present, Allkem is the operating joint venture partner of the Sales de Jujuy Olaroz lithium carbonate facility and operator of the Mt. Cattlin spodumene mine and concentration project.

1.9 Economic Analysis - Stage 1 Only

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.

1.9.1 Financial Evaluation - Stage 1 Only

The Discounted Cash Flow (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% Project basis, include:

- NPV at a discount rate of 10%.
- Internal rate of return (IRR), when applicable.
- Payback period, when applicable.

The financial evaluation is dependent on key input parameters and assumptions:

1. Production schedule, including annual brine production, pond evaporation rates, process plant production, and ramp-up schedule. The Sal de Vida Project Stage 1 nominal capacity of annual lithium carbonate is estimated to be 15,000t/year.
2. Plant recoveries and lithium grades.
3. Operating, capital, and closure costs for a 40-years operating life.
4. 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).
5. Product sales are assumed to be Free on Board (FOB) South America.
6. For the purpose of this report, the Corporate Rate was 35%.
7. The economic analysis assumes 100% equity financing.
8. All estimates outlined herein are expressed in FY2024 prices. All projections are estimated in real terms, and they do not incorporate allocations for inflation, or financial expenses, and all financial assessments are expressed in US dollars.

The key metrics for the Sal de Vida Project are summarized in Table 1-7.

Table 1-7 - Main Economic Results.

Summary Economics		
Production		
LOM	yrs	40
First Production	Date	2H CY25
Full Production	Date	2026
Capacity	tpa	15,000
Investment		
Development Capital Costs *(sunk cost)*	US$m	374
Sustaining Capital Costs	US$m per year	11
Development Capital Intensity	US$/tpa Cap	24,959
Cash Flow		
LOM Operating Costs	US$/t LCE	4,529
Avg Sale Price (TG)	US$/t LCE	27,081
Financial Metrics		
NPV @ 10% (Pre-Tax)	US$m	2,006
NPV @ 10% (Post-Tax)	US$m	1,152
NPV @ 8% (Post-Tax)	US$m	1,555
IRR (Pre-Tax)	%	45.5%
IRR (Post-Tax)	%	32.5%
Payback After Tax (production start)	yrs	2.6
Tax Rate	%	35.0%

1.9.2 Sensitivity Analysis - Stage 1 Only

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%.

As seen in Figure 1-3, the commodity price has the most significant impact on the Sal de Vida Project's NPV, followed by production levels, OPEX, and CAPEX. Even under adverse market conditions, such as unfavorable price levels, increased costs, and investment challenges, Sal de Vida remains economically viable.

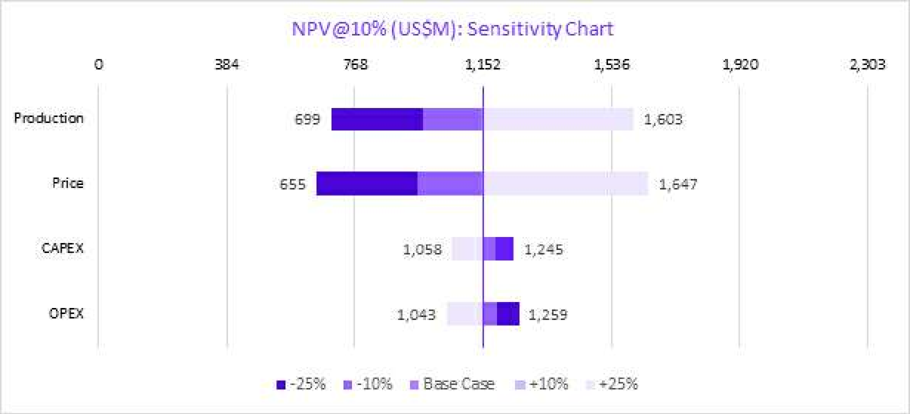

Figure 1-3 - Stage 1 Sensitivity Chart.

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

1.10 Additional Information - Stage 2 Expansion

1.10.1 Stage 2 Description and Layout

The Technical report focusses on the current Sal de Vida Stage 1 execution followed by a planned modular Stage 2 expansion.

The Sal de Vida lithium carbonate plants were designed to produce 15,000 tpa of lithium carbonate in Stage 1, with Stage 2 enabling the production of an additional 30,000 tpa through two 15,000 tpa modules. The modular plant design was based on average brine supplies of 26 m^3/h for Stage 1 and an additional 52 m^3/hr for stage 2 respectively. The design includes an average lithium concentration of 21 g/l in the softening feed. Plants will operate continuously with a design availability of 91%.

Stage 2 will consist of further expansion of operations as established in Stage 1. All Stage 2 facilities will be located within the Stage 1 Project tenements in the southern sector of the Salar del Hombre Muerto. The wellfield will be located directly above the western sub-basin of the Salar del Hombre Muerto over the salt pan. The brine distribution will traverse the salar southeast towards the evaporation ponds on the alluvial field. The production plant for Stage 2 will be sited adjacent to the production plant for Stage 1. The waste disposal areas will surround the evaporation ponds.

A layout of the Stage 2 expansion as depicted in Figure 1-4.

1.10.2 Stage 2 Infrastructure

Utilities and support infrastructure will be expanded in a modularized fashion as necessary to support Stage 2.

Given that Stage 2 is a planned expansion of SDV Stage 1, certain infrastructures such as roads and camp will either remain the same or experience incremental changes (i.e., an extra tank, genset, or another module). This section includes a description of the main infrastructure located at site, including the facilities outlined in Table 1-8.

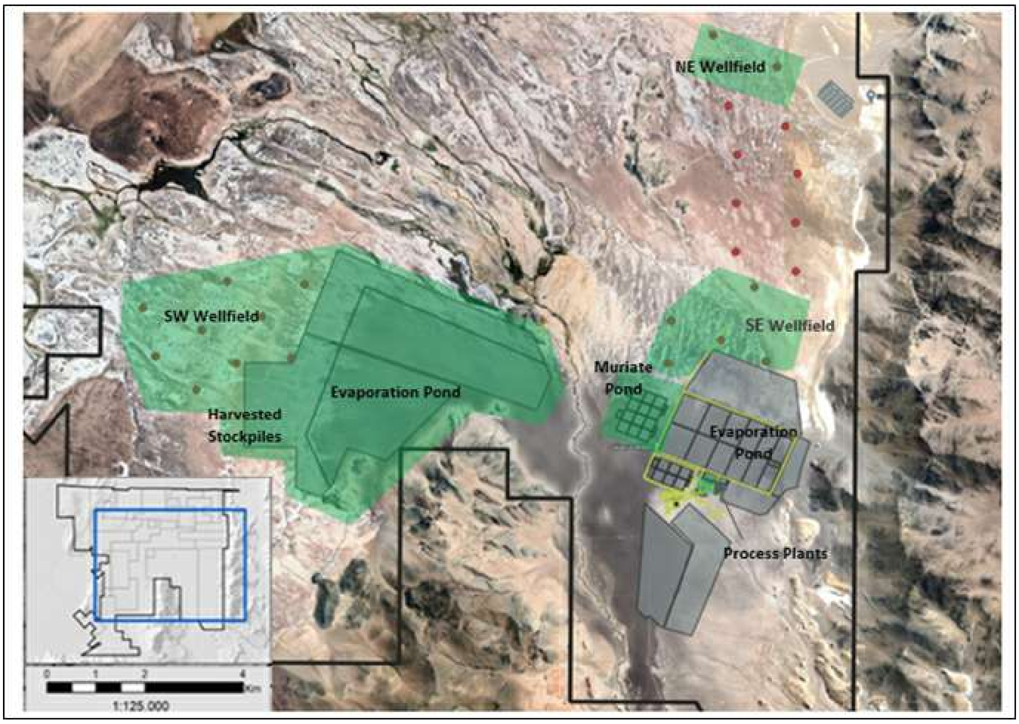

Figure 1-4 - Sal de Vida Stage 2 integrated expansion (Allkem, 2022).

Table 1-8 - Sal de Vida Infrastructure Facilities.

Facility	**Stage 2 Expansion** (Incremental)
Raw water, Reverse Osmosis (RO) water and Demineralized water	**Camp** - 1 raw water tanks, 1 RO plants and 2 RO water tanks **Plant** - 6 raw water tanks, 2 RO plants, 2 demineralized water plants
Power generation and distribution	**Camp** - 1 genset (0.6 MW) **Wellfield** - 16 gensets adjacent to wells **Booster Station** - 2 x 1.4 MW powerhouses **Plant** - 8 MW Hybrid generation
Fuel storage and dispensing	**Camp** - NIL **Plant** - 4 x 75m^3 additional diesel tanks or equivalent
Camp	**Operations** - 3 sleeping modules (100 beds) **Construction** - NIL
Sewage treatment plant	**Operations** - 60 m^3 per day **Construction** - NIL
Fire protection system	**Camp** - NIL

Facility	**Stage 2 Expansion** (Incremental)
	Plant - Extension of system to cover new buildings
Buildings	**Camp**: ● Medical centre (expansion). ● Kitchen and dining room (expansion). ● Offices (expansion). **Plant**: ● Process plant building expansion. ● Reagent storage and preparation building expansion. ● Product storage building expansion. ● Administration offices expansion. ● Canteen expansion. ● First aid building expansion.
Site roads, causeways and river crossings	● Main southwestern access road. ● Rio de los Patos river crossing. ● Salt harvesting roads (west). ● SW wellfield road network.
Communications	● Internet service: increase capacity. ● Radio: repeat station (west).
Mobile equipment	● 25 x Heavy Vehicles. ● 25 x Light Vehicles.
Steam generation	● 4 units (6.7 t/hr of saturated steam each)
Compressed air	● 4 units

1.10.3 Stage 2 Permitting

The physical, biological, and social baseline data for the Project has been collected over the wider area of the Salar de Hombre Muerto since 2011 (ERM, 2011). Specific baseline field campaigns and environmental impact studies will need to be performed as part of the environmental permitting for Stage 2 of the Project. The Stage 2 baseline field campaigns have not commenced as yet.

The Environmental Impact Declaration (DIA) approved in December 2021 was for Stage 1 only. The Stage 2 will require an amendment to the Stage 1 DIA with separate investigations related to the Stage 2 affected areas. The Stage 2 DIA application has not commenced as yet. Further study and basic engineering are required to further define the Stage 2 affected areas and related impacts.

The Sal de Vida Project will require 100-120 m^3/hr of raw water for the operation of Stage 1 and 2. The water permits that will be required to take account of the increased water demand to construct and operate Stage 2 have not been applied for yet.

It is estimated that required engineering definition, studies, and permitting application processing will require approximately 18 months based on timelines experienced with Stage 1.

1.10.4 Stage 2 Capex and Opex

The capital cost estimate for Stage 2 of the Sal de Vida Project was prepared by Allkem based on previously completed studies by Worley Chile S.A. and Worley Argentina S.A. (Collectively, Worley) in collaboration with Allkem. Allkem supplemented previous study estimates with actual construction cost data obtained from the ongoing Sal de Vida Stage 1 construction. The estimate is a Class 4 AACCE with an expected accuracy of +30% / - 20%. The costs are based on Q2 2023 pricing and reflective of the Effective Date.

Capital Cost Estimation for Stage 2 was based on the Sal de Vida Stage 1 AACE class 2 estimate currently in execution. The modularized nature of the project expansion allows for direct cost comparisons from Stage 1 to Stage 2, supplemented by escalation estimation and appropriate contingency.

Table 1-9 summarizes the Stage 2 capital cost estimate.

Table 1-9 - Capital Expenditures: Stage 2 (Standalone).

Description	Capital Intensity (US$ / t Li_2CO_3)	CAPEX Breakdown (US$ m)
Direct Costs		
General Engineering & Studies	1,146	34
Wellfields & Brine Distribution	818	25
Evaporation Ponds, Waste & Tailings	4,692	141
LiCO Plant & Reagents	11,408	342
Utilities	546	16
Infrastructure	427	13
Total Direct Cost	**19,036**	**571**
Owner Costs + Contingency	2,855	86
TOTAL CAPEX	**21,891**	**657**

The total sustaining and enhancement capital expenditures for Sal de Vida Project Stage 2 are shown in Table 1-10

Table 1-10 - Sustaining and Enhancement Capex Stage 2 (Standalone)

Description	Total Year* (US$ m)	Total LOM (US$ m)
Enhancement CAPEX	-	39.8
Sustaining CAPEX	16.7	624.9
Total	**17**	**665**

* Long Term estimated cost per year

The operating cost estimate (Opex) for Stage 2 of the Sal de Vida Project was prepared by Allkem's team based on Olaroz Stage 1 experience and progress on the Sal de Vida Stage 1 development The Opex estimate is based on current operational pricing as described in Section 18 of the report. Subject to the exceptions and exclusions set forth in this pre-feasibility study. The summary Opex breakdown is presented in Table 1-11.

Table 1-11 - Estimated Operating Costs by Category.Stage 2 (Standalone)

Description	Per Tonne LOM (US$ / t Li_2CO_3)	Total LOM (US$ m)	Total Year* (US$ m)
Reagents	1,844	2,034	55
Labour	257	284	7
Energy	603	665	17
General & Administration	432	476	13
Consumables & Materials	415	457	12
SITE CASH COSTS	**3,550**	**3,917**	**104**
Transport & Port	175	193	5
FOB CASH OPERATING COSTS	**3,726**	**4,110**	**109**

* Long Term estimated cost per year

1.10.5 Stage 2 Economic Analysis

The financial evaluation is dependent on key input parameters and assumptions:

1. Production schedule, including annual brine production, pond evaporation rates, process plant production, and ramp-up schedule. The Sal de Vida Project Stage 2 nominal capacity of annual lithium carbonate is estimated to be 30,000t/year.
2. Plant recoveries and lithium grades.
3. Operating, capital, and closure costs for a 37-years operating life.
4. 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).
5. Product sales are assumed to be Free on Board (FOB) South America.
6. For the purpose of this report, the Corporate Rate was 35%.
7. The economic analysis assumes 100% equity financing.
8. All estimates outlined herein are expressed in FY2024 prices. All projections are estimated in real terms, and they do not incorporate allocations for inflation, or financial expenses and all financial assessments are expressed in US dollars.

The results are summarized in Table 1-12.

Table 1-12 - Summary of Sal de Vida Economic Analysis, Stage 2.

Summary Economics		
Production		
LOM	yrs	37
First Production	Date	2027
Full Production	Date	2028
Capacity	tpa	30,000
Investment		
Development Capital Costs	US$m	657
Sustaining Capital Costs	US$m per year	17
Development Capital Intensity	US$/tpa Cap	21,891

Summary Economics		
Cash Flow		
LOM Operating Costs	US$/t LCE	3,726
Avg Sale Price (TG)	US$/t LCE	26,922
Financial Metrics		
NPV @ 10% (Pre-Tax)	US$m	3,509
NPV @ 10% (Post-Tax)	US$m	2,028
NPV @ 8% (Post-Tax)	US$m	2,834
IRR (Pre-Tax)	%	50.3%
IRR (Post-Tax)	%	35.3%
Payback After Tax (production start)	yrs	2.4
Tax Rate	%	35.0%

Table 1-13 shows the impact of changes in key variables on the Project's pre-tax net present value.

Table 1-13 - Project Net Present Value Sensitivity Analysis, Stage 2.

Driver Variable	Base Case Values		Project NPV@10% (MMUS$)				
			Percent of Base Case Value				
			-25%	-10%	Base Case	+10%	+25%
Production	Tonne/yr	30,000	1,289	1,733	2,028	2,323	2,765
Price	US$/tonne	26,922	1,204	1,699	2,028	2,357	2,850
CAPEX*	MUS$	1,321	2,198	2,096	2,028	1,960	1,858
OPEX	US$/tonne	3,726	2,176	2,088	2,028	1,967	1,876

* Capital + Enhancement + Sustainnig

1.10.6 Stage 2 Risk Management

A Risk Assessment process was conducted in 2021 (Spark, 2021) which identified a broad spectrum of hazards that provides a reasonable representation of the current risk profile for the Stage 2 expansion project. The overall risk profile is currently driven by Project Delivery, and Financial/Operational Performance risks, which is to be expected of this project at the Pre-feasibility stage. While it is clear there is still considerable risk management work to be undertaken through the development of the Sal de Vida Project, there are no current identified risk issues that are considered insurmountable or that will prevent the Stage 2 expansion from proceeding into execution.

1.10.7 Stage 2 Conclusions and Recommendations

The planned Sal de Vida Stage 2 expansion has been studied at a pre-feasibility study level. The process pond infrastructure, process plant design, and support service infrastructure are deemed of suitable design and sufficiently quantified to support the level of study. The accuracy of cost information gained from ongoing Stage 1 execution is deemed sufficiently accurate for the level of study.

After completing any required value engineering, finalizing technology tradeoffs and selections, and advancing engineering design, the permitting process should commence in parallel with further engineering design. Progression of the Stage 1 execution must be monitored, and lessons learned incorporated into the Stage 2 project. Ongoing risk management and reviews are recommended to ensure currency of risk management activities. Social engagement processes and programs can be amended as needed to include for the future Stage 2 expansion.

1.11 Project Risks and Opportunities - Stages 1 and 2

1.11.1 Risks

A Project risk workshop was held in February 2020 and was subsequently updated in a risk assessment process conducted on March 21, 2021, prior to Stage 1 construction commencement. Ongoing risk reviews and mitigating action progress occur periodically. The current risk register is deemed current as of the Effective Date.

The workshops identified a broad spectrum of hazards which provides a reasonable representation of the current Project risk profile, with a focus on the initial stage of the Project. The overall risk profile is currently driven by Project delivery, and financial/ operational performance issues, which is to be expected of a brine project at the feasibility and early execution stage. This is consistent with the Project management team's expectations for a feasibility-stage study, given the industry's history with medium-sized project delivery, and the inherent uncertainty as to how a number of key risks in these areas can to be managed.

The Sal de Vida Project identified areas of focus in the Project risk register. The key risks to Project viability can be summarized as:

- Allkem activities fail to meet health, safety, environmental, community (HSEC) or CSR expectations.
- Loss of community support for the Project.
- Project capital cost increases significantly (e.g., productivity, incomplete engineering, poor estimation, Project delays, poor Project controls, changing market conditions).
- Plant unable to achieve name plate production within expected timeframes.
- Plant fails to achieve the production metrics (e.g., throughput, utilization, recovery, product quality).
- Changes to the Argentinian financial/regulatory framework (e.g., taxation, new legislation, import/ exports, inflation).
- Increased complexity of the design (BG, automation, late changes to the design) impacting the rate of engineering, procurement of long leads, commissioning etc.
- Performance of selected contractors (schedule, cost, quality, remote operations).
- COVID-19 or similar global issues impacting the Project (cost, schedule, outbreak on site).

- Ability to meet all required stakeholder conditions (e.g., local employment, environmental).

The existing risk controls and those implemented during the implementation/operations phases are broadly defined in the relevant risk register and will be enhanced as the register is revisited throughout the Project delivery phase and into the operational phase. These controls are predicted to be appropriate for further risk reduction; however, ongoing effort will be required to ensure the delivery of all required controls to achieve acceptable risk levels within the Project, and that these risks are well-understood. This risk/reward evaluation will need to be reviewed at each key Project stage.

1.11.2 Opportunities

Strategically, the two staged modular approach allows prudent de-risking of the Project's development, by adopting experience from Stage 1 into later stages and limiting upfront capital expenditure. It is expected that Stage 2 will not commit significant funds until the previous stage production is proven. Additionally, it is expected that Stage 2 delivery costs from the continuity of people, systems, and processes, engineering efficiencies, and targeted allocation of contingency may provide an upside. The PFS level does not accommodate these synergies, but they are expected as engineering advances.

The estimated Brine Resources and Brine Reserves summarized in this Report may have upside potential for tonnage increases, based on results from the ongoing production well drilling, and aquifer testing of the recently constructed Eastern wellfield production wells.

A large portion of the resource remains as Indicated. Further drilling campaigns and sampling will enhance aquifer understanding and could result in Brine Resource confidence category upgrades.

Further deeper drilling could indicate further depth potential of the resource. These deeper drill holes have upside potential to extend the limit of the Brine Resource estimates at depth.

The Brine Resources are reported above a 300 mg/l Li cut-off. Many of the brine-based lithium companies in the industry use a 200 mg/l Li cut-off. Should Allkem elect to lower the cut-off, there is potential for additional lithium carbonate content to be estimated as part of the Brine Resources. Changing the cut-off grade will have no impact on the Brine Reserve because all the production wells associated with the Brine Reserve are being designed to avoid capturing this lower lithium-grade brackish water. If the Project continues past the current projected 40-year mine life, lower- grade brine and brackish water have potential to be economic in the future.

1.12 Conclusions and QP Recommendations - Stages 1 and 2

The Sal de Vida project hosts a yet undefined lithium resource with a defined reserve that supports both Stages 1 and 2 of the Project. Additional exploration is likely to define additional resources or upgrade the resource classification. The collected data and models are deemed reliable and adequate to support the Mineral Resource estimate, cost estimates and the indicated level of study for both Stages 1 and 2.

The described processing and service infrastructure is deemed adequately sized to meet the designed Stage lithium carbonate production rates with inherent risks remaining as described. Support service infrastructure is adequately sized to support Stage 1 with additional expansions required for Stage 2 at that time.

Social, environmental, and government aspects are deemed sufficiently addressed and resulted in the progression of the Stage 1 permitting for construction. Further and ongoing monitoring and actions will be required to maintain and progress the renewal of permitting.

Under the assumptions described in this Report, the Project shows feasible economic extraction for both described Stages at the indicated study level.

1.12.1 Recommendations

1.12.1.1 Exploration

Further exploration should be conducted to better identify and potentially demonstrate additional extractable brine in other parts of the basin. Further geophysical surveys (gravity and magnetic), core drilling deeper than 300 m, downhole sampling of any additional wells, and additional 30-day pumping tests can contribute to expanding the reserve.

1.12.1.2 Resource Estimate

It is recommended that a resource block model be created instead of the polygon method to estimate the lithium brine resource. New brine sample results from pumping and production wells should be incorporated.

Based on newly obtained field data the resource estimate should be updated. The categorization should also be reviewed based on newly obtained information.

1.12.1.3 Reserve Estimate

The numerical model should be updated in the short to medium term to simulate lithium in addition to total dissolved solids. The simulation of total dissolved solids is necessary to properly simulate density-driven flow due to its good correlation to water density.

A review of the numerical model should be completed when further information from recommended field work is available, and the grid should be further refined in areas of the projected production wells. The deeper portions of the numerical model should be updated with improved information on the brines at depth, including the hydraulic conductivity and storage zones.

1.12.1.4 Permits

Ongoing monitoring and reporting requirements must continue to ensure compliance with permitting conditions. Frequent and periodic collection of streamflow measurements, rainfall, run-off, and shallow groundwater data can be used to improve representations in the numerical water balance and other basin models.

SDV Stage 2 requires separate environmental impact and permitting assessments. Following sufficient engineering progress, proactive application for further freshwater extraction, environmental assessments, and development permits for Stage 2 must progress to avoid delays.

1.12.1.5 Further Studies

Further environmental and engineering studies have been identified to progress the Project:

- Investigate water reuse technology and other technologies that will allow reduction of the carbon footprint.
- Emphasize scaling the capacity of the Solar Plant to produce clean energy for Stage 2 maximizing production and project benefits.
- Proceed with FEED and Detailed engineering of Stage 2.
- Complete further decarbonatization energy trade-off studies considering renewable power from a photovoltaic farm and potential connection to a regional natural gas pipeline located 20 km from the Project.
- Continue with geotechnical investigations to confirm ground suitability Stage 2 infrastructure.

1.13 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

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 and Reserve Estimates 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 Reserves and related economic extraction potential.

Sal de Vida (latitude 25° 24' 33.71" South, longitude 66° 54' 44.73" West) is located approximately 200 km south of Olaroz in the high-altitude Puna ecoregion of the Altiplano of northwest Argentina at approximately 4,000 meters above sea level (Figure 3-1). Sal de Vida is within Salar del Hombre Muerto in the Province of Catamarca, 650 km from the city of San Fernando del Valle de Catamarca via Antofagasta de la Sierra and 390 km from the city of Salta via San Antonio de los Cobres. The nearest villages are Antofagasta de la Sierra in Catamarca Province, 145 km south of the project site, and San Antonio de los Cobres in Salta Province, 210 km north of the project site.

The report includes the results of a feasibility study for Stage 1 and a preliminary feasibility study for Stages 2 and 3, which includes the economic impact of increasing capacity from 10 kilotonne per annum (ktpa) to 15 ktpa for Stage 1 at a feasibility level. The report consolidates Stages 2 and 3 (10.7 ktpa each) into a single expanded 30 ktpa LCE stage at a pre-feasibility level.

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
- Final forecast recovery (Chapter 10.3)
- QP Statement on metallurgy (Chapter 10.6)
- QP Statement on Environmental Compliance (Chapter 17)
- Additional information regarding production quantities (Chapter 13.1)
- Additional economic information regarding key assumptions and LOM totals (Chapter 19.3)
- Additional information regarding the calculation of the cut-off grade (Chapters 11 and 12)
- Change in cut-off grade calculation (Chapter 11.5 and Chapter 12.3.4.5)
- Minor typos and non material fixes (throughout)

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:

- Employees of Montgomery & Associates Consultores Limitada (Montgomery & Associates); 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 Gunn Metallurgy
3	Project Property Description	Employees of Montgomery & Associates
4	Accessibility, Climate, Local Resources, Infrastructure, Physiography	Employees of Montgomery & Associates
5	History	Employees of Montgomery & Associates
6	Geological Setting and Mineralization and Deposit Types	Employees of Montgomery & Associates
7	Exploration	Employees of Montgomery & Associates
8	Sample Preparation, Analyses and Security	Employees of Montgomery & Associates
9	Data Verification	Employees of Montgomery & Associates
10	Mineral Processing and Metallurgical Testing	Employee of Gunn Metallurgy
11	Mineral Resource Estimates	Employees of Montgomery & Associates
12	Mineral Reserve Estimates	Employees of Montgomery & Associates
13	Mining Methods	Employees of Montgomery & Associates
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	Employees of Montgomery & Associates
18	Capital and Operating Costs	Employee of Gunn Metallurgy
19	Economic Analysis	Employee of Gunn Metallurgy
20	Adjacent Properties	Employee of Gunn Metallurgy
21	Other Relevant Data and Information	Employee of Gunn Metallurgy
22	Interpretation and Conclusions	All
23	Recommendations	All
24	References	All
25	Reliance on Information Supplied by the Registrant	All

Montgomery & Associates Consultores Limitada is a professional consulting firm that has been involved with the Sal de Vida Project during the period from 2009 to present and has visited the Project in Salar del Hombre Muerto during the program to review the exploration, sampling, and production well activities. Montgomery & Associates Consultores Limitada is an independent consulting firm to the lithium industry and its employees that prepared this report are Qualified Persons (QPs) as defined by 17 CFR §229.1300. All Montgomery & Associates QPs to this report are employees of Montgomery & Associates and are not employees 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. 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

The employees of Montgomery & Associates Consultores Limitada have visited the Project from April 5 to 10, 2010, August 11 to 16, 2010, January 16 to 26, 2011, June 22 to 28, 2011, August 15 to 20, 2011, and April 13, 2018. Most recently, a site visit was conducted from July 31 to August 2, 2023.

Mr. Gunn is familiar with the Sal de Vida Project area and has visited the Project many times prior to 2020. His last visit to the Sal de Vida site was on August 1, 2023.

During the last visit, the group toured the general areas of mineralization, infrastructure, evaporation ponds, production wells and brine distribution systems, as well as the pilot plant and the construction area of the project. Additionally, they had meetings with Allkem technical staff related to the process, construction planning, and geological information.

2.3 Effective Date

The Effective Date of this report of the Mineral Resource and Reserve estimates is June 30, 2023. Since the end of Allkem’s last fiscal year (June 30, 2023), no production has occurred. To the extent known by the QPs, there are no material changes to the Mineral Resources and Mineral Reserves between June 30, 2023, and the filing date of this report.

2.3.1 Previous Technical Reports

This SEC Technical Report Summary is the first that has been prepared for Allkem’s Sal de Vida Lithium Brine Project. Thus, this report is not an update of a previously filed Technical Report Summary under the SK Regulations.

Another relevant technical report for the Project is Canadian National Instrument (NI) 43-101 compliant report titled: “*Sal de Vida Project, Salar del Hombre Muerto, Catamarca, Argentina, NI 43-101 Technical Report*”, prepared by Rosko, M., Sanford, A., Riordan, J. and Talbot, B., 2021 and filed with the Canadian Securities Exchange System for Electronic Document Analysis and Retrieval (SEDAR).

2.4 Other Sources of information

Other technical reports of relevance to the Project include:

- Houston, J., and Jaacks, J., 2010. Technical Report on the Sal De Vida Lithium Project Salar de Hombre Muerto Catamarca, Argentina. Report prepared for Lithium One, effective date 5 March 2010.
- Rosko, M., and Jaacks, J., 2011. Inferred Resource Estimate for Lithium and Potassium Sal de Vida Project Salar del Hombre Muerto Catamarca-Salta, Argentina. Report prepared by Montgomery & Associates for Lithium One, effective date 25 April 2011.
- Kelley, R.J., Burga, E., Lukes, J., 2011. NI 43-101 Technical Report for: Preliminary Assessment and Economic Evaluation of the Sal de Vida Project Catamarca & Salta Provinces, Argentina. Report prepared by Worley Parsons for Lithium One, effective date 18 November 2011.
- Rosko, M., and Jaacks, J., 2012. Measured, Indicated and Inferred Lithium and Potassium Resource, Sal de Vida Project Salar del Hombre Muerto Catamarca-Salta, Argentina. Report prepared by Montgomery & Associates for Lithium One, effective date 7 March 2012.

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.

2.5 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 lithium, base, or precious metal mining. Brine is a 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 Project 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 in the following section for a definition of terms.

2.6 Units of Measure & Glossary of Terms

2.6.1 Currency

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

2.6.2 Units and Abbreviations

Reference Table 2-2 for a list of acronyms and abbreviations included in the report. Table 2-3 includes all units of measurement and their associated abbreviations.

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)
ESS	stationary energy storage
EV	electric vehicles
EVT	evapotranspiration

Abbreviation	Definition
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
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
NVP	net present value
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.

Abbreviation	Description
°C	degrees Celsius
%	percent
AR$	Argentinean peso

Abbreviation	Description
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
L/s/m	litres per second per metre
kdmt	thousand dry metric tonnes
km	kilometer
km2	square kilometers
km/hr	kilometer 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
ppb	parts per billion
t	tonne
s	second
tpa	tonnes per annum
µm	micrometer
µS	microSeimens
V	volt
w/w	weight per weight
wt%	weight percent

3. PROPERTY DESCRIPTION

3.1 Property Location, Country, Regional and Government Setting

Sal de Vida (latitude 25° 24’ 33.71” South, longitude 66° 54’ 44.73” West, Gauss Kruger, POSGAR 2007, Zone 3) is located approximately 200 km south of Olaroz in the high-altitude Puna ecoregion of the Altiplano of northwest Argentina at approximately 4,000 m above sea level (Figure 3-1). Sal de Vida is within Salar del Hombre Muerto in the Province of Catamarca, 650 km from the city of San Fernando del Valle de Catamarca via Antofagasta de la Sierra and 390 km from the city of Salta via San Antonio de los Cobres. The nearest villages are Antofagasta de la Sierra in Catamarca Province, 145 km south of the project site, and San Antonio de los Cobres in Salta Province, 210 km north of the project site. Refer to Figure 3-1.

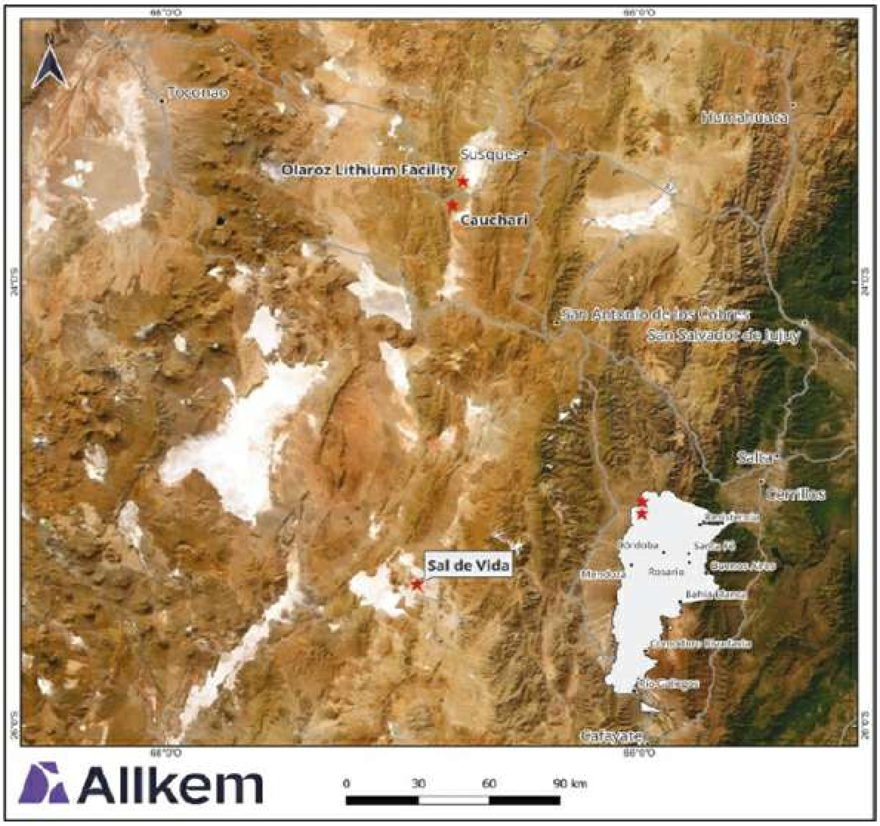

Figure 3-1 - Project Location Plan.

3.2 Property and Titles in Argentina

Allkem currently has mineral rights over 26,253 ha at Salar del Hombre Muerto, which are held under 31 mining concessions (Table 3-1 and Figure 3-2). All concessions are in good standing with all statutory annual payments (mining canon) and reporting obligation up to date. The canon should be paid in advance and in equal parts in two semesters, which will expire on June 30 and December 31 each year.

Table 3-1 - Sal de Vida Mining Concessions.

No.	File	Tenement	Dated	Has.	Date of Last Annual Canon Payment
1	78-1986	La Redonda 4	1986	599.39	December 31, 2023
2	210-1994	Los Patos	1994	499.65	December 31, 2023

No.	File	Tenement	Dated	Has.	Date of Last Annual Canon Payment
3	261-1997	Centenario	1997	89.18	December 31, 2023
4	77-1999	Barreal 1	1999	599.49	December 31, 2023
5	27-2000	Maktub XXIII	2000	968.78	December 31, 2023
6	54-2000	Aurelio	2000	399.65	December 31, 2023
7	55-2000	La Redonda I	2000	599.44	December 31, 2023
8	56-2000	Don Carlos	2000	499.45	December 31, 2023
9	161-2002	Redonda 5	2002	399.73	December 31, 2023
10	162-2002	Don Pepe	2002	499.56	December 31, 2023
11	168-2002	Agostina	2002	204.94	December 31, 2023
12	185-2002	Chachita	2002	554.15	December 31, 2023
13	398-2003	Delia	2003	99.9	December 31, 2023
14	787-2005	Juan Luis	2005	199.98	December 31, 2023
15	788-2005	Maria Lucia	2005	99.81	December 31, 2023
16	913-2005	Maria Clara	2005	479.2	December 31, 2023
17	914-2005	Maria Clara 1	2005	593.82	December 31, 2023
18	1178-2006	El Tordo	2006	1864.96	December 31, 2023
19	754-2009	Sonqo	2009	987.92	December 31, 2023
20	1198-2006	Quiero Retruco	2009	775,22	December 31, 2023
21	1197-2006	Truco	2006	956,97	December 31, 2023
22	1279-2006	Agustin	2006	2828.34	December 31, 2023
23	1280-2006	Luna Blanca	2006	160,82	December 31, 2023
24	1281-2006	Fidel	2006	409.53	December 31, 2023
25	1430-2006	Meme	2006	2298.00	December 31, 2023
26	657-2009	Rodolfo	2009	100	December 31, 2023
27	709-2009	Luna Blanca II	2009	1530.6	December 31, 2023
28	814-2009	Luna Blanca VI	2009	399.25	December 31, 2023
29	65-2016	Montserrat I	2016	2949.62	December 31, 2023
30	254-2011	Montserrat	2011	3500.00	December 31, 2023
31	45-2020	Luna Blanca Oeste	2020	105.88	December 31, 2023

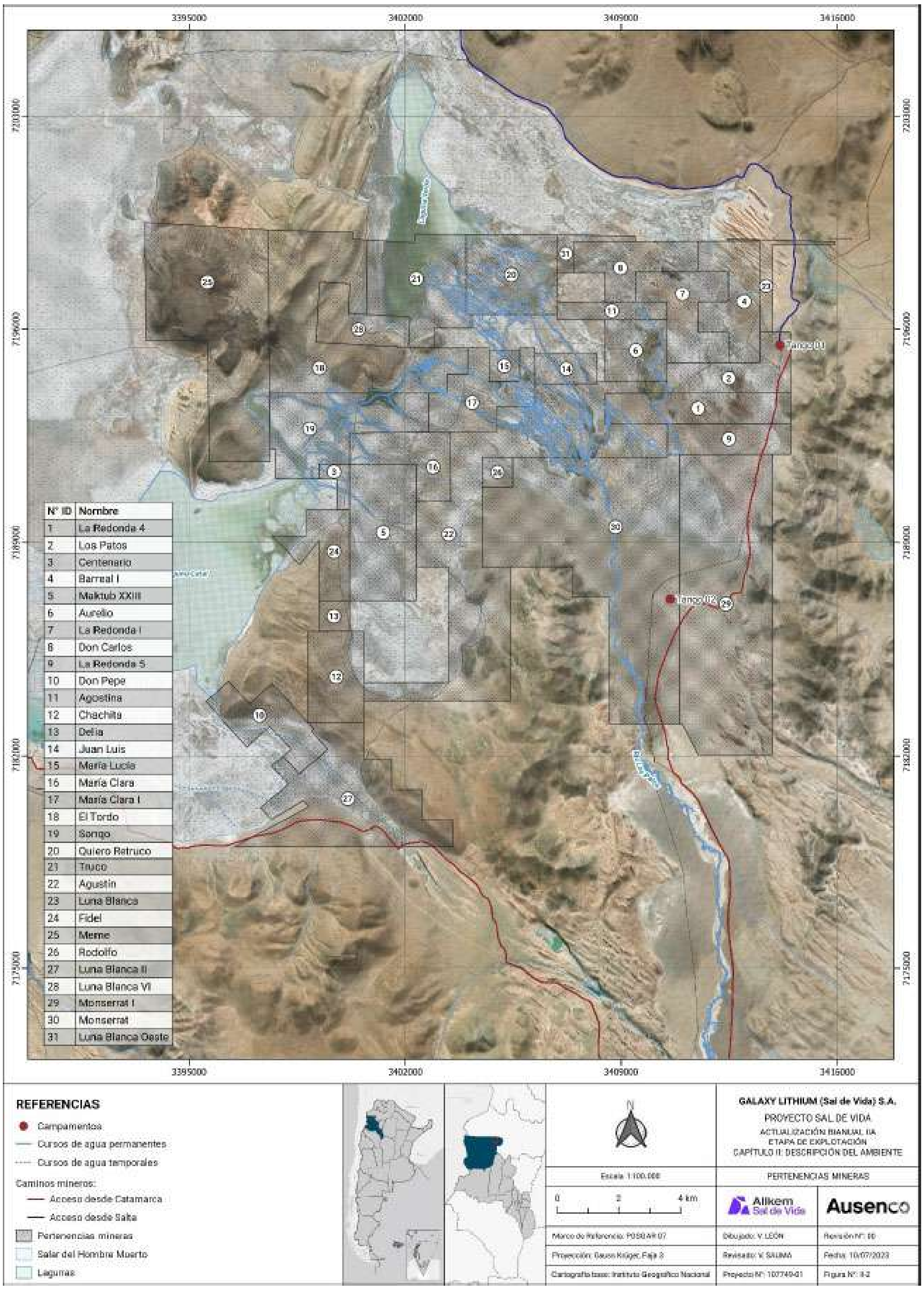

Figure 3-2 - Claim Location Map (Allkem, 2022).

3.2.1 Mining Title

The basic statute that governs mining activity in Argentina is the National Mining Code, National Law 1919 (AMC). The Argentinean Constitution recognizes the provincial or federal original ownership of the minerals located within their jurisdictions and the AMC establishes a non-discretionary system under which mining rights are awarded to private entities and/or individuals, which are equivalent in rights to private ownership and constitutes a complete and different property of the land of which its underlays. Regardless the state of nature of the mineral (solid, liquid, or gaseous), the AMC considers three categories of mines, being the lithium classified as a metalliferous substance included in the first category of mines. The AMC recognizes the private entities right to explore and develop deposits and freely dispose of the minerals extracted within the area of the concession, as well as the right to transfer such rights without any previous government discretional approval. These regulations create the legal framework that governs the relationship between the government and miner (through an exploration permit or a mining concession), and between the miner and third parties.

Key parameters of the AMC include:

- Mining properties form a different property from the surface ownership where they are located (either regarding fiscal or private land).
- Any individual or legal entity with capacity to legally purchase and own a real estate property may petition and own a mining right.
- The original ownership of a mining right is acquired through a legal concession granted for limited (in case of an exploration permit) or unlimited (in case of an exploitation concession) time and only subject to the compliance of certain maintenance conditions as set by the AMC.
- There is provincial jurisdiction regarding mining police, administrative authority and in environmental matters.

The AMC governs the rights, obligations, and procedures referring to the exploration, exploitation, and use of mineral substances.

There are two main mining rights that can be awarded under the AMC:

- Exploration permits (“cateo”): cateos grant the applicant an exclusive right to explore a specific area (maximum 10,000 ha) for a certain period (maximum 1,500 days). No exploitation can be undertaken, but any exploratory method is acceptable as long as the method is consistent with a previously approved Environmental Impact Study.
- Exploitation concessions (from “manifestacion de descubrimiento” to “mina”): exploitation concessions are acquired by means of a “legal concession” granted by the Mining authority (Mining Authority) under the provisions of the AMC. The exploitation concession has no time limit. There are different ways of acquiring an exploitation concession:
    - By discovering minerals as a consequence of exploration activity within a cateo.
    - When minerals are discovered by accident; that is, without a cateo (e.g., the area is free of previous exploration permits) or exploitation concessions.

    - When an exploitation right has been declared and registered by the Mining Authority as “vacant” due to a non-compliance with the requirements settled by law by a third party.

The discoverer must also indicate an area which does not exceed twice the maximum possible extension of an exploitation concession, within which the exploration works will be conducted, and mining claims (“pertenencias”) will be confined to. This area includes the discovery site and would remain unavailable until a survey is duly approved and authorized. When filing an application, it is customary to refer to the exploration permit within which the discovery is located, so that any overlap with existing rights is already anticipated. Any area of land within which boundaries the holder of a mining concession is allowed to conduct exploration and or exploitation works is called a “claim”. Each claim of a lithium or borates deposit is 100 ha. The exploitation concessions do not expire but are subject to the fulfilment of certain specific conditions or obligations known as “amparo minero”. This includes payment of a mining fee, and completion of an investment plan:

- Mining fee (canon): the AMC requires a titleholder to pay an annual fee per claim, which is periodically fixed as required by federal law. If the payment is not made within 2 months of the claim expiration date, the concession is terminated ipso facto. In the case of lithium claims, the AMC was amended by Nacional Law 27,701 in Sections 213 and 215, the fee is updated in accordance with an annual resolution issued by the Secretary of Mining, based on the price increase index. Currently AR$8,000 as of Effective Date.
- Investment plan: within 1 year from the date of request of the legal survey (irrespective of the mining property being surveyed or not), the applicant/concessionaire must submit to the Mining Authority an estimate of a 5-year plan and amount of capital investment that it intends to perform in connection with:
    - The execution of mining works.
    - The construction of camps, buildings, roads, and other related works.
    - The acquisition of machinery, stations, parts, and equipment, indicating its production or treatment capacity.

In accordance with the provisions of Article 217 of the AMC, the investment for a mining property cannot be less than 300 times the annual fee that corresponds to such mining property, based on its category and the number of claims, provided that such investment is fully completed within five years from its filing. An amount not lower than 20% of the estimated aggregate amount must be invested in each of the first two years.

A sworn statement on the compliance status of the investments must be submitted to the Mining Authority within three months of the expiration of each annual period.

The Mining Authority in each Province has the ability to:

- Enact the Mining Procedure Code (for example, Provincial Law No. 5682 in Catamarca Province), which must follow AMC guidelines.

- Award mining rights and control its compliance in accordance with the AMC and applicable Procedure Code provisions.

Although each Mining Authority awards and controls the mining rights within its territory, in practice the Mining Authority must strictly follow AMC guidelines, as every procedural step is clearly detailed in the AMC.

3.2.2 Surface Rights

The AMC sets out rules under which surface rights and easements can be granted for a mining operation, and covers aspects including land occupation, rights-of-way, access routes, transport routes, rail lines, water usage and any other infrastructure needed for operations.

For private property, compensation must be paid to the affected landowner in proportion to the amount of damage or inconvenience incurred; however, no provisions or regulations have been enacted as to the nature or amount of the compensation payment.

For instances where no agreement can be reached with the landowner, the Mining Authority and/or the competent court pursuant to the applicable procedure shall resolve the conflict.

For fiscal property (national or provincial ownership) the AMC rule that the surface rights and easements should be granted for a mining operation without compensation.

The AMC provides the mining right holder with the right to expropriate at least the required property up to a maximum of one claim.

3.2.3 Water Rights

Typically, Provincial water authorities:

- Issue water usage permits, including usage purpose, amount of water required, how the water is to be delivered to the end-user, and any infrastructure requirements.
- Establish a priority system for the permits, based on the type of water consumption.
- Govern the duration of issued permits.
- Levy usage fees based on the amount of water consumed/used.

Water use rights may be acquired by permit, by concession, and, under laws enacted in some Provinces, through authorization. Revocable permits for water use can be granted for a specific purpose. A grant (concession) is typically awarded for a time period that is based on the intended use; however, some permits concessions can be granted in perpetuity.

3.2.4 Fraser Institute Policy Perception Index

The QPs used the Investment Attractiveness Index from the 2020 Fraser Institute Annual Survey of Mining Companies report (the Fraser Institute survey) as a credible source for the assessment of the overall political risk facing an exploration or mining project in the Province of Catamarca, Argentina.

The QPs used the Fraser Institute survey because it is globally regarded as an independent report-card style assessment to governments on how attractive their policies are from the point of view of an exploration manager or mining company senior management and forms a proxy for the assessment by the mining industry of the political risk in the Province of Catamarca, Argentina. In 2020, the rankings were from the most attractive (1) to the least attractive jurisdiction (77), of the 77 jurisdictions included in the survey.

The Province of Catamarca, Argentina ranked 44 out of 77 jurisdictions in the attractiveness index survey in 2020, 45 out of 77 in the policy perception index, and 44 out of 77 in the best practices mineral potential index.

3.3 Ownership

All of Allkem’s mining tenement interests in the Sal de Vida Project are held by Galaxy Lithium (Sal de Vida) S.A., which is a wholly owned subsidiary of Galaxy Resources Ltd. (Australia) which is owned by Allkem Ltd., as shown in Figure 3-3.

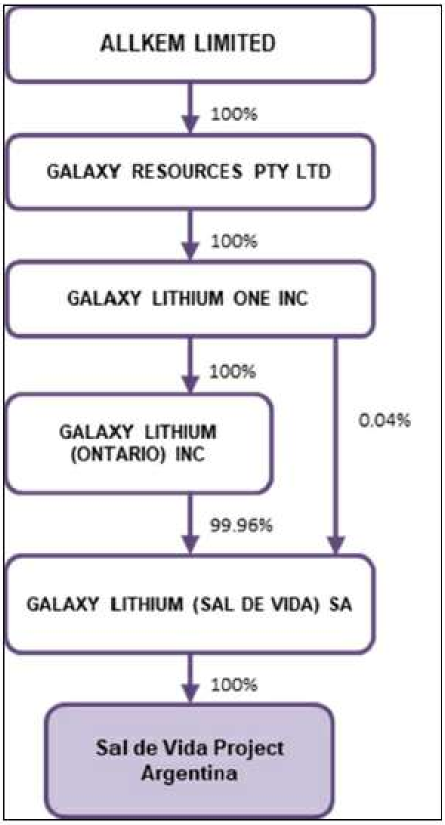

Figure 3-3 - Sal de Via Project Ownership Structure.

3.4 Surface Rights

Sal de Vida is located within fiscal lands owned by the Province of Catamarca with no private land holders. According to the Royalty Agreement (see Section 3.8), the Government of Catamarca agreed that if any change or amendment to the legal status of such fiscal lands is introduced which results in Allkem being obligated to pay any amount for the use, occupation of or damages to such lands to any person, entity or government, any amount payable under such changes or amendments, after approval from the province shall be deducted from the Additional Contribution and (where necessary) the CSR Contribution to be paid by Allkem.

3.5 Water Rights

Water permits are discussed in Section 17. According to the Royalty Agreement (see Section 3.8), the Governor of the Province agrees to grant the relevant water concession applied for by GLSSA in accordance with Section 7 of the Provincial Water Law No. 2577, as amended.

3.6 Easements

Allkem acquired the following mining easements through legal and judicial processes. The easements are indicated below and in Figure 3-4:

- Water easements: granted on July 4, 2013, under File No 04/2013. A petition for a new water easement for exclusive use was filed on September 8, 2016, and was granted on December 23, 2020, under File No 66/2016.
- Camp easements: granted on May 17, 2017, under File No 166/2011.
- Infrastructure and service easements: granted on July 4, 2013, under File No 18/2013. A petition for a new infrastructure and services easement for exclusive full use over the mining property was filed on September 20, 2019, and was granted on December 23, 2020, under File No 94/2019.

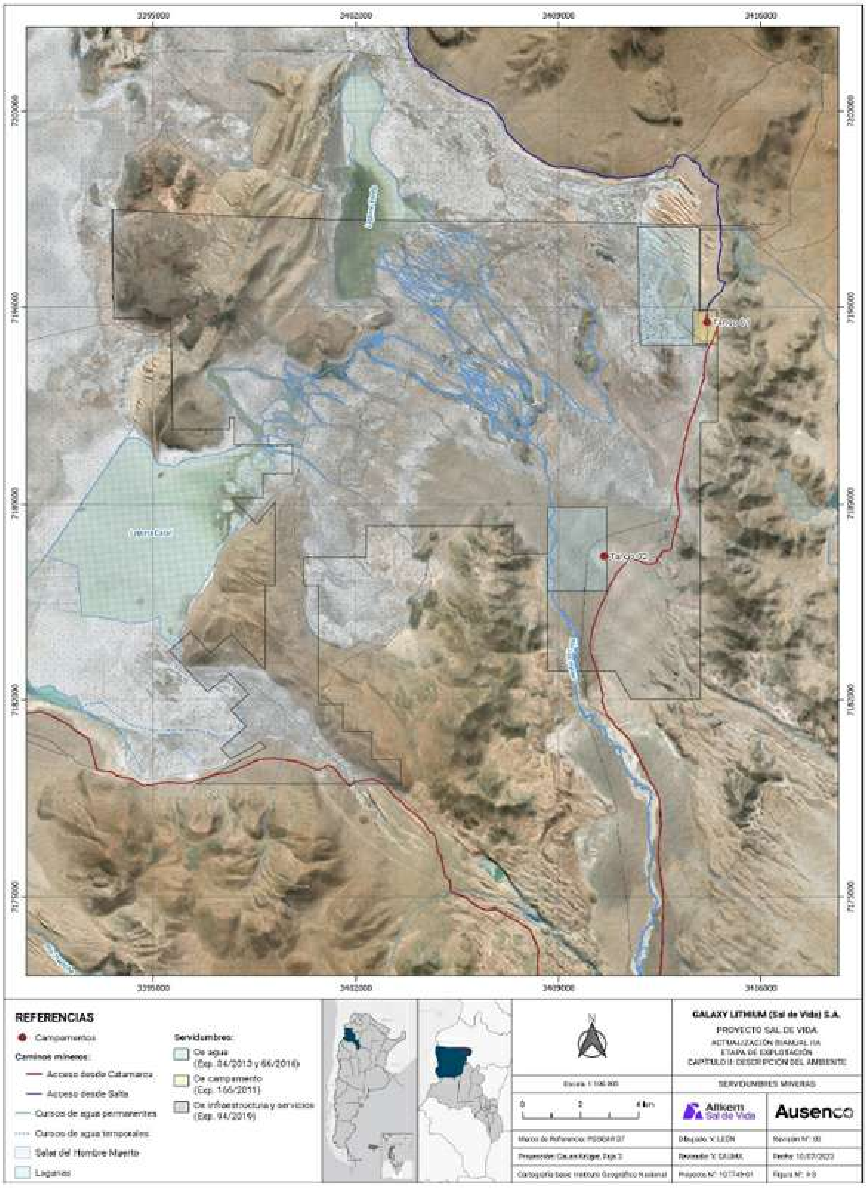

Figure 3-4 - Sal de Vida - easements map (Allkem, 2023).

3.7 Third-Party Rights

All the mining concessions for the Sal de Vida Project were secured under purchasing agreements with pre-existing owners and claimants. In some cases, sellers retained usufruct rights (a legal right accorded to a person or party that confers the temporary right to use and derive income or benefit from someone else's mining property) and commercial rights (third-party rights) for the development of ulexite (borates) at surface (Table 3-2).

The transfer deeds establish that the lithium property holder, Allkem, has priority over these rights. Allkem has retained the option to buy out any of these rights if it considers it necessary at any point in time.

Table 3-2 - Ulexite Usufruct and Commercial Rights.

Owner	Mining Concession	Type of Right
Mendieta Ricardo Carlos	Centenario	Usufruct right
	Chachita	Usufruct right
Rafaelli	Don Pepe	Usufruct right
	La Redonda 4	Usufruct right
	La Redonda 5	Usufruct right
Avanti S.R.L.	Agostina	Usufruct right
Maktub Compañía Minera S.R.L.	Juan Luis	Commercial right
	Maria Clara	Commercial right
	Maria Clara 1	Commercial right
	Maktub XXIII	Commercial right
	Maria Lucia	Commercial right
	Meme	Commercial right
	Truco	Commercial right
	Quiero Retruco	Commercial right

3.8 Mining Royalties

Pursuant to Law 4757 (as amended), Catamarca Mining royalty is limited to 3% of the mine head value of the extracted ore, which consist in the sales price less direct cash costs related to exploitation (excluding fixed asset depreciation, the "Mining Royalty").

On December 20, 2021, GLSSA and the Governor of the Province of Catamarca subscribed a Royalties Commitment Deed (the "Royalty Agreement"), pursuant to which GLSSA agrees to pay to the Province of Catamarca a maximum amount of 3.5% of the "net monthly revenue" from the Project, as follows:

- The "Mining Royalty" will be paid as indicated by the provincial Royalty Regime.
- An "Additional Contribution" of 3.2% less the Mining Royalty and the applicable water cannon.
- 0.3% shall be paid as a "CSR Contribution".

The validity of the Royalty Agreement is subject to the approval of the Legislature of the Province of Catamarca, which is in due course to be obtained.

The payment of Mining Royalty is due once the commercial production of the Sal de Vida Project commences, and the payment of the Additional Contribution and CSR Contribution is due once the Province of Catamarca (through the relevant authority) grants GLSSA the relevant water concession pursuant to Section 7 of the Water Law No. 2577, as amended.

The Additional Contribution and CSR Contribution will be paid through a Trust, pursuant to provincial legislation to be enacted.

The 3.5% maximum amount shall be the maximum amount payable by GLSSA to the province of Catamarca, for any reason whatsoever, for the whole life of the Project (including any expansions).

The “net monthly revenue” will be calculated by reference to the amounts invoiced by GLSSA each month for the sale of lithium products produced from the Project, and for the Mining Royalty, less (i) any taxes, duties, levies included on those invoiced amounts and (ii) any sales reimbursement.

The Additional Contribution made to the Trust shall be used exclusively for conducting investment projects, infrastructure works, and productive development within the area where the Project is located and, specifically, within the direct (Department of Antofagasta) and indirect (Department of Belén and Santa María) zones of influence of the Project.

The CSR Contribution shall be used exclusively for conducting investment projects, infrastructure works and productive development within the site area where Project is located and, specifically, within the direct zone of influence (Department of Antofagasta).

3.9 Permitting Considerations

Permitting considerations are discussed in Chapter 17 - Environmental Studies, Permitting, Social or Community Impacts.

3.10 Environmental Considerations

The Project is not subject to any known environmental liabilities. There has been active ulexite mining within the boundaries of the existing land agreement, but the operations are limited to within 5 m of the surface and will reclaim naturally fairly quickly. All ulexite activities are dormant in the area as a result of the low ulexite prices and there is no indication of reactivation.

Environmental considerations are discussed in Chapter 17 - Environmental Studies, Permitting, Social or Community Impacts.

3.11 Social License Considerations

Social considerations are discussed in Chapter 17 - Environmental Studies, Permitting, Social or Community Impacts.

3.12 Conclusion

Legal opinion provided supports that Allkem currently holds an indirect 100% interest in the Sal de Vida Project through its subsidiary Galaxy Lithium (Sal de Vida) S.A.

Legal opinion provided supports that the mineral tenures held are valid and sufficient to support declaration of Brine Resources and Brine Reserves.

The AMC sets out rules under which surface rights and easements can be granted for a mining operation. In instances where no agreement can be reached with the landowner, the AMC provides the mining right holder with the right to expropriate the required property up to a limited minimum surface. Water use rights may be acquired by temporary permits, by permanent concessions, and, under laws enacted in some Provinces, through authorization.

Allkem currently has approved water permits; see Section 17.5.3.

A number of the mining concessions are subject to usufruct rights for ulexite.

Social and permitting applications have sufficiently progressed to permit the commencement of Stage 1 construction. The employees of Montgomery & Associates are not aware of any significant environmental, social, or permitting issues that would prevent future exploitation of the Sal de Vida Project, other than as discussed in this Report.

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

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

4.1 Physiography

The Project is located in a flat plain at an altitude of about 4,000 m above land surface. Vegetation in the Puna is sparse, reflecting the high-altitude desert environment, and consists of low woody herbs, grasses, and cushion plants. There is no vegetation on the salar.

Two major perennial streams feed the salar from the south, the Río de los Patos and the Río Trapiche. The Río de los Patos drains about 79% of the total salar catchment area, and the Rio Trapiche drains approximately 8%.

There are no protected area or natural reserves in the Sal de Vida Project area. Within the baseline environmental study area there are two reserves, Los Andes Reserve in the Province of Salta, and the Laguna Blanca Biosphere Reserve in the Province of Catamarca. The Sal de Vida Project is 75 km south of the Los Andes Reserve and 35 km north of the Laguna Blanca protected area.

4.2 Accessibility

The main route to the Project site is from the city of Catamarca via national Route 40 to Belen, and provincial Route 43 through Antofagasta de la Sierra to Salar del Hombre Muerto. The road is paved all the way to Antofagasta de la Sierra and continues unpaved for the last 145 km to Salar del Hombre Muerto. This road is well maintained and serves Livent Corporation’s Fenix lithium operations, Galan Lithium Ltd.’s Hombre Muerto Project and Allkem’s Sal de Vida Project.

The shortest route to the Project site is from Salta via San Antonio de los Cobres. The access road is paved for the first 75 km to San Antonio de los Cobres and continues unpaved for 215 km to Salar del Hombre Muerto. The total distance between the city of Salta and the Sal de Vida Project is 390 km. Provincial Route 51 is a well-maintained road and is used by a number of mining projects. The drive time is approximately 6 hours in a four-wheel drive vehicle or 10 hr by heavy vehicle or bus.

4.3 Climate

The Project is located in the Puna ecoregion of the Altiplano, where the climate is extremely cold and dry. The warmest months are January and February, with average temperatures of 11.6°C and 10.9°C respectively. The coolest month is July, with an average temperature of 1.6°C.

Solar radiation is intense, especially during the summer months of October through March, leading to high evaporation rates. Average annual evaporation in the Salar de Hombre Muerto is estimated at 2,710 millimeters (mm).

Rainfall is generally restricted to the summer months (December to March). Based on weather data collected in 2001, the annual precipitation from 1992 to 2001 averaged 77.4 mm.

The area is extremely windy; wind speeds of up to 80 km/hour have been recorded during the dry season.

Operations are planned to be conducted year-round.

4.4 Local Resources and Infrastructure

The nearest villages are Antofagasta de la Sierra in the Province of Catamarca, 145 km south of the Project site, and San Antonio de los Cobres in the Province of Salta, 210 km north of the Project site. Antofagasta de la Sierra has an estimated population of 1,200 people and the village has basic services. San Antonio de los Cobres has an estimated population of 5,000 inhabitants with greater services including medical facilities, border patrol (Gendarmería Nacional), and schools.

The closest powerline, a 330-kVA line, is located 140 km north of the Sal de Vida Project, oriented southeast-northwest, and supplies power to Chile. Based on the distance to the Sal de Vida Project and the estimated capital requirements for accessing this network in the 2021 Feasibility Study, Allkem assumed that site-generated power is the preferred option.

The Argentine train network is well established and connects the major cities and ports. However, the system is currently not fully functional, and many lines are derelict. The Ferrocarril Belgrano line is located 100 km to the north of the Salar del Hombre Muerto. It consists of a narrow-gauge railway connecting with the Chilean railway network Ferronor to reach the Pacific Ocean. Livent reinstated the Pocitos-Antofagasta link which is used to ship product and import reagents. The Chilean section regularly services the Escondida and Zaldivar mines. A public airstrip is located in Antofagasta de La Sierra and a private airstrip is located at Livent's Salar del Hombre Muerto operations.

International cargo for Sal de Vida could use a combination of ports in the Buenos Aires region of Argentina and the Antofagasta region of Chile. The Ports of Antofagasta and Angamos consist of deep-water port facilities serving the mining industry in northern Chile. The Port of Antofagasta is an inbound port and could be used by Allkem to import 50% of the soda ash requirements. The Port of Angamos is an outbound port and could be used by Allkem to export lithium carbonate via the Pacific Ocean. The Ports of Rosario, Campana and Buenos Aires consist of large port facilities serving multiple industries in Argentina's main economic hubs.

Additional information on infrastructure that may be available to the Project, and which will be required for Project operations, is provided in Chapter 15 - Infrastructure.

4.5 Conclusion

Any future mining operations are expected to be operated year-round.

There is sufficient suitable land available within the mineral tenure held by Allkem for infrastructure such as waste disposal, process plant, and related mine facilities.

A review of the existing power and water sources, manpower availability, and transport options indicates that there are reasonable expectations that sufficient labor and infrastructure will be available to support exploration activities and any future mine development.

5. HISTORY

This section summarizes the history of the Project.

5.1 Historical Exploration and Drill Programs

A summary of the Project exploration history is provided in Table 5-1. Details of the exploration activities are discussed in Chapter 7.

Table 5-1 - Exploration History.

Operator	Date	Comment
Lithium One	2009 - 2012	• Obtained mineral tenure • Established an operating base on the salar • Conducted exploration drilling and Brine Resource estimates • Ran a pilot plant with a 20 L/batch capacity between 2011 and 2012 • Completed a preliminary economic assessment (PEA) • Completed a feasibility study assuming production of lithium carbonate and potassium chloride
Galaxy	2012	• Obtained Project interest through acquisition of Lithium One
	2012 - 2018	• Core drill programs • Short-term and constant-rate pumping tests • Assessment of Project scientific and technical design requirements • Mining and process studies • Technical studies in support of infrastructure and transport options • Updated Brine Resource estimates • Capital and operating cost estimates • Updated risk assessments • Prepared baseline studies and an Environmental Impact Report
	2018	• Sold the northern portion of its then tenement package to POSCO • Completed a feasibility study assuming production of lithium carbonate and potassium chloride
	2019 - 2021	• Conducted geotechnical surveys and detailed topography • Constructed and operated 20 ha of pilot ponds and plant • Built a 330-person camp • Completed exploration drilling of untested areas in the southern portion of the tenement package • Updated engineering, capital and operating cost estimates • Completed a feasibility study assuming production of BG, TG, and PG lithium carbonate • Completed Stage 1 production wells drilling • Obtained the DIA permit to construct and operate Stage 1

5.2 Historical Resource and Reserve Estimates

In 2012, a NI 43-101 Technical Report for Sal de Vida detailing a lithium and potassium resource estimate (Montgomery & Associates and GAI, 2012). Most recently, a NI-43 101 Technical Report was prepared for the Project detailing an updated reserve as well as a reserve estimate (Allkem, 2022).

5.3 Historical Production

No formal production of lithium carbonate has occurred from the Project area. The only production of lithium carbonate has been from pilot plant operations.

6. GEOLOGICAL SETTING, MINERALIZATION AND DEPOSIT

This section summarizes the deposit and geological setting of the Project.

6.1 Regional Geology

The regional geological setting is Altiplano Puna plateau, an area of uplift that began during the middle to late Miocene (10 - 15 Ma). Red-bed sediments formed during the early to middle Miocene in areas of structural depressions. During the middle to late Miocene, a combination of thrust faulting, uplift and volcanism led to the sedimentary basins becoming isolated. The Cordilleras and major watersheds bound the Puna area to the west and east. Sedimentation in these basins began with the formation of alluvial fans at the feet of the uplifted ranges and continued with the development of playa sandflats and mudflat facies.

In basin areas, the watersheds are within the basins; there are no outlets from the basins. Ongoing runoff, both surface and underground, continued solute dissolution from the basins and concentration in their centers where evaporation is the only outlet. Evaporite minerals occur both as disseminations within clastic sequence and as discrete beds.

6.2 Local & Property Geology

The lithologies in the Project area are summarized in Table 6-1 and showing in Figure 6-1.

Table 6-1 - Lithology Table.

Unit	Age	Description	Note
Quaternary	Flows dated at 0.754 ± 0.2 Ma	Clastic sediments, evaporites and basaltic lava flows	
Cerro Galan Volcanic Complex	2.56 ± 0.14 Ma	Dacitic ignimbrites	Widespread occurrence in the area, and forms the eastern border of the salar
Ratones Andesite	7.1 ± 0.2 Ma	Andesites	Volcano and flows
Tebenquicho Formation	14 ± 5 and 11 ± 1 Ma	Dacites and andesites	Crop out in the southern border of the salar
Sijes Formation	5.86 ± 0.14 Ma	Clastic sediments and evaporitic rocks	Contains Rio Tinto's Tincalayu borate deposit
Catal Formation	Age date ranges from 15.0 ± 0.2 Ma and 7.2 ± 1.4 Ma	Conglomerate with sandstone, and interbedded with ignimbrite flows and volcaniclastic rocks	
Vizcachera Formation		Conglomerates, sandstone, and red clays with gypsum	
Geste Formation	Middle Eocene	Conglomerates and red sandstones	

Unit	Age	Description	Note
Falda Cienega Formation	Ordovician	Greywacke, tuff and volcaniclastic sandstone	Widespread along the eastern flank of the salar
Tolillar Formation	Lower Paleozoic	Volcaniclastic sandstone with subordinate sandstone beds	Crop out along the northwestern border of the salar
Pachamama Formation	Neoproterozoic	Metamorphic sequence, consisting of schist and migmatites interbedded with metamorphic limestone and amphibolite	Located along the East flank of the Hombre Muerto Salar

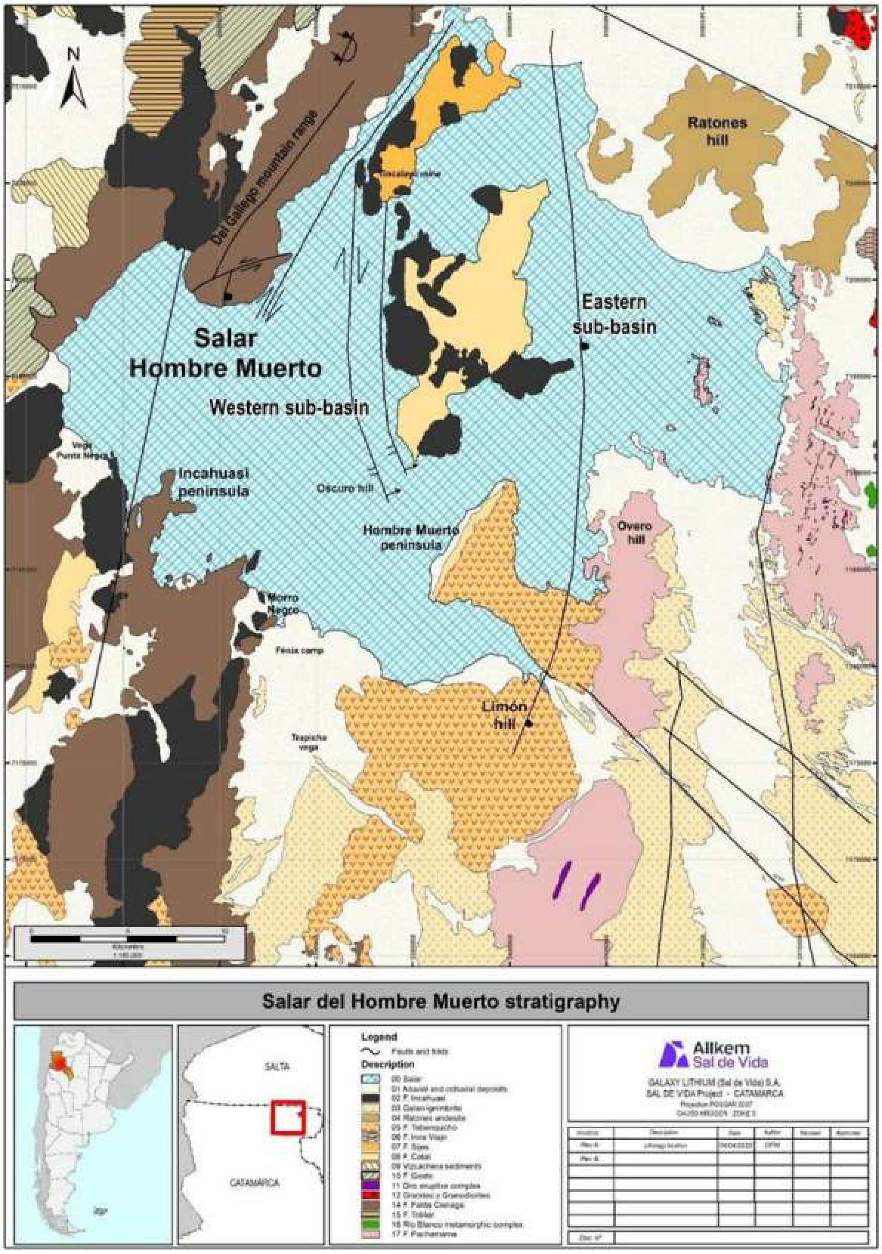

Figure 6-1 - Project Geology Map.

6.3 Deposit Description

6.3.1 Introduction

Playa (salar) basins typically have closed topography and all drainage trends towards the interior of the basin. Generally, no significant groundwater discharges from these basins. Most groundwater exits from the aquifer naturally by evapotranspiration, which is a combination of direct evaporation and transpiration from vegetation. Surface waters that flow into the basin are either directly evaporated or enter the groundwater circulation system and are subsequently evaporated. The entrained evaporation cycle subsequently concentrates fresh water on solutes. Over time concentrated brines can be produced from aquifers at depth.

Within the salar, the brine concentration is typically most concentrated in the center of basin, within the evaporite core. Groundwater tends to be more diluted along the margins where fresh water enters the basin and becomes more brackish as the freshwater mixes with brines.

Salar basin geometry and depths are typically structurally controlled but may be influenced by volcanism that may alter drainage patterns. Basin-fill deposits within salar basins generally contain thin to thickly bedded evaporite deposits in the deeper, low-energy portion of the basin, together with thinly to thickly bedded, low-permeability lacustrine clays.

Coarser-grained, higher permeability deposits associated with active alluvial fans are commonly observed along the edges of the salar. Similar alluvial fan deposits, associated with ancient drainages, may occur buried within the basin-fill deposits. Other permeable basin-fill deposits that may occur within salar basins include pyroclastic deposits, ignimbrite flows, lava-flow rocks, and travertine deposits.

Several of the salar brines of Chile, Argentina, and Bolivia contain relatively high concentrations of lithium, likely due to the presence of lithium-bearing rocks and local geothermal waters associated with Andean volcanic activity. The conceptual model for the Hombre Muerto basin, and for its brine aquifer, is based on exploration of similar salar basins in Chile, Argentina, and Bolivia.

6.3.2 Hombre Muerto Basin

The salar system in the Hombre Muerto basin is considered a typical mature salar. Such systems commonly have a large halite core and are characterized by having brine as the main aquifer fluid at least in the center and lower parts of the aquifer system. Conceptual hydrogeological sections were prepared incorporating the results of exploration drilling. The Hombre Muerto basin has an evaporite core that is dominated by halite. Basin margins are steep and are interpreted to be fault controlled. The east basin margin is predominantly Pre-Cambrian metamorphic and crystalline rocks belonging to Pachamama formation. Volcanic tuff and reworked tuffaceous sediments, most likely from Cerro Galan complex, together with tilted Tertiary rocks, are common along the western and northern basin margins. In the Sal de Vida Project area, the dip angle of Tertiary sandstone is commonly about 45º to the southeast. Porous travertine and associated calcareous sediments are common in the subsurface throughout the basin and are flat lying; these sediments appear to form a marker unit that is encountered in most core holes at similar altitudes. Several exploration boreholes located near basin margins completely penetrated the flat-lying basin-fill deposits, and have bottoms in tilted Tertiary sandstone, volcanic tuff, and micaceous schist.

6.3.3 Hydrogeological Units

Results of core drilling indicate that basin-fill deposits in Salar del Hombre Muerto can be divided into hydrogeological units that are dominated by six lithologies, all of which have been sampled and analyzed for both drainable porosity and brine chemistry, except for the micaceous schist. No brine samples were obtained from the micaceous schist. The predominant lithologies, meters drilled, and number of analyses are summarized in Table 6-2. It is worth noting that evaporite type rock is more predominant in the north part of the basin, currently lying under Posco mining concessions, purchased by Galaxy in 2018.

For brine estimation purposes, travertine, tuff, and dacitic gravel were grouped together based on similar drainable porosity and expected similar hydraulic conductivity. The grouping is not based on geological similarities.

Table 6-2 - Sample Data from Exploration Core Holes for Hydrogeological Units.

Predominant Lithology of Hydrogeological Unit	Meters of Lithological Unit Described	Number of Drainable Porosity Analyses	Number of Brine Chemistry Analyses
Clay	285.2	24	15
Halite, gypsum, or other evaporites	1,127.1	100	130
Silt and sandy or clayey silt, and siltstone	449.6	50	48
Sand, silty sand, and sandstone	1,072.2	109	129
Travertine, tuff, and dacitic gravel	238.8	25	30
Micaceous schist	10.0	1	0
Total	**3,182.9**	**309**	**352**

DDH holes have been correlated to infer the lateral continuity of the different lithologies over the salar. Figure 6-2 is a plan view showing the location of the vertical cross-sections provided in Figure 6-3 to Figure 6-6. It is worth noting that cross-section D-D' (Figure 6-6) actually lies over Posco mining concessions purchased from Galaxy in 2018. The same situation occurs with the north extension of cross-section A-A' starting at approximately Well-SVH10_06 heading north (Figure 6-3). Most of the evaporites described in Table 6-2 occur in thee Posco-held concessions.

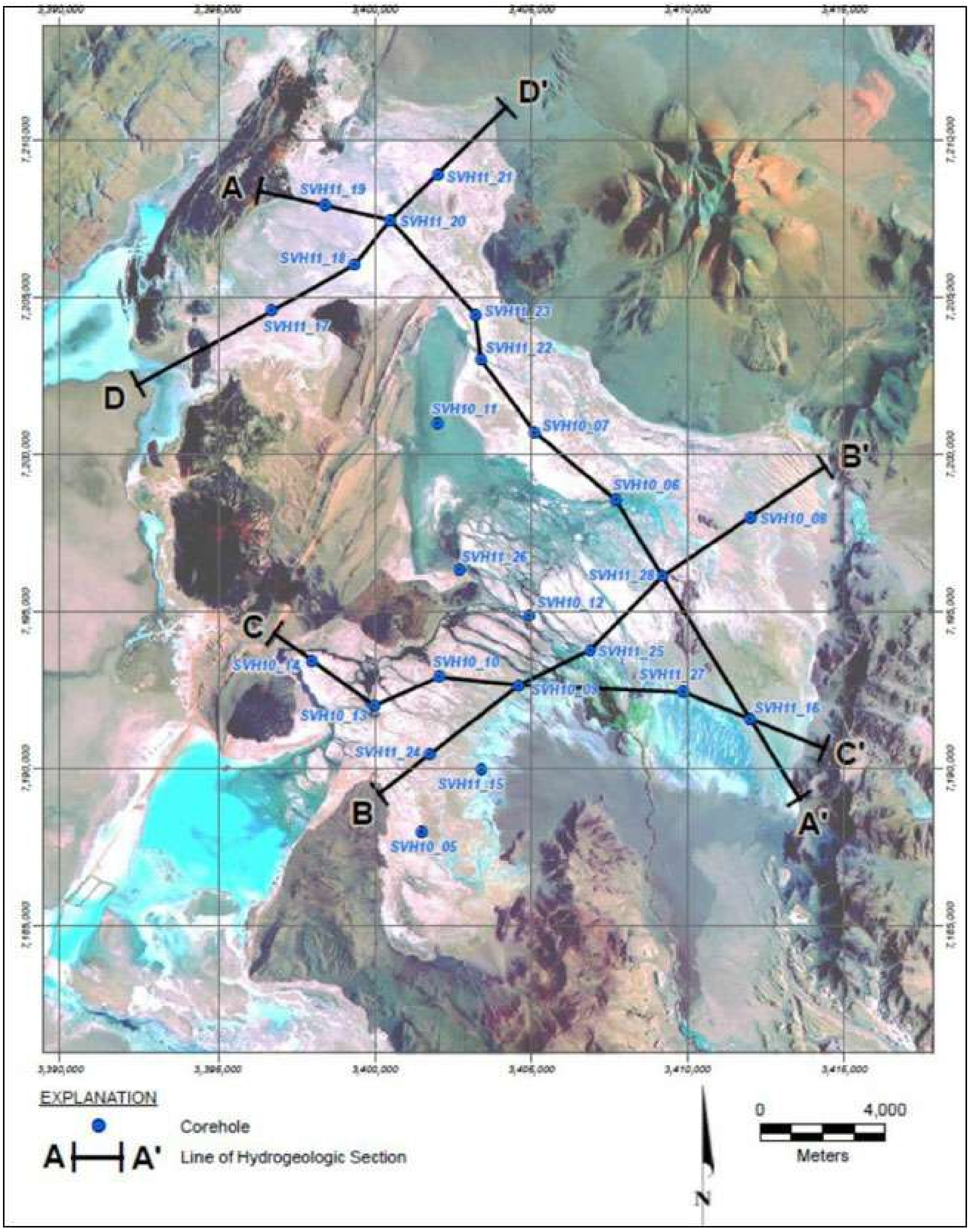

Figure 6-2 - Hydrogeological Cross-Section Location Plan.

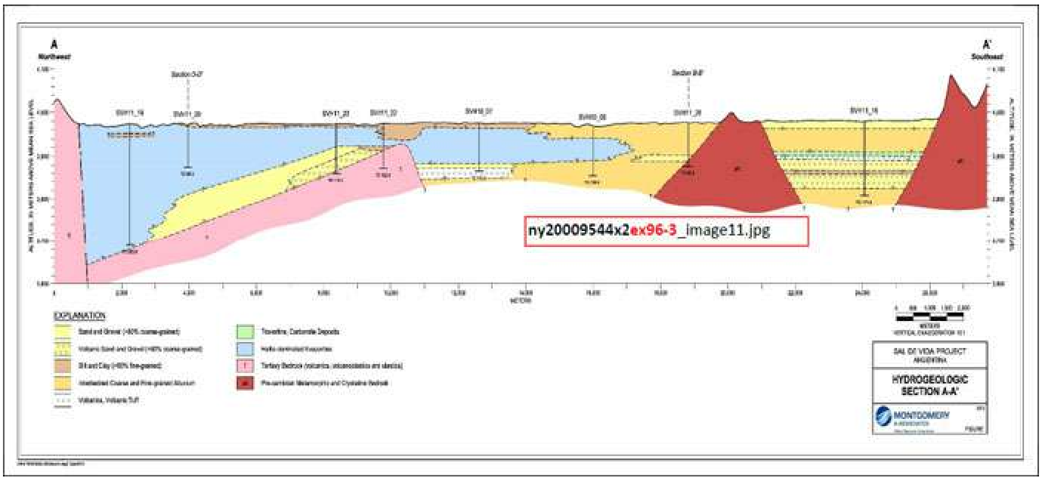

Figure 6-3 - Hydrogeological Cross-Section A-A'.

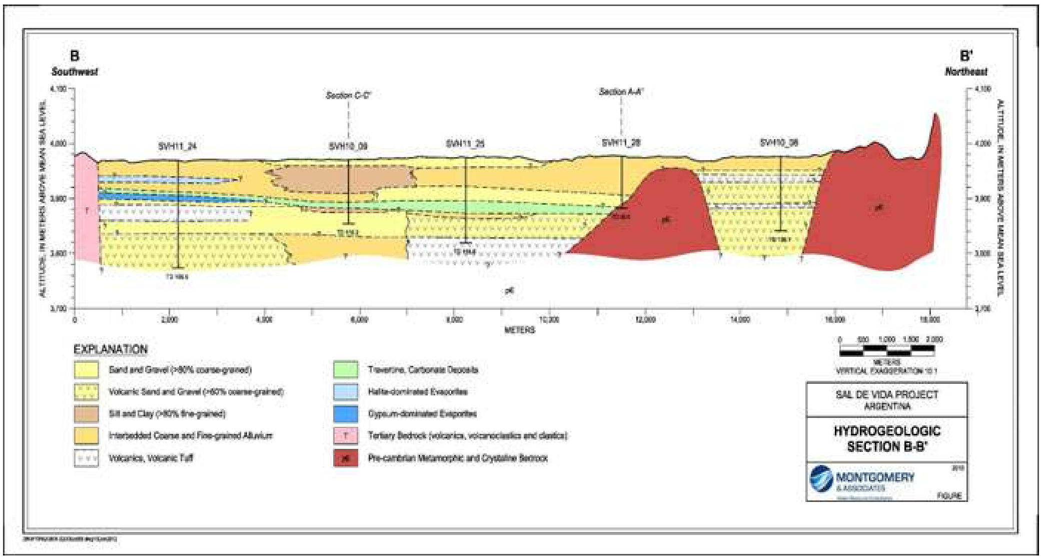

Figure 6-4 - Hydrogeological Cross-Section B-B'.

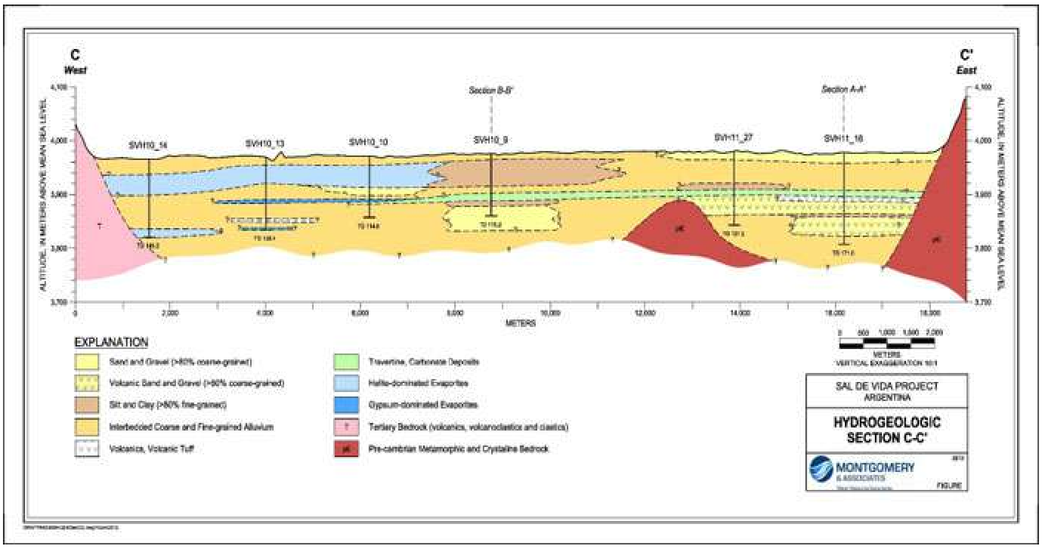

Figure 6-5 - Hydrogeological Cross-Section C-C'.

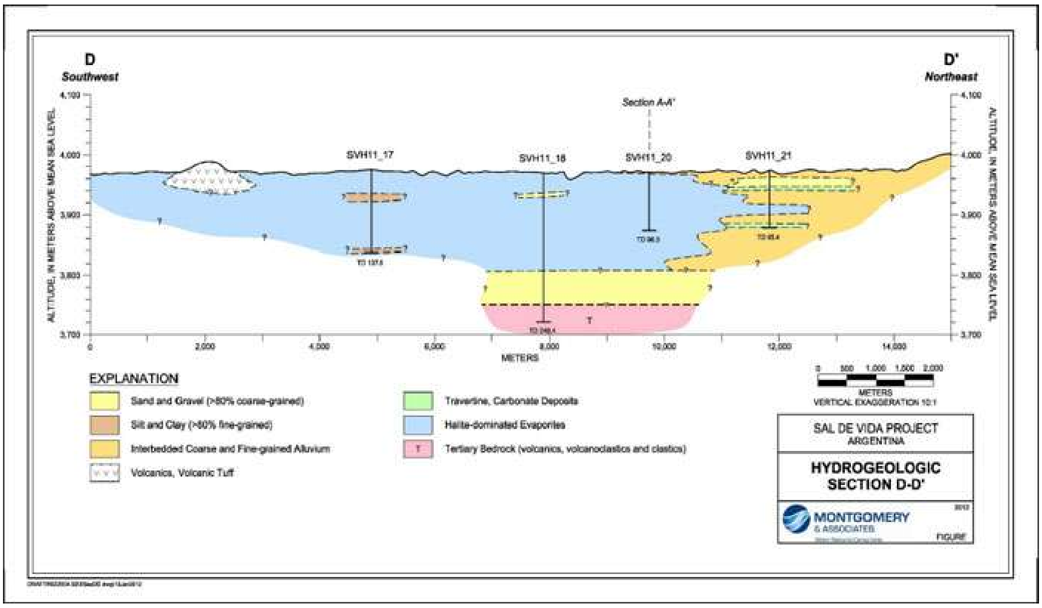

Figure 6-6 - Hydrogeological Cross-Section D-D’.

Figure 6-7 shows stratigraphic columns within the mine concessions of the salar. In general, the stratigraphic sequence is characterized by a predominance of clastic and volcaniclastic sediments with variable grain sizes and interbedded evaporites, tuff, and travertine. Surficial coarse-grained sediments of the eastern sector are largely sourced from the Rio de los Patos alluvial sub-basin and grade to finer-grained sediments in the northwest and western areas of the mine concessions due to the transition to a lower energy depositional environment. In addition, the northwest sector hosts a thick evaporite unit due to increased historical evapoconcentration and subsequent mineral precipitation. At depth, unconsolidated sediments are found in all highlighted areas and host lithium-rich brine. This sedimentary unit unconformably overlies basement rock which is mainly inferred from geophysical surveys; on the western side of the properties, Tertiary basement rock is deduced from neighboring outcrops, while Precambrian bedrock on the eastern side corresponds to the Pachamama Metamorphic Complex.

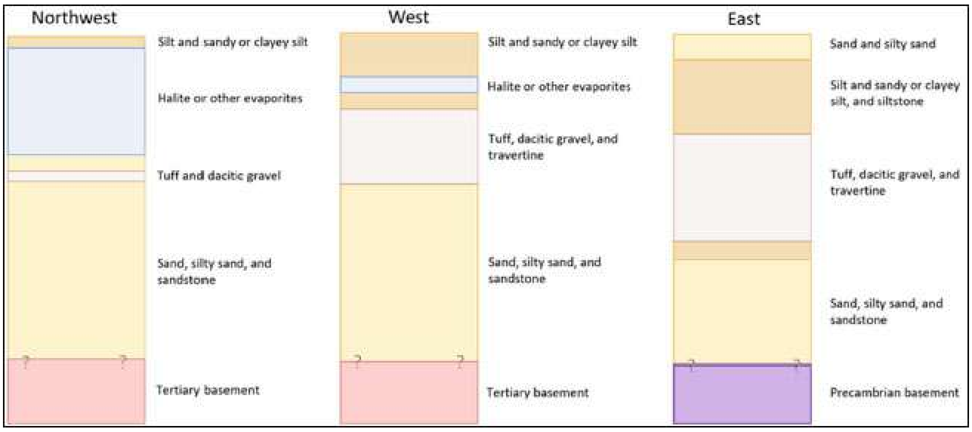

Figure 6-7 - Generalized Stratigraphic Columns[2]

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[2] Notes: the unit representation is simplified, and the scale is not exact. The northwest, west, and east stratigraphic columns are largely based on the SVH10]07, SVH11-24, and SVH11-16 well logs, respectively.

6.4 Deposit Model

The deposit model is summarized from Munk et al. (2016) and Houston et al. (2011). Lithium is found in four main types of deposits:

- Pegmatites.
- Continental brines.
- Hydrothermally altered clays.
- Oil-petroleum deposits within salty and brine waters underneath hydrocarbons reservoirs.

Continental brine deposits typically share the following characteristics:

- Located in semi-arid, arid, or hyper-arid climates in subtropical and mid-latitudes.
- Situated in a closed basin with a salar or salt lake. Salars or salt crusts are common where brines exist in subsurface aquifers.
- Occur in basins that are undergoing tectonically driven subsidence.
- Basins show evidence of hydrothermal activity.
- Have a viable lithium source (e.g., high-silica volcanic rocks, pre-existing evaporites and brines, hydrothermally derived clays, and hydrothermal fluids). The nearly 5,900-m-high resurgent dome of the Cerro Galán caldera may be an important recharge area for Salar del Hombre Muerto at ~4,000 m elevation.
- Have an element of time-stability to allow the leach, transport, and concentration of lithium in continental brines.

The majority of important lithium-rich brines are located in the “Lithium Triangle” of the Altiplano-Puna region of the Central Andes of South America (Figure 6-8) and are classified either as “immature clastic” or “mature halite” (Figure 6-9) types.

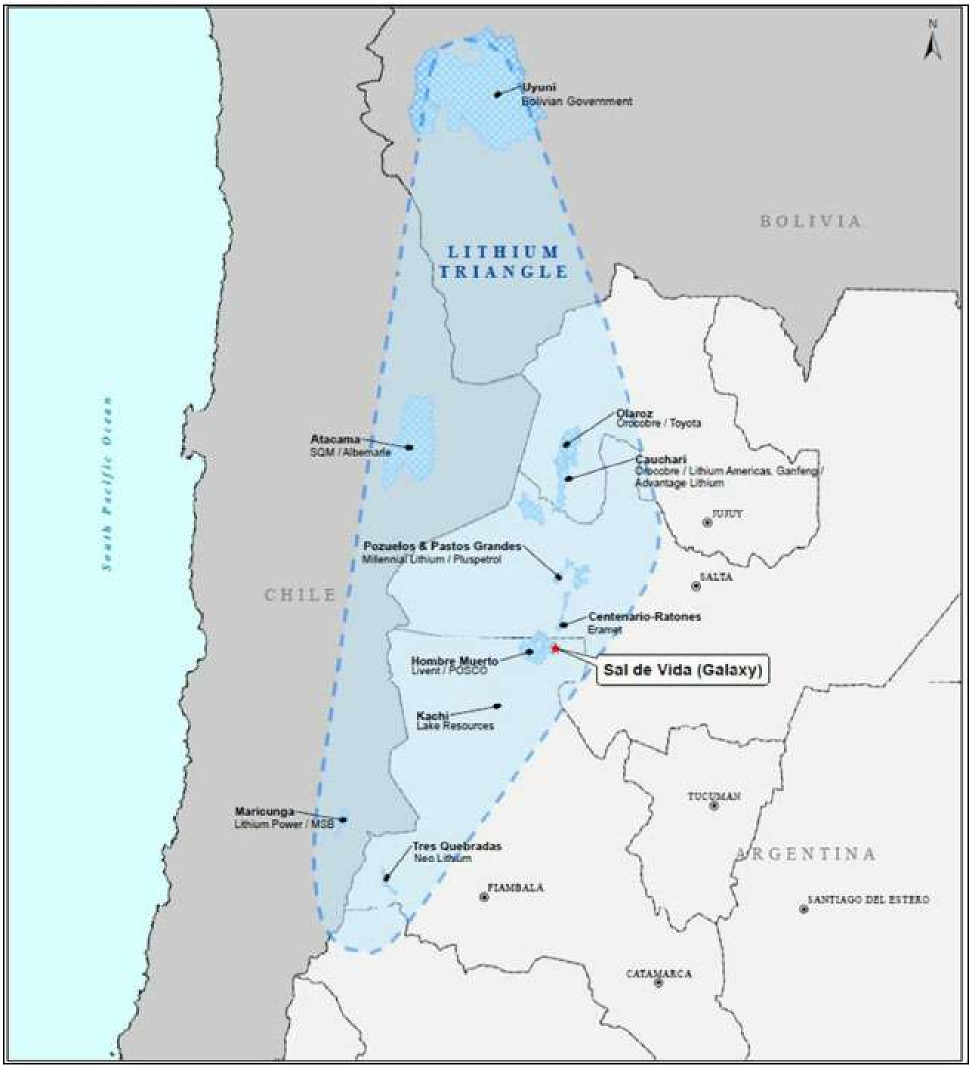

Figure 6-8 - Lithium Triangle.

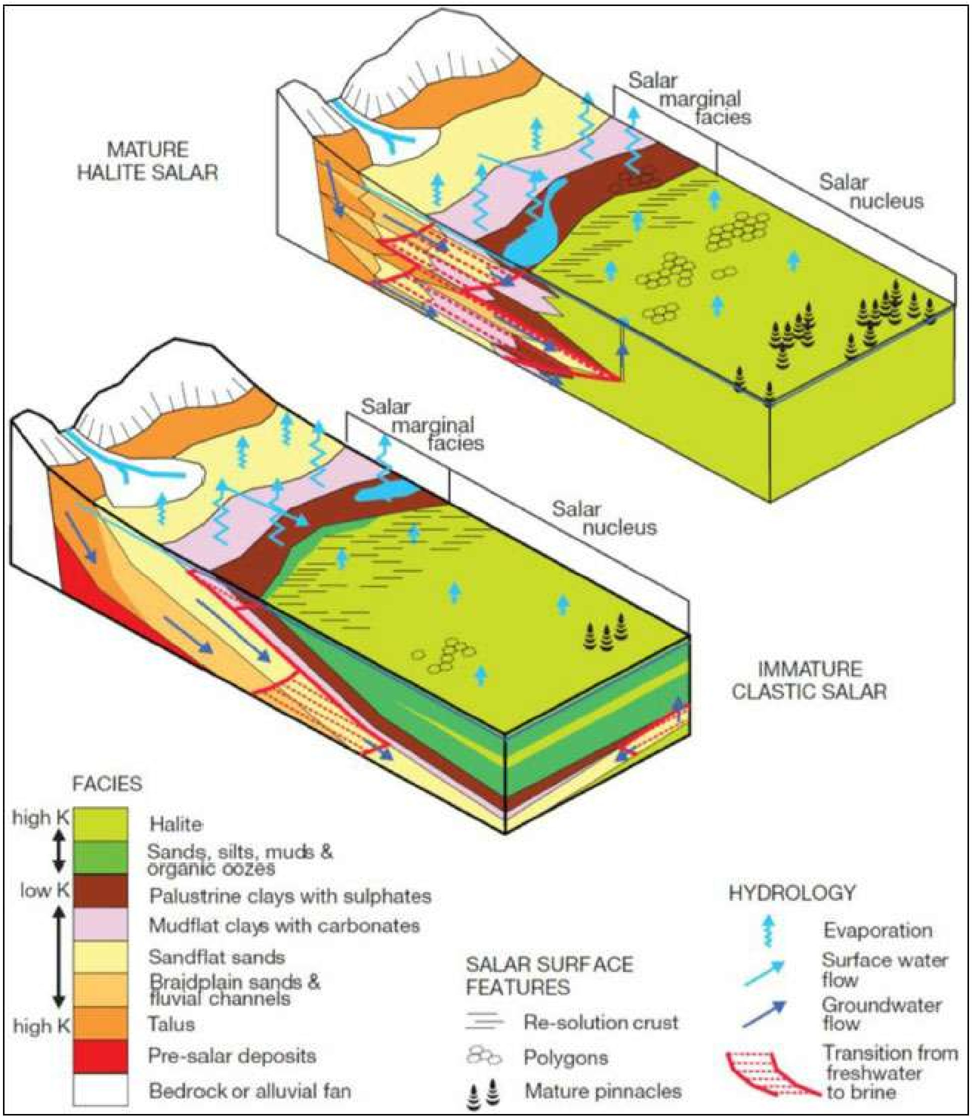

Figure 6-9 - Schematic Showing Immature Clastic and Mature Halite Salars (Houston et al., 2011).

These salar classifications are based on:

- The relative amount of clastic versus evaporite sediment.
- Climatic and tectonic influences, as related to altitude and latitude.

- Basin hydrology, which controls the influx of fresh water. The immature clastic classification refers to basins that generally occur at higher (wetter) elevations, contain alternating clastic and evaporite sedimentary sequences dominated by gypsum, have recycled salts, and a general low abundance of halite.

The mature halite classification refers to salars in arid to hyper-arid climates that reach halite saturation and have a central halite core. Houston et al. (2011) note that a key input is the relative significance of aquifer permeability which is controlled by the geological and geochemical composition of the aquifers. Munk et al. (2016) observe that immature salars may contain easily extractable lithium-rich brines simply because they are comprised of a mixture of clastic and evaporite aquifer materials that have higher porosity and permeability.

In the Salar del Hombre Muerto, a mature sub-basin exists to the west as a result of moderately evolved brines decanting from an immature eastern sub-basin over a subsurface bedrock barrier (Houston et al., 2011). A conceptual model for brine development is provided in Figure 6-10. Economically extractable lithium brines typically contain a minimum of 100 mg/l lithium concentration to more commonly 250 mg/l or more lithium. Common inflow waters may contain lithium concentrations in the range of 1 - 10 mg/l or less range. The combined effects of evaporation and precipitation of evaporite minerals concentrate the inflow waters by many orders of magnitude over time and the time-integrated flux of water through the basin must be sufficient to create a lithium brine deposit that contains sufficient total lithium to be economic, irrespective of lithium concentration.

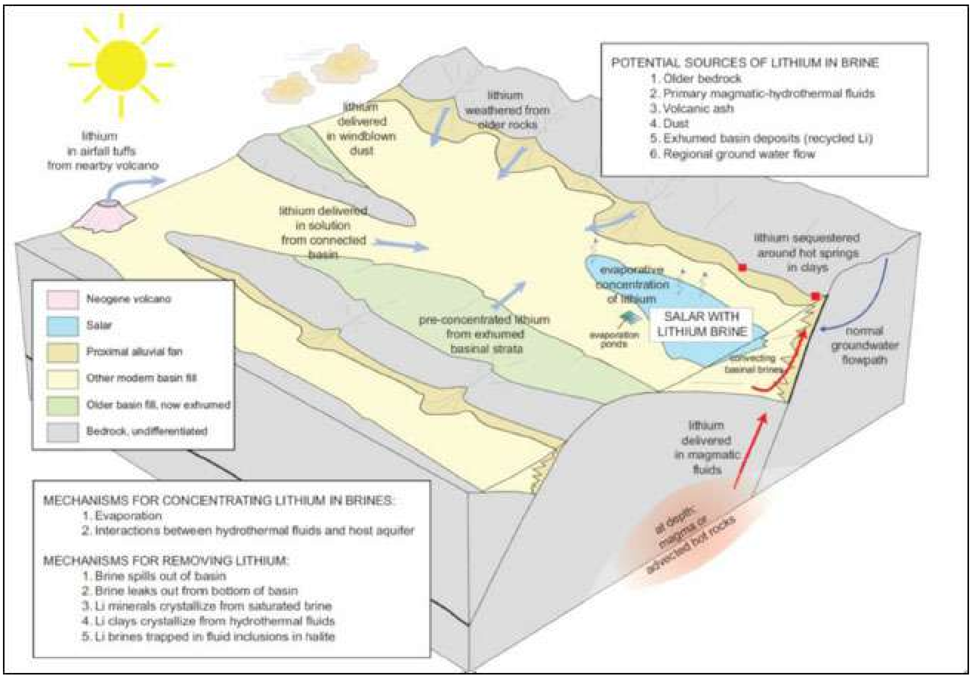

Figure 6-10 - Schematic Brine Deposit Model Similar to the Sal de Vida Project (Munk et al., 2016).

6.5 Comments on Geological Setting, Mineralization, and Deposit Types

The knowledge of the geological setting of the salar and the associated hydrogeological systems is sufficient to support the Brine Resource and Reserve estimates. The recent drilling program of Phase 6 wells confirms the conceptualized geological setting and location of brine-bearing salar sediments. New lithologic data from cuttings and geophysical surveys confirm lithium-rich brine mineralization.

The Sal de Vida deposit shares the six common characteristics of a brine system, as outlined by Munk et al., (2016). In the opinion of the employees of Montgomery & Associates, the brine system deposit model would be a reasonable basis for the design of additional exploration programs.

7. EXPLORATION

This section summarizes exploration conducted in support of the Project.

7.1 Historical Exploration

Historical exploration activities are summarized in Chapter 5.1 - Historical Exploration and Drill Programs, and the following sub-sections detail specific surveying, geophysical, drilling, and sampling activities that have been conducted to support the Project.

7.2 Grids and Surveys

Four generations of topographic surveys were completed (Table 7-1). The 2012 survey was conducted by former owner Lithium One, where the remaining three surveys were conducted by Galaxy Lithium. The two 2020 surveys were used to locate drill collar locations and to provide sufficiently accurate data for engineering design purposes.

Table 7-1 - Topographic Surveys.

Operator/Contractor	Purpose	Date	Note
PDOP-Topografía Minera de Salta	Drill collar geo-referencing	2012	Survey tied-in to survey station P.A.S.M.A. (Instituto Geográfico Nacional, Red de Apoyo al Sector Minero Argentino) Punto 08-008 (Vega del Hombre Muerto) of the Argentine grid, using POSGAR 94 with Gauss-Kruger projection
Galaxy/PDOP- Topografía Minera de Salta	Drill collar geo-referencing	2020	Survey tied-in to the Instituto Geográfico Nacional (IGN) network using the Salta (UNSA), Tinogasta (TGTA) and Alumbrera (ALUM) stations as well as to Galaxy's three survey stations
Galaxy/Grupo Territorio - Ingeniería, Agrimensura y Ambiente	Engineering design	2019-2020	East and south zone drone flights covering 4,500 ha. Nine flight plans covering ~500 ha each, which were processed individually and stitched together using ArcGIS Desktop Advanced 10.8 software. Quality control points were measured every 200 - 350 m with the GPS units. Data were obtained and processed using the GEOIDE- Ar16 gravimetric geoid model developed by IGN and Trimble Navigation Standards. Final data were converted to AutoCAD for engineering.
Galaxy/Enzo Lotta Servicios de Agrimensura	Construction	2021	Southwest zone drone flights covering 2,595 ha. Quality control points were measured every 250 - 300 m with the GPS instrumental. Results were presented with a DEM in tif format, contour lines with equidistance every 20 cm and 50 cm, in ".shp" and CAD format.

7.3 Geophysical Surveys

A number of geophysical surveys have been completed and are summarized in Table 7-2. The gravity survey locations are shown in Figure 7-1, the vertical electric sounding point locations in Figure 7-2, transient electromagnetic survey profile line locations in Figure 7-3, and 2D and 3D reinterpretation of depth to basement rock at Sal de Vida Project is shown in Figure 7-4 and Figure 7-5 respectively.

Table 7-2 - Geophysical Surveys.

Operator/Contractor	Survey Type	Date	Note
Quantec Ltd.	Gravity	2009, 2010	96 linear km across the eastern sub-basin to provide information on bedrock by density. Results suggested that the deepest part of the basin was in the center of the western sub-basin, where salar deposits may be as much as 380 m thick.
Geophysical Exploration and Consulting S.A.	Vertical electrical sounding	2010	Conducted to investigate brackish or raw water-brine interface conditions beneath the margins of the Hombre Muerto basin, along alluvial fans, and adjacent to the Río de los Patos. Data interpretations suggest that highly conductive material, possibly brine, is present beneath alluvial fans along the basin margins. The following resistivity ranges were used for brackish water/salt water- bearing formations and brines: 1 ohmmeter (ohm-m) < apparent resistivity < 15 ohm-m: brackish water-bearing formations; apparent resistivity < 1 ohm-m: sea water, geothermal fluids, and brine-bearing formations.
Quantec Geoscience Argentina S.A.	Transient electro-magnetic	2018	127 measurements in five profiles. The acquired data are of high quality, and the inversion results provide a good representation of the subsurface resistivity distribution to depths ranging from approximately 100 - >400 m, varying in association with the conductivity. The surveys detected resistivity ranging from <1 ohm-m to approximately 1,000 ohm-m. Several conductive zones of resistivity of <1 ohm-m were detected.
Mira Geoscience	3D Gravimetry	2021	Objective of Project was to generate a revised depth to basement interpretation of gravity data for the Sal de Vida area in Argentina, using geologically constrained 3D gravity forward modelling and inversion techniques. Interpretation was constrained by supporting data, including outcrop, drilling, transient electromagnetics (TEM), and DC resistivity soundings (Vertical Electric Soundings, VES). All supplied data was imported and registered in GOCAD Mining. Data compiled comprised is: - Topographic data - Geological maps showing basement outcrop - Interpreted cross-sections - Drill data, including petrophysical data on drillhole samples (density and porosity) - Surface sample petrophysical data (Sharpe, 2010). - Geophysical data - TEM - Gravity - VES

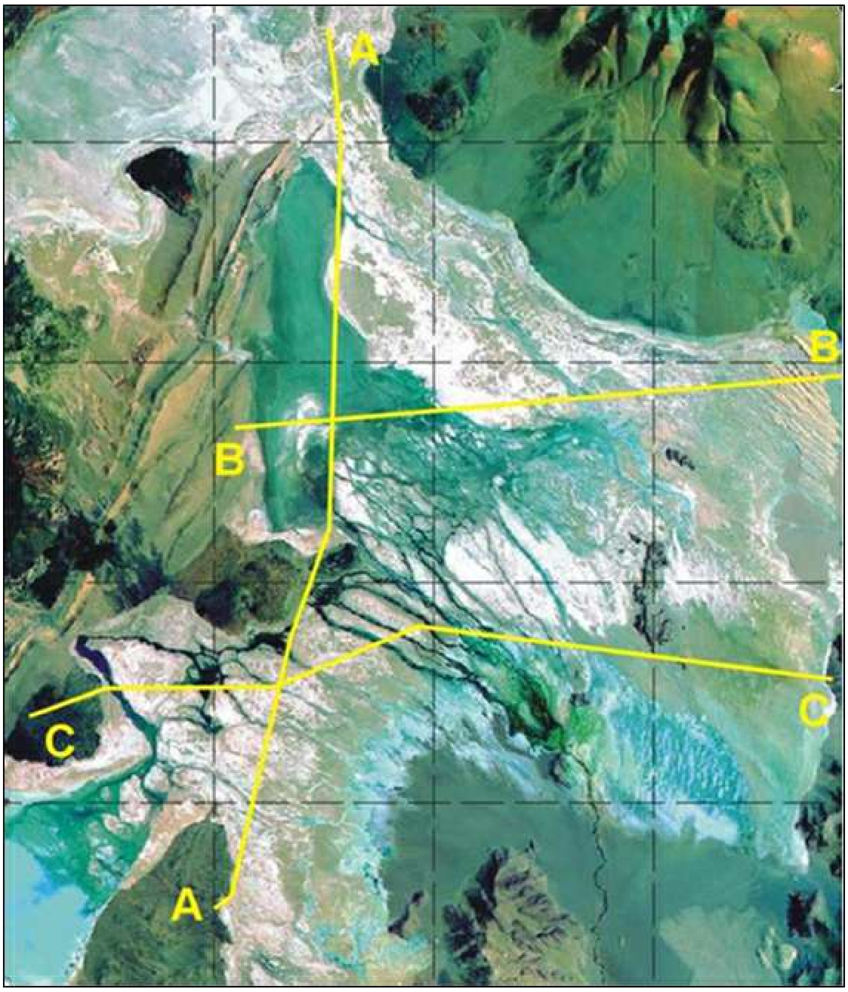

Figure 7-1 - Location of Year 2021 Gravity Survey Lines.

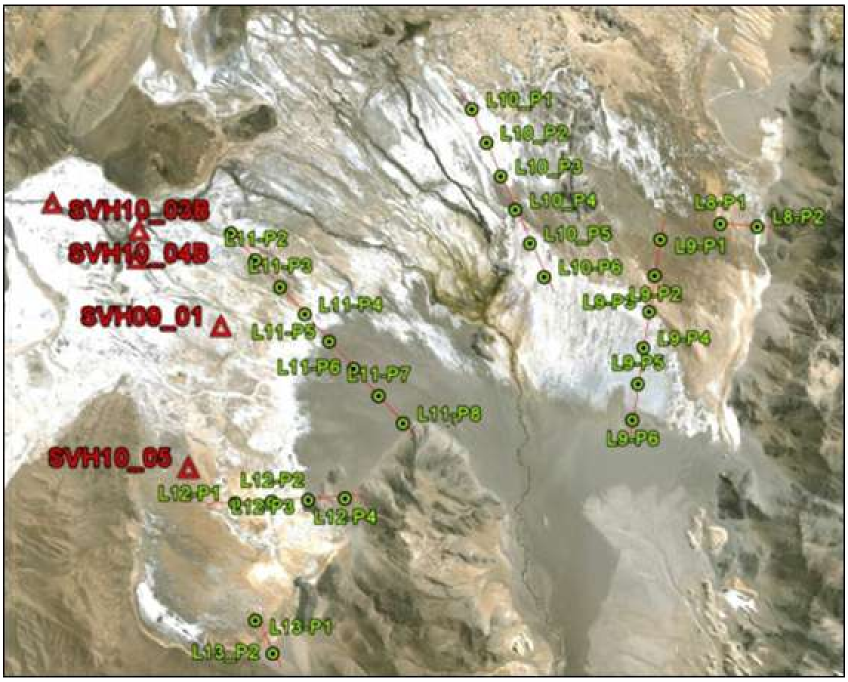

Figure 7-2 - Location Map, Vertical Electric Sounding Points[3].

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[3] Figure from GEC Geophysical Exploration & Consulting S.A., 2010. Green represents VES readings and red proposed drill holes. Red triangles represent core holes.

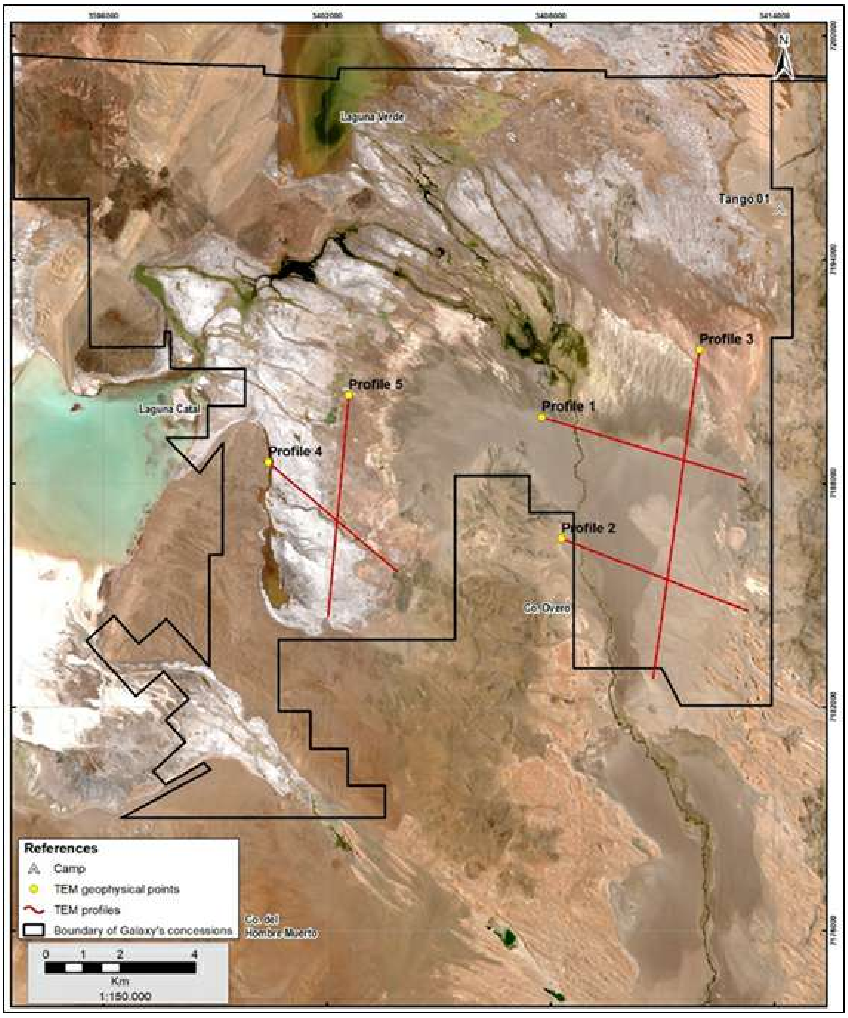

Figure 7-3 - Location Map, Transient Electromagnetic Survey Profiles.

Prior to the drilling of the eight production wells in the east wellfield in year 2021, most of the drillholes at Sal de Vida have not encountered basement rock. Only transient electromagnetic and vertical electric sounding surveys have occurred to approximate depth to bedrock. Due to the uncertainty of depth to bedrock, Allkem contracted Mira Geoscience to interpret depth to basement using interpretation of available supporting data. Coordinate system used in this project was POSGAR, Argentina Zone 3, and interpretation and model development were carried out in GOCAD Mining Suite, which consists of a 3D forward modelling and inversion algorithm for gravity and magnetic data that operates on a geological model. The data compiled in this 3D Model project included:

- Topographic data.
- Geological maps show basement outcrops.
- Interpreted cross-sections.
- Drill data, including petrophysical data on drillhole samples (density and porosity).
- Surface sample petrophysical data (Sharpe, 2010).
- Geophysical data from TEM, VES, and Gravity surveys.

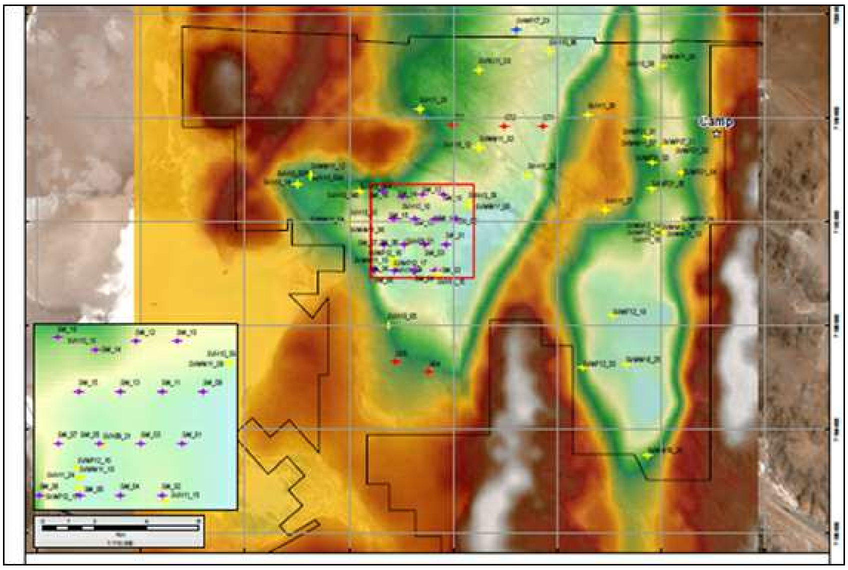

Figure 7-4 - 2D Plan View of Sal de Vida Basement Map[4].

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[4] Tertiary Basement is indicated in green and in the Precambrian Basement is indicated in brownish yellow.

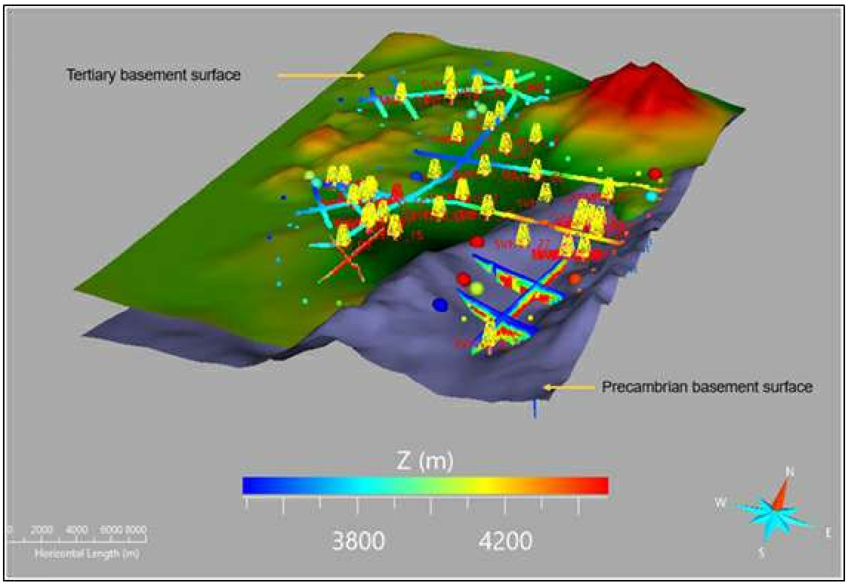

Figure 7-5 - 3D Model Update Outcropping Cerro Ratones Northeast Edge[5].

7.4 Pits and Trenches

Pits and trenches were used to establish the presence of lithium-bearing brines in the Project area, and the information collected is superseded by drill data.

The first campaign was completed by Lithium One in 2009 to verify if there were brines within the concessions. Mapping and observation of the exploration pits indicated the presence of a free-flowing aquifer transmitted through at least one poorly sorted sand and silt horizon.

A second, more detailed set of 42 trenches were excavated by Lithium One within an area of approximately 75 km^2, providing an average density of one sample per 1.5 km^2. Not all of these trenches are within the current Project area. The chemistry of the fluids sampled in the trenches confirmed that there was only one brine type within the salar, originating from the evaporation of influent waters.

The final pit phase was conducted in 2009-2010 by Lithium One, with 21 near-surface samples collected from excavated pits. The samples were used to obtain information on the basic physical parameters of each brine sample (e.g., pH, density, electrical conductivity, TDS, temperature, Eh).

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[5] Tertiary Basement is indicated in green and the Precambrian Basement in gray with a 1:3 vertical exaggeration.

7.5 Drilling

Drilling was conducted in several phases. These were broken out into Phase 1 to 6, with Phase 1 commencing in 2009, and Phase 6 in late 2020 as part of the East Wellfield development. The drill programs are summarized in Table 7-3, and drill collar locations are provided in Figure 7-6. Drilling Phases 1, 2, and 3 were conducted by Lithium One; Phases 4, 5, and 6 were conducted by Galaxy Lithium.

7.5.1 Phase 1

The drilling contractor for the core program was Energold Drilling Inc., (Energold) headquartered in Vancouver, Canada and based out of Mendoza, Argentina. The drill rig used for wells SVH10_05 - SVH11_15 was a DDH Energold Series 3 type. Core holes recovered HQ core sizes (63.5 mm core diameter), and, if needed to suit drilling conditions, were reduced to NQ (47.6 mm). HWT (71 mm) casing was installed in the drill holes.

Brine wells SVH09_01 and SVH09_02 were drilled by Hidroplus S.R.L. (Hidroplus) using conventional air circulation. These wells could not be cased and were abandoned. Wells SVH10_03A through SVH10_04B were drilled by Ernesto Valle, S.R.L., a firm based in the city of Salta, using conventional circulation mud-rotary drilling methods, and were cased with 4.5-inch PVC screened casing and gravel pack filter.

7.5.2 Phase 2

The core drilling contractor was Energold. Core holes recovered HQ core sizes (63.5 mm core diameter), and, if needed to suit drilling conditions, were reduced to NQ (47.6 mm). All core holes were cased with 2-inch (50.8 mm) PVC casing for use as monitor wells. The measured depth to water below the land surface was 3 m for all wells.

Drilling contractors for the brine and reverse circulation (RC) wells were Compañía Argentina de Perforaciones S.A. (CAPSA), from Mendoza, Argentina, and Andina Perforaciones S.A. (Andina), based in the city of Salta, Argentina. All brine exploration wells were cased with 8-inch (203 mm) PVC casing, except well SVWW11_07, which was cased with 6-inch (152 mm) PVC casing.

7.5.3 Phase 3

The drilling contractor was Andina. Some wells were designed to be pumping wells and some were designed to be observation wells for long-term tests. All wells were drilled by conventional mud rotary circulation. Drilled borehole diameters were 17.5 inches (444.5 mm), 12.25 inches (311.2 mm) and 8 inches (203.2 mm). Once drilling was completed, 8-inch (203.2 mm) and 2-inch (50.8 mm) blank PVC casing, and slotted PVC well screens were installed (slot size 1 mm) for monitoring wells. The pilot production wells were cased with 10-inch (254 mm) blank PVC casing and a PVC well screen (slot size 1 mm). Gravel pack (1 - 2 mm and 1 - 3 mm diameters) was installed in the annular space surrounding the well screen. A bentonite seal was installed above the gravel pack, and fill material was placed up to the level of the land surface.

7.5.4 Phase 4

A single exploration well was drilled by Andina using a rotary drill rig and completed with 10-inch PVC casing and gravel pack filter.

7.5.5 Phase 5

The exploration wells were completed by Andina (SVWW18_25) and Hidroper S.R.L (SVWW18_26) using a rotary drill rig and completed with 8-inch PVC casing and gravel pack filter.

7.5.6 Phase 6

The drilling contractor was Cono Sur Drilling, a division of Energold Drilling. The operation occurred from December 2020 to November 2021. All wells were designed to be part of the first production wellfield to provide brine to the evaporation ponds as part of the process to concentrate the brine. The wells were drilled by conventional mud rotary circulation. Drilled borehole diameters were 24 inches (609.6 mm), 16 inches (406.4 mm) and 8.75 inches (222.25 mm). Once drilling was completed, production wells were cased with 10-inch (254 mm) blank PVC casing and a PVC well screen (slot size 0.75 mm). Gravel pack (1 - 2 mm and 1 - 3 mm diameters sand) was installed in the annular space surrounding the well screen. A bentonite seal was installed above the gravel pack, then cement and fill material were placed to the level of the land surface.

A freshwater well was constructed by Cono Sur Drilling Co. during Phase 6. This well was labeled as SVFW21_21 and the drilled borehole diameters were 16 inches (406.4 mm) and 8.75 inches (222.25 mm). Once drilling was completed, the production water well was cased with a 10-inch (254 mm) blank PVC casing and a PVC well screen (slot size 0.75 mm). Gravel pack (1-2 mm) was installed in the annular space surrounding the well screen. The upper part of the well was sealed with cement.

Location coordinates and construction information for the production wells and freshwater well are given in Table 7-4.

Table 7-3 - Drill Summary Table.

Drilling Phase	Duration	Note	Number of Holes	Meters (m)	Max Depth (m)	Comments
Phase 1	2009 to early 2011	Core holes	9	271.0	SVH11_15 149.0 m	Nine conventional core holes. Core was logged, recovery recorded, and the holes were analyzed for drainable porosity and brine chemistry. Results from Phase 1 indicated that basin-fill deposits in Salar del Hombre Muerto could be divided into hydrogeological units dominated by five lithologies, all of which had been sampled and analyzed for drainable porosity.
		Brine exploration wells	6	1,070.2	SVH10_04B 63.0 m	Six small diameter shallow wells were completed and one well (SVH10_04B) was used for pilot plant brine supply. Work included geological control with cutting sampling and lithological description and physical-chemical analysis of brine samples.
Phase 2	2011	Core holes	6	894.3	SVH11_24 195.24 m	Six core holes. The measured depth to water below the land surface was 3 m for all wells. Analytical results for drainable porosity and brine chemistry are available for all core holes. For each core hole, electrical conductivity and temperature were measured at 2-5 m intervals using an Aquatroll 200 downhole electrical conductivity probe. Using the results from the downhole electrical conductivity profiles, it was possible to identify raw-water influences in the upper part of four core holes.
		Brine exploration wells	9	1,440.0	SVWW11_13 165.0 m	Nine brine exploration wells and one reverse circulation (RC) well. Short-term pumping tests were completed on brine exploration wells SVWW11_02 and SVWW11_04 to SVWW11_13.
Phase 3	2012	Brine exploration wells	5	651.0	SVWW12_16 175.70 m	Five wells. Short-term (24-hour) pumping tests were conducted at each well. The pumping rate was measured using a Krohne magnetic flowmeter. Water- level measurements were taken using both electric water level sounders, and non-vented in-situ LevelTroll pressure transducers/dataloggers. Water level recovery after pumping was measured for all wells for a period of time at least equal to the pumping period. Distance from pumped wells to observation well ranged from 25-130 m. Drawdown data were analyzed for aquifer transmissivity. The results confirmed potential for production in the western and eastern areas. A recommendation was made to perform 30-day pumping tests in both areas and confirm the viability for long-term production.
Phase 4	2017	Brine exploration wells	1	158.5	SVWP17_21 158.49 m	One well completed. Activities included geological wireline logging with spontaneous-potential, long and short induction, sample splitting, lithological descriptions, and downhole brine sampling. Results from this well confirmed that the tested zone had production potential and a recommendation was made to perform a 30-day pumping test in this area and confirm the viability for long-term production.
Phase 5	September 2018 to March 2019	Brine exploration wells	2	535.0	SVWP18_25 303.0 m	Two wells completed. Short-term pumping tests conducted. Brine samples were obtained at regular intervals from the discharge pipeline. Drawdown and recovery data were analyzed. The laboratory results support the interpretation that the wells may have been perforated in both the upper freshwater aquifer and the lower brine aquifer. This program provided geological and brine chemistry data that were used to characterize the southeastern area.

Drilling Phase	Duration	Note	Number of Holes	Meters (m)	Max Depth (m)	Comments
Phase 6	Commenced in Q4 2020. Finalized in Q4 2021.	Production Wells	8	2,021.7	SVWP21_02 307.0 m	Eight wells completed. Activities included geological wireline logging with spontaneous-potential, long and short induction, borehole magnetic resonance, spectral gamma ray and lithological descriptions. Short-term (36- 72hour) pumping tests were conducted at each well. The pumping rate was measured using a Rosemount magnetic flowmeter and a v-notch tank. Water- level measurements were taken using both electric water level sounders, and non-vented Solinst® Levelogger pressure transducers/dataloggers. Water level recovery after pumping was measured for all wells for a period of time at least equal to the pumping period. Distance from pumped wells to observation well ranged from 6.74-2,438 m. Drawdown data were analyzed for aquifer transmissivity. This program was planned to develop the first production wellfield to provide brine to the evaporation ponds as part of the process to concentrate and obtain lithium from the brine.
	Commenced in Q4 2021. Finalized in Q1 2022.	Fresh Water Well	1	42.0	SVFW21_21 42.0 m	One fresh water well completed, located in the southeast area of the properties. Activities included geological wireline logging with long and short resistivities, conductivity, gamma ray, temperature. Data from pumping test are still pending.

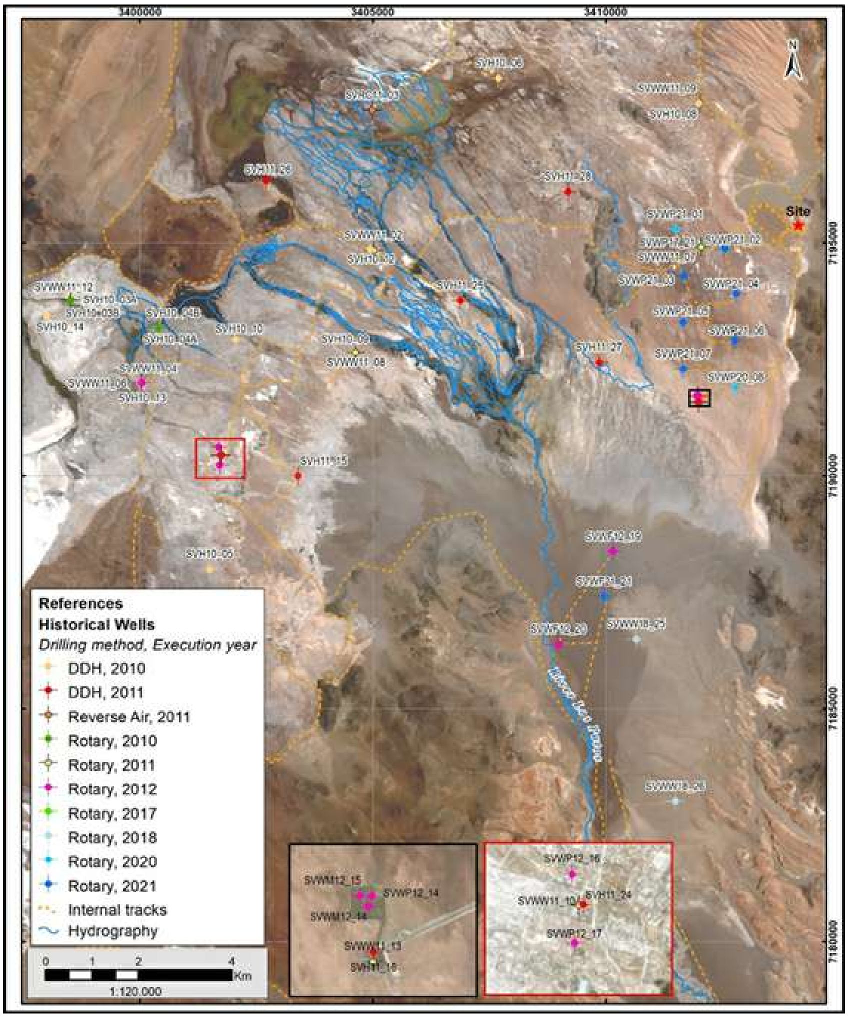

Figure 7-6 - Drill Collar Location Map.

Table 7-4 - Summary of Well Construction Information for Production Wells and Fresh Water Well.

Borehole ID	Well Coordinates[a]			Borehole		Production Casing		
	Northing	Easting	Altitude (masl)[b]	Dia. (in)	Depth Drilled (m bls)[c]	Dia. (in)	Depth (m, bls)	Screened Intervals (m bls)
SVWP21_01	7,195,299	3,411,502	3,972.40	24	0 - 102	10	0 - 230	117.9 - 223.9
				17	0 - 102			
				16	102 - 233			
				8 ¾	0 - 240			
SVWP21_02	7,194,884	3,412,559	3,972.70	24	0 - 91	10	0 - 299.9	123.1 - 170.2 & 176.9 - 293.78
				16	0 - 303			
				8 ¾	0 -307			
SVWP21_03	7,194,301	3,411,664	3,973.70	24	0 - 65	10	0 - 177	88.5 - 135.6 & 141.5 - 171
				16	0 - 182			
				8 ¾	0 - 202			
SVWP21_04	7,193,909	3,412,798	3,973.80	24	0 - 84	10	0 - 223.7	87.8 - 129.1 & 135 - 217.5
				16	0 - 226.7			
				8 ¾	0 - 236			
SVWP21_05	7,193,289	3,411,643	3,973.10	24	0 - 87.5	10	0 - 202.2	90.4 - 137.4 & 143.2 - 190.2
				16	0 - 208.3			
				8 ¾	0 - 212			
SVWP21_06	7,192,906	3,412,771	3,973.80	24	0 - 86	10	0 - 252.8	87.5 - 140.6 & 148.4 - 248.4
				16	0 - 264			
				8 ¾	0 - 267.7			
SVWP21_07	7,192,294	3,411,658	3,973.60	24	---	10	0 - 235.1	87.4 - 140.7 & 146.3 - 229
				16	0 - 12			
				8 ¾	0 - 58			
SVWP20_08	7,191,901	3,412,781	3,975.60	24	0 - 92	10	0 - 270.4	111.9 - 159 & 170.8 - 264.3
				18	92 - 98			
				16	0 - 280			
				8 ¾	0- 307			
SVWF21_21	7,187,411	3,409,970	3,980.00	24	---	10	0 - 33.7	4.0 - 27.5
				16	0 - 42			
				8 ¾	0 - 36			

Notes: a = Coordinates on UTM system (Universal Transverse Mercator), Datum GAUSS KRÛGGER-POSGAR 07.
b = meters, amsl = above mean sea level
c = meters, bls = below land surface

7.5.7 Logging and Recovery

Unwashed and washed drill cuttings from the exploration and RC wells were described and stored in labelled plastic cutting boxes. Core was described at 1-m intervals. Downhole geophysical logging was completed for the Phase 2 to Phase 5 programs, and consisted of gamma ray, resistivity, spontaneous-potential surveys, and borehole magnetic resonance and spectral gamma ray which was conducted in wells SVWP21_01, SVWP21_06, and SVWP21 07 during Phase 6 of drilling program.

Recovery percentages of drill core were recorded for each core hole; percent recovery was excellent for the majority of the samples obtained, except for weakly cemented, friable clastic sediments. General summary of downhole geophysical survey conducted during initial phases of drilling program is shown in Table 7-5, more detail downhole geophysical survey including BMR survey conducted in Phase 6 of this last drilling campaign is shown in Table 7-6.

Table 7-5 - Summary of General Geophysical Survey Conducted on Phases 2, 3, 4, 5, and 6 of Drilling Program[6].

Wells		GR	SP	RS	RL	BMR	DPOR	TPOR	CAL	U/K/Th	EC	T°	Acoustic Imaging
Wells from Phase 2, 3, 4, and 5	SVWW11-04	X	X	X	X								
	SVWW11-06	X	X	X	X								
	SVWW11-08	X	X	X	X								
	SVWW11-10	X	X	X	X								
	SVWW11-12	X	X	X	X								
	SVWW11-13	X	X	X	X								
	SVWM12-14		X	X	X								
	SVWP17_21		X	X	X								
	SVWW18_25		X	X	X								
	SVWW18_26		X	X	X								
	SVWF12-19		X	X	X								
	SVWF12-20			X	X								
Wells from Phase 6	SVWP21_01	X		X	X	X	X	X	X		X	X	X
	SVWP21_02	X	X	X	X				X				
	SVWP21_03	X		X	X				X	X			X
	SVWP21_04	X	X	X	X				X		X	X	
	SVWP21_05	X		X	X				X	X			
	SVWP21_06	X		X	X	X	X	X	X	X	X	X	
	SVWP21_07	X		X	X	X	X	X	X	X	X	X	X
	SVWP21_08	X	X	X	X						X	X	
	SVWF21-21	X		X	X						X	X	

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[6] GR = Gamma Ray; SP = Spontaneous Potential; RS = Short Normal Resistivity; RL = Long Normal Resistivity; BMR = Borehole Magnetic Resonance; DPOR = Drainable Porosity; TPOR = Total Porosity; CAL = Caliper; U/K/Th = Uranium, Potassium, Thorium; CE - Electrical Conductivity; T = Temperature.

Table 7-6 - Summary of Geophysical Surveys Conducted During Phase 6 of the Drilling Program.

Borehole ID	Borehole		Geophysical Survey	Geophysical Logs					
	Dia. (in.)	Drilled Depth (m bls)a	Date	Caliper Depth (m btoc)b	Normal Resistivity Depth (m btoc)b	Spontaneous-Potential Depth (m btoc)b	Specific Yield/ Specific Retention Depth (m btoc)b	Gamma Rays Depth (m btoc)b	Electric Conductivity Temp. Depth (m btoc)b
SVWP21_01	24	0 - 102	17-03-2021	0 - 235	3 - 237	---	3 - 227	8 - 238	8 - 235
	17	0 - 102							
	16	102 - 233							
	8 ¾	233 - 240							
SVWP21_02	24	0 - 91	18-04-2021 & 19-04-2021	140 - 301.3	90 - 301.6	90 - 301.6	---	90 - 302.4	90 - 301.6
	16	91 - 140							
	8 ¾	140 - 307							
VWP21_03	17	0 - 68	06-10-2021	12.5 - 197	12.5 - 199	---	not surveyed	0 - 197	not surveyed
	8 ¾	0 - 202							
SVWP21_04	17	0 - 80	10-02-2021 & 12-02-2021	8 - 211	3 - 227	3 - 227	---	8 - 212	8 - 212
	8 ¾	0 - 236							
SVWP21_05	18	0 - 12	06-07-2021	12 - 192	12 - 196	---	not surveyed	0 - 192	not surveyed
	8 ¾	12 - 196							
SVWP21_06	24	0 - 85	27-09-2021 & 28-09-2021	11 - 260	0 - 264	---	not surveyed	0 - 260	0 - 263
	16	0 - 256							
	8 ¾	0 - 267.5							
SVWP21_07	24	0 - 76	01-09-2021	76 - 237	76 - 238	---	82.5 - 236	0 - 235	0 - 238
	8 ¾	0 - 250							
SVWP20_08 Run 1	17½	0 - 17	28-12-2020	0 - 124	0 - 124	0 - 124	---	0 - 124	0 - 70
	8 ¾	17 - 129.5							
SVWP20_08 Run 2	18	0 - 98	13-01-2021	0 - 255	---	---	---	0 - 305	---
	8 ¾	98 - 307							
SVWF21_21	16	0 - 42	19-10-2021	1.7 - 36	5.3 - 31.0	---	---	6.9 - 32.3	0 - 33.3
	8 ¾	0 - 36							

7.5.8 Collar Surveys by Lithium One

A professional collar survey was conducted in 2011 of core holes SVH10_05 through SVH11_28, exploration wells SVWW11_01 through SVWW11_08, and RC drill hole SVRC11_02 was conducted using a Trimble differential global positioning system (GPS) instrument. The remaining exploration wells (SVWW11_09 through SVWW11_13) and RC drill hole SVRC11_03 were surveyed using hand-held portable GPS equipment.

7.5.9 Collar and Downhole Surveys by Galaxy Lithium

Collars since 2011 have been surveyed by Galaxy personnel using a differential GNSS instrument. Over the years 2020/2021, core holes SVH10_05 through SVH11_28, exploration wells SVWW11_01 through SVWW11_08, RC drill hole SVRC11_0240, SVWW11_09 through SVWW11_13, and RC drill hole SVRC11_03 were measured obtaining high precision position corrections, including production wells SVWP21_01 through SVWP21_08. The North and East coordinates, elevation above ground level, elevation at the wellhead and stick-up elevation were provided, through the RTK method, linked to the official reference system and reference frame.

During the exploration program, downhole electrical conductivity surveys were conducted at many of the wells after completion and boreholes to identify fresh water and brine-bearing parts of the aquifer. Following installation of 2-inch PVC in the exploration core holes, and after waiting several weeks for the brine inside the casing to equilibrate to the surrounding aquifer, a downhole electrical conductivity profile was conducted at the core holes and selected wells. Electrical conductivity is a measure of the water's ability to conduct electricity and is an indirect measure of the water's ionic activity and dissolved solids content. Electrical conductivity is positively correlated with brine concentration. The purpose of the profiles was to:

- Determine the electrical conductivity profile and identify potential freshwater influence and low density.
- Provide additional verification for the chemistry profiles generated from depth-specific samples.

For each core hole, electrical conductivity and temperature were measured at 2- to 5-meter intervals using an in-situ brand Aquatroll 100 downhole electrical conductivity probe. The probe was calibrated with a standard solution before each survey. Three 1-minute measurements were obtained at each depth station; the average of the three measurements was used to generate the profile. Measurements were taken only while lowering the probe through the column of brine.

During later phases of drilling other wells were also surveyed for temperature and electrical conductivity using similar style Aquatroll probe for the purposes explained above. Downhole temperature and electrical conductivity surveys were completed on core holes SVH11_16 and SVH11_24 to SVH11_28. For each core hole, electrical conductivity and temperature were measured at 2-5 m intervals using an Aquatroll 200 downhole electrical conductivity probe. Three measurements were obtained for one minute each at each depth station; the average of the three measurements was used to generate the profile. Measurements were taken only while lowering, not raising, the probe through the column of brine, to minimize disturbance of the fluid column during measurements.

7.6 Hydrogeological and Hydrological Studies

The most notable source of fresh water to the Salar del Hombre Muerto is the Río de los Patos drainage that enters the basin from the southeast. Depth specific sampling from core holes in this area show brackish water from the water table to around 60 m depth, and brine concentrations comparable to other parts of the basin below 80 m depth. Because field data in this area are sparse, the density profile of the aquifer is uncertain in the farthest southeast part of the property where aquifer water quality may have a future effect on long-term pumping of the proposed East Wellfield.

Hydraulic conductivity in the vertical direction of groundwater flow (Kz) is typically less than hydraulic conductivity in the horizontal direction (Kh). For layered sediments, such as occur in the Salar del Hombre Muerto, the ratio Kz/Kh is commonly 0.01 or less (Freeze and Cherry, 1979). The low vertical permeability of the salar sediments, combined with the density difference between surface water inflow and deep brine, restrict the vertical circulation of fresh water entering the salar from the Río de los Patos.

Water density is typically observed to increase with depth. Fresh or brackish waters are observed within the upper 50 m of the aquifer in some locations, typically near the margins of the salar and in the south where the Río de los Patos enters the basin. Results of exploration activities suggests that most of the brackish and fresh water in the system stays in the upper part of the aquifer system, partly because it is less dense, and because fine-grained lacustrine sediments restrict downward flow. It is possible that there is some deeper freshwater input into the basin, but no fresh or brackish water zones have been observed at depth in any of the exploration holes.

Sal de Vida’s brine chemistry has a high lithium grade, low levels of magnesium, calcium and boron impurities and readily upgrades to battery grade lithium carbonate. Dense brine was observed as the interstitial fluid at all depths in the basin, typically increasing brine density with depth. In addition, although there is no borehole data currently to support this, it is anticipated that dense brine will also be located in the lower parts of the older rock units that form the margins of the basin.

7.6.1 Short-Term Pumping Tests

The following sub-sections describe the pumping tests conducted in support of the Project. Hydrological pump testing under operating conditions has demonstrated excellent brine extraction and aquifer recharge rates to support the production design basis.

7.6.1.1 Phase 2

Short-term pumping tests were completed on brine exploration wells SVWW11_02 and SVWW11_04 to SVWW11_13. All brine exploration wells were equipped with temporary submersible electric pumps, and short term (24-hours or less) pumping tests were conducted at each well to measure aquifer transmissivity, obtain a representative brine sample, and provide design data for future, higher-capacity, production wells.

Installation depths for the submersible pumps at each tested brine exploration well ranged from 32 - 91.5 m. A short step-rate pre-test was conducted at most wells to determine the pumping rate for the constant rate tests. Typically, a Krohne magnetic flowmeter was used for pumping rate measurements. Water-level measurements were taken using electric water-level sounders and non-vented LevelTroll pressure transducer/dataloggers. Pressure transducers were adjusted to compute the water-level drawdown using a brine specific gravity of 1.2 g/cm^3.

The pumping period duration was 24 hours for all constant rate tests, except the test for brine exploration well SVWW11_07, which was tested for 12.25 hours due to generator failure. Core drill holes, cased with 2-inch (50.8 mm) PVC, served as observation wells during pumping tests. The distance from pumped wells to observation well core holes ranges from 14.1 - 70.4 m. Brine exploration well SVWW11_07 was in an area where there was no adjacent core hole.

Raw-water inflows were noted in the upper part of core holes SVH10_08, SVH11_15, SVH11_16 and SVH11_27. For these wells, laboratory-specific conductivity values were found to be similar to the results measured by the downhole probe. Core holes SVH10_08, SVH11_16 and SVH11_27 was located on the eastern side of the basin where mountain-front recharge of raw water, and surface water inflows, were believed to enter the groundwater system. Core holes SVH11_15 and SVH10_09 were located near the edge of a large alluvial fan in the southern part of the basin and showed profiles that suggested raw-water influence in the upper part of the well. This could be due to raw-water infiltration from the Río de los Patos into coarser fan sediments, or due to precipitation recharge from the south.

7.6.1.2 Phase 3

Most wells were equipped with temporary submersible electric pumps, and short-term (24-hour) pumping tests were conducted at each well. During testing, the pumping rate was measured using a Krohne magnetic flowmeter. Water-level measurements were taken using both electric water level sounders, and non-vented in-situ LevelTroll pressure transducers/dataloggers. Water level recovery after pumping was measured for all wells for a period of time at least equal to the pumping period. Distance from pumped wells to observation well ranged from 25 - 130 m.

Results confirmed potential for production in the western and eastern areas. A recommendation was made to perform 30-day pumping tests in both areas and confirm the viability for long-term production.

7.6.1.3 Phase 4

Exploration well SVPW17_21, was equipped with a temporary submersible electric pump, and a short-term, 48-hour pumping test was completed. SVWW11_07 served as an observation well with a distance from the pumped well of 6.13 m. The installation depth for the submersible pump was 90 m. A short step-rate pre-test was conducted to determine the pumping rate for the constant-rate tests. Pumping rates were measured with a graduated bucket and a stopwatch. Water-level measurements were taken using both electric water-level sounders, and non-vented LevelTroll pressure transducers/dataloggers. The water-level recovery after pumping was measured for a period of 38 hours.

Results from this well supported that the tested zone had production potential and a recommendation was made to perform a 30-day pumping test in this area and check long-term production viability.

7.6.1.4 Phase 5

Exploration wells SVWW18_25 and SVWW18_26 were equipped with temporary submersible electric pumps, and short-term pumping tests (48 hours for exploration well SVWW18_25 and 24 hours for exploration well SVWW18_26) were conducted at each well. Installation depths for the submersible pumps at each tested exploration well ranged from 85.5 - 89.0 m. A short step-rate pre-test was conducted at each well to determine pumping rate for the constant-rate. Pumping rates were measured with a graduated tank and a stopwatch. Water level measurements were taken using both electric water level sounders, and non-vented LevelTroll pressure transducers/dataloggers.

The water level recovery after pumping was measured for both wells for same number of minutes of pumping (2,880 and 1,440 minutes after the pump was stopped). As there were no nearby wells, no measurement of water levels at observation wells could be taken.

During the tests at exploration wells SVWW18_25 and SVWW18_26, brine samples were obtained at regular intervals from the discharge pipeline.

The laboratory results support the interpretation that exploration wells SVWW18_25 and SVWW18_26 may have been perforated in both the upper freshwater aquifer and the lower brine aquifer. This program provided geological and brine chemistry data that were used to characterise the southeastern area.

7.6.1.5 Phase 6

All production wells were equipped with temporary submersible electric pumps, and short-term pumping tests were conducted at each well. Installation depths for the submersible pumps at each tested production well ranged from 103.5 - 132.5 m. A short step-rate was conducted at each well to determine pumping rate for the constant-rate. Pumping rates were measured with a graduated tank and magnetic flowmeter. Duration of constant-rate pumping test was 36 hours for well SVWP21_02; 48 hours for wells SVWP21_01, SVWP21_05, SVWP21_06 and SVWP20_08; 52.5 hours for well SVWP21_03; and 72 hours for wells SVWP21_04 and SVWP21_07. Water level measurements were taken using both electric water level sounders, and non-vented Levelogger pressure transducers/dataloggers.

The water level recovery after pumping was measured for the same number of minutes of pumping at wells SVWP21_01, SVWP21_04, SVWP21_05, SVWP21_06 and SVWP21_07 (2,880 and 4,360 minutes after the pump was stopped). For wells SVWP21_02, SVWP21_03 and SVWP20_08 time for water level recovery measurement exceeded the time of pumping ranging from 2,580 to 6,060 minutes. During testing water level was measured at observation wells in the nearby wells at each location; however, observed water level drawdowns were too small to be used to compute hydraulic parameters because the wells were too far from the pumped well.

During the tests at the production wells, brine samples were obtained at regular intervals from the discharge pipeline. A summary of pumping tests conducted at production wells is given in Table 7-7.

Table 7-7 - Summary of Pumping Tests at Production Wells.

Well ID	Pumping Start Date	Pumping Duration (hours)	Pre-pumping Water Level (m bls)[1]	Average Pumping Rate (L/s)[2]	Drawdown at End of Pumping (m)	Specific Capacity (L/s/m)[3]
SVWP21_01	08-09-2021	48	8.93	27.54	74.55	0.37
SVWP21_02	19-06-2021	36	10.18	26.1	67.12	0.39
SVWP21_03	22-08-2021	52.5	9.59	35.04	55.42	0.63
SVWP21_04	08-04-2021	72	10.81	17.8	87.55	0.2
SVWP21_05	31-10-2021	48	10.77	30.04	88.79	0.34
SVWP21_06	02-12-2021	48	11.43	33.34	42.98	0.77
SVWP21_07	15-11-2021	72	11.27	33.04	4.72	7
SVWP20_08	14-03-2021	48	12.25	26.1	52.6	0.5
SVWF21_21	---	---	---	---	---	---

Note: [1] metre below land surface
[2] L/s = litres per second flowrate
[3] L/s/m = litres per second per meter

7.6.2 Long-Term Pumping Tests

Two long-term pumping test campaigns were undertaken to simulate wellfield production:

- Long-term pumping test, 2012: two 30-day tests in the western and eastern sub-basins (SVWW11_10 and SVWW11_13).
- Long-term pumping test, 2020: one 28-day test north of the eastern sub-basin (SVWP17_21).

7.6.2.1 2012 Tests

Additional investigations were conducted during 2012 in two areas of the basin where aquifer conditions appeared most favorable for long-term brine production. Factors used to select these potential wellfield areas included favorable brine quality, comparatively large aquifer transmissivities and yield from existing wells in these areas, and the presumed continuity and large extent of the favorable aquifer units. To better understand the potential of these two areas, a pilot production wellfield program was designed and included new wells and 30-day aquifer tests. Long-term testing was conducted at exploration well SVWW11_13 in a simulated eastern wellfield and at well SVWW11_10 in a simulated southwestern wellfield:

- Exploration well SVWW11_13 was pumped at a constant rate of 15.2 L/s during the period August 27 to September 26, 2012. During testing, four observation wells, SVH11_16, SVWM12_14, SVWP12_14, and SVWM12_15, were monitored for water-level changes.
- Exploration well SVWW11_10 was pumped at a constant rate of 9.8 L/s during the period October 19 to November 18, 2012. During testing, three observation wells, SVH11_24, SVWP12_16, and SVWP12_17, were monitored for water-level changes.

Based on the results of the 30-day tests, the simulated wellfield locations are suitable for brine production at a rate of about 350 L/s. Because of the larger transmissivity, the efficiency of a wellfield in the eastern sub-basin may be larger and therefore result in less pumping lift; however, brine grades were more favorable, and brackish water influence was less in the western sub-basin.

Operational pumping rates were maintained throughout the pumping periods without significant encounters of subsurface hydraulic boundaries (i.e., positive, or negative boundaries caused by faulting or aquifer heterogeneities that could affect pumping water level trends). Transmissivity values were consistent with previous shorter-term testing results, being 400 m^2/day for exploration well SVWW11_13 and 110 m^2/day for exploration well SVWW11_10.

In the simulated eastern wellfield area, storativity values on the order of 10^{-4} to 10^{-3}, derived from observation wells during pumping at exploration well SVWW11_10, were indicative of confined to semi-confined, leaky aquifer conditions.

In the western wellfield area, due to anomalous water-level trends at observation wells during testing at exploration well SVWW11_13, storativity values were uncertain. After long-term pumping in the production wellfields, when unconfined aquifer conditions are established, the specific yield was anticipated to be on the order of 10-1.

The available data suggest that the horizontal conductivity (Kr) is one to two orders of magnitude greater than vertical conductivity (Kz), indicating that the aquifer is horizontally stratified.

Analysis of brine samples collected daily during the 30-day pumping periods indicates averages as follows:

- Lithium concentration of 776 mg/l at exploration well SVWW11_13 and 840 mg/l at exploration well SVWW11_10; the standard deviation was 11 and 23 mg/l, respectively.
- Potassium concentration averaged 8,590 mg/l at exploration well SVWW11_13 and 8,351 mg/l at exploration well SVWW11_10; the standard deviation was 103 and 105 mg/l, respectively.
- The magnesium to lithium ratio was 2.8 at exploration well SVWW11_13 and 1.84 at exploration well SVWW11_10.

Although hydraulic parameters indicated vertical stratification of the aquifer, the variance in critical brine chemistry parameters during the 30-day production tests was small. Similarly, no dilution of produced brine was evident during the pumping periods.

Several downhole temperature and electrical conductivity profiles were collected at pumping and observation wells, before, during, and after the 30-day long-term pumping tests in each wellfield. In general, although some variation between pre- and post-testing measurements were observable, the overall vertical electrical conductivity profiles were mostly similar or the same for all the wells. Variations in scale may be due to the accuracy of the instrument. Overall, results did not suggest that significant or demonstrable increases or decreases were observed as a result of pumping for 30 days.

For the 30-day pumping test at well SVWW11_13 in the southwestern wellfield, observation wells SVWP12_14 and SVH11_16 was measured for electrical conductivity and temperature profiles during and after testing. For each observation well, the during- and post-pumping vertical profiles for both temperature and electrical conductivity show the same shapes and shifts, particularly at observation well SVH11_16 where a dramatic shift is observed at a depth of about 57 m. However, similarly to the observation wells in the southwestern wellfield, the absolute electrical conductivity values were slightly different during and post-pumping profiles. For observation well SVH11_16, the post-pumping profile indicates a larger electrical conductivity, but for observation well SVWP12_14, the profile indicates smaller electrical conductivity values. Although it is possible that a true change in chemistry occurred, because the differences are relatively small and the profiles were measured only 24 hours apart, it is not believed that this would be sufficient time for inflow of denser or less dense water to the well that would result in these changes. Therefore, the variation may be a function of instrument calibration or accuracy.

For the 30-day pumping test at well SVWW11_10 in the southwestern wellfield, the pumped well SVWW11_10 and observation wells SVH11_24, SVWP12_16 and SVWP12_17 were measured for electrical conductivity and temperature profiles before and after testing. For pumping well SVWW11_10 and observation well SVH11_24, the pre- and post-pumping vertical profiles for both temperature and electrical conductivity are essentially the same. However, for observation wells SVWP12_16 and SVWP12_17, the post-pumping electrical conductivity profile is slightly shifted toward lower electrical conductivity values. Although it is possible that a true change in chemistry occurred, because the differences are relatively small (<10% variation), the observed change may be a function of instrument calibration or accuracy.

Based on 30 days of pumping at each wellfield, the results do not show any significant or obvious change in the aquifer water chemistry entering the wellfields during the pumping period. Minor variations may be related to instrument sensitivity and/or water mixing within the borehole.

7.6.2.2 2020 Tests

Following the results from the 2012 long-term pumping tests, a long-term test was conducted at well SVWP17_21 in the northern end of the east wellfield, which was undertaken during the period May-June 2020. The constant-rate test was planned as part of pond filling to take advantage of the opportunity to obtain long-term pumping data in the northern part of the wellfield. The test work results were used to assist with numerical groundwater flow model calibration. This basin sector is dominated by clastic sediments, with clay and sand in the upper part of the system and underlying coarse sediments (mostly gravel and sand) in the lower part where pumping occurs.

Pumping was monitored for a total of 28.8 days. Mechanical problems with the generator interrupted pumping at that time and the test was terminated. The 28.8-day duration was considered adequate for reliable evaluation of the test results. During the test, water-level drawdown was measured at the pumped well and at three observation wells, SVWP11_07, SVH11_27 and SVWP12_14, located at distances ranging from 6 - 3,300 m from the pumped well.

The flow rate was measured using a Rosemount mechanical flowmeter. The average flow rate measured during the test was 61.6 m^3/hr, or about 17.1 l/s. During the 28.8-day pumping period, short-term shutdowns of the pump occurred either due to generator malfunction or maintenance. These brief shutdowns are not considered to affect the test results.

Water levels were measured using a pressure transducer and a sounder for the pumped well and observation wells. Field parameters (temperature, pH, and electrical conductivity) were measured using a calibrated multiparameter instrument. Brine density was measured using a hydrometer. Barometric pressure was also measured to correct water-level data for barometric changes. Pumped water was conveyed 1,250 m from pumped well SVWP17_21 to minimize potential interference with testing and for filling existing evaporation ponds. During pond filling, Galaxy personnel moved the discharge to different locations inside the ponds; this is not considered to have had an effect on testing.

During the test, 39 brine samples were collected. One early-time, and one late-time sample were sent to Alex Stewart Laboratories in Mendoza, Argentina (Alex Stewart) for chemical analyses. Results of the laboratory results for these two samples indicate that the chemical composition of the brine did not change during the pumping period; therefore, analysis of the remaining samples was not considered necessary.

At the pumped well, transmissivity was calculated to be 260 m^2/d using the drawdown measurements based on the Cooper and Jacob (1946) method. Recovery data are considered more reliable in general because minor changes in water level due to pumping variations were not observed. Recovery measurements at the pumped well were analyzed using the Theis (1935) recovery method; transmissivity was calculated to be 250 m^2/d and is consistent with the transmissivity value calculated using drawdown data.

The distant observation wells showed little to no drawdown. About 0.4 m of drawdown was observed during pumping at observation well SVWP12_14, and about 7.7 m of drawdown was observed at observation well SVWW11_07. Similar to the pumping well, drawdown measurements at observation well SVWW11_07 show evidence of flow rate changes and generator failures at the pumped well. A transmissivity value of 320 m^2/d was calculated for observation well SVWW11_07 using the Theis (1935) method). The operative transmissivity for the aquifer was calculated to be 250 m^2/d.

7.6.2.3 2021 Tests

After production wells were completed in Phase 6, they were pump tested with temporary submersible electric pumps. Water level measurements were taken manually with sounders, and Levelogger pressure transducers.

Constant discharge pumping tests were conducted at all 8 production wells; water level drawdown and recovery water levels were measured with same instruments. Transmissivities and specific capacities were calculated for each production well. During testing, observation wells were used to measure water levels; drawdown was too small to compute hydraulic parameters.

Wells SVPW21_06 and SVWP21_07 have the highest specific capacities of 0.77 and 7.0 liters per second per meter of water level drawdown (l/s/m) respectively (Table 7-7).

Wells SVWP21_03 and SVWP21_07 have the highest transmissivity values of 220 and 600 m^2/d respectively (Table 7-8).

Table 7-8 - Summary of Flowrates and Transmissivities from 2021.

Pump Well ID	Average Pumping Rate (L/s)^1	Cooper-Jacob Drawdown Method (1946) Transmissivity (m2/d)^2	Theis Recovery Method (1935) Transmissivity (m2/d)^2
SVWP21_01	27.5	55	100
SVWP21_02	26.1	75	90
SVWP21_03	35	220	270
SVWP21_04	17.8	100	100

Pump Well ID	Average Pumping Rate (L/s)[1]	Cooper-Jacob Drawdown Method (1946) Transmissivity (m2/d)[2]	Theis Recovery Method (1935) Transmissivity (m2/d)[2]
SVWP21_05	30	120	100
SVWP21_06	33.3	130	110
SVWP21_07	33	600	690
SVWP20_08	26.1	150	100

Note: [1] (L/s) = litres per second, flowrate
[2] (m^2/d) = square meter per day, transmissivity

7.6.3 Raw Water Wells

Two wells were completed in 2012 to identify and provide a source of raw water for mineral processing, and the camp. The wells were designed to be 8-inch diameter freshwater production wells and could also serve as observation wells during long-term testing.

Wells SVWF12_19 and SVWF12_20 was drilled in the southern section near the Río de los Patos. Each well was pumped at rates of over 20 l/s with very little drawdown, suggesting a favorably large transmissivity.

Pumping resulted in groundwater that had an average specific electrical conductivity of 2,550 µS and a TDS content of 1,500 mg/l. Although this TDS value is typically higher than accepted for drinking water purposes, these wells, or additional shallow wells in the area, are considered adequate to supply water for treatment and ultimately processing at the design rates.

Each well was pumped at rates of over 20 l/s with very little drawdown, suggesting a favorably large transmissivity. The estimated raw-water requirement for use in future brine processing is 20 - 40 l/s. The recommendation was to designate well SVWF12_19 for production and SVWF12_20 for monitoring, given the proximity to the Río de los Patos.

During Phase 6 of drilling program, a new raw water well SVFW21_21 was constructed during the period of October of 2021. Total depth was 42 m. The initial bore hole was 8 ¾ inches in diameter and it reached 36 m of depth. Downhole geophysical survey was conducted immediately after finishing exploration drilling and the borehole was reamed to a diameter of 16 inches down to a depth of 42 m. The well screen was installed 33.7 m deep with slotted PVC casing between 4 m of depth to 27.5 m. Gravel pack of 1-3 mm diameter were installed, and the well was developed. During the development, water sampling and physico-chemical measurements on this well indicated that pH ranges from 8.9 to 9.4 values.

In February 2022 a short-term pumping test was performed to infer well productivity. The water table was 3.21 m. The maximum tested pumping rate during the step-rate test was 50 l/s with a drawdown of 4.5 m. After the step-rate test a 36-hour production drawdown test followed by same time build-up was performed to estimate aquifer properties. Interpretation by Theis' and Cooper and Jacob's methods gave a transmissivity value of 1,574 m^2/d and a storativity of 0.027, typical of unconsolidated unconfined aquifer systems.

The recommendation is to designate well SVWF12_21 for production of raw water, to be used in the process plant and for camp consumption after to be treated by the osmosis reverse plant to be installed in the area 4 (industrial facilities).

7.6.4 Stream Gauging

Stream gauging was conducted to quantify baseflow conditions, and to develop baseline measurements. Flows were measured in the Río de los Patos, and at the much smaller La Redonda stream on the northeast part of the main salar.

Measurements were conducted during relatively dry times of the year, using a Pygmy flowmeter and Aquacalc recording system, and it is considered to be reliable. Water flow readings taken in May 2011 and May 2012 indicate that there can be quite a large variation in flow rates on an annual basis. The majority of surface water inflow is believed to occur during flood events on the Río Los Patos; flow rates associated with such events have not been gauged.

7.6.5 Water Balance

A steady state water balance for the SDV project was developed over the Río de Los Patos alluvial aquifer and delta (M&A, 2020).

The following elements summarize the water balance and recharge estimates:

- Recharge to basins similar to Salar de Hombre Muerto is typically 5-20% of its volumetric precipitation (Hogan et al., 2004). The intersection of these bounds with the evaporative discharge estimate provides an approximate range for the studied sub-basin recharge.
- Liquid and solid (snowmelt) precipitation in the Salar de Hombre Muerto basin is estimated to be about 106 mm/a, or as a volumetric rate, 11,050 l/s. Using 5-20% of the annual volumetric precipitation, an estimated range of precipitation recharge is likely between 550-2,210 l/s.
- Low, medium, and high evaporation estimates for the east sub-basin of Salar del Hombre Muerto are estimated to be 850 l/s, 1,450 l/s and 2,290 l/s, respectively. The higher evaporation estimate is slightly too large compared to the upper bound of the precipitation recharge estimate (2,210 l/s). In addition, the lower bound of the precipitation recharge estimate (550 l/s) is too low compared to the lower evaporation estimate (~850 l/s).
- The recharge estimate for the east sub-basin of Salar del Hombre Muerto is believed to range from 850- 2,210 l/s based on the results of intersecting the evaporation and precipitation recharge ranges. Within this range, the current best estimate for a recharge to the salar is 1,500 l/s based on the calculated medium evaporation discharge, which approximately corresponds to 13.1% of total volumetric precipitation (including snowmelt) estimated for the basin (Montgomery, Chapter 7 - Hydrology and Modelling ,2021).

Regarding Laguna Catal, the underlying hypothesis is that surface water and groundwater movement from the Eastern Basin is conditioned by a structural dip or downthrown bedrock, which together with the difference in topography, generates a hydraulic gradient from the Eastern Basin towards Laguna Catal. The hypothesis is supported on surface geology and the difference of evaporites found at the western and eastern basins. In the Eastern Basin, the evaporites are boratiferous with low chloride content; in the western basin, thick halite accumulations are present, with little or no borates (Vinante y Alonso, 2006).

7.7 Geotechnical Considerations

Planned production includes vertical wells that allow for the extraction of lithium-rich brine through a perforated interval of the well (at depth) in clastic sedimentary deposits and evaporites. Due to the fact that the mining of this type of deposit does not involve excavations or underground workings (as with hard rock deposits), it is not necessary to carry out detailed geotechnical studies of the soil and rock strength parameters.

7.8 Conclusions

Exploration to date has identified the Sal de Vida brine, and has used exploration methodology conventional to brine exploration, such as geophysics and surface sampling, in addition to the drilling programs. In the opinion of the employees of Montgomery & Associates, the drill data and hydrogeological studies are acceptable to support the Brine Resource and Reserve estimates.

8. SAMPLE PREPARATION, ANALYSES AND SECURITY

The following sub-sections detail historical and recent sampling methods that have been conducted to support the Project. Sampled wells include diamond drillholes (for the analysis of drainable porosity and brine chemistry) as well as reverse circulation wells (to analyze brine chemistry).

8.1 Sampling Methods

8.1.1 Drainable Porosity Sampling Methodology

Porosity samples were collected during 2010, 2011, and 2012 from intact HQ and NQ-core. Full diameter core with no visible fractures was selected and submitted for laboratory analyses. The selected sleeved core samples were capped with plastic caps, sealed with tape, weighed, and stored for shipment. The typical sample length was 15 - 40 cm. Porosity samples were shipped to Core Laboratories Petroleum Services Division, Houston, Texas (Core Laboratories) for analysis.

8.1.2 Brine Sampling Methodology

In addition to the depth-specific brine samples obtained by drive-points during coring, brine samples used to support the reliability of the depth-specific samples included analyses of the following:

- Brine centrifuged from core samples.
- Brine obtained from low flow sampling of the exploration core holes.
- Brine samples obtained near the end of the pumping tests in the exploration and production wells.

8.1.2.1 Brine Sampling by Drive-Point Samplers

Brine samples were collected during 2010-2011 from the same core holes that provided porosity samples. Brine samples were collecting by removing the core barrel and installing a drive-point onto BT size (55 mm) drill rods. The drive-point was driven to a depth below the drill bit using a drop hammer on the drill rig. An impermeable diaphragm located just above the drive-point prevented the BT drill rods from being filled during driving. After driving the drive-point to the desired depth, an electric water-level sounder was lowered into the BT drill rods to ensure that the rod interiors were dry. The sounder was removed, and the diaphragm was perforated using a weighted pin lowered with the wireline. This piercing allowed brine to flow into the drive-point and begin filling the BT rods. After bailing and discarding the first fluid, the brine sample was bailed from the drill rods.

8.1.2.2 Brine Sampling by Centrifuge Phase 2

For core hole SVH11_15, a second set of centrifuge pucks was cut in 2011 from core samples at Core Laboratories, centrifuged for an extended period, and brine removed was collected and submitted to Alex Stewart for analysis. Brine was collected from a total of 15 core pucks. The volume of brine obtained by centrifuge ranged from 10-36 ml. Selected samples were split, and duplicate analyses were obtained. The results of the brine centrifuge sampling and analysis validated and confirmed the drive-point sample collection methodology.

8.1.2.3 Brine Sampling by Low-Flow Pumping Phase 2

Brine samples were collected in 2010 and 2011 by pumping selected 2-inch (50.4 mm) PVC wells to acquire composite brine samples from core holes and confirm the brine chemistry derived from other sampling methods. The average pumping rate ranged from about 1 - 4 l/min. Wells were pumped for sufficient time to remove three borehole volumes, and samples were collected for analysis. Brine samples from the low-flow sampling program, together with duplicate and standard samples were sent to Alex Stewart Assayers of Mendoza, Argentina (Alex Stewart).

For most core holes, results indicated that lithium and potassium values for low-flow pumped samples were similar to the results derived from drive-point samples.

8.1.2.4 Brine Sampling During Pumping Tests and Drilling

Brine samples were collected directly from the discharge line for analysis near the end of each pumping test for reverse circulation (RC) wells. Physical-chemical parameters including temperature, electrical conductivity, pH, and brine density were monitored during pumping. Brine samples from the pumping test program together with duplicate and standard reference material (standard) samples were sent to Alex Stewart.

For brine samples collected from pumping test at the proposed East Wellfield, lithium results obtained by Galaxy Laboratories and from Alex Stewart Laboratories were compared. A summary of results is shown for each pumping well at Table 8-1.

Table 8-1 - Lithium Concentration Results from Galaxy and Alex Stewart Labs.

Well	Sample ID	Lithium Concentration (mg/l)	
		Galaxy Lab	Alex Stewart Lab
SVWP21-01	SV-08141	921	859
	SV-08142	924	852
SVWP21-02	SV-08119	844	807
	SV-08120	848	812
	SV-08121	853	812
	SV-08123	857	815
SVWP21-03	SV-08132	935	908
	SV-08133	932	905
SVWP21-04	SV-08146	981	957
	SV-08147	980	941
	SV-08148	978	932
SVWP21-05	SV-08155	847	837
	SV-08159	835	845
SVWP21-06	SV-08174	868	821
	SV-08175	862	828
SVWP21-07	SV-08165	846	832
	SV-08166	843	831

A graphical comparison between the results is shown in Figure 8-1. A good fit is observed between both data sets although the results from Alex Stewart lab are generally slightly lower than those of Galaxy lab. Because the data used for the Brine Resource estimation corresponds to the Alex Stewart lab, the estimated Brine Resource may be slightly conservative.

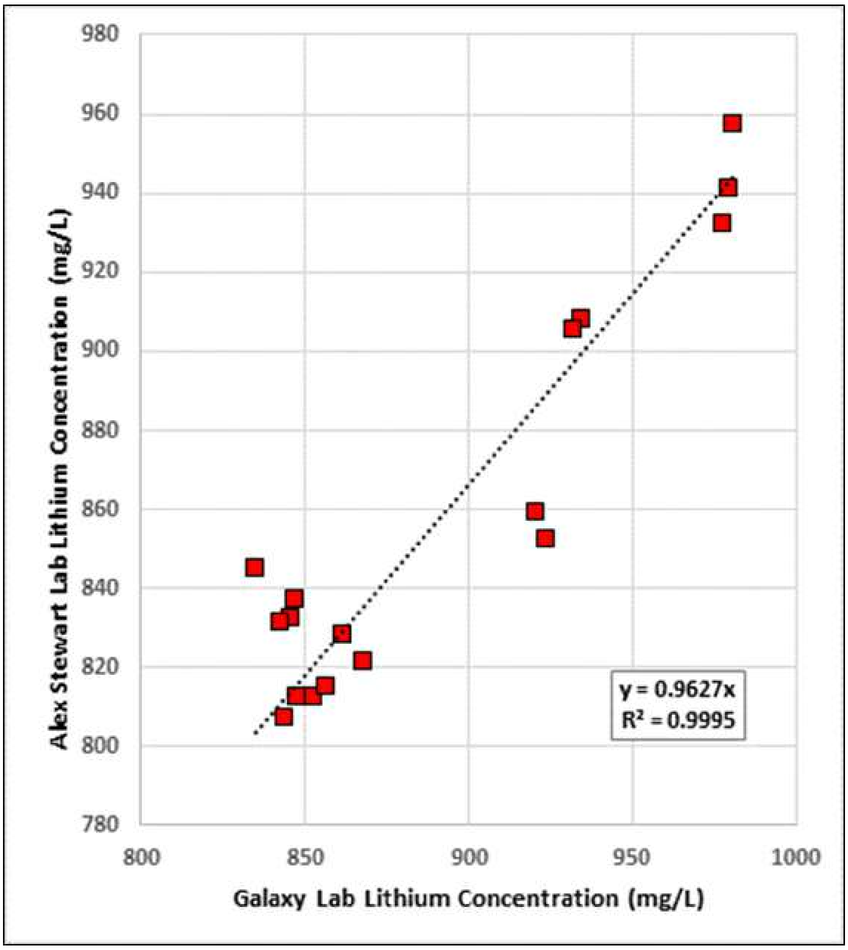


Figure 8-1 - Galaxy Lab Lithium Data vs. Alex Stewart Lab Lithium Data.

Brine samples were also collected during drilling of drill hole SVRC11_03. These samples were collected by airlift pumping from the opened borehole at 6-m intervals as the hole was drilled. These samples represent a composite sample of the drill hole at different depths. For each sample, airlift pumping rate, brine temperature, pH, electrical conductivity, and density were measured and recorded.

Brine samples from short-term pumping tests provide the best available analyses for the brine chemistry that would be produced during production pumping. Results indicate only small variations in the lithium
(standard deviation <11 mg/l) and potassium (standard deviation <139 mg/l) content for all time-series samples.

8.2 Analytical and Test Laboratories

Porosity analyses were conducted by Core Laboratories. Core Laboratories is ISO 9000:2008 accredited. The laboratory is independent of Allkem.

Brine chemistry samples from Sal de Vida were analyzed by Alex Stewart, a laboratory that has extensive experience in analyzing lithium-bearing brines. Alex Stewart is ISO 9001 accredited and operates according to Alex Stewart Group standards which are consistent with ISO 17025 methods at other laboratories. The laboratory is independent of Allkem.

Selected duplicate samples were sent to the University of Antofagasta, Chile, as part of the quality assurance and quality control (QA/QC) procedure. The University of Antofagasta laboratory is not ISO certified but has extensive experience in the analysis of brines samples submitted from all over South America. The laboratory is independent of Allkem.

The ACME Santiago laboratory (ACME) was also used for check analysis. The laboratory is ISO 9001 certified and independent of Allkem.

Duplicate samples were also sent to ALS Chemex in Mendoza for check analyses. The ALS Chemex laboratory is ISO 17025 and ISO 9001:2000 accredited. These samples were transferred from the ALS Chemex preparation facility in Mendoza to the laboratory facility in Santiago for analysis. The laboratory is independent of Allkem.

8.3 Sample Preparation

Neither porosity (core) nor chemistry (brine) samples were subjected to any further preparation prior to shipment to participating laboratories. After the samples were sealed on site, they were stored in a cool location, and then shipped in sealed containers to the laboratories for analysis.

8.4 Analytical Methods

8.4.1 Drainable Porosity

The laboratory analytical procedure for drainable porosity by centrifuge as described by Core Laboratories consisted of:

- Cut 38 mm (1.5 inch) diameter cylindrical plug from sample material (plunge cut or drill); typical length was about 45 mm (1.75 inch).
- Freeze sample material with dry ice if needed to maintain integrity.

- Caliper the bulk volume of the cylindrical plug and weigh sample.
- Encapsulate plug (as needed) in Teflon and nickel foil, with nickel screen on ends of plugs, and weigh encapsulated sample.
- Calculate bulk density as: (mass of plug before encapsulation)/(caliper bulk volume).
- Place plug in brine and saturate under vacuum to ensure full saturation. Core Laboratories uses a standard sodium chloride brine containing 244,000 ppm NaCl. The standard brine has a density of 1.184 g/cm^3, which approximates the density of brine samples collected from core holes (field measurement of 119 brine samples collected from bore holes during core drilling have a mean specific gravity of 1.18; median specific gravity for these samples is 1.19).
- Record weight of saturated core.
- Desaturate samples in high-speed centrifuge for 4 hours. Spin rates were calculated to give drainage pressure of 1 psi for poorly cemented or loose sands; and 5 psi for clay and halite. Pressure was calculated at the center of the plug placed in the centrifuge.
- Collect any drainage and record volume; discard drained fluid. (Fluid collected from these cores is not representative of in situ brines, due to re-saturation with NaCl).
- Remove plug from centrifuge and record weight.
- Drained fluid volume is calculated as: (saturated plug weight - drained plug weight)/1.184.
- Drainable porosity is calculated as: (drained fluid volume)/(caliper bulk volume).

Screened and wrapped “pucks” of the sampled sediment were returned to the employees of Montgomery & Associates in Tucson.

Drainable porosity estimates are given as a fraction of the total rock volume and are unitless. For example, if a rock has a volume of 100 mL, and 10 mL of fluid can drain from the rock, the drainable porosity is 10/100, or 0.10. Although determined by laboratory methods, the drainable porosity is essentially the same as specific yield as defined in classical aquifer mechanics.

For boreholes SVH11_15, SVH11_22 and SVH11_25, 15 core samples were sub-sampled twice, with a centrifuge puck removed from each end of the core. The core samples were selected to be visually uniform. Results demonstrate the high variability of drainable porosity measurements but are consistent within expected porosity ranges associated with a given lithology. Analyses for drainable porosity are difficult to duplicate for the following reasons:

- The measurement method is destructive of the samples.
- Duplicate samples are impossible to obtain due to natural variation of properties.
- Inter-laboratory standard comparisons are difficult, due to the above cited reasons.

8.4.2 Total Porosity

After drainable porosity measurements were completed, the plug samples from the centrifuge were analyzed for total porosity. Total porosity, like drainable porosity, is given as a fraction of the total rock volume and has no units. The determinations included the following steps:

- Oven dry sample for 5 days at 115.6º C.
- Weigh oven-dried sample.
- Assume that all weight loss is pure water lost from pore space: Therefore, volume of water lost due to oven-drying is calculated as: ((drained plug weight) - (oven-dried plug weight))/ (water density of 1 g/cm^3).
- Total porosity is calculated as: ((drained fluid volume) + (oven drying fluid loss))/ (caliper bulk volume).

8.4.2.1 Brine Chemistry

Table 8-2 lists the analytical methods used by the laboratories. These are based upon American Public Health Association (APHA), Standard Methods for Examination of Water and Wastewater, Environmental Protection Agency (EPA), and American Society for Testing Materials (ASTM) protocols.

Physical parameters, such as pH, conductivity, density, and TDS are directly determined from the brine samples. Analysis of lithium, potassium, calcium, sodium, and magnesium is achieved by fixed dilution of filtered samples and direct aspiration into atomic absorption (AA) or inductively coupled plasma (ICP) instruments.

Table 8-2 - Basic Analytical Suite (Note: AA = atomic absorption, ICP = inductively-coupled plasma).

Analysis Type	Alex Stewart	University of Antofagasta	ACME	ALS Chemex	Method Description
Physical Parameters					
Total dissolved solids	SM 2540-C	APHA 2540-C	2B05-B	APHA 2540-C	Total dissolved solids dried at 180°C
pH	SM 4500-H+-B	APHA 4500-H+-B	2B02	APHA 4500-H+-B	Electrometric method
Conductivity	SM 2510-B	APHA 2510-B	2B03	APHA 2510-B	Meter
Density	IMA-28	Pycnometer	2B14	Gravimetric method, pycnometer	Pycnometer
Alkalinity	SM 2320-B	APHA 2320-B	2B06	APHA 2320-B	Titration method
Alkalinity (carbonates)	SM 2320-B	APHA 2320-B	2B13-B	APHA 2320-B	Titration method
Alkalinity (bicarbonates)	SM 2320-B	APHA 2320-B	2B13-B	APHA 2320-B	Titration method
Inorganic Parameters					
Boron (B)	IMA-23-Version 1	APHA 4500-B-C	2C	APHA 4500-B-C	Carmine method

Analysis Type	Alex Stewart	University of Antofagasta	ACME	ALS Chemex	Method Description
Chloride (Cl)	SM 4500-Cl-B	APHA 4500-Cl-B 2B12	Argentometric Method	APHA 4500-Cl-B	
Sulphates (SO4)	SM 4500-SO4-C	APHA 4500-SO4-C	SO4	APHA 4500-SO4-C	Gravimetric method with ignition of residue
Dissolved metals					
Lithium (Li)	ICP-13 APHA	3500-Li-B	2C	APHA 3500-Li-B	Direct aspiration - ICP or AA finish
Potassium (K)	LACM16	APHA 3500-K-B	2C	APHA 3500-K-B	Direct aspiration - ICP or AA finish
Sodium (Na)	LACM16	APHA 3500-Na-B5	2C	APHA 3500-Na-B5	Direct aspiration - ICP or AA finish
Calcium (Ca)	LACM16	APHA 3111-B-D	2C	APHA 3111-B-D	Direct aspiration - ICP or AA finish
Magnesium (Mg)	ICP-13	APHA 3111-B-D	2C	APHA 3111-B-D	Direct aspiration - ICP or AA finish

8.5 Quality Assurance and Quality Control

8.5.1 Quality Assurance and Quality Control Procedure

Analytical quality was monitored through the use of randomly inserted quality control samples, including standard reference materials (SRMs), blanks and duplicates, as well as check assays at independent laboratories. Each batch of samples submitted to the laboratory contained at least one blank, one low-grade SRM, one high-grade SRM and two sample duplicates. Approximately 38% of the samples submitted for analysis were quality control samples.

8.5.1.1 Standard Reference Materials

Three SRMs were used in the 2010-2011 sampling program. These reference materials were collected from selected brine sources of known lithium concentration, Wells SVWW11_09 and SVWW11_10. The brines were collected as bulk samples, homogenized, filtered, and bottled prior to shipment for analysis. Sets of randomized replicates were sent in a laboratory round robin analysis program to five laboratories to determine the certified values used in assessing the quality of analyses.

SRM analyses at Alex Stewart indicate acceptable accuracy generally well within the mean ±2 standard deviations for all of the standards analyses. Where failures were observed, the values lie just outside of the mean ±2 standard deviation error limits. None of the failures exceeded the mean ±3 standard deviation error limits. Relative standard deviations are a measure of the reproducibility of measurements or precision of the standard. A value below 10 indicates acceptable reproducibility for a standard. The lower the value, the more precise the measurement. The relative standard deviation values for the Alex Stewart analyses ranged from 3.7 to 7.5, indicating good overall analytical reproducibility for the standard analyses conducted.

8.5.1.2 Blanks

Blank samples consisting of distilled water have been included for laboratory analysis as part of the QA/QC program. Requested analytes for the blank samples have been the same as for the other brine samples from the wells and boreholes sent to the laboratory. Laboratory results for the blank samples have consistently reported values consistent with distilled water, with lithium being reported below detection limits.

The relative standard deviation values for the Alex Stewart analyses range from 3.0 to 7.4, indicating good overall analytical reproducibility for standard analyses conducted at Alex Stewart.

8.5.1.3 Duplicates

Sample duplicates were obtained during sample collection. Sample duplicate analyses at Alex Stewart indicated acceptable precision within 2% or less for lithium, potassium, and magnesium. All of the lithium, potassium, and magnesium laboratory duplicates were within 10% of one another and all of the samples were within the ± 10% limits. The observed bias between duplicates was within 1% and the correlation was high (r2 >0.99). All of the duplicate lithium, potassium, and magnesium analyses were within 10% and all of the samples were within the ± 10% limits.

Sample and laboratory duplicate analyses indicated acceptable precision for lithium, potassium, and magnesium analyses conducted at Alex Stewart.

8.5.1.4 Check Analyses

The round robin analytical program conducted by Lithium One at the beginning of the 2010 - 2011 drill program indicated comparable accuracy and precision to that achieved by Alex Stewart. For this reason, the University of Antofagasta was chosen as the check analysis laboratory for the 2010 drill program. Due to turnaround time delays using the University of Antofagasta, ACME was used as the check analysis laboratory for the 2011 drill program.

Fifteen percent of the original samples were sent for check analysis. In addition, blanks, low-grade and high-grade lithium SRMs were included to monitor accuracy and potential laboratory bias. The SRMs included with these samples indicated acceptable accuracy and precision for lithium and potassium. No significant bias was observed in these analyses.

8.5.1.4.1 University of Antofagasta

Precision ranges from 5.7% for lithium to 8.4% for magnesium. Bias is acceptable and ranges from -1.7% for lithium to 7.2% for potassium. The correlation is high (r2 = 0.97 to 0.99).

Precision of these duplicate analyses is acceptable for lithium and potassium. Seventy-eight percent of the lithium analyses are within ± 10% of one another. One hundred percent of the lithium analyses are within 20% of one another. Seventy-two percent of the potassium analyses are within ± 10% of one another. One hundred percent of the potassium analyses are within 20% of one another. Only 50% of the magnesium analyses are within 10% of one another, but this percentage improves, and all of the magnesium analyses are within 20% of one another.

The magnesium analyses at the University of Antofagasta show lower precision than corresponding analyses at Alex Stewart. The reason for this greater imprecision is related to the analytical finish used by each of the laboratories. Alex Stewart uses an ICP finish while University of Antofagasta uses an AA finish. The greater imprecision at the University of Antofagasta is introduced by the incomplete digestion of microcrystals of magnesium hydroxide (suspended in the brine) by lower plasma temperatures used during AA analyses.

8.5.1.4.2 ACME

Precision ranges from 7.4% for potassium to 9.1% for lithium. Bias is acceptable and ranges from -1% for magnesium to 5.3% for potassium. Correlation is high (r2 = 0.90 to 0.96).

Sixty-eight percent of the lithium analyses are within ± 10% of one another. Ninety-four percent of the lithium analyses are within 20% of one another. Fifty percent of the potassium analyses are within ± 10% of one another. Ninety-seven percent of the potassium analyses are within 20% of one another. Sixty-eight percent of the magnesium analyses are within 10% of one another, but this percentage improves and 91% of the magnesium analyses are within 20% of one another.

The ACME results display slightly poorer reproducibility for lithium and potassium than the University of Antofagasta check analyses. This lower precision is also reflected within the set of laboratory duplicates analyzed by ACME within the check analyses program. This suggests that the imprecision observed between the original ASA analyses and the ACME check analyses is not only a function of the sample difference, but incorporates the imprecision contributed by ACME’s inability to reproducible analyses to the same precision level as Alex Stewart or University of Antofagasta. Regardless of the precision comparison, the population standard deviations and means between the sets of data for Alex Stewart and ACME are not statistically significantly different.

8.5.1.4.3 ALS Chemex

Three non-certified SRMs were used. Brine fluids were collected from selected surface brine pools of known concentration which have undergone significant mixing and homogenization and were included as control samples with the check samples. Three ALS analyses exceeded the +10% accuracy limits, appear to be analytical outliers, and could be classified as analytical failures.

ALS Chemex laboratory lithium analyses for Standard 1 were generally half of the value of the Alex Stewart analyses. As the concentration of lithium increased to above 300 mg/l for Standards 2 and 3, (excluding an obvious analytical outlier of 952 mg/l for Standard 2), the mean difference between lithium analyses by each laboratory decreases from over 50% for Standard 1 to within 6% for Standards 2 and 3.

Although there is a significant bias at low concentrations, analyses of lithium at higher grades are within 6% of one another and are considered to be within acceptable limits of analytical reproducibility.

Standard analyses at ALS Chemex are more variable than those at Alex Stewart, but still generally within +10% of the mean and +2 standard deviations.

Duplicate analyses at ALS Chemex show more variable results than those performed at Alex Stewart, but still indicate acceptable precision of less than + 10% for the sample duplicates, with only one sample exceeding a precision of + 10%.

Check analyses were conducted at ALS Chemex using duplicate samples. The correlation between Alex Stewart and ALS Chemex analyses ranges from 0.94 for magnesium to 0.98 for lithium and potassium. Precision of these duplicate analyses is acceptable, but there is an analytical bias between the laboratories. ALS Chemex analyses are biased 4.9% for potassium, which is within analytical acceptability, to 21.1% for magnesium, which is significantly lower than corresponding Alex Stewart analyses. ALS Chemex lithium analyses are biased 11.5% lower than corresponding Alex Stewart analyses. This bias is observed throughout the range of grades analysed, and most likely reflects instrumental calibration bias between the laboratories.

Check analysis statistics for pH, density, and conductivity between Alex Stewart and ALS Chemex were evaluated. The parameters are measured with different instrumental methods than lithium, potassium, and magnesium. Correlation of check analyses between the laboratories ranges from 0.73 for pH to 0.99 for conductivity. Accuracy and precision are within acceptable limits (<10%) and there is no significant bias between physical measurements conducted at either laboratory.

8.5.2 Anion-Cation Balance

Another measure of accuracy of water analyses involves determining the anion-cation balance of the samples. The accuracy of water analyses may be readily checked because the solution must be electrically neutral. Thus, the sum of cations in meq/l should equal the sum of anions in meq/l.

The term meq/l is defined as: Meq/l = mg/l * valency / formula weight.

The charge balance is usually expressed a percentage, where:

$$\text{Balance} = ((\sum C - \sum A)/(\sum C + \sum A) \times 100$$

Where $\sum C$ is the sum of cations and $\sum A$ is the sum of anions.

If the balance calculated by this formula is <5%, the analysis is assumed to be acceptable. The anion-cation balances for all of the samples analyzed at Alex Stewart have a balance within a value of 5.0. Overall, the Alex Stewart analyses show acceptable accuracy and precision, and anion-cation balance such that the data can be used in Brine Resource estimation.

8.6 Databases

In the early phases of the Project, all data were transferred into a central data repository managed by Montgomery & Associates and other consultants. The database was originally located in Denver, Colorado and later synchronized with a data repository in the Project offices in Argentina, and a separate data repository at Montgomery & Associates' offices in Tucson, Arizona. Currently, Allkem manages the main database.

Raw data from the Project were transferred into a customized Access database and used to generate reports as needed.

Field data were transferred by field personnel into customized data entry templates. Field data were verified before being uploaded into the Access database using the methodology of crosschecking data between field data sheets and Excel tables loaded in the server. Data contained in the templates were loaded using an import tool, which eliminated data reformatting. Data were reviewed after database entry.

Laboratory assay certificates were directly loaded into the Access database, using an import tool. Quality control reports were automatically generated for every imported assay certificate and reviewed to ensure compliance with acceptable quality control standards. Failures were reported to the laboratory for correction.

The drainable porosity and chemistry data to support the Brine Resource estimates were verified. These verifications confirmed that the analytical results delivered by the participating laboratories and the digital exploration data were sufficiently reliable for Brine Resource estimation purposes.

8.7 Sample Security

All samples from the Lithium One and Galaxy Lithium programs were labelled with permanent marker, sealed with tape, and stored at a secure site until transported to the laboratory for analysis. Labels were hand-written in accordance with the chain-of-custody field data sheets. Samples were packed into secured boxes with chain-of- custody forms and shipped to the relevant laboratory.

8.8 Sample Storage

All core and drill cuttings are stored in Allkem's Catamarca office.

8.9 Conclusions

Sample collection, preparation, analysis, and security for the drill programs are in line with industry-standard methods for brine deposits.

The Alex Stewart analyses show acceptable accuracy and precision with an acceptable anion-cation balance. Check analyses at University of Antofagasta and ACME validate lithium and potassium analyses conducted at Alex Stewart. The lower bias observed in the ALS Chemex data for lithium, potassium and magnesium is most likely due to calibration differences between the ICP and AA instruments used to analyze the samples.

Drill programs included QA/QC measures. QA/QC program results do not indicate any problems with the analytical programs.

The employees of Montgomery & Associates are of the opinion that the quality of the sample preparation, security, and analytical procedures are in accordance with industry standards, and are sufficiently reliable to support the Brine Resource and Reserve estimates.

The conceptual understanding of the hydrogeological system of Salar del Hombre Muerto is good, and the observed drilling and testing results are consistent with anticipated stratigraphic and hydrogeological conditions associated with mature, closed-basin, high altitude salar systems. One of the most important features of this hydrogeological system is the general consistency of the lithium and potassium grades measured throughout the entire salar. The majority of the salar contains high-density brine with an average lithium grade over 700 mg/l. The identified aquifer units in the basin are shown to be aerially extensive with a demonstrated ability to pump brine.

9. DATA VERIFICATION

The following chapter summarizes the data verification processes and methods utilized for the Project.

9.1 2010 Technical Report

The following is a summary of the data verification performed in support of the 2010 Technical Report.

Lithium One carried out an internal validation of the available assay data for the 51 sample sites. Data verification was completed on the entire set of samples for each sample collected in the second sampling campaign. This included Alex Stewart and ALS Chemex values for pH, density, conductivity, TDS, sulphate, Cl, alkalinity, B, Ca, K, Li, Mg, and Na. No data errors were found.

Verification of the location of trenches and samples collected by use of differential GPS was also conducted.

The employees of Montgomery & Associates concluded that the information was acceptable to support Brine Resource estimation.

9.2 2011 and 2012 Technical Reports

The following is a summary of the data verification performed in support of the 2011 and 2012 Technical Reports. Lithium One implemented a series of industry-standard routine verifications to ensure the collection of reliable exploration data. Documented exploration procedures existed to guide most exploration tasks to ensure the consistency and reliability of exploration data. The QPs for the reports conducted site visits and inspected Project core stored on site.

The employees of Montgomery & Associates, and Lithium One personnel inspected laboratory facilities at Core Laboratories, and reviewed laboratory procedures with Core Laboratories personnel. Geochemical Applications International has conducted laboratory audits of Alex Stewart.

The QPs for those reports considered that these verifications confirmed that the analytical results delivered by the participating laboratories and the digital exploration data were sufficiently reliable for the purpose of Brine Resource estimation.

9.3 2018 Feasibility Study

Lithium One and Galaxy retained Montgomery & Associates to undertake Brine Resource and Brine Reserve estimations. These estimates formed the basis of the 2018 Feasibility Study.

Montgomery & Associates personnel verified the drainable porosity and chemistry data used for the Brine Resource estimates. These verifications support that the analytical results delivered by the participating laboratories and the digital exploration data were sufficiently reliable for the Brine Resource and Brine Reserve estimations outlined in this Report.

9.4 2021 Feasibility Study

Galaxy retained Montgomery & Associates Consultores Limitada to undertake Brine Resource and Brine Reserve estimations. These estimates formed the basis of the 2021 Feasibility Study.

Montgomery & Associates Consultores Limitada personnel verified the drainable porosity and chemistry data used for the Brine Resource estimates. These verifications support that the analytical results delivered by the participating laboratories and the digital exploration data were sufficiently reliable for the Brine Resource and Brine Reserve estimations outlined in this Report.

9.5 Verification by the Qualified Person

Verification by the QP employees of Montgomery & Associates Consultores Limitada covered field exploration and drilling and testing activities. These included descriptions of drill core and cuttings, laboratory results for drainable porosity and chemical analyses, including quality control results, and review of surface and borehole geophysical surveys.

9.6 Conclusions

The employees of Montgomery & Associates are 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 and Brine Reserve estimates.

10. MINERAL PROCESSING AND METALLURGICAL TESTING

10.1 Initial Brine Characterization and Scoping Studies

10.1.1 Raw Brine Metallurgical Characterization

The chemical composition and physical properties of raw brine from production wells are displayed in Table 10-1. These measurements are taken from 7 different production wells and analyzed by the onsite laboratory.

Table 10-1 - Characterization of raw brine.

	Li+	Ca2+	Mg2+	Na+	K+	Cl-	SO42-	B3+	Sr2+	Density	Conductivity
Measurement Method	A.A.	ICP-OES	ICP-OES	A.A.	ICP-OES	Volumetry	ICP-OES	ICP-OES	ICP-OES	Densimeter	Conductimetry
Units	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	g/cm³	mS/cm
Value	841	1,108	2,363	107,033	9,323	182,291	6,576	559	19	1.205	248
Ratio to Li	1	1.32	2.81	127.23	11.08	216.7	7.82	0.66	0.02		

A.A = atomic absorption spectroscopy.
ICP-OES = inductively coupled plasma with optical emission spectrometer

The lithium concentration is above 800 mg/l, which is relatively high when compared with other Argentine brines. The relative concentration of the other elements with respect to lithium must be reduced prior to production of lithium carbonate. Large amounts of sodium, potassium, strontium, and chloride can be removed by evaporation prior to liming, via precipitation of salts. Calcium, magnesium, sulphate, and boron must be reduced by other means. The SDV process for removing these contaminants and producing the final lithium carbonate product is outlined in Section 14.

10.1.2 Final Product

Lithium carbonate is a salt of lithium and is produced as a white granular solid which exists exclusively in an anhydrous form. Details on the characterization of lithium carbonate product from the SDV pilot plant can be found in Section 10.2.10.

10.2 Metallurgical Laboratory Test-Work Program

10.2.1 History

Galaxy conducted a series of internal and external testwork programs to determine the feasibility of producing battery-grade (BG) lithium carbonate from the Sal de Vida Project. Both external laboratories are fully certified and highly regarded in the resource industries.

A conventional brine flowsheet was initially investigated that used common unit operations for lithium brine processing. The initial design also included a potash plant for production of saleable potassium chloride, processed from the salts precipitated in the muriate solar ponds. The initial flowsheet and unit operations are summarized in Table 10-2.

Table 10-2 - Initial testwork flowsheet.

Operation	Element Targeted	Description
Solar evaporation	Na, K, water	Evaporation of brine in ponds to remove water. Precipitation of sodium and potassium as halite and sylvite salts in halite and muriate ponds respectively
Liming	Mg, B, SO4	Reaction of brine with calcium hydroxide (Ca(OH)2) to remove magnesium, sulphate and some boron as magnesium hydroxide, calcium sulphate and borate solids
Solvent extraction (SX)	B	Removal of boron by pH adjustment and contact with an organic extractant
Ion exchange (IX)	B, Ca, Mg	Eluting of brine through a column with a resin with a high affinity for calcium, magnesium and/or boron
Softening	Mg, Ca	Reaction of brine with sodium carbonate (Na2CO3) and/or caustic soda (NaOH) to precipitate calcium and magnesium as calcium carbonate and magnesium hydroxide solids
Crystallization	Li	Precipitation of lithium carbonate (Li_2CO_3) crystals by reaction with sodium carbonate at elevated temperatures
Bicarbonation	Li	Purification of lithium carbonate by reacting with carbon dioxide to produce soluble lithium bicarbonate (LiHCO3), filtration to remove solid impurities and recrystallisation of refined lithium carbonate by heating to >75 °C and expulsion of CO2

10.2.2 Evaporation Rate Dynamics

A standard Class A pan test was performed on site between 2011 - 2013 to understand the evaporation rate dynamics on the salar. This involved taking daily readings of the pan and replenishing the amount of water that had evaporated during the previous day. A 16 wt% NaCl solution was used. The gross evaporation (inclusive of rainfall) for each month was recorded. The relation between the NaCl solution activity and density was used to estimate the equivalent evaporation rate of pure water. The study outcomes and established correlations were used to estimate a preliminary evaporation rate for modelling purposes.

10.2.3 Liming and Concentration Pathway Testwork

Testwork was performed on site in 2012 to generate concentration path data from limed brine. Raw brine was limed batchwise, then evaporated to different final concentrations in six 3-m and 6-m test ponds, with daily sampling and ion analysis. The results were used to plot sodium and potassium concentrations as a function of lithium concentration. Results indicated that raw brine could be evaporated to 2.2 wt% Li without lithium precipitation.

10.2.4 Galaxy-Jiangsu Lithium Carbonate Plant

Galaxy commissioned its Jiangsu lithium carbonate plant in China to investigate the applications of solvent extraction (SX), ion exchange (IX), softening, and crystallization.

Jiangsu was requested to perform boron SX testwork to provide a greater understanding of the applicability of a boron SX circuit in the process. Jiangsu conducted several softening optimization testwork to determine its effects on the circuit's performance, conducted optimization testwork for Ca/Mg IX and boron IX, and optimization testwork for the crystallization circuit. This option was not pursued further.

10.2.5 Hazen Research Inc.

Hazen Research Inc. of Golden, Colorado (Hazen), completed bench-scale testwork and larger batch tests using a supplied 50 kg evaporated brine (2.2 wt% Li) produced on site. Hazen first performed a process review and testwork program to determine the most appropriate extractant for boron removal, which was found to be 2,2,4-trimethyl-1, 3-pentanediol in iso-octanol (Exxal 8). Bench-scale testwork for calcium and magnesium removal with sodium carbonate (Na_2CO_3) was also performed prior to the larger-scale runs.

The Hazen testwork demonstrated that a primary-grade (PG) lithium carbonate could be produced from a 2.2 wt% Li brine, at a larger scale than bench work. The testwork also provided some insight into optimal conditions and the flowsheet arrangement; for example, including caustic addition to target pH 10.4 prior to softening via sodium carbonate addition reduced the quantity of reagents required.

10.2.6 Galaxy Testwork

In 2018, Galaxy conducted IX scoping tests using two types of chelating resins: LSC 750 and LSC 780, with a high selectivity to divalent cations (magnesium and calcium) and boron respectively. Results indicated that IX, with an appropriate resin, could reduce the impurities in concentrated 2.2 wt% Li brine by 88% for calcium, 97.5% for magnesium and 99% for boron.

10.2.7 ANSTO

10.2.7.1 Laboratory Testwork - Stage 1

The Australian Nuclear Science and Technology Organization (now ANSTO Minerals; ANSTO) was contracted to provide ongoing validation testwork. Site brine samples were produced on site for ANSTO testwork by evaporating wellfield brine in 6-m pans. This testwork was performed using 2.2 wt% Li evaporated brine samples. The investigations performed included:

- SX and IX testwork for boron, calcium, and magnesium removal.
- Softening investigating Na_2CO_3 and NaOH addition testwork for removal of calcium and magnesium and pH adjustment.
- Crystallization of primary Li_2CO_3.
- Lithium carbonate purification by bi-carbonation, IX, and re-crystallization.

The key findings were:

- SX and IX for boron removal are not required as almost all boron is rejected during the crystallization of primary lithium carbonate as well as recrystallisation of refined Li_2CO_3.
- Recycling of mother liquor from crystallization can be achieved without the inclusion of a specific boron- targeted removal step.
- The divalent cations, calcium, and magnesium can be mostly removed by addition of NaOH, Na_2CO_3 and/or a combination of the two. A combination of the two can easily reject all divalent ions but presents risks of lithium losses.
- IX treatment to removal calcium and magnesium is not required prior to precipitation of primary Li_2CO_3.
- Bicarbonation, followed by clarification, results in rejection of the majority of divalent carbonates as these carbonates are largely insoluble, while lithium bicarbonate is highly soluble.
- Some sodium and potassium are rejected during bicarbonation/clarification.
- Control of the crystallization of Li_2CO_3 is vitally important to minimizing sodium and potassium contamination in the final product.
- With the baseline flowsheet, IX for divalent cation removal after bicarbonation would always be required to produce BG product.

The primary recommendation was to investigate the effect of liming as an impurity removal step, and to adopt the simplified process flowsheet set out in Figure 10-1.

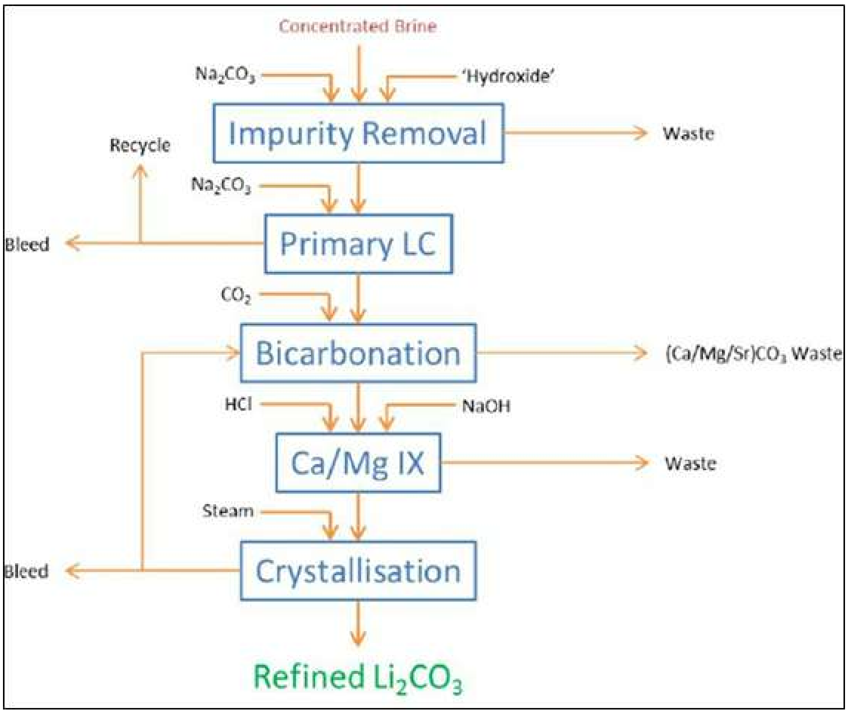


Figure 10-1 - Simplified Block Flow Diagram.

10.2.7.1.1 Small-Scale Evaporation

Evaporation testwork was performed on site with site produced brine, evaporated under ambient conditions in ~50 cm plastic trays. Through routine sampling to track ion concentrations, modelling of the brine concentration pathway and density changes during evaporation was updated. The data can be found in Table 10-3. This work was validated by similar evaporation testwork performed in Perth, under heat lamps (Bureau Veritas (BV) and Nagrom).

Table 10-3 - Small scale evaporation results.

Sample	Li (mg/l)	Ca (mg/l)	Mg (mg/l)	K (mg/l)	B (mg/l)	SO_4 (mg/l)	Na (mg/l)	Cl (mg/l)	Density (g/ml)
SV-07704	832	1,050	2,450	9,380	578	6,627	112,000	191,416	1.21
SV-07705	1,890	645	5,750	19,800	1,250	11,039	106,000	204,738	1.22
SV-07701	2,480	501	8,270	28,100	1,840	13,990	93,700	210,754	1.23
SV-07703	5,740	143	19,200	41,900	4,270	25,914	66,300	215,265	1.24

Sample	Li (mg/l)	Ca (mg/l)	Mg (mg/l)	K (mg/l)	B (mg/l)	SO_4 (mg/l)	Na (mg/l)	Cl (mg/l)	Density (g/ml)
SV-07699	6,990	150	21,200	43,500	3,660	25,787	57,200	218,057	1.24
SV-07700	8,450	96	25,100	45,700	4,400	29,573	58,300	226,864	1.24
SV-07707	9,290	124	27,800	36,100	3,370	35,389	49,300	214,031	1.24
SV-07708	11,700	87	34,700	32,000	4,290	40,366	36,200	215,516	1.24
SV-07702	12,000	74	36,900	29,500	3,600	40,818	32,600	226,470	1.24
SV-07709	13,500	55	40,000	31,200	4,190	40,378	28,100	223,678	1.24
SV-07706	14,000	63	41,100	27,700	3,570	39,826	26,600	226,116	1.24
SV-07710	14,800	55	45,900	30,800	4,320	40,296	22,400	233,890	1.24
SV-07711	15,100	67	43,900	29,800	3,810	40,538	19,500	245,461	1.24

The major outcomes included:

- Raw data were obtained to further validate concentration pathway correlations.
- The work performed in Perth revealed that some lithium would precipitate as potassium lithium sulphate ($KLiSO_4$) beyond a concentration of 1.2 wt.% Li in the brine. As a result, the evaporation limit for process design was lowered from 2.2 wt% to 1.2 wt%.

10.2.7.1.2 Single Go Forward Option

A single go forward option was determined, based on the following considerations:

- Liming will be performed after evaporation of the raw brine rather than upfront. This will reduce the throughput volume of the liming plant and hence the capital cost. There is also potential for the cost to be deferred until later in the Project timeline.
- The Sal de Vida plant will produce a primary grade Li_2CO_3 that can then be shipped elsewhere for purification or sold to customers. This will be more economically favorable as it allows for a simplified flowsheet to be used on-site, while purification can be performed offsite, without the constraints of isolation and altitude.

The flowsheet selected for the proposed on-site process plant and subsequent process development is provided in Figure 10-2.

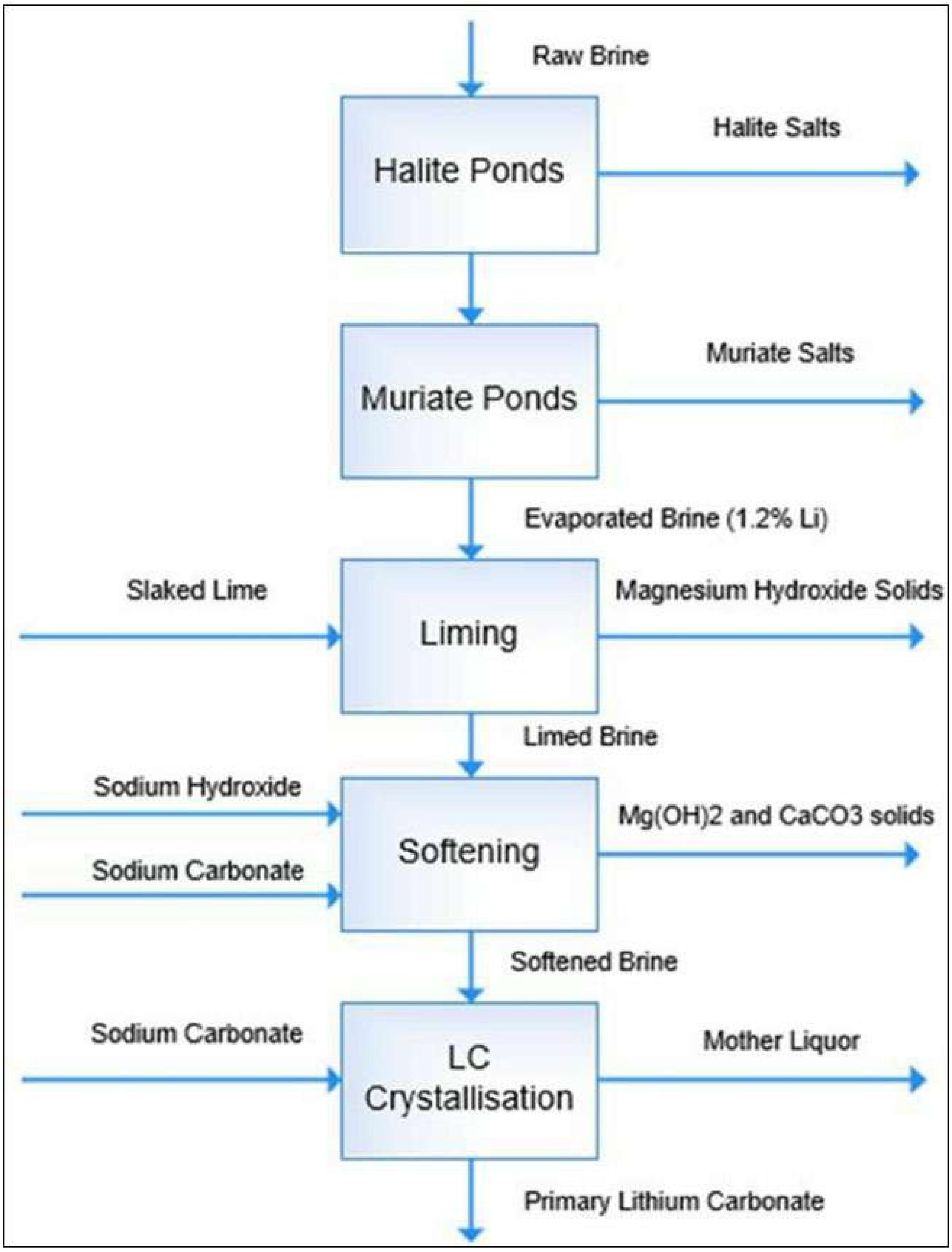


Figure 10-2 - Recommended Flowsheet.

10.2.7.2 Laboratory Testwork - Stage 2

The ANSTO Stage 2 testwork was performed on a combination of synthetic and site-produced evaporated brines, targeting a range of lithium concentrations. Two programs were completed.

10.2.7.2.1 Program 1

Work performed included:

- Evaporation profiles to investigate the impact of sulphate concentration.
- Characterization of the effect of liming on calcium, magnesium, and SO_4 concentrations at 0.7 wt% Li.
- Multi-step validation to help determine the best sequence of liming, evaporation and softening for optimum impurity removal and lithium recovery.

Findings included:

- Lithium precipitates at an earlier concentration than previous testwork had indicated - after 0.7 wt.% Li rather than 1.2 wt.% Li - but this can be prevented up to at least 1.2 wt% Li by keeping sulfate concentrations below 3.2 wt%.
- Lime is more effective in less concentrated brines.
- Magnesium that is not removed in liming can be removed in the softening circuit.
- Softening performance is not affected by reaction temperatures between 20-40°C.
- Li_2CO_3 can be produced at a purity above 99% using the recommended flowsheet. The dominant impurities are sodium, potassium, and chlorine.

The flowsheet was modified (Figure 10-3) to place liming between the two stages of evaporation ponds, rather than before or after. The halite ponds evaporate the brine to 0.7 wt% Li, after which the brine is limed to remove magnesium, then evaporated again in muriate ponds to a target of 1.2 wt% Li. The intermediate liming stage removes sulfate, which affects the chemistry of the brines such it can be evaporated beyond 0.7 wt% Li without precipitation of lithium.

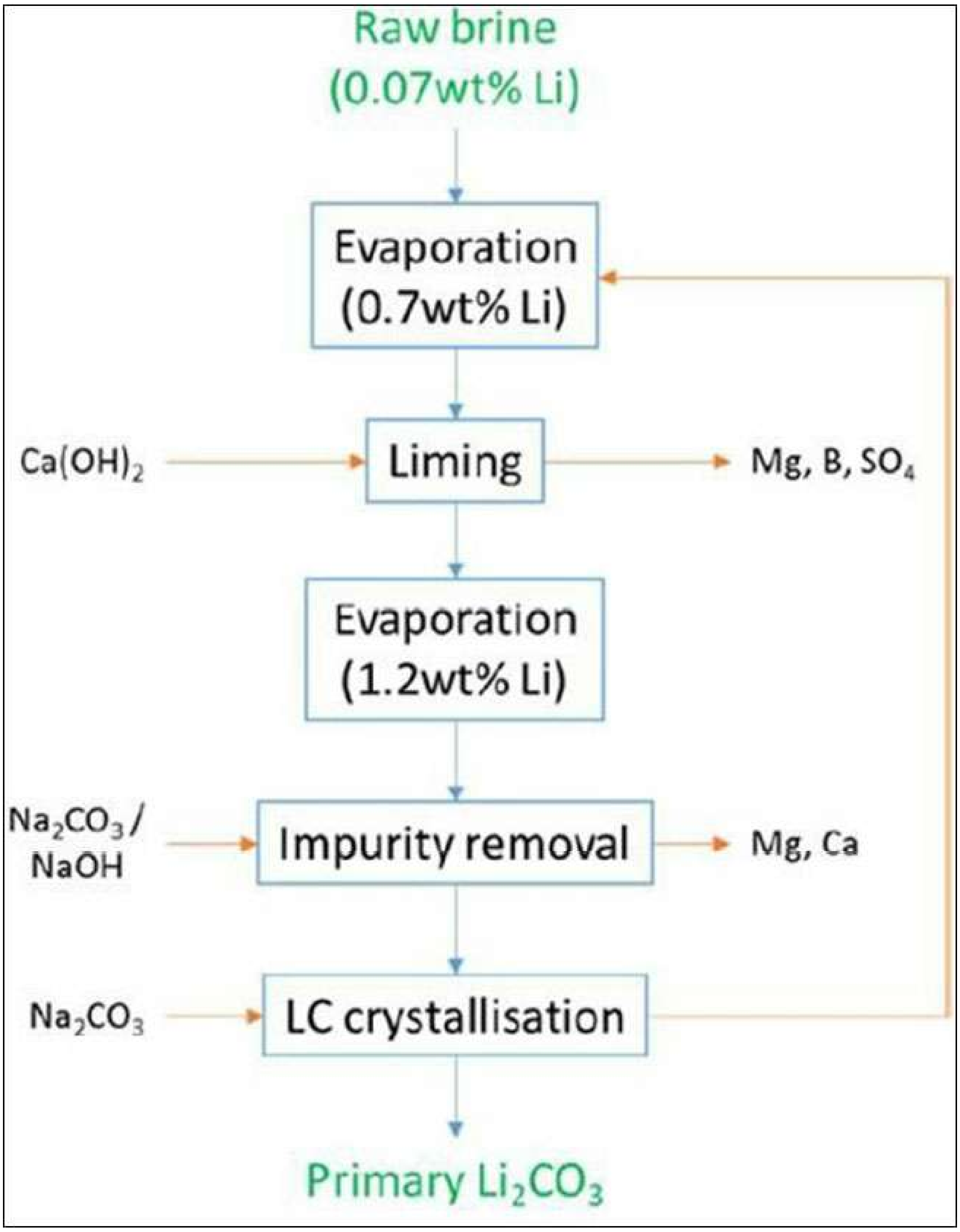


Figure 10-3 - Flowsheet Modified Based on ANSTO Testwork.

10.2.7.2.2 Program 2

Work completed included flowsheet validation testwork, ‘locked-cycle’ testwork (replicating the inclusion of anticipated recycle streams) with site reagents, investigation into liming temperature, and solid-liquid separation assessment for liming, softening and crystallization.

Findings included:

- High purity Li_2CO_3 (99.5%) can be reproducibly prepared using site reagents and site brine.
- Liming slurries demonstrated fast filtration rates of 400-800 kg/m²/hr, resulting in a cake moisture of 66 - 70%.
- Softening slurries demonstrated slow filtration rates ranging from 100 kg/m²/hr to 10 kg/m²/hr. Perlite filter aid did not improve the performance. However, repulping softening slurry with liming thickener underflow increased the filtration rate by two to three times.
- Li_2CO_3 can be readily filtered at a fast rate based on the Li_2CO_3 filtration tests.

10.2.8 Class A Pan Evaporation Rate Measurement

Additional Class A pan tests using 16 wt% NaCl solution commenced in March 2020 to monitor site evaporation and collect modelling data in the area of the site camp and pilot ponds. Daily density, brine activity and pan level decrease measurements were recorded, with the level maintained through the addition of purified water. In November 2021, another Class A pan was installed in the industrial ponds area. This testwork program was in progress at the Report effective date, with the collected data to be used for validation and expansion of the 2011 - 2013 Class A pan data.

As of August 2023, the Class A pan tests have collected over 3 years’ worth of evaporation data in the vicinity of the camp and pilot ponds and almost 2 years of data in the industrial ponds area, which have compared favorably with the values used in evaporation pond design (which were based on the 2011 - 2013 Class A pan measurements and larger datasets from nearby operations). Figure 10-4 shows the average daily evaporation broken down by month, comparing it to the design evaporation rates.

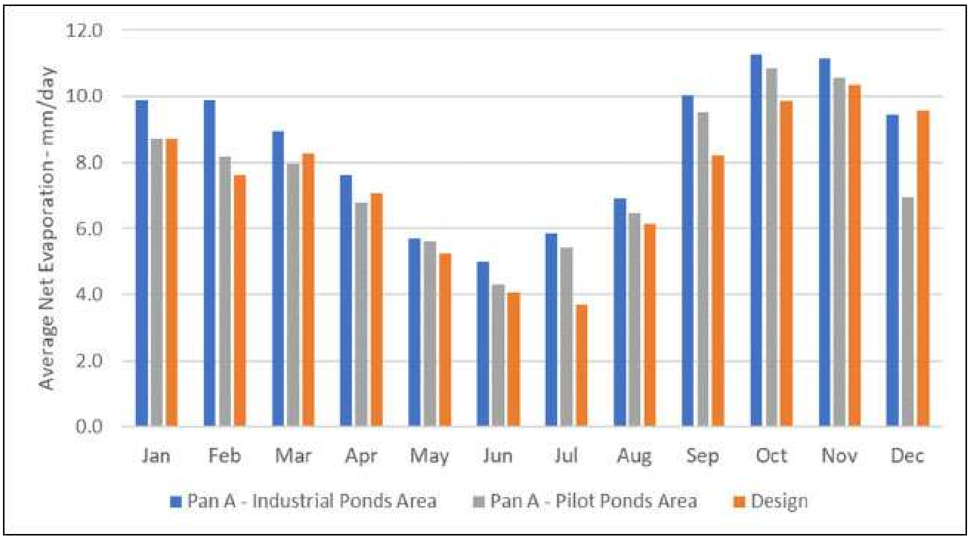


Figure 10-4 - Daily Net Evaporation Measured by Class A Pan Test.

The Class A pan results indicate that the monthly evaporation rates in this area are generally higher than the design rates, meaning that the evaporation pond design is conservative.

Additional Class A pan tests are underway using site brine, limed and un-limed, at concentrations representative of the conditions in the evaporation ponds. These tests will be used to validate the effect of brine composition on evaporation rates.

10.2.9 Pilot Ponds

The pilot ponds consist of 31 ponds of various sizes arranged in 5 strings (Figure 10-5). The ponds are numbered according to string and pond number, e.g., H51 is the first pond in String 5. Each string can be used for a different activity or purpose.

The pilot ponds are subject to routine surveys in which the levels of the brine and salt beds are measured. In late 2020, the temperature profile across the time of day was recorded once or twice per month to understand how the pond temperature responds to changes in the ambient temperature. Pond samples from the ponds are laboratory analysis for ion concentrations when needed to track the concentration path.

10.2.9.1 April 2020 - February 2021 - Batch Evaporation

The brine for Run 2 in the pilot plant (see Section 10.2.3) was evaporated batchwise in the String 4 H and K ponds along with H53 and H54, which were consolidated as needed to adjust the surface area (and hence the evaporation rate) such that the brine would reach the correct lithium concentration in the brine (0.7%) when the team was ready to begin the liming operation (Figure 10-5). When the brine concentration of lithium reached 0.7%, it was transferred to R5 to minimize evaporation as it was processed through the liming plant. Following liming, the brine was pumped to R4 for continued evaporation to a 1.2% lithium concentration, before being transferred to storage tanks to feed the softening circuit.

H11 was slated for salt harvesting testwork, so in late 2020 it was filled with raw brine with the intention of building up a salt layer thick enough for harvesting in 2022. Other ponds were used for disposal of various waste brines, including raw brine from well pump tests (H51, H52, H12) and pilot plant waste (R3).

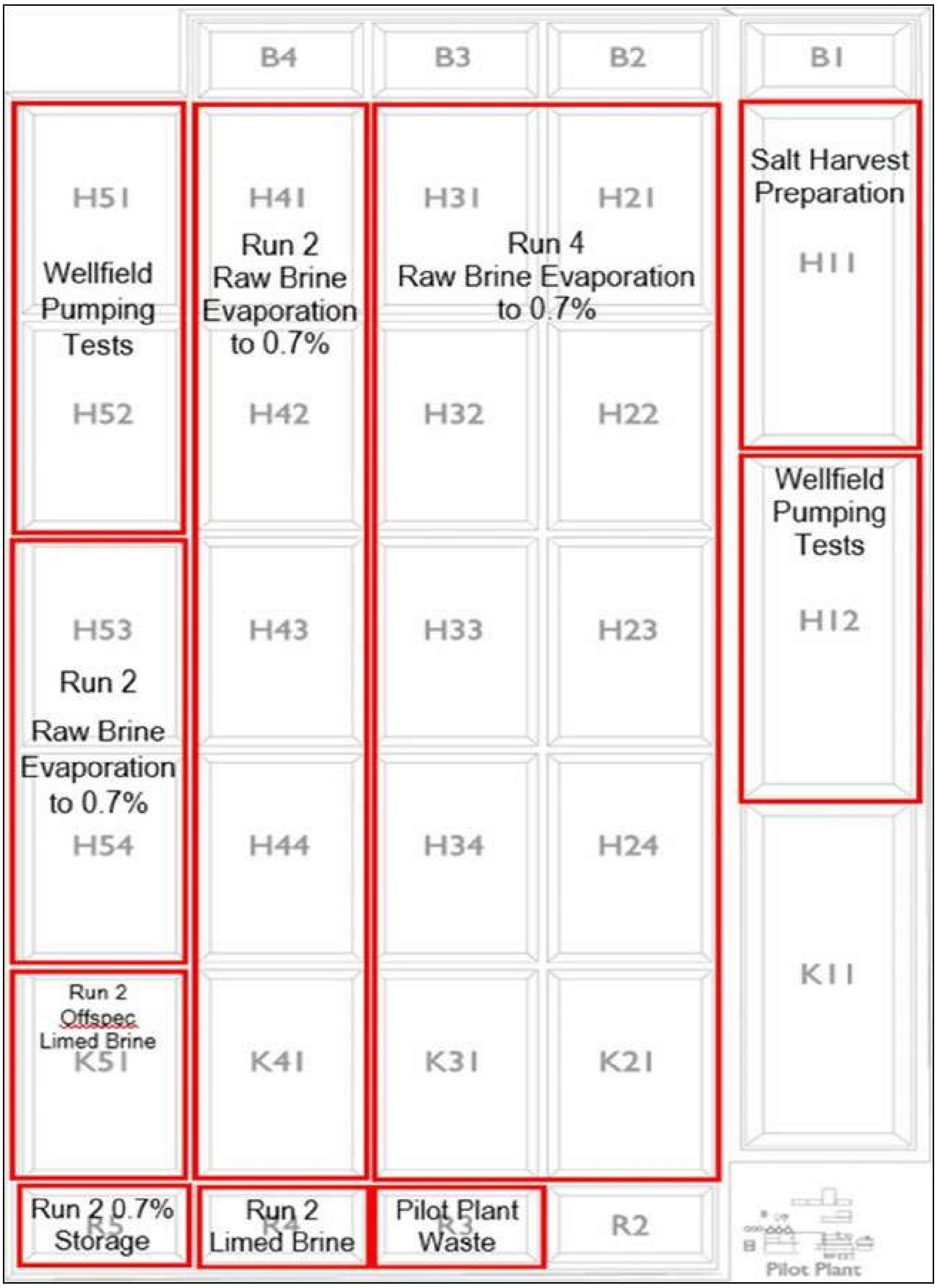


Figure 10-5 - Pilot Pond Operations Apr 2020 - Feb 2021.

10.2.9.2 February 2021 - February 2022 - Continuous Pond System

At the end of February 2021, a continuous pond system was implemented in String 5, wherein brine was continually pumped from the holding pond B4 into H51 and flowed through the weirs into K51. The operation was later expanded into String 4 by pumping the brine across to K41, allowing it to flow through the weirs to H41 where it was pumped to storage pond B3. This exercise allowed the site team and technical support to develop experience with operating and controlling a continuous system through changing evaporation rates and weather conditions, including snow and rain. B2 was used as additional storage when B3 became full (Figure 10-6).

The brine from Strings 2 and 3 was consolidated into H24 as it approached 0.7% Li. This pond was used to feed the liming plant during the 2021 liming exercise for pilot plant Run 4. The limed brine from this exercise was stored in R4 for further evaporation to 1.7%, at which point it was transferred to the plant storage tanks to be used for softening operations. Regular sampling of the limed brine during evaporation allowed the concentration path to be defined for limed brine from the liming plant output concentration (0.6%) to the softening feed concentration (1.7%), with the results used for pond modelling. R3 continued to be used for pilot plant waste disposal.

10.2.9.3 February 2022 - Salt Harvesting

In February 2022, H11 was drained and harvested. Earthmoving equipment constructed ramps for ingress and egress, and a layer of approximately 30 cm was removed according to a procedure developed by the site team, leaving a sacrificial salt layer of approximately 20 cm. The exercise allowed the team to gain experience in salt harvesting and was used to update the harvesting procedure for operational readiness for the commercial ponds. In addition, a report was issued detailing the amount and composition of the entrained brine recovered and the properties of the harvested salt.

The key findings of the salt harvesting test were:

- Demonstrating the feasibility of harvesting salt precipitated from SDV brine.
- Demonstrating that a sacrificial salt layer of 20 cm is relatively adequate (only one leak was detected). However, harvesting in the industrial ponds will utilize a sacrificial layer of 30 cm to be conservative.
- An initial (pre-drain-and-squeeze) entrainment factor of 0.21 t of brine per t of dry salt was calculated.
- A recovery factor of 0.12 t brine per t of dry salt was calculated for the entrained brine during the harvest (i.e. more than half the 0.21 tonnes of entrained brine can be recovered from each tonne of harvested salt).

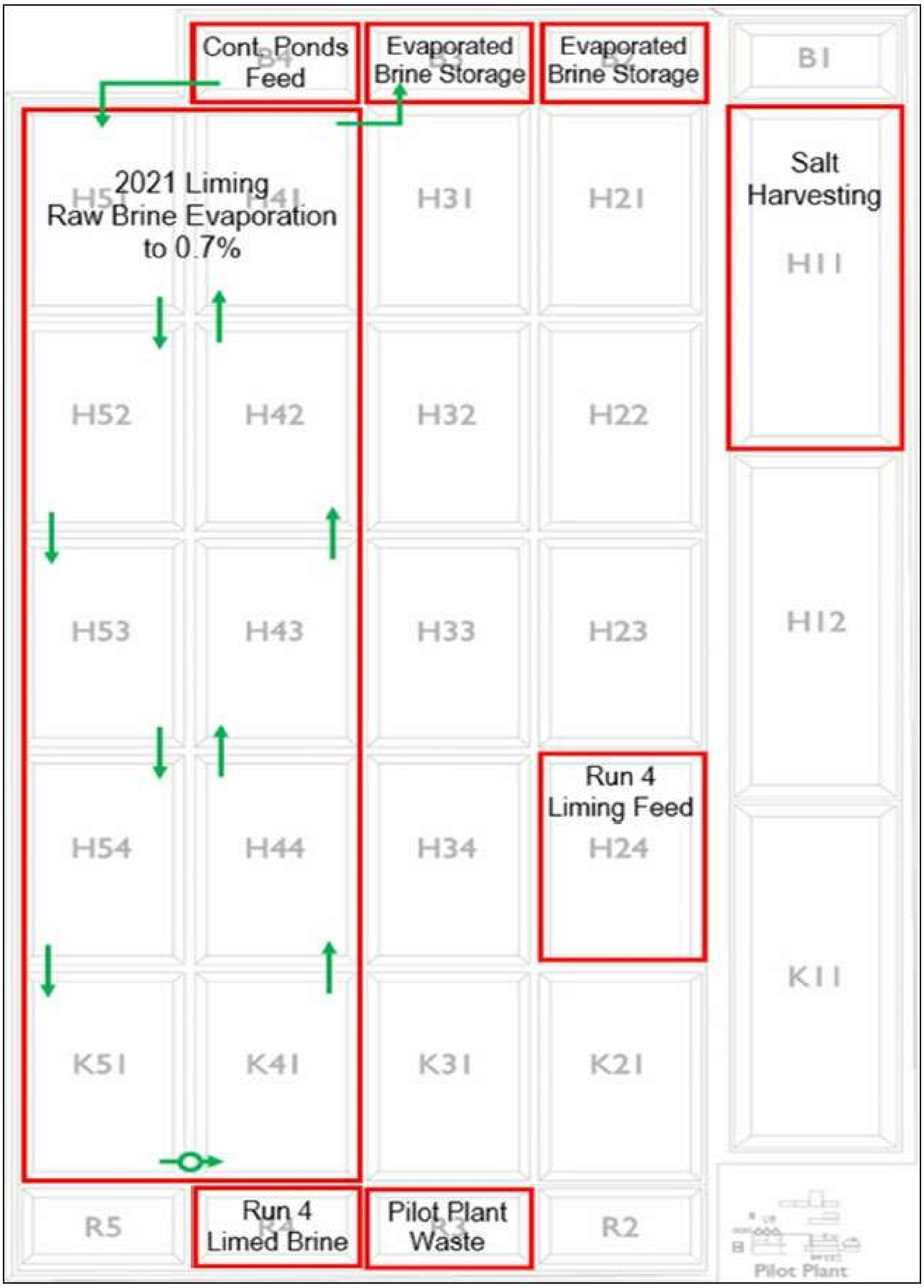


Figure 10-6 - Pilot Pond Operations Feb 2021 - Feb 2022.

10.2.9.4 February 2022 - June 2022 - Continuous Production

Beginning in February 2022, the continuous pond system was expanded across Strings 3 and 2 (Figure 10-7), with the evaporated brine being stored in B2 (with B3 being used to store the existing evaporated brine from the operation thus far). The mode of operation was also changed to a production focus, with the goal of producing ~50 m^3 of evaporated brine at 1.0% Li per day once at steady state and maintaining this concentration in the storage pond.

This operation continued until June 2022 and allowed the site team and technical support to gain experience in operating the continuous ponds in the same manner that will be employed in the commercial process. The production target was exceeded, with an average of 64 m^3 produced per day.

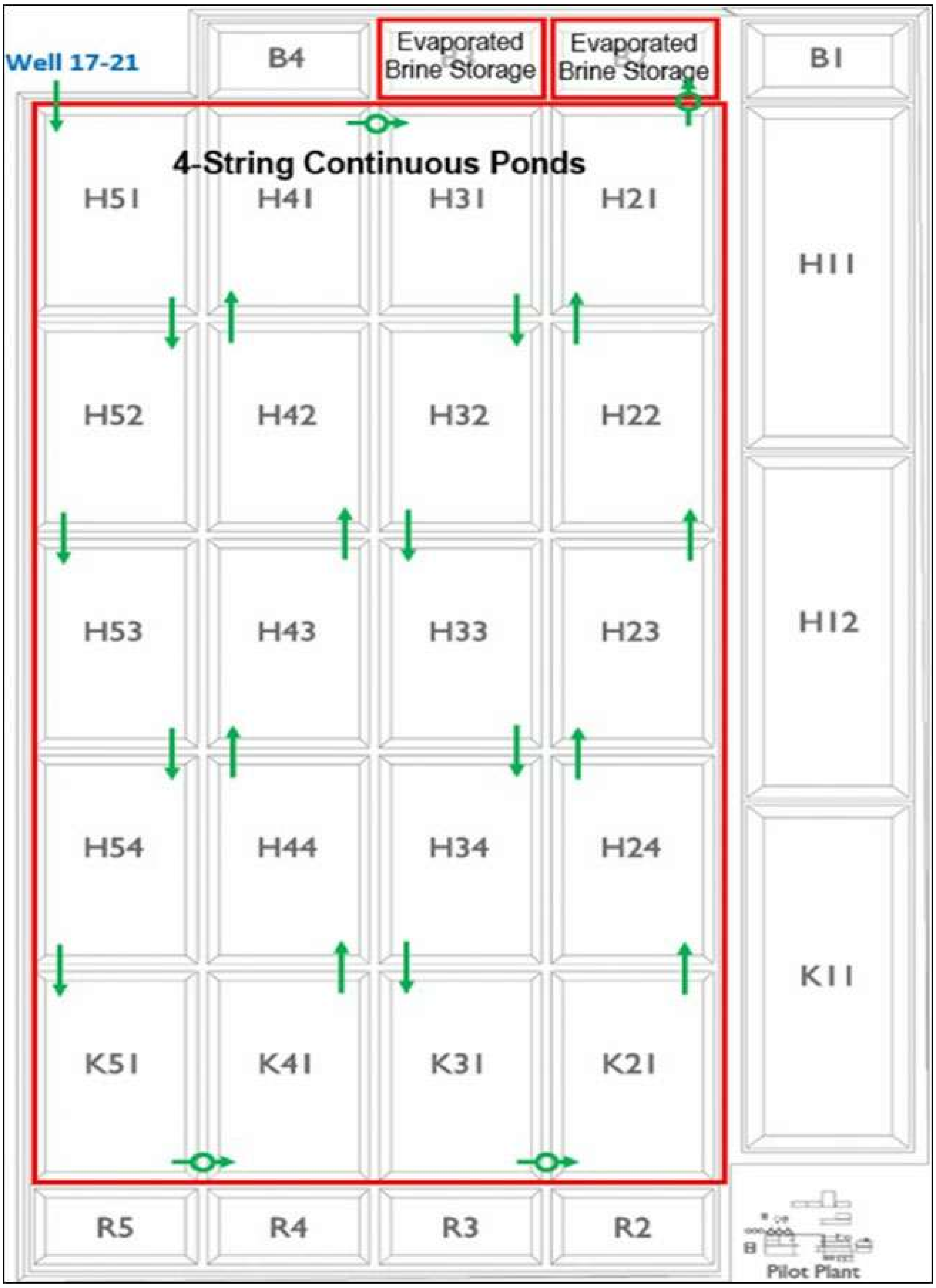


Figure 10-7 - Pilot Pond Operations Feb 2022 Onward.

The pilot pond data was used to validate the concentration paths used for the evaporation pond model. This data can be seen in Figure 10-8 through Figure 10-11.

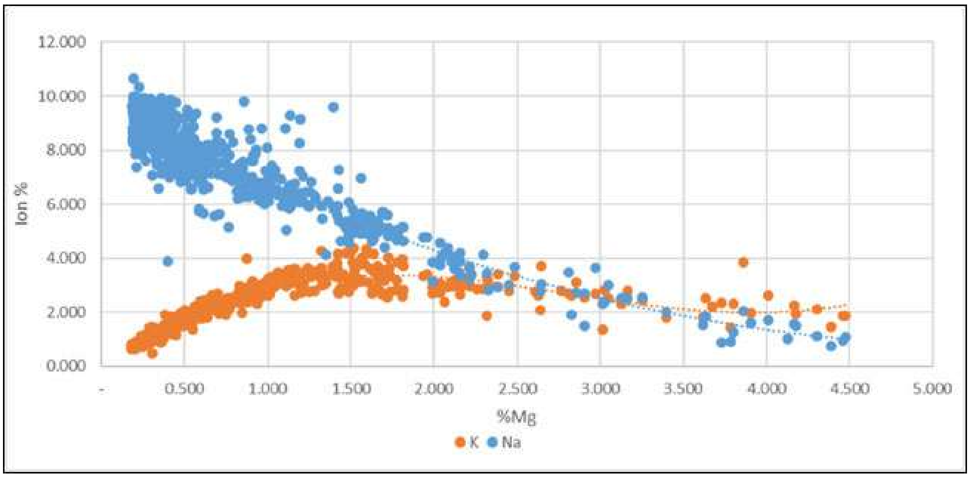


Figure 10-8 - Sodium and Potassium Concentration Paths from Pilot Ponds (Raw Brine).

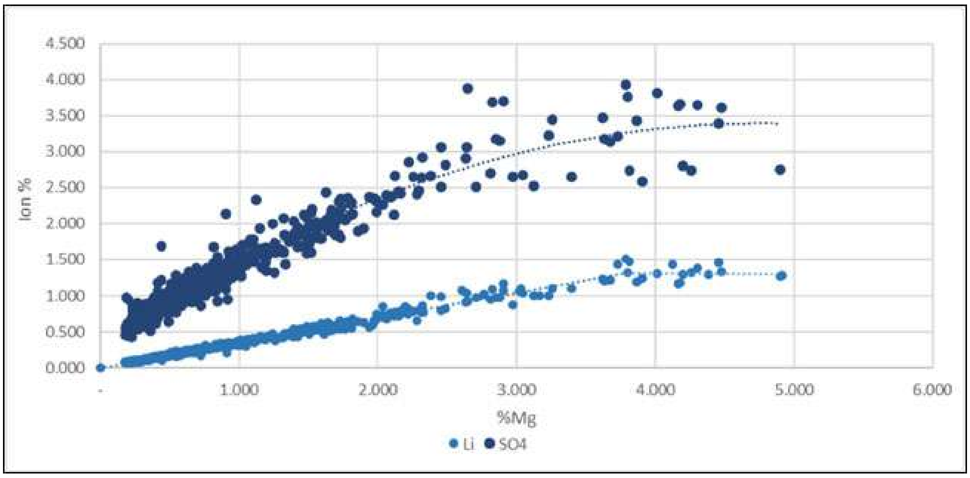


Figure 10-9 - Lithium and Sulphate Concentration Paths from Pilot Ponds (Raw Brine).

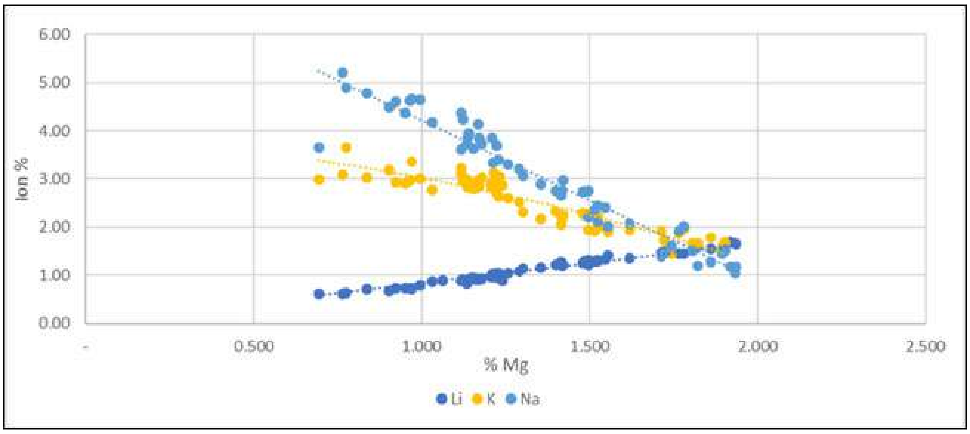


Figure 10-10 - Lithium, Sodium, and Potassium Concentration Paths from Pilot Ponds (Limed Brine).

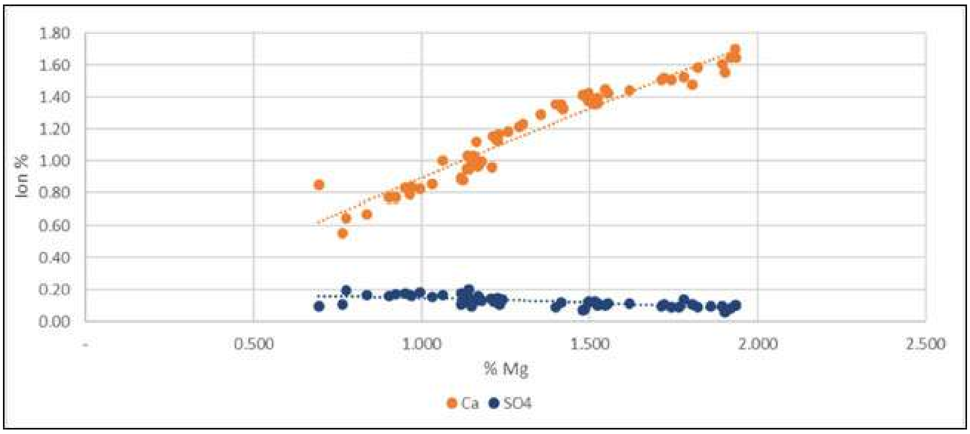


Figure 10-11 - Calcium and Sulfate Concentration Paths from Pilot Ponds (Limed Brine).

10.2.10 Pilot Plant

A pilot-scale plant was constructed close to the pilot evaporation ponds, to validate laboratory testwork and explore operational considerations. Run 1 used synthetic brine for commissioning of the pilot plant with Run 2 and 3 using “real” site brine evaporated from the pilot ponds (Table 10-4).

Table 10-4 - Pilot Plant Runs.

Run Number	Description	Activities	Date
1	Liming plant commissioning with synthetic brine.	Commissioning	July 2020
2	Pilot trials using raw brine from wellfields. Process validation and first pilot-scale lithium carbonate product.	Evaporation to 0.7%	Mar - Aug 2020
		Liming	Aug 2020
		Evaporation to 1.2%	Aug - Sep 2020
		Softening	Oct 2020
		Crystallization	Oct - Nov 2020
3	Production run using 1.2% brine from Run 2 to produce lithium carbonate product for customers.	Softening	Nov 2020
		Crystallization	Dec 2020
4	Concentration and liming of raw brine to prepare feed stock for subsequent piloting. Objectives: process optimization focusing on Li recovery and demonstration of high- grade Li_2CO_3 production. Softening and crystallization cancelled due to COVID-19, with objectives met in Runs 5 and 6 instead.	Evaporation to 0.7%	Sep 2020 - Mar 2021
		Liming	Mar - Apr 2021
		Evaporation to 1.2%	Apr - May 2021
		Softening	Cancelled
		Crystallization	Cancelled
5	Investigation of Ca/Mg ion exchange (IX) and alternative filtration technologies in softening, as well as reagent addition strategies, residence time and heating profiles in crystallization; in order to meet BG specifications.	Softening + IX	Jul 2021
		Crystallization	Jul 2021
6	Integration of IX and candle filtration into Softening circuit operation and optimization of Li recoveries in Softening. Further investigate recycling needs within Crystallization. Instrumentation review within pilot trials of pH, density, turbidity, and pressure monitoring devices.	Softening + IX	Aug - Sep 2021
		Crystallization	Sep 2021
7	Crystallization heating review - trialing 'scraper heat exchanger'. Assessment of particle size control in relation to product purity, with 'proof of concept' application of product screening. Continuation of Run 6 instrumentation review with in-pilot trials. Integration of all unit operations from softening through to crystallization in continuous operation.	Softening + IX + Crystallization	Nov - Dec 2021

10.2.10.1 Liming 2020 (Run 2)

Liming was performed in Run 2 in August 2020, with 360 m^3 of brine processed over 21 days. The process included lime slaking, the liming reaction and solid-liquid separation to remove the solids produced. Operational observations and outcomes included:

- Only on-specification limed brine was produced, validating the laboratory testwork.
- Filter press cycle time of 40 min was achieved.
- Operational targets were adjusted to account for the differences in process conditions compared with laboratory testwork.
- The impact of commercial lime quality on slaking temperature and magnesium removal was examined, highlighting the impact of poor-quality lime on process control.
- Thickener data were obtained, validating the settling properties of the liming solids.

10.2.10.2 Softening 2020 (Run 2 - 3)

The softening circuit was run during October 2020 for Run 2, processing 37 m³ of evaporated limed brine at 1.2% Li and producing approximately 27 m³ of on-spec softened brine over seven days. The circuit was run again for Run 3 in November, processing a further 40 m³ of 1.2% limed brine and producing 32 m³ of on-spec softened brine over seven days. Caustic addition was followed by sodium carbonate addition in a series of cascading tanks, and the resulting slurry was filtered to remove the solids. Key findings were:

- Validation of laboratory testwork, with calcium and magnesium reduction exceeding expectations.
- Excellent filtration performance, with cake moisture levels around 50% versus the expected 70%.
- Some of the solids exist as fine particulates which can pass through the filter press cloths. If not immediately filtered with a cartridge filter or similar, these solids can re-dissolve and re-introduce calcium and magnesium to the liquor. This highlights the importance of effective removal of fines immediately following press filtration and informed the large-scale plant design.
- If necessary, off-specification softened brine can be re-treated to bring the brine back on-specification.
- Variation in temperature above 20°C has no effect on softening performance - therefore, 20°C was selected as the desired operating temperature.
- Circuit stability is important to softening performance.

10.2.10.3 Lithium Carbonate Crystallization 2020 (Run 2 - 3)

The crystallization circuit was operated in late October 2020 as part of Run 2. Brine from Run 2 softening was heated to 70°C and sodium carbonate was added to precipitate lithium as lithium carbonate, which was recovered by filtration and subject to a repulp wash followed by secondary filtration with a displacement wash of 1 kg water per kg cake. Over 300 kg of washed lithium carbonate cake was produced at approximately 30% moisture, after processing 17 m³ of softened brine. The circuit was operated again in December 2020 as part of Run 3, processing a 25 m³ of brine from Run 3 softening to produce 600 kg of washed lithium carbonate cake. Unlike in Run 2, the cake was recovered by centrifugation and washed within the centrifuge with a displacement wash of 6 kg water per kg cake. The following were noted:

- Due to the high temperature and low atmospheric pressure, evaporation of brine resulting in saturation of sodium was a potential issue. To combat this, the sodium carbonate solution was diluted to 20% and additional dilution water was added to the brine heating tank.
- Short circuiting presented a risk due to up-comers in mixing tanks becoming blocked. Regular cleaning will be required.

- Product quality depends strongly on having a stable process. Short circuiting, blockages and stopping/starting can cause major process upsets and reduce product quality.
- Lithium dissolution loss during repulp washing presented a serious issue, especially at lower temperatures. This highlights the importance of temperature control and suggests that the use of a saturated lithium solution may be beneficial for washing.
- Repulp washing, followed by a secondary filtration with a displacement wash, was required to achieve TG specifications when using vacuum filtration to recover the product (Run 2). When recovering product with centrifugation (Run 3), only a displacement wash was required. This confirmed centrifugation as the preferred solids recovery method from both a purity and recovery perspective.
- Validation of and improvement over laboratory testwork, with TG (99.5% lithium carbonate) achieved whenever the process was stable, and BG specifications achievable for all elements except Ca and Mg.

10.2.10.4 Vendor Testwork

The pilot plant produced a variety of samples suitable for additional testwork. This testwork was conducted at external vendors' facilities and the results informed the design of the plant for optimum operational efficiency.

10.2.10.4.1 GBL Thickening and Pressure Filtration

GBL were supplied representative samples of the liming, softening and crystallization slurries produced on site, to conduct thickening and pressure filtration test work. The test work was performed to:

- Calculate TDS for each process liquor - liming, softening, crystallization.
- Define thickening properties - liming, softening, crystallization.
- Test the suitability and performance of the DrM Fundabac pressure filter (proprietary candle filtration unit) - softening.
- Test the suitability and performance of plate and frame pressure filtration - softening, tailings.
- Determine the sizing parameters for each duty.

The primary findings were:

1. Liming slurry

- % solids measured at ~4.5 wt.% (excluding TDS).
- The diluted liming slurry settled well without the use of flocculant.
- Feed dilution was optimal at ~1 wt.% solids.

- Solids flux rates ranged from 0.005 - 0.02 t/m^2/h with associated rise rates of 0.36 - 1.46 m/h.
- The highest underflow solids concentration achieved was 31 wt.%.
- The TDS was measured at 68 % water content and 32 % salt.

2. Softening slurry

- % solids measured at ~6.7 wt. % (excluding TDS).
- The sample did not settle well with or without the use of flocculant.
- Pressure filtration (Nutsche and TSD [replicating candle filtration]) was fairly slow, with flux of 20 to 50 t/m^2/h with reasonable cake thickness and specific solid throughput of 4 to 18 kg/m^2/h - depending on conditions and use of filter aid.
- 55 wt.% and 23 wt.% moisture for the Nutsche and candle filter respectively.
- Specific solids throughput for tests without filter aid ranged between 3-12 kg/m^2/h, with specific solids throughput ranging between 38-40 kg/m^2/h where filter aid was body-fed.
- The TDS was measured at 72 % water content and 28 % salt.

3. Crystallisation slurry

- % solids measured at ~6.4 wt.% (excluding TDS).
- The undiluted Crystallisation slurry settled well without the use of flocculant.
- Feed dilution was optimal at ~2.5 - 6.4 wt.% solids.
- Solids flux rates ranged from 0.025 - 0.05 t/m^2/h with associated rise rates of 0.84 - 1.7 m/h.
- The highest underflow solids concentration achieved was 27.3 wt.% at a flux rate of 0.025 t/m^2/h.
- The TDS was measured at 76 % water content and 24 % salt.

4. Tailings slurry

- A mixing ratio of 5.8:1 (wt.% DS / wt.% DS) for liming versus softening solids was applied when mixing liming underflow with softening wet cake to create a tailings sample.
- The water content of the filtered cake measured 50.6 wt. %.
- Specific solid throughput was 7 kg/m^2/h.

Andritz were supplied representative samples of the crystallisation slurry and Li_2CO_3 cake produced on site, to investigate the application of a centrifuge for dewatering and displacement washing of the Li_2CO_3 final product. Andritz were also engaged to provide feedback on the extent of dewatering achievable and the positioning and sizing of a centrifuge within the circuit. The primary findings were:

- Trials with pilot plant samples were in good alignment to Andritz’s previous experience with lithium carbonate.
- Feeding the centrifuge directly from the reactor is possible however a feed solid content of ~20 w/w% is recommended.

- Feeding the centrifuge at lower solids content results in a prolonged filling phase hence cycle time and reduced throughput of the machine. A cyclone to pre-thicken the feed to 20 w/w% may be more viable than a larger centrifuge size.
- The lowest residual moisture achieved with repulp washing of the lithium carbonate from site was 10 w/w%.
- The bench-scale drying test was successful. No encrustation or lump formation during drying was observed. A residual moisture of 0.1 w/w% was achieved.

10.2.10.5 Battery-Grade Development Program

Toward the end of pilot Run 3 in 2020, several hypotheses were tested to understand their impact on the product quality. Results obtained during these tests indicated an improvement in product quality. High-grade product from Run 3 achieved BG specification in all elements except for calcium and magnesium (Table 10-5).

Table 10-5 - Battery-Grade Targets.

Element (ppm)	Run 3 High-Grade Product	Battery-Grade Target
Mg	165	<50
Ca	125	<50
Na	103	<180
K	26	<30
B	36	<50
SO_4	135	<375
Cl	33	<50
Li_2CO_3 (%)	>99.83	>99.65

The process modifications proposed to achieve BG specification were as follows:

- Increased lithium tenor in softening feed from 1.2% Li to 1.7% Li (as ongoing testwork had indicated that, after liming, 1.7% was achievable without precipitation of lithium).
- Additional polishing filtration steps in softening, including candle filtration, to remove fine particles of calcium and magnesium solids.
- Ion exchange columns between softening and crystallization, to remove any remaining Ca and Mg in solution.
- Particle size control in crystallization by management of recycle stream and implementation of a wet screen.

The implementation and testing of the circuit modifications necessary to achieve BG specification in the pilot plant was tested in 2021 in pilot plant Runs 5 - 7. The modified process flowsheet is shown in Figure 10-12.

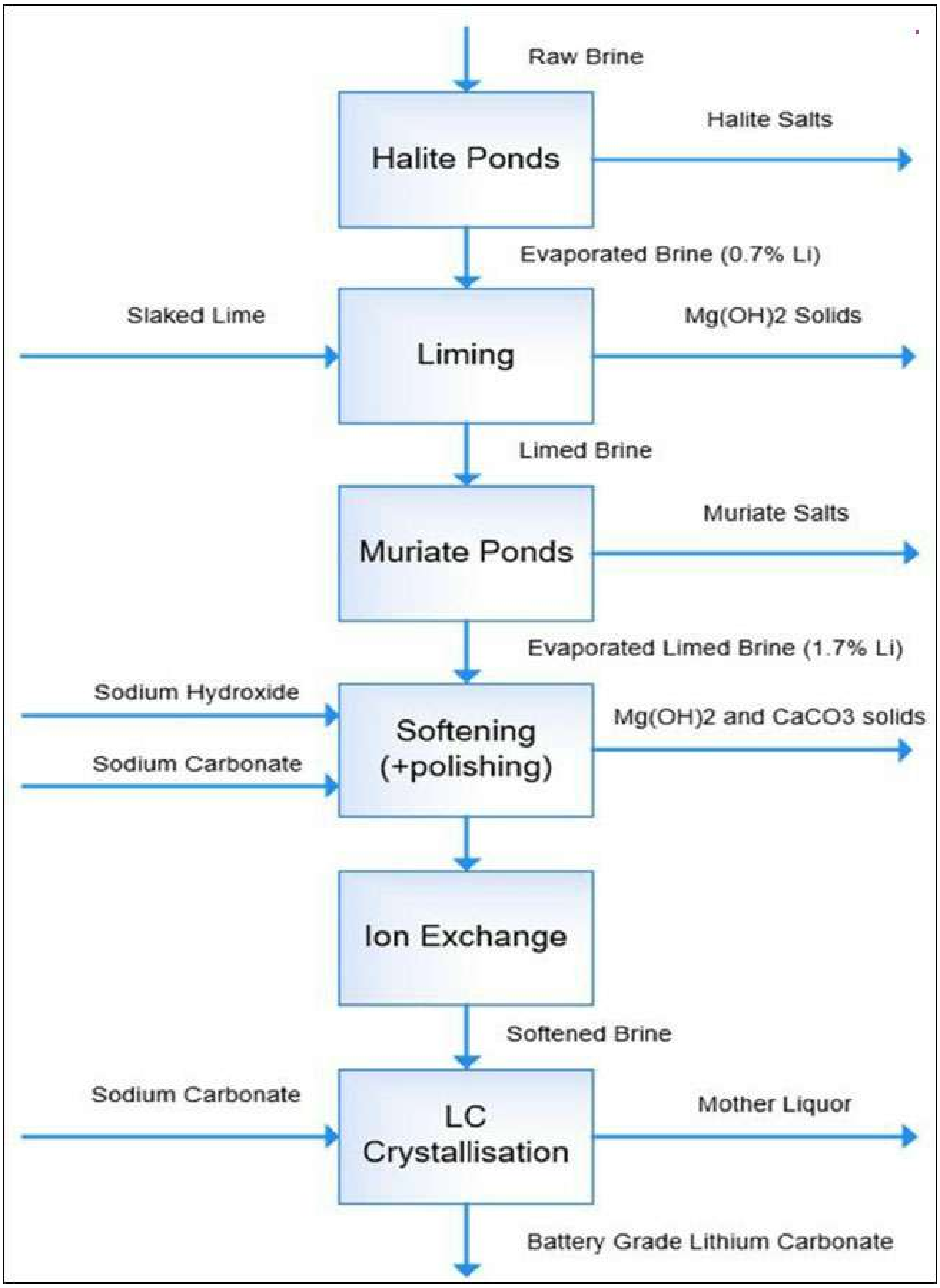


Figure 10-12 - Flowsheet Modified for Battery-Grade.

10.2.10.6 Liming 2021 (Run 4)

Liming was performed in Run 4 in March and April of 2021, with 665 m³ of limed brine produced over 33 days. After thickening was shown to be inefficient for liming solids in Run 2 and the GBL testwork, no thickening was performed in Run 4 liming and only filtration was used for solid-liquid separation. Liming was shown to be effective across a broad range of feed concentrations, from 0.4% to 0.8% Li, demonstrating that the process is operationally robust. The limed brine produced by Run 4 liming was returned to the evaporation ponds for evaporation to 1.7% Li.

10.2.10.7 Liming 2021 (Runs 5-7)

Three different softening runs were performed in 2021, all utilizing the 1.7% limed brine from Run 4. The major process changes from 2020 were the implementation of a candle filtration step after the plate-and-frame filter to remove very fine solids and ion exchange columns post-filtration to remove and residual dissolved Ca and Mg. In addition, dilution and reagent addition strategies were investigated to optimize performance and lithium recovery. The findings were:

- Softening successfully demonstrated using a 1.7 wt.% Li brine feed, while removing Ca and Mg to levels of ~10 mg/l in filtrate.
- Dilution of the 1.7 wt.% Li brine to ~1.4 wt.% Li provided significant benefits to circuit operation. The circuit could tolerate operation at a higher pH, with improved robustness of operation (e.g., in the event of Na_2CO_3 over addition), while maintaining Li recoveries of >97% to liquor.
- Addition strategy of reagents is crucial to meet performance specifications:
- 2-stage addition of NaOH; first reactor of the circuit and then immediately prior to filtration (filter feed tank or final reactor). The second addition was in the order of 1% stoichiometric addition, applied on an ‘as needed’ to maintain the pH, optimizing Mg removal without significant Li loss.
- Negligible effect on Ca rejection when using 2-stage addition of Na_2CO_3, versus 1-stage addition. 2-stage addition did provide greater control of dosing during piloting, although this is not expected to be as sensitive at larger scale.
- Addition of Na_2CO_3 must be controlled against the Ca content after Mg removal (NaOH addition), instead of the feed brine. This philosophy reduces the risk of overdosing and therefore limiting Li losses to precipitation.
- Typical NaOH dosages were between 100-110% (stoichiometric vs. Mg) and Na_2CO_3 was 104 - 110% (stoichiometric vs. Ca, post NaOH addition). Additions are in line with design expectations.

- Run 5 demonstrated effective polishing of softened brine, utilizing 1 µm and 0.2 µm filters connected in series. Cartridge filters were capable of maintaining performance during short periods of high solids content in the feed liquor (filter press filtrate). Results informed the use of ~1 µm and ~0.2 µm industrial cartridge filters in series and duty/standby configuration to manage offline time for cartridge replacement in the industrial plant.
- Candle filter (DrM Fundabac) performance was comparable to cartridge filtration, with respect to removal of fines. The findings supported the application of candle filtration at full-scale, while retaining cartridge filtration in a 'guard' capacity. The increased capacity of the candle filter also allows for it to better tolerate upset conditions, where increased solids report to the filter press filtrate.
- Pre-coating (filter aid) of candle filter cloths for each cycle was not required. Good performance was observed with an initial precoat applied to 'fresh' filter cloths. Multiple cycles were performed in the pilot without the need to refresh the filter aid application. Improvements may be observed with cloth selection, further minimizing the use of filter aid.
- IX demonstrated in a lead-lag configuration; two columns online in series, one offline for regeneration. Resin used was Lewatit MDS TP 208.
- IX columns were operated continuously, removing Ca and Mg from the softened brine (~10 mg/l) to concentrations of <1 mg/l in IX barrens (crystallization feed). Robust operation observed with brine concentrations between 10 - 30 mg/L Ca and Mg, still reduced to <1 mg/L following IX.
- The main operational challenge experienced in IX was the passing of fine solids (Ca and Mg containing) through the resin bed after 3 to 4 days of operation. Anticipated breakthrough of soluble Ca/Mg was ~5 days, based on testwork. The solids collected within the IX column were able to be redissolved and Ca/Mg removed from the system through routine regeneration cycles.
- Run 7 demonstrated that the softening circuit could be run in tandem with crystallization.

10.2.10.8 Crystallization 2021 (Runs 5-7)

Three different crystallization runs were conducted in 2021, utilizing the softened brine from each respective softening run. The softened brine was first diluted to ~0.95 wt% Li to match 2020 operations. The diluted softened brine was heated, and sodium carbonate was added to precipitate lithium carbonate, which was recovered by centrifugation with a displacement wash with hot reverse osmosis (RO) water (similar to Run 3). In Run 7, a screen was implemented in the recycle stream for particle size control, and the suitability of a scraped heat exchanger was assessed for maintaining circuit temperature by recirculation of the reactor contents. A product summary of the crystallization runs is in Table 10-6.

The following findings were made regarding the crystallization circuit:

- Feed to crystallization was diluted to ~0.95 wt.% Li (~10.5 g/l, matching 2020 operations), following testwork recommendations. The dilution is necessary to minimize K and Na reporting to Li2CO3, due to elevated concentrations in the 1.4/1.7 wt.% Li-softened brines.
- A ‘flat’ temperature profile was implemented, with the circuit operating at a range 80-86°C, compared to previous targets of 70-86°C. High quality Li_2CO_3 production in the pilot was consistent with similar conditions in lab testwork.
- Circuit residence times of ~4.5 h and ~6 h demonstrated with no change in Li_2CO_3 quality.
- Investigation of 2-stage addition (Tank 1 and 2) vs. 3-stage addition (Tanks 1 - 3) of Na2CO3 resulted in no discernible difference in Li_2CO_3 product quality. 2-stage addition is to be retained, in line with findings following 2020 piloting (Run 3).
- Investigation of recycle ratio to manage crystal size. This informed the industrial plant design to recycle between 20 - 50% solids, to allow for optimization.
- Importance of particle size was highlighted in Run 5 and Run 6:
  - The formation and settling of Li_2CO_3 agglomerates within reactors were identified. The settled product (lower tank discharge) was found to be of a poorer quality, with elevated Ca, K and Na - attributed to entrainment of mother liquor.
  - The application of internal tank recycling, using both opened and closed impeller centrifugal pumps, ensured the tank contents were homogeneous and minimized agglomeration. With prolonged use, the Li_2CO_3 reporting to the centrifuge became finer and in turn, difficult to wash on the centrifuge.
  - Control of particle size distribution is recommended through techniques such as cut size of cyclones, internal tank recycles, attritioning tanks and screening of slurry. Careful monitoring of particle size is required to balance between the formation of agglomerates (occlusion of mother liquor) and a particle size which is too fine (detrimental to washability).
- Upgrade from technical to BG Li2CO3 in 2021 piloting activities. Greater than 77% and 85% of product in Run 5 and 6 respectively met or exceeded BG targets with respect to elemental impurities. In Run 7, 95% of the product achieved BG. The remaining product was predominately technical grade, with the decrease in quality largely attributed to poor washing characteristics on the centrifuge.

Table 10-6 - 2021 Crystallization Product Summary.

Sal De Vida Site Analysis	Dist. %	Li_2CO_3 %	Ca	Mg	K	B	SO4	Na	Fe
			ppm (ICP, AA for K and Na)						
Battery-grade (target)	80	>99.75	<25	<15	<30	<50	<400	<181	<15
Technical grade (target)	10	>99.65	250	205	80	75	375	305	35
Run 5									
Battery-grade	78	99.94	15	<10	16	<25	59	126	NR
Technical grade	22	99.85	17	<10	70	26	67	442	NR
Run 6									

Sal De Vida Site Analysis	Dist. %	Li_2CO_3 %	Ca	Mg	K	B	SO4	Na	Fe
			ppm (ICP, AA for K and Na)						
Battery-grade	85	99.95	<10	<10	12	<25	<30	72	<10
Technical grade	15	99.88	12	<10	47	<25	<30	371	11
Run 7									
Battery-grade	95	99.95	33	11	12	<25	41	81	<20
Technical grade	5	99.82	29	11	28	<25	46	301	<21

Further observations were made in Run 7 regarding the new additions of a screen and scraped heat exchanger:

- Use of screen technology successfully produced a Li_2CO_3 slurry of a target particle size.
- At 100 µm, ~1% of Li_2CO_3 solids reported to oversize. At 63 µm the use of 'repulp' stages was identified as critical to manage rate of dewatering, with between 3 - 4% Li_2CO_3 solids reporting to oversize (unoptimized). Without the use of these features the oversize fraction increased to 10 - 20%.
- Screening at 100 µm, critical impurities (i.e., Ca and Mg) were rejected via the oversize stream, confirmed via solids analysis. This trend was not evident when screening at 63 µm, indicating high impurity agglomerates were primarily >100 µm in size.
- The scraped heat exchanger was suitable for both crystallization brine pre-heating and circuit heating duties, with effective scale management. Consideration is needed for materials of selection to avoid product contamination. Steam is the preferred heating media, compared to hot RO water. Existing steam capacity to be reviewed and considered in supply package.

10.3 Products and Recoveries

10.3.1 Process Losses and Recovery

Recovery and losses for Sal de Vida have been based on test work results and process modelling and validated by independent third-party experts. A breakdown of the losses and overall recovery for the process is shown in Table 10-7. The final lithium recovery for the process is estimated as 70%.

Because of the process design and utilization of recycle streams, lithium is only lost through three avenues: entrainment of pond brine in precipitated salts, leakage of pond brine (including permeation, liner punctures and other brine losses) and entrained liquor in the cake of solids from the liming filter. Most of the lithium remaining in the mother liquor from the crystallization process is recycled to the ponds (see Sections 14.1 and 14.2 for more information on recycle and waste streams).

Table 10-7 - Breakdown of lithium losses, expressed as a percentage of lithium in the raw brine feed.

Location	Type	Recovery Loss	Comments
Pond	Entrainment	15%	Equivalent to 0.14t brine/t salt and 0.11t brine/t salt in the halite and muriate ponds respectively. This is a conservative estimate based on test work conducted on site (Section 10.2.9). Modelled in pond model.
	Leakage	4%	Equivalent to 0.03mm/d and 0.02mm/d of brine in the halite and muriate ponds respectively. This has been validated and has been considered conservative by pond experts. Modelled in pond model.
Plant	Liming Filter Cake	11%	Based on vendor test work and modelled in MetSim software. Li is lost here primarily as entrained mother liquor.
	Total Losses:	**30%**	
	Process Recovery:	**70%**	

10.3.2 Products

The only product planned for sale from SDV is lithium carbonate, expected to be 80% battery grade and 20% of technical grade. Piloting indicates that a distribution of 95% battery grade and 5% technical grade will be achievable, allowing flexibility to adapt to market demands (Section 10.2.10). Results from Pilot Plan Run 7 are displayed in Table 10-8.

Table 10-8 - Target and expected product compositions. Expected compositions are based on Pilot Plant Run 7 results.

Lithium Carbonate Product	Dist. %	Li_2CO_3 %	Ca	Mg	K	B	SO_4	Na	Fe
			ppm (ICP, AA for K and Na)						
Battery Grade									
Target	90	>99.75	<25	<15	<30	<50	<400	<181	<15
Expected		99.95	33	11	12	<25	41	81	<20
Technical Grade									
Target	10	>99.65	250	205	80	75	375	305	35
Expected		99.82	29	11	28	<25	46	301	<21

10.4 Metallurgical Variability

10.4.1 Variation in Well Brine

Results from recently drilled production wells show higher lithium head grade and with generally lower impurity levels than basis of design composition. Production well samples are similar in composition to Well 17_21, which was used for piloting and laboratory testwork since 2019.

Table 10-9 shows a comparison of brine composition.

Table 10-9 - Sample brine composition comparison.

Element	Unit	Basis of Design		Well 17_21		Production Well 20_08		Production Well 21_04	
		Conc.	Ion/Li Ratio	Conc.	Ion/Li Ratio	Conc.	Ion/Li Ratio	Conc.	Ion/Li Ratio
Li	mg/l	802	1.0	806	1.0	954	1.0	911	1.0
Na	mg/l	110,939	138.3	103,386	128.1	104,993	125.8	114,575	110.1
K	mg/l	9,107	11.4	8,750	10.8	10,494	10.4	9,474	11.0
Mg	mg/l	2,233	2.8	2,327	2.9	2,858	3.0	2,753	3.0
Ca	mg/l	969	1.2	901	1.12	792	0.8	760	0.8
SO_4	mg/l	7,790	9.7	5,963	7.4	7,276	8.4	7,668	7.6
B	mg/l	543	0.7	566	0.7	544	0.6	577	0.6
SG	g/ml	1.194		1.2		1.21		1.21	

10.4.2 Variations in Process

A wide range of lithium concentrations from 6,400 mg/l to 8,200 mg/l Li was tested during the liming pilot run in 2020. This run utilized brine evaporated on site from Well SVWP17_21. Results from the pilot run did not indicate any performance issues relating to operating the liming plant within this range of lithium feed concentrations. Sufficient flexibility is incorporated in the lime system to cope with seasonal fluctuations in key brine components such as sulphate.

Flexibility in the liming system can be achieved by varying the lime addition to achieve the desired magnesium removal, even with a varying feed magnesium concentration as demonstrated in the pilot plant. The liming process also removes sufficient sulphate and boron such that these elements do not pose a problem downstream in the process plant anywhere in the wide range of brine concentrations tested.

The large residence time of the pond system can also serve to 'smooth out' temporary deviations, as otherwise out-of-spec brine will mix with a large volume of normal in-spec brine, bringing it back into specification.

The softening stage also contains flexibility in case of deviations in magnesium and calcium. Dosage of caustic and sodium carbonate can be varied to achieve the desired magnesium and calcium removal without significant loss of lithium, in accordance with the variation in the feed to the process plant. The candle filter and ion exchange circuits at the end of the softening stage can remove small amounts of calcium and magnesium remaining after press filtration as solutes or fine solids, allowing the concentrations to be reduced to near zero (<1 mg/l). Two softened brine storage tanks in duty/standby configuration at the end of the softening circuit will allow for confirmation that the brine is on-spec before advancing to the crystallization circuit. If it is not, it can be transferred to a third tank for batch re-treatment and reintroduction to the softening circuit, preventing any off-spec feed brine crystallization.

For more information on the design of the process plant, see Section 14.2.

10.5 Deleterious Elements

There are two major sources other than brine feed of deleterious elements that may be introduced into the process: impurities from reagents and metallic iron from plant equipment.

Sodium carbonate is of particular concern as insoluble deleterious elements will report to the product, impacting its quality. In order to mitigate this risk, a series of steps have been taken to ensure that the sodium carbonate being utilized in the crystallization circuit is free from these impurities. Two manual cartridge filters in a duty/standby configuration are used to ensure that insoluble particles are captured and removed from the process before being fed into the crystallization circuit. An IX circuit will also be used to remove any trace divalent ions that may be present in the sodium carbonate solution.

Another source of deleterious elements introduced into the system is iron from plant equipment such as pumps or agitators. Strategically placed magnets within the process are used to capture and remove these impurities.

10.6 Conclusion

It is the opinion of the employee of Gunn Metallurgy that the mineral processing and metallurgical testing data is adequate for the purposes used in the technical report summary. The test work conducted is in concept appropriate and well-conceived and the described process design is reasonable and implementable. The process concept is largely standard and has been previously proven to produce similar products.

11. MINERAL RESOURCE ESTIMATES

This section contains forward-looking information related to Mineral Resource estimates for the Sal de Vida Project. The material factors that could cause actual results to differ from the estimates or conclusions include any significant differences from one or more of the material aspects or assumptions set forth in this section including geological and brine grade interpretations, as well as controls and assumptions related to establishing reasonable prospects for economic extraction.

11.1 Introduction

The deposit type is a brine aquifer within a salar basin. Brine deposits differ from solid phase industrial mineral deposits by virtue of their fluid (dynamic) nature. Because of the mobility the brines, the flow regimes, and other factors such as the hydraulic properties of the aquifer material are just as important as the chemical constituents of the brine in establishing a Brine Resource estimate. The essential elements for Resource Estimation in brines include the determination of drainable porosity and brine concentration through drilling and sampling.

11.2 Definition of Hydrogeologic Units

Results of diamond drilling indicate that basin-fill deposits in Salar del Hombre Muerto can be divided into hydrogeologic units that are dominated by five lithologies, all of which have been sampled and analyzed for drainable porosity. The micaceous schist was assumed to have a negligible drainable porosity, therefore only 5 units were used to estimate the resource. Predominant lithology, number of analyses and statistical parameters for drainable porosity of these units are given in Table 11-1.

Table 11-1 - Summary of Drainable Porosity.

Predominant Lithology of Conceptual Hydrogeologic Unit	Number of Analyses	Mean Drainable Porosity	Median Drainable Porosity	Standard Deviation
Unit 1: Clay	9	0.034	0.026	0.024
Unit 2: Halite, gypsum or other evaporates	75	0.041	0.030	0.042
Unit 3: Silt and sandy silt	11	0.049	0.048	0.016
Unit 4: Sand and silty sand	25	0.131	0.146	0.086
Unit 5: Travertine, tuff and dacitic gravel	1	0.042	0.042	---

Each borehole was divided into hydrogeologic units using the five predominant lithologies given above. Drainable porosity values for each hydrogeologic unit within a single polygon were computed by averaging the available drainable porosity data from within the hydrogeologic unit at the polygon borehole. For a few hydrogeologic units, within some polygon blocks, no porosity data were available. For these units, drainable porosity was estimated and assigned from laboratory analyses of similar lithologies in other Hombre Muerto boreholes, or conservative drainable porosity values were estimated from published values (Johnson, 1967), and assigned based on lithology, as follows in Table 11-2.

Table 11-2 - Assigned Drainable Porosity Values.

Predominant Lithology of Hydrogeologic Unit	Assigned Drainable Porosity
Clay	0.02
Halite, gypsum, or other evaporites	0.04
Silt and sandy or clayey silt, and siltstone	0.05
Sand, silty sand, and sandstone (>50% sand)	0.10
Travertine, tuff, and dacitic gravel	0.15

For those hydrogeologic units within an individual borehole where no chemistry data are available, the analyses from the nearest samples both above and below the unit were averaged and the average value was applied to the entire unit.

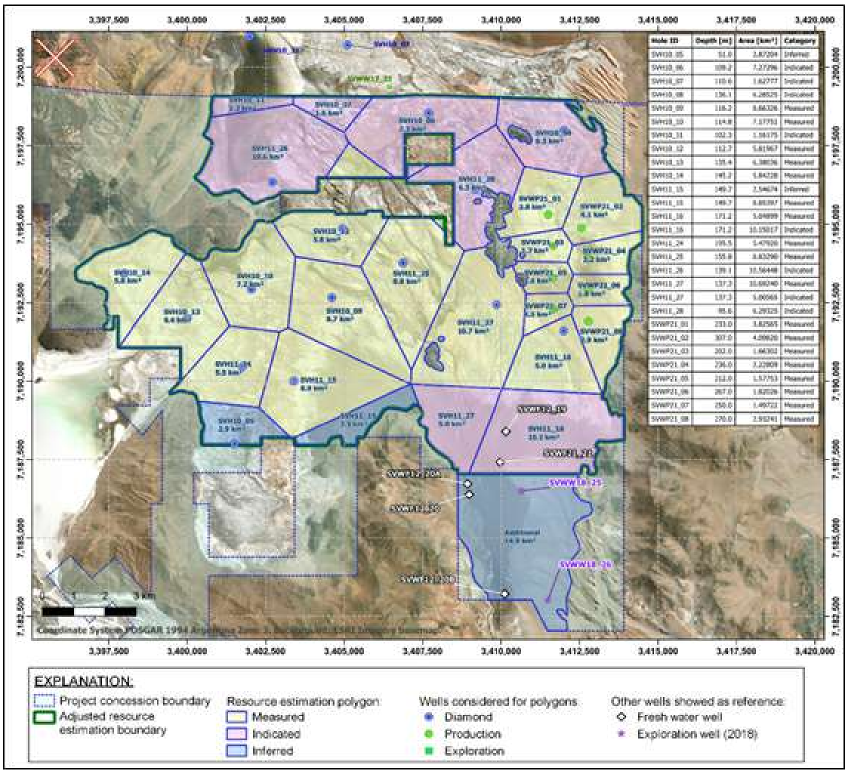
11.3 Mineral Resource Methodology

The following is an abbreviated summary of the utilized methodology and resource calculations which have been applied in industry for other lithium brine resource estimates. To estimate the total amount of lithium in the brine, the basin was first sectioned into polygons based on location of exploration drilling. Each polygon block contained one diamond drill exploration hole or exploration well. Boundaries between polygon blocks are generally equidistant from diamond drill holes, and the Houston et al., 2011 methodology was considered when determining the area of the polygons. For most polygon blocks, outer boundaries are the same as basin boundaries, as discussed above.

Within each polygon shown on the surface, the subsurface lithological column was separated into hydrogeologic units which vary with depth based on the lithologic logs and other available field information such as geophysics. Each interval of the individual polygons was given a representative value for drainable porosity and average lithium content based on laboratory analyses of samples collected during exploration drilling. The total depth of each polygon was based on the total depth of each borehole. The resource was estimated by summing the aquifer volume multiplied by drainable porosity and lithium grade for each interval of the individual polygons and resource category.

11.4 Mineral Resource Classification

Figure 11-1 is a location map for Sal de Vida Project showing Measured, Indicated, and Inferred lithium resource polygons. The total area of polygon blocks used for resource calculations is about 146 km^2, not including Inferred Resource in the southeast part of the concession area, which is about 14.9 km^2.



Hole ID	Depth [m]	Area [km²]	Category
SVH10_05	51.0	2.87204	Inferred
SVH10_06	109.2	7.27296	Indicated
SVH10_07	110.6	1.62777	Indicated
SVH10_08	136.1	6.26525	Indicated
SVH10_09	116.2	8.66326	Measured
SVH10_10	114.8	7.17751	Measured
SVH10_11	102.3	1.16175	Indicated
SVH10_12	112.7	5.81967	Measured
SVH10_13	135.4	6.38036	Measured
SVH10_14	145.2	5.84238	Measured
SVH11_15	149.7	2.54674	Inferred
SVH11_15	149.7	8.85397	Measured
SVH11_16	171.2	5.04899	Measured
SVH11_16	171.2	10.15017	Indicated
SVH11_24	155.5	5.47926	Measured
SVH11_25	155.8	3.83298	Measured
SVH11_26	139.1	10.56448	Indicated
SVH11_27	137.3	10.69240	Measured
SVH11_27	137.3	5.00565	Indicated
SVH11_28	95.6	6.29325	Indicated
SVWP21_01	231.0	3.82565	Measured
SVWP21_02	307.0	4.09920	Measured
SVWP21_03	202.0	1.66302	Measured
SVWP21_04	236.0	3.22809	Measured
SVWP21_05	212.0	1.57753	Measured
SVWP21_06	267.0	1.62026	Measured
SVWP21_07	250.0	1.49722	Measured
SVWP21_08	270.0	2.93241	Measured

Figure 11-1 - Location Map Showing Measured, Indicated, and Inferred Lithium Resources.

To classify a polygon as Measured or Indicated, the following factors were considered:

- Level of understanding and reliability of the basin stratigraphy.
- Level of understanding of the local hydrogeologic characteristics of the aquifer system.
- Density of drilling and testing in the salar and general uniformity of results within an area.
- Available pumping test and historical production information.

Areas were designated as Measured where additional information exists on the physical brine aquifer parameters that were derived from pumping tests (e.g., transmissivity, aquifer thickness, hydraulic conductivity, and storativity), or where the stratigraphic conditions allow more confident understanding of the units (e.g., bedding, induration, lateral continuity). In the Measured status area, several aquifer tests have been conducted in the basin and support an increased understanding of the hydrogeologic conditions and support the idea that the brine can be pumped from production wells at sufficiently large rates to support long-term economic production of brine rich in lithium. In the eastern-central portion of the mine properties, production has occurred since 2022 which further supports the Measured category. Based on reasonable agreement with aquifer test results and our conceptual model of these areas, there is sufficient understanding of the areas with respect to both stratigraphy and aquifer properties to be able to characterize these as Measured.

Areas were designated as Indicated where confidence is high in the interpolation of units between wells. Although there are several areas where reasonable stratigraphic interpolation can be made between boreholes, the level of confidence drops extrapolating outward from the well where there are either: 1) no other nearby wells, or 2) where the geologic and hydrogeologic nature of basin boundaries is less uncertain based on available field information. Because some of the extractable brine fluid resource will move between units to production pumping centers, a more exact interpretation of the lithologic units at this stage of the estimation process was not believed to be required and the level of accuracy at the scale of data on record is believed acceptable for the Indicated areas.

The areas that were categorized as Inferred include areas where no drilling or testing was conducted but are believed to have resource in them based on results for nearby areas. For this report, although relatively common in the industry, no Inferred Resource was estimated for areas below depths drilled, even when geophysical results suggest that a brine-rich reservoir exists beneath the well.

11.5 Cut-Off Grade

A lithium cut-off grade of 300 mg/l was conservatively utilized based on a breakeven cut-off grade for a projected lithium carbonate equivalent price of US$20,000 per tonne (US$25,000 with a revenue factor of 0.75) over the entirety of the LOM. Considering the economic value of the brine against production costs, the employees of Montgomery & Associates consider the economic assumptions appropriate for the 300 mg/l cut-off grade assignment to account for potential uncertainties in the projected price as well as 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, and the grade-tonnage curve of Figure 11-2 indicates that the overall tonnage of Measured, Indicated, and Inferred does not vary materially under a cut-off grade of 500 mg/l.

The average lithium grade of the measured and indicated resources corresponds to 742 mg/l and represents the flux-weighted composite brine collected as brine is routed to the evaporation ponds. Extracted grades at individual production wells and the average measured and indicated resources concentration are well above the 300 mg/l cut-off grade, demonstrating that there are reasonable prospects for economic extraction.

The estimated economic cutoff grade utilized for resource reporting purposes is 300 mg/l lithium, based on the following formula and inputs:

$$Cutoff\ Grade = \frac{\dfrac{(Total\ Capital\ Expenditure\ +\ Total\ Operating\ Expenditure)}{Total\ Brine\ Extracted}}{(Recovery * Conversion\ from\ Li\ to\ LiCO_3 * Projected\ LCE\ Price * (1 - Export\ Duties) * (1 - Royalties))}$$

Where:

Total Capital Expenditure = US$ 2,097 million

Total Operating Expenditure = US$ 6,749 million

Cost of Capital = US$ 210 million (10 percent of Total Capital)

Total Brine Extracted = 617 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 = 3.5%

Calculated Recovery = 68%

Resulting in a calculated cut-off grade of 220 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.

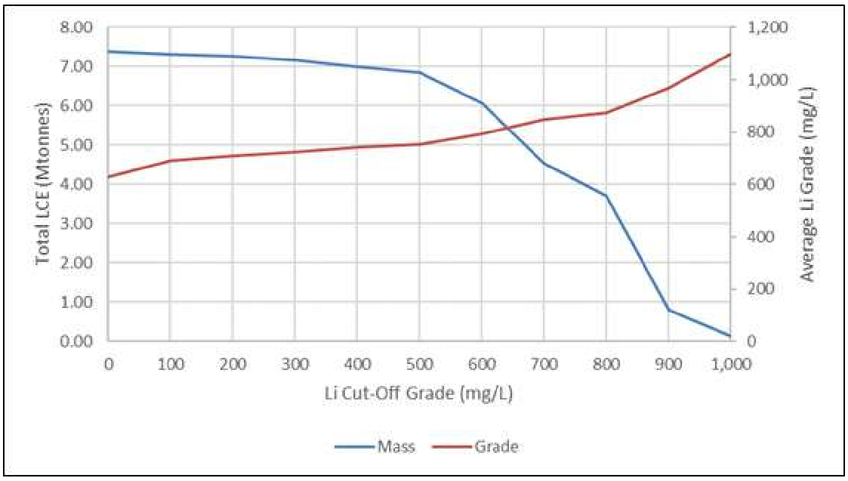


Figure 11-2 - Grade-Tonnage Curve for Different Cutoff Grades.

11.6 Mineral Resource Statement

This sub-section contains forward-looking information related to Mineral Resource estimates for the Sal de Vida Project. The material factors that could cause actual results to differ from the estimates or conclusions include any significant differences from one or more of the material aspects or assumptions set forth in this section including geological and brine grade interpretations, as well as controls and assumptions related to establishing reasonable prospects for economic extraction.

Table 11-3 presents the Mineral Resources exclusive of Mineral Reserves (Chapter 12). When calculating Mineral Resources exclusive of Mineral Reserves, 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 brine pumped to the evaporation ponds were subtracted from the Resources inclusive of Reserves.

Table 11-3 - Summary of Measured, Indicated, and Inferred Brine Resources, Exclusive of Mineral Reserves (Effective June 30, 2023).

Category	Lithium (Million Tonnes)	Li2CO3 Equivalent (Million Tonnes)	Average Li (mg/L)
Measured	0.58	3.07	745
Indicated	0.18	0.96	730
Total Measured and Indicated	**0.76**	**4.03**	**742**
Inferred	0.12	0.65	556

1. S-K §229.1300 definitions were followed for Mineral Resources and Mineral Reserves.
2. The Qualified Person(s) for these Mineral Resource estimates are the employees of Montgomery & Associates for Sal de Vida.
3. Comparison of values may not add up due to rounding or the use of averaging methods.
4. Lithium is converted to lithium carbonate (Li_2CO_3) with a conversion factor of 5.323. .
5. 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.
6. The cut-off grade used to report Sal de Vida Mineral Resources and Mineral Reserves is 300 mg/l.
7. 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.

Mineral Resources are also reported inclusive of Mineral Reserves. The current Mineral Resource estimate, inclusive of Mineral Reserves, for the Sal de Vida Project is summarized in Table 11-4.

Table 11-4 - Summary of Measured, Indicated, and Inferred Brine Resources, Inclusive of Mineral Reserves (Effective June 30, 2023).

Category	Lithium (Million Tonnes)	Li2CO3 Equivalent (Million Tonnes)	Average Li (mg/L)
Measured	0.66	3.52	752
Indicated	0.56	3.00	742
Total Measured and Indicated	**1.22**	**6.52**	**747**
Inferred	0.12	0.65	556

1. Shown in Figure 11-2
2. S-K §229.1300 definitions were followed for Mineral Resources and Mineral Reserves.
3. The Qualified Person(s) for these Mineral Reserves estimates are the employees of Montgomery & Associates for Sal de Vida.
4. Comparison of values may not add up due to rounding or the use of averaging methods.
5. Lithium is converted to lithium carbonate (Li_2CO_3) with a conversion factor of 5.323.
6. The cut-off grade used to report Sal de Vida Mineral Resources and Mineral Reserves is 300 mg/l.

7. 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.

Mineral Resources were estimated on an in-situ basis. Currently, the employees of Montgomery & Associates do not know of any environmental, legal, title, taxation, socio-economic, marketing, political, or other factors that would materially affect the current Resource estimate.

11.7 Uncertainty

Factors that may affect the Mineral Resource estimate include:

- Locations of aquifer boundaries, and or shallower than anticipated bedrock near hard rock area.
- Lateral continuity of key aquifer zones.
- Presence of fresh and brackish water that have the potential to dilute the brine in the wellfield area.
- The assumed uniformity of average aquifer parameters within specific aquifer units.

While these uncertainties exist, the employees of Montgomery & Associates conservatively assigned resource categories in a manner aligned with industry practices for lithium brine projects. To support an upgrade of the resource categories, the following factors are key to reduce uncertainty: the level of understanding and reliability of the basin stratigraphy; the level of understanding of the local hydrogeologic characteristics of the aquifer system; the density of drilling and testing in the salar and general uniformity of results within an area.

11.8 Conclusion

In the experience of the employees of Montgomery & Associates with groundwater and brine extraction from clastic and salar basins, a realistic assumption is that potentially 30% - 40% of the Resource (inclusive of Mineral Reserve) should be considered as a reasonable estimate of long-term, total recoverable brine based on the existing information. Recovering more than 50% of the brine in storage may not be feasible. To completely drain the basin would require increasingly large numbers of production wells and would increase the amount of fresh water moving into the brine aquifer. Therefore, 100% drainage is not technically or economically feasible for a project such as Sal de Vida. That said, the employees of Montgomery & Associates believe that there is substantial upside potential for increasing both the Resource categories (i.e., changing Inferred to Indicated or Measured, and/or changing Indicated to Measured), and also by increasing the total volume of the Resource by drilling in unexplored areas, and also by drilling deeper. It has been demonstrated in several parts of the basin that the lithium brine aquifer extends to depths greater than currently used to estimate the Resource.

To the extent known by the employees of Montgomery & Associates, there are no known environmental, permitting, legal, title, taxation, socioeconomic, marketing, political or other relevant factors that could affect the Mineral Resource estimate which are not discussed in this Report.

12. MINERAL RESERVES ESTIMATES

This section contains forward-looking information related to Mineral Reserve estimates for the Sal de Vida Project. The material factors that could cause actual results to differ from the estimates or conclusions include any significant differences from one or more of the material aspects or assumptions set forth in this section.

The methodology used in this section consider modifying factors for converting Mineral Resources to Mineral Reserves, including allowable well field pumping and dilution of brine during pumping, among others.

12.1 Numerical Model

Given that the economic reserve is estimated based on physical pumping of the brine that flows during wellfield pumping, a calibrated numerical model which simulates groundwater flow and solute transport was used to estimate the Mineral Reserve.

12.1.1 Numerical Model Design

The 3D numerical model was constructed using the Groundwater Vistas interface Version 7 (Environmental Simulations Incorporated, ESI) software and was simulated using the control volume finite difference code Modflow USG-Transport (Panday, 2019). Modflow-USG was selected because of its advanced capabilities that include its local grid refinement option, its numerical robustness using the Newton Raphson formulation (Hunt and Feinstein, 2005) and upstream weighting, as well as its ability to simulate variable-density flow and transport with advection and dispersion.

The active model domain encompasses the clastic sediments and evaporite deposits that comprise the Salar del Hombre Muerto as well as the upgradient alluvial deposits and the Río de los Patos sub-basin. The extent of the active model domain, which covers an area of about 383 km^2, is shown in Figure 12-1.

The active model domain includes the salar and outlying areas of the basin; the domain was designed to be extensive enough to adequately incorporate zones of recharge associated with the Río de los Patos and minimize the influence of applied boundary conditions on the production well simulation. The base of the active model domain was set based on current interpretation of depth to basement, considering the location of the Tertiary basement in the western part of the model and the Precambrian basement in the eastern part of the model.

Local layers of clays based in stratigraphy information from drilled wells in the east zone of the basin (projected East Wellfield) was also incorporated in the model.

12.1.2 Grid Specifics

The 3D model domain was divided into a grid of node-centered, rectangular prisms commonly referred to as cells. Using the quadtree feature of Modflow-USG, cells with small lateral dimensions (maximum refinement of 3.125 m) were assigned in areas of interest such as pumping well locations, while larger elements (200 m) were assigned in areas with little available information or in zones farthest from the areas of interest. Vertically, the domain was divided into 12 model layers based on the amount of exploration data with depth. Each layer consists of a variable number of cells depending on the presence of low permeability bedrock or lack of exploration data at depth. Model layer thicknesses range from 10 - 60 m, and each layer, other than the basal layer, was of a constant thickness. The lower layer was set to be thicker because there is less information in the deeper portions.

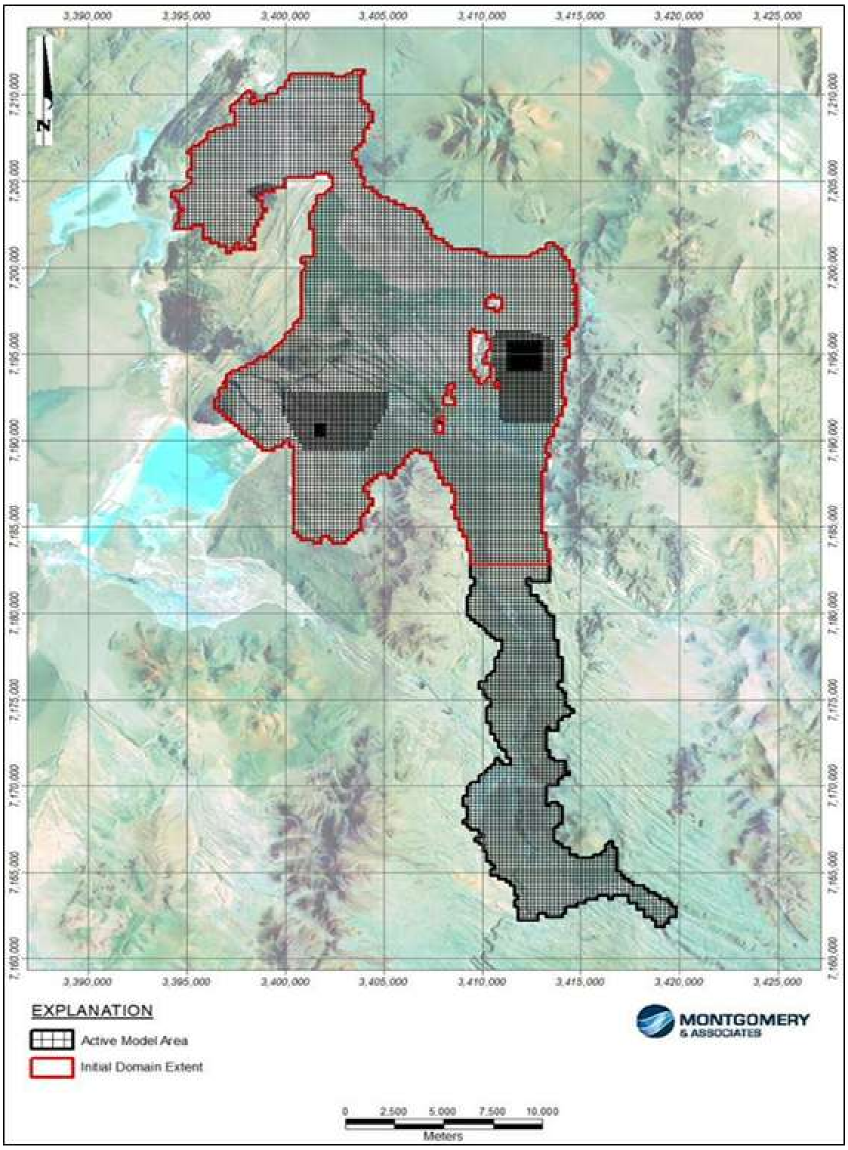


Figure 12-1 - Numerical Model Domain.

12.1.3 Density Driven Flow and Transport

The density-driven flow (DDF) package, coupled with block-centered transport (BCT), was utilized to simulate variable-density flow and transport. The modeled area included zones of mixing where incoming recharge of lower density water enters the salar but discharges to the surface due to differences with the density of the brine in the aquifer. Thus, the numerical model was designed to simulate changes in solute concentration during pumping that are likely to occur due to influx of fresh water to the future production wells.

Total dissolved solids (TDS) in the brine and freshwater were defined as the only solute component in the numerical model to represent the concentration-water density relationship and freshwater-brine interface. The DDF package assumed a linear relationship between TDS concentrations and water density. As can be seen in Figure 12-2, there is a strong positive linear relationship between the density of the brine and the amount of TDS.

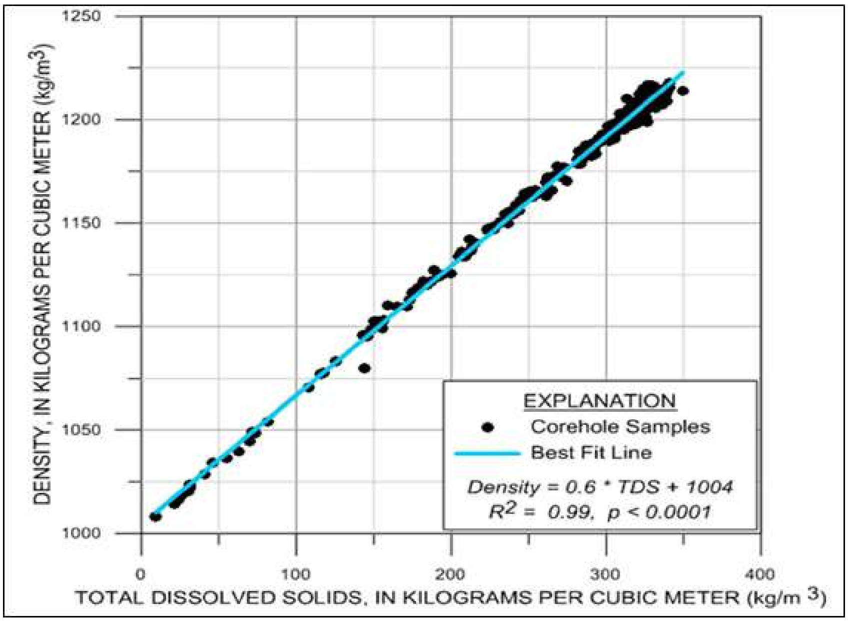


Figure 12-2 - Relationship Between Total Dissolved Solids and Density for Groundwater (Brine and Freshwater) Samples.

The following linear relation was used to model variable density flow and transport:

- A freshwater density of 1,000 kg/m^3 for a TDS concentration of 0 kg/m^3.
- A water density of 1,210 kg/m^3 for a TDS concentration of 329 kg/m^3.

Initial concentrations were defined based on laboratory measured values from samples collected during exploration drilling and were then interpolated to create an initial distribution for the model. During the steady-state (long-term transient) calibration, the hydraulic head solution was cycled until an approximate equilibrium was achieved with the simulated concentrations (which are based on the initial concentrations from measured samples). The concentration solution of the steady-state model was subsequently used as initial conditions for the transient calibration and simulation.

The linear relationships with TDS were used to estimate concentrations in pumped brine from the wellfield simulation. The evapotranspiration (ET) concentration factor was set to 0, signifying that TDS mass did not leave the system due to evapotranspiration.

12.1.4 Numerical Model Boundary Conditions

Groundwater outflow from the basin occurs via evaporation from dry and moist salar surfaces in addition to evapotranspiration from vegetation and from open water evaporation surface water bodies (Laguna Verde). Groundwater movement is generally from the margins of the salar, where mountain front recharge enters the model domain as groundwater underflow, toward the center of the salar. Tertiary sediment outcrops along the west and north basin boundaries conceptually approximate low to no-flow boundaries which are expected to contribute negligible brine to the basin-fill deposit in the salar. Metamorphic and crystalline bedrock along the east basin margin is expected to have low hydraulic conductivity and was assumed to represent a no-flow groundwater boundary during extraction of brine from basin-fill deposit aquifers by pumping wells.

The numerical model boundary conditions were designed to be consistent with the conceptual baseline water balance (Montgomery & Associates, 2020 and Chapter 7), assuming average natural long-term hydrologic conditions, where inflows (recharge from precipitation and snowmelt) are approximately equivalent to outflows (evaporative discharge) and no production pumping occurs in the salar. As indicated in Chapter 7, the conceptual water balance was implemented by following the equation:

$$Precipitation\ Recharge + Snowmelt\ Recharge = Evaporation\ Discharge$$

Long-term evaporation rate estimates of 850 l/s, 1,500 l/s and 2,300 l/s for low, medium, and high evaporation rate scenarios, respectively, were obtained, using remote sensing combined with an evaporation rate characterization based on local meteorological data. The higher evaporation estimate is slightly too large compared to the upper bound of the precipitation recharge estimate (2,210 l/s). In addition, the lower bound of the precipitation recharge estimate (550 l/s) is too low compared to the lower evaporation estimate (~850 l/s) and is not believed to be realistic. The recharge estimate for the east sub-basin of the Salar del Hombre Muerto is believed to range from 850 - 2,210 l/s based on the results of intersecting the evaporation and precipitation recharge ranges. Within this range, the current best estimate for a recharge to the salar is 1,500 l/s based on the calculated medium evaporation discharge, which approximately corresponds to 13.1% of total volumetric precipitation (including snowmelt) estimated for the basin. The current best estimate is considered to be that obtained from the evaporation estimate, which is specifically the medium evaporation rate scenario at 1,500 l/s. Direct precipitation recharge was applied over all areas of the active model domain, and a dissolved TDS concentration of 1.5 kg/m^3 was assumed for inflow at the recharge cells.

The Río de los Patos was simulated using a river (RIV) package, which simulates the interaction between groundwater and surface water. For the purposes of the Brine Reserve estimate, the river behavior in the far upper region of the Río de los Patos sub-basin is not considered a key factor because it ultimately translates to a net amount of water moving toward the salar. Similar to the simulated recharge, modeled TDS concentrations in the river water were set to 1.5 kg/m^3.

The general head boundary (GHB) condition represents the connection between groundwater in the active model domain and the immediate area of Laguna Catal, a natural zone of discharge. The GHB stage was set to equal the average elevation of the surface water in Laguna Catal (3,965 m), and the conductance was specified based on the distance between Laguna Catal and the southwest limit of the active domain as well as the hydraulic conductivity and saturated cell volume. TDS concentrations of potential inflow to the domain from those cells were conservatively set to 0 mg/l to assume maximum potential dilution in the future. The specified flux (WEL) cells were assigned in the northwest portion of the salar to represent a small outflow of 10 m^3/d (Montgomery & Associates, 2018).

The evapotranspiration (EVT) package was used in cells of the salar to simulate evaporation from three distinct zones including soil, vegetation, and open water. The zone representing open water evaporation was specifically applied in the Laguna Verde area. The EVT package simulated a linear change in evaporation from the specified extinction depth to land surface. The extinction depth is defined as the depth below which groundwater does not evaporate. The evaporation rates varied according to the zone, and extinction depths were set based on the type of soil and measured water density trends.

12.1.5 Modeled Hydraulic Properties

Hydraulic properties of the numerical model include hydraulic conductivity in the three cardinal directions (Kx, Ky, and Kz), specific storage (Ss), and specific yield (Sy). These parameters were assigned based on the hydrogeological unit and were adjusted throughout the calibration in specific zones according to the conceptual range. The range of assigned hydraulic properties is generally consistent with expected values in this environment of deposition as well as the calculated values and trends observed from on-site aquifer tests (Montgomery & Associates, 2013; 2018). Also, results from hydraulic testing in recently drilled production wells were used as a reference for calibration in the east zone of the model. Specific hydraulics values were also assigned to local clay layers in this zone of the model, based on stratigraphy information from drilled wells. Table 12-1 includes the calibrated hydraulic parameters; note that the mica schist was not modeled due to its expected low permeability and representation via a no-flow boundary condition.

Table 12-1 - Calibrated Hydraulic Parameter Ranges[7]

Hydrogeological Unit	Maximum Horizontal Hydraulic Conductivity (m/d)	Minimum Horizontal Hydraulic Conductivity (m/d)	Ratio of Vertical to Horizontal Hydraulic Conductivity (Kz/Kh)	Specific Storage (1/m)
Mixed evaporites [a]	0.16	0.1	0.01 to 0.1	5.00E-05
Upper salar sediments [b]	2.3	0.5	0.01	0.0001 to 5e-005
Volcaniclastics	1.1	0.8	0.5 to 1	5.00E-05
Lower sediments [c]	2.3	0.01	0.01 to 1	5.00E-05
Travertine	2	2	0.2	5.00E-05
Alluvial sediments	100	1	0.1 to 1	5e-005 to 0.0001

Without evidence of horizontal anisotropy from testing results, Kx was considered equal to Ky, and the horizontal hydraulic conductivity is termed radial hydraulic conductivity (Kr). Vertical anisotropy (Kz/Kr) was applied in certain zones throughout the calibration in accordance with the geological unit and form of deposition. Where anisotropy was incorporated for calibration purposes, the ratios of Kz/Kr also consider estimates from literature values for similar regimes (e.g., Freeze and Cherry, 1979 and Mason and Kipp, 1998).

The range of specific storage assigned in the model is based on the type of lithology and estimates from literature (Batu, 1998). The lower end of the range is near the compressibility of water, which indicates a rigid, low porosity material with small compressibility of the rock mass, and the upper end is indicative of a higher porosity and larger compressibility of the rock mass. Assigned values of specific yield considered laboratory testing results (Montgomery & Associates, 2018) and used values in comparable geological units of similar salars.

Effective porosity was generally assumed to be equivalent to specific yield and varies spatially depending on the lithology. For simulating the transport of dissolved TDS, assigned values of dispersivity correspond to 20 m for longitudinal dispersivity, 2 m for transverse dispersivity, and 0.2 m for vertical dispersivity. These values and ratios are generally consistent with those determined from controlled field experiments (Hess et al., 2002). Molecular diffusion was not included in the numerical model because it is considered to be negligible in large-scale regional models.

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[7] Note: Table prepared by Montgomery & Associates, 2020. a) Includes interbedded sediments. b) Includes the upper clay and upper sands. c) Includes the sediments below halite, sediments below lower volcanics, sediments below travertine, sediments below upper clay.

12.2 Numerical Model Calibration

Prior to the simulation of future brine production, the numerical model was calibrated to verify assigned model parameters such as hydraulic conductivity and storage. International modelling guides were used to evaluate the quality of the calibration (Reilly and Harbaugh, 2004; Anderson et al., 2015).

12.2.1 Steady-State Calibration

The numerical groundwater model was initially calibrated to average, steady-state conditions using the available average on-site field measurements of water levels in observation wells. The numerical model simulates variable-density flow and transport, therefore a “long-term transient” model, with constant stresses (used interchangeably here with ¨steady-state model¨), was simulated over a sufficiently long time period to approach equilibrium steady-state conditions. The hydraulic head and concentration solutions were then cycled until the change in storage was sufficiently low (approximately 0.1% of the average total inflow and outflow). Although the spatial variations in hydraulic head indicate that groundwater flow occurs predominantly from the south to the north, the change in head over time at the end of the long-term transient simulation is negligible. The calibrated solution in steady state is considered acceptable with all hydraulic head residuals (observed value minus simulated value) within 7 m, a mean residual of -0.44 m, and a scaled RMS of approximately 3%. Figure 12-3 shows the simulated piezometric surface in layer one and indicates that groundwater flow occurs from the south (higher elevation alluvial sub-basin) towards the north (lower elevation salar).

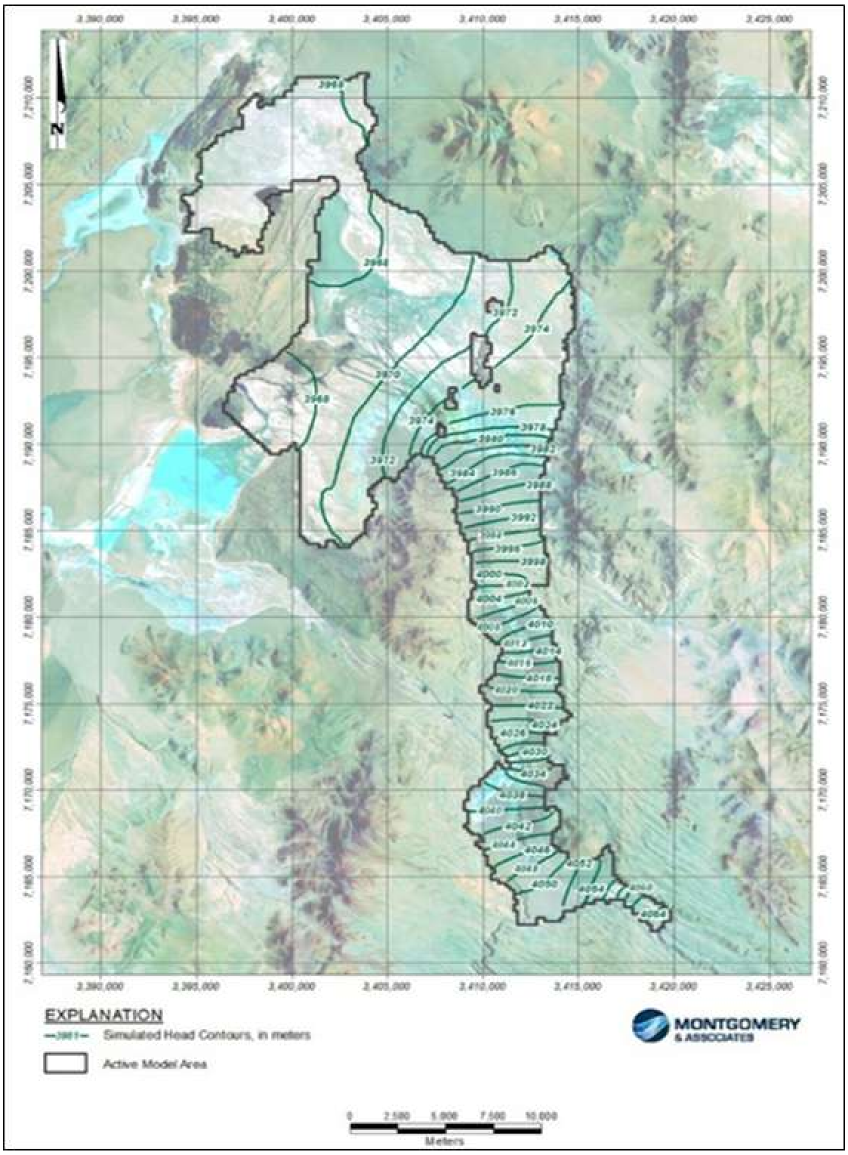


Figure 12-3 - Simulated Water Table, Steady-State Calibration Model.

12.2.2 Transient Calibration

Following the steady-state calibration, a transient model calibration was conducted to better represent the aquifer's response to pumping. The head and concentration results from the steady-state model were used as initial conditions for two separate transient calibrations using water level drawdown data from long-term pumping tests conducted at SVWW11-10 and SVWP17-21. Although these two transient calibrations were local, the modelled aquifer parameter zones extend beyond the immediate pumping areas (e.g., the volcaniclastic hydrogeological unit), so a larger area of the numerical model was also improved as a result of the transient calibration:

- Observed and simulated hydrographs of observation wells during the SVWW11-10 test in the proposed Southwest wellfield closely agree and show that the model adequately represents the aquifer's response to pumping (i.e., drawdown) at the distinct observation wells. Other calibration parameters include a scaled RMS of approximately 6% and absolute residual mean of about 0.1 m, which is considered acceptable.
- Observed and simulated hydrographs of observation wells during the SVWP17-21 test in the proposed East Wellfield are closely matched and show that the model is appropriately representing the aquifer response to pumping at the distinct observation wells. Other calibration parameters include a low scaled RMS of approximately 3% and absolute residual mean of under 0.2 m, which is considered acceptable.

12.2.3 Model Verification

Following the historical calibration period described above, simulated production concentrations were compared with real extracted concentrations from January to early March 2023. During this time, production from all the following pumping wells occurred in the East Wellfield: SVWP21-01, SVWP21-02, SVWP21-03, SVWP21-05, SVWP21-06, and SVWP21-07. The average extracted lithium concentration from these pumping wells was approximately 856 mg/l, while the flux-weighted average concentration of those production wells in the numerical model during the first three months of projected pumping (see Section 12.3; the simulated pumping is similar to real pumping during January to March 2023) corresponds to 803 mg/l. Thus, the model slightly underpredicts extracted concentrations in the Stage I East Wellfield by 6%, which is considered acceptable as it is conservative in terms of the overall extracted mass.

12.3 Predictive Simulation

This sub-section contains forward-looking information related to Mineral Reserve estimates for the Sal de Vida Project. The material factors that could cause actual results to differ from the estimates or conclusions include any significant differences from one or more of the material aspects or assumptions set forth in this section.

Following the steady-state and transient calibrations, a predictive simulation was conducted with future brine extraction from the east and southwest portions of the mine concessions. The wellfields and simulated production wells are shown on Figure 12-4. Projected production locations were based on the Measured Resource zones and were configured to reduce well interference during pumping. Modifying factors associated with the conversion of Measured and Indicated Mineral Resources to Mineral Reserves were considered, including the production wellfield design and efficiency (e.g., location and screen) and potential dilution from pumping.

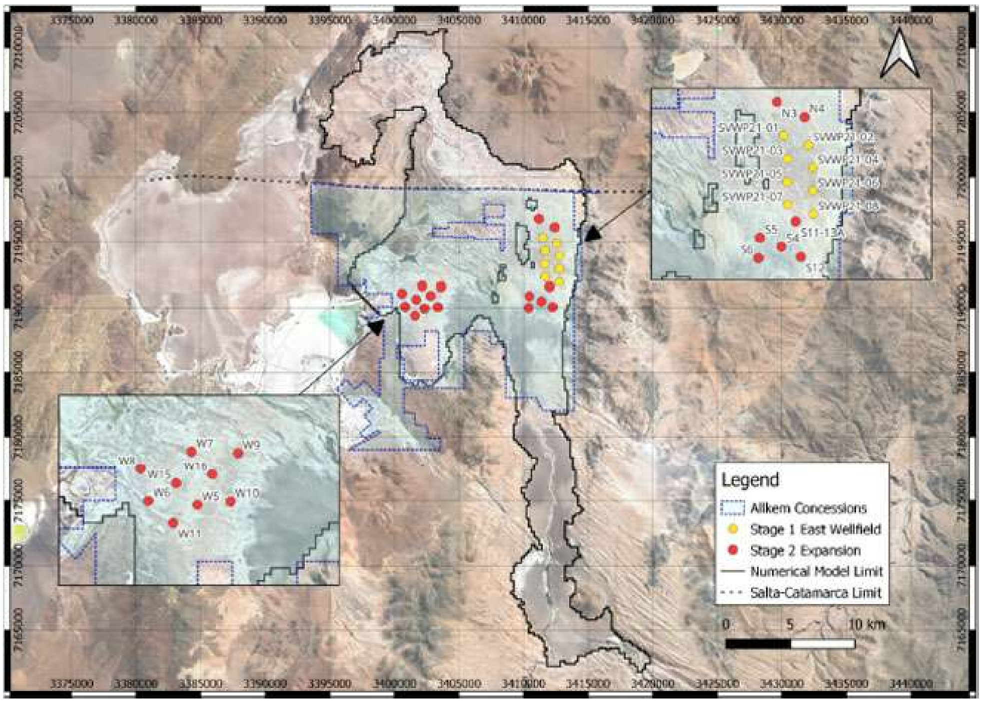


Figure 12-4 - Simulated Production Well Locations.

Using the predictive model results, the cumulative mass of lithium produced was estimated. The results were then multiplied by a conversion factor of 5.322785 (based on molecular weight to compute LCE). The resulting values from each production well were then summed up for each production year to determine the predicted annual LCE production.

12.3.1 Projected Pumping

The Stage 1 pumping from the East Wellfield is expected to produce 15,000 t of lithium carbonate equivalent (LCE) per year, while the Stage 2 Expansion will generate a total of 45,000 t of LCE per year with active pumping from both wellfields (assuming processing losses). Due to seasonal changes in pond evaporation and maintaining the lithium carbonate target for each stage, the modeled production pumping rates are time-variable on both a monthly and annual timeframe (Table 12-2). Rates were varied spatially to optimize the extracted mass and reduce dilution and drawdown.

Table 12-2 - Simulated Stage 1 and 2 Pumping Rates.

Month	Stage 1 Total Pumping (L/s)	Stage 2 Total Pumping (L/s)	Stage 2 East and Northeast Pumping per Well (L/s)[a]	Stage 2 Southwest Pumping per Well (L/s)[b]	Stage 2 Southeast Pumping per Well (L/s)[c]
January	91.1	288.6	13.6	12.3	8.4
February	97.3	308.0	14.6	13.1	9.0
March	189.2	595.0	28.3	24.9	17.6
April	173.9	547.4	26.0	22.9	16.1
May	123.3	389.3	18.4	16.4	11.4
June	96.8	306.3	14.5	13.0	8.9
July	79.9	253.7	12.0	10.8	7.4
August	153.7	484.3	23.0	20.3	14.3
September	201.6	633.7	30.1	26.5	18.7
October	256.0	803.7	38.3	33.5	23.8
November	268.8	843.6	40.2	35.2	25.0
December	197.4	620.6	29.5	26.0	18.3
Average	**161**	**506**	**24**	**21**	**15**

[a] Pumping wells SVWP21-01, SVWP21-02, SVWP21-03, SVWP21-04, SVWP21-05, SVWP21-06, SVWP21-07, SVWP21-08, N3, and N4
[b] Pumping wells W10, W11, W15, W16, W5, W6, W7, W8, and W9
[c] Pumping wells S11-13A, S12, S4, S5, and S6

The expected LOM is 40 years, and pumping is anticipated to proceed as follows:

- Stage 1 (8 wells in the East Wellfield) is assumed to start pumping at day 1 and continues for 2 years.
- Stage 2 Expansion (9 wells in the Southwest wellfield and 15 total wells in the East) is assumed to begin at the start of Year 3 and continues pumping for 38 years.

Initial conditions for flow and transport were defined from the steady-state model solution and in the case of the Southwest Wellfield, each production well was screened from 120 m bls (layer 7) to 180 m bls (layer 9). In the case of the Stage I East Wellfield and Stage 2 expansion in the east, each already installed was screened based on its own construction and well schematics. For the projected wells in the east, their screens vary between 120 m (Layer 7) and 200 m (Layer 10). Results of the 40-year pumping simulation were analyzed to estimate the extracted lithium grade as a function of time and estimated lithium reserve.

12.3.2 Conversion of Simulated Total Dissolved Solids to Lithium

The numerical groundwater model simulates lithium concentrations based on linear relationships developed from measured values of lithium and TDS. Additionally, the groundwater model simulates density-dependent flow based on measured relationships between fluid density and TDS. These relationships were developed for each wellfield by establishing a correlation between these components using the results of the chemical analyses for samples collected during the initial pumping tests and for the depth-specific samples collected from the core holes in the wellfield areas.

The linear equation used to convert model results of simulated TDS content for the East Wellfield to concentrations of lithium is as follows:

$$Li\,(mg/L) = 2.5242 * TDS + 3.1884, \qquad R2 = 0.96, p < 0.0001$$

The following linear equation (valid for TDS>20 kg/m^3) was used for converting model results of simulated TDS (kg/m^3) content for the Southwest wellfield to concentrations of lithium:

$$Li\,(mg/L) = 2.4937 * TDS + 17.3042, \qquad R2 = 0.70, p < 0.0001$$

12.3.3 Deleterious Elements

Together with lithium, the pumped brine is projected to contain significant quantities of potassium, magnesium, calcium, sulphate, and to a lesser degree, boron. These constituents must be removed from the brine to enable effective retrieval of the lithium. The specific design and operation of the industrial processes for the removal of magnesium, calcium, sulphate, and boron are detailed in Section 10 of this Report.

The numerical groundwater flow model simulates concentrations for these deleterious elements based on linear relationships between their measured values and measured values of TDS. These relationships were developed for each wellfield by establishing a correlation between these components using data from samples collected during pumping tests and from depth-specific core hole samples in the wellfield areas.

The following linear equations (valid for TDS>50 kg/m^3) are used to convert projected TDS (kg/m^3) content for the Southwest Wellfield to concentrations of magnesium, sulphate, and boron:

$$Mg\,(mg/L) = 5.9347893 * TDS - 98.70213, R2 = 0.37, p < 0.0001 \qquad (1)$$

$$Sulphate\ (mg/L) = 19.368905 * TDS + 2183.2078, R2 = 0.43, p < 0.0001 \quad (2)$$

$$B\ (mg/L) = 1.3765573 * TDS + 133.34104, R2 = 0.54, p < 0.0001 \quad (3)$$

$$Ca\ (mg/L) = 0.3626721 * TDS + 808.72624, R2 = 0.007, p < 0.4134 \quad (4)$$

The linear equations used to convert projected TDS (kg/m^3) content for the East Wellfield to concentrations of magnesium, sulphate, and boron (valid for TDS>50 kg/m^3) are as follows:

$$Mg\ (mg/L) = 7.3030067 * TDS - 78.49239, R2 = 0.94, p < 0.0001 \quad (1)$$

$$Sulphate\ (mg/L) = 17.779001 * TDS + 2160.0505, R2 = 0.64, p < 0.0001 \quad (2)$$

$$B\ (mg/L) = 1.2432718 * TDS - 150.73217, R2 = 0.84, p < 0.0001 \quad (3)$$

$$Ca\ (mg/L) = 0.3983328 * TDS + 924.55047, R2 = 0.015, p < 0.3880 \quad (4)$$

Because calcium shows no clear correlation to TDS, there is a low-level confidence using the best-fit equation to predict calcium concentrations based on TDS content projected by the numerical model.

For each wellfield, the dilution effects of downward and lateral migration of fresh/brackish water results in decreased TDS concentrations during sustained pumping, and thus the decrease of other solute concentrations.

12.3.4 Mineral Reserves

12.3.4.1 Conversion from Brine Resources to Brine Reserves

The Mineral Resource was estimated based on key input parameters of drainable porosity and lithium grade (Chapter 11). Because a lithium brine is a fluid resource and moves within the aquifer, traditional mining methods of estimating a Brine Reserve need to also consider aquifer mechanics associated with production wellfield pumping, and additional aquifer hydraulic properties are required to estimate the Brine Reserve.

The industry-accepted method for simulating removal of aquifer fluid (fresh water or brine) is to use a numerical groundwater flow model to simulate wellfield pumping. The model can be used to estimate water level drawdown associated with pumping (local and regional) and also determine maximum pumping rates, sustainability of wellfield pumping, and in the case of modelling lithium brines, the average lithium grade of the brine over time. Polygonal estimates or 3D block models do not have the capability of doing this type of simulation.

Similar to the Resource methodology, the numerical model used to estimate the Brine Reserve for this Project considers the conceptual hydrogeological model (hydrogeologic units, parameters, and chemistry) determined during the Brine Resource estimation, and it was used to construct the framework of the numerical groundwater flow model. In addition to these initial parameters, aquifer boundary conditions, basin recharge and discharge, estimates, hydraulic conductivity and storativity obtained from aquifer testing, and other parameters were included in construction of the numerical model. Finally, the model was calibrated against data obtained in the field to improve reliability of the simulations.

The groundwater model simulates concentrations of TDS, which are used to derive concentrations of lithium by linear relationships developed for each wellfield. It is assumed that the relationship between TDS and lithium content is constant during 40-year period of brine production from the East and Southwest Wellfields. In this manner, the concentrations of lithium on model projections of TDS in the brine produced from pumping wells in each production wellfield are estimated.

Using the numerical groundwater flow model projections, total lithium to be extracted from the proposed production wells was calculated for a total period of 40 years, considering the two stages of the Project, and considering that East Wellfield will be pumping for 40 years, and the Stage 2 Expansion will be active for 38 years (starting year 3). Projected production wells were placed in Measured Resource zones. The model projections used to determine the Brine Reserve indicate that the proposed wellfields should be able to produce a reliable quantity of brine at an average annual rate of approximately 315 l/s in the case of the East Wellfield and about 191 l/s in the case of Southwest. The average grade at start-up calculated from the initial model simulations used to estimate the Brine Reserve is expected to be about 805 mg/l of lithium in the East Wellfield) and 815 mg/l in the Southwest Wellfield; average final grade after 40 years of pumping is projected to be approximately 750 mg/l of lithium (considering all wellfields). Depending on how the wellfields are ultimately operated, these rates and grades may be different.

Using the groundwater model, the average TDS content of brine was estimated for each pumping cycle for each wellfield. After estimating the total lithium content for each time step and summing the amounts of lithium projected to be pumped during those time steps.

Total mass values in 1,000-kilogram units (tonnes) of lithium were then converted to LCE units. Therefore, the amount of lithium in the brine supplied to the ponds in 40 years of pumping are estimated to be about 2.48 Mt LCE. Modeling results indicate that during the 40-year pumping period, brine will be diluted by fresh and brackish water, so the pumping rates increase slightly with time to meet the anticipated LCE tonnes per year for each wellfield.

Extracted Lithium

Table 12-3 contains the extracted lithium mass during the projected model simulation.

Table 12-3 - Total Projected Lithium and Lithium Carbonate Pumped.

Time Period	Years	Active Wellfield	Projected Total Brine Pumped (m^3)	Lithium (Million Tonnes)	Li_2CO_3 Equivalent (Million Tonnes)
1	1 - 2	Stage 1 East	1.02E+07	0.008	0.043
2	3 - 40	Stage 2 Expansion	6.08E+08	0.459	2.443
Total			**6.18E+08**	**0.467**	**2.486**

1.2.3.4.2 Mineral Reserve Statement

Table 12-4 gives results of the Proven and Probable Brine Reserves from the two wellfield stages at the point of reference of brine pumped to the evaporation ponds.

Table 12-4 - Summary of Proven and Probable Brine Reserves (Effective June 30, 2023).

Reserve Category	Wellfield	Time Period	Average Lithium Grade (mg/l)	Lithium (Million Tonnes)	Li_2CO_3 Equivalent (Million Tonnes)
Proven	Stage 1 East	1-7	785	0.031	0.163
Proven	Stage 2 Expansion	3-9	807	0.053	0.282
Total Proven			**799**	**0.084**	**0.445**
Probable	Stage 1 East	8-40	726	0.147	0.780
Probable	Stage 2 Expansion	10-40	763	0.237	1.261
Total Probable			**748**	**0.383**	**2.041**
Total Proven and Probable			**757**	**0.467**	**2.486**

(1) S-K §229.1300 definitions were followed for Mineral Resources and Mineral Reserves.
(2) The Qualified Person(s) for these Mineral Reserves estimates are the employees of Montgomery & Associates for Sal de Vida.
(3) Comparison of values may not add up due to rounding or the use of averaging methods.
(4) Lithium is converted to lithium carbonate (Li_2CO_3) with a conversion factor of 5.323.
(5) The cut-off grade used to report Sal de Vida Mineral Resources and Mineral Reserves is 300 mg/l.

12.3.4.3 Process Recovery Factors

During the evaporation and concentration process of the brine, there will be anticipated losses of lithium. Based on the Chapter 10 breakdown of recoveries and consideration of deleterious element concentrations, the amount of recoverable lithium from the ponds and plant is calculated to be 70% of the total brine supplied to the ponds. This applies to the current processing method which may be subject to improvements at a later date.

Figure 12-5 shows the yearly reserve for total production (both the Stage I and Stage 2 Expansion) as a saleable product, considering all process recovery factors of the ponds and plant. As can be seen, the production plan of 15,000 LCE per year for Stage I and 45,000 LCE per year for Stage 2 is met.

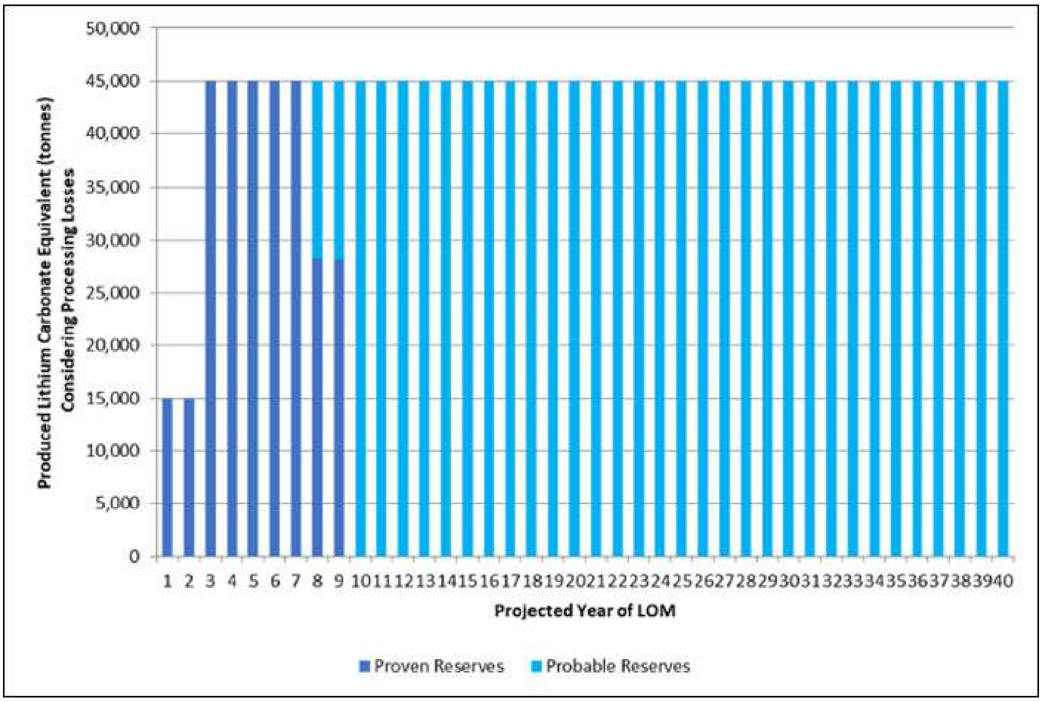


Figure 12-5 - Yearly Production of Lithium Carbonate Equivalent, Considering Processing Losses.

12.3.4.4 Mineral Reserve Classification

The Mineral Reserve was classified according to industry standards for brine projects, as well as the confidence of the numerical model predictions and potential factors that could affect the estimation. The projected well locations were also located in Measured Resource zones, and a majority of the extracted mass is sourced from Measured Resources. The employees of Montgomery & Associates believe that the Proven and Probable Mineral Reserves were adequately categorized, as described below:

- Proven Reserves were specified for the first 7 years of operations (years 1-7 in the East Wellfield (Stage 1) and years 3-9 in the Stage 2 Expansion Period) given that short-term results have higher confidence due to the current model calibration and also the initial portion of the projected LOM has higher confidence due to less expected short-term changes in extraction, water balance components, and hydraulic parameters.
- Probable Reserves were conservatively assigned after 7 years of operation (years 8-40 in the East Wellfield and years 10-40 in the Southwest Wellfield (Stage 2)) because the numerical model will be recalibrated and improved in the future due to potential changes in neighboring extraction, water balance components, and hydraulic parameters.

12.3.4.5 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. The employees of Montgomery & Associates consider the economic assumptions appropriate for the 300 mg/l cut-off grade assignment to account for processing considerations (see Chapter 10), and 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:

$$Cutoff\ Grade = \frac{\frac{(Total\ Capital\ Expenditure\ +\ Total\ Operating\ Expenditure)}{Total\ Brine\ Extracted}}{(Recovery * Conversion\ from\ Li\ to\ LiCO_3 * Projected\ LCE\ Price * (1 - Export\ Duties) * (1 - Royalties))}$$

Where:

Total Capital Expenditure = US$ 2,097 million

Total Operating Expenditure = US$ 6,749 million

Cost of Capital = US$ 210 million (10 percent of Total Capital)

Total Brine Extracted = 617 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 = 3.5%

Calculated Recovery = 68%

Resulting in a calculated cut-off grade of 220 mg/l.

The cut-off grade was elevated to 300 mg/l to increase margin and derisk 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.

Pumped brine is ultimately collected in a booster station, followed by the evaporation ponds (Chapter 14), where a composite grade is present and can be approximated by a flux-weighted average concentration from the production wells. During the 40-year reserve simulation, extracted lithium grades from individual production wells vary between approximately 815 and 520 mg/l due to dilution over the LOM. The average lithium grade of the Proven and Probable Reserves corresponds to 757 mg/l and represents the flux-weighted composite brine collected before processing. Extracted grades at individual production wells and the average Proven and Probable reserve concentration are well above the 300 mg/l cut-off grade (Figure 12-6), demonstrating that production is economically viable.

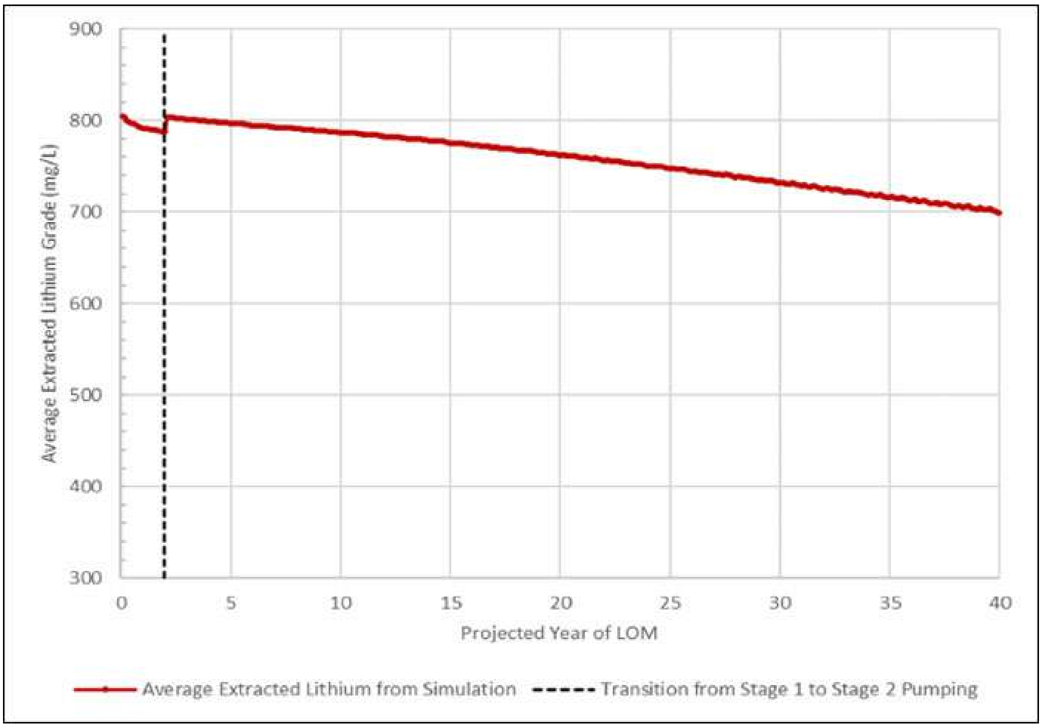


Figure 12-6 - Flux-Weighted Average of Lithium Extracted from the Production Wells over the Reserve Simulation.

12.4 Uncertainty

The Brine Reserve estimate may be affected by the following factors:

- Assumptions regarding aquifer parameters and total dissolved solids used in the groundwater model for areas where empirical data do not exist.
- Estimated vertical hydraulic conductivity values which partially control the amount of anticipated future dilution in areas where fresh water overlies brine.

Regardless of these sources of uncertainty, a steady-state and transient (pumping test) calibration was undertaken using current data followed by a model verification to extracted concentrations to support reserve model predictions. Future calibration efforts will strengthen the model for subsequent predictions.

12.5 Conclusions

Based on the modeled hydrogeological system and results of the numerical modeling, it is appropriate to categorize the Proven Brine Reserve as what is feasible to be pumped to the ponds during the first 7 years for each wellfield. The model projects that the wellfields will sustain operable pumping for 40 years; thus, the following 33 years of pumping as a Probable Brine Reserve have been categorized. These values represent about 38% of the total Brine Resource Estimate, Inclusive of Reserves.

The current numerical model projections suggest that additional brine could be pumped from the basin from the proposed wellfields over a period of 40 years. However, recalibration of the model would be required after start-up pumping of each wellfield to refine the model and support this projection.

In addition, exploration should be conducted to better identify and potentially demonstrate additional extractable brine in other parts of the basin. Favorable exploration results represent Project upside potential.

The relative accuracy and confidence in the Brine Reserve estimate is dominantly a function of the accuracy and confidence demonstrated in sampling and analytical methods, development and understanding of the conceptual hydrogeologic system, and construction and calibration of the numerical groundwater model. The input data and analytical results were validated via sample duplication, use of multiple methods to determine brine grades throughout the basin, and with pumping tests. Using these data developed using standard methods, a conceptual geological and hydrogeological model was created consistent with the geological, hydrogeological, and chemical data obtained during the exploration phases.

In the opinion of the employees of Montgomery & Associates, each phase of the Project was conducted in a logical manner, and results were supportable using standard analytical methodologies. In addition, calibration of the numerical model against long-term pumping tests provides solid support for the conceptual hydrogeologic model developed for the Project. Thus, there is a reasonably high-level confidence in the ability of the aquifer system to yield the quantities and grade of brine estimated as Proven and Probable Mineral Reserves.

To the extent known by the employees of Montgomery & Associates, there are no known environmental, permitting, legal, title, taxation, socioeconomic, marketing, political or other relevant factors that could affect the Mineral Reserve estimate which are not discussed in this Report.

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

Brine operations are not conventional mining operations; the commodity is extracted by pumping from wells rather than excavation from solid rocks or minerals, thus detailed geotechnical studies are not required. There are two stages being considered for production: one in the East (SVWP wells) and the second in the Southwest (W wells), Southeast (S wells), and North (N wells), as shown in Figure 13-1. For Stage 1 (years 1-2), only wells from the East Wellfield (SVWP wells) will be used, while the Stage 2 Expansion (years 3-40) will also utilize the W, S, and N wells. The projected LOM is 40 years and Section 12.3 - Predictive Simulation details the production well schedule and predictive model results.

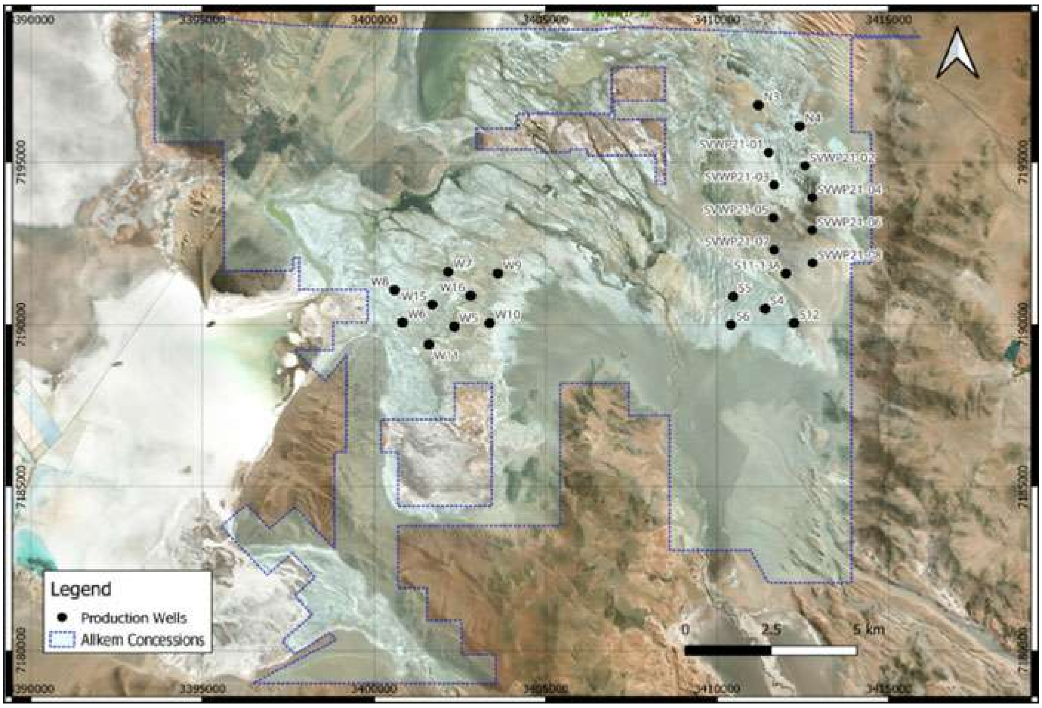


Figure 13-1 - Current Production Wellfield Map.

The production well locations were selected to reduce long-term freshwater level drawdown and maintain as high a brine grade as possible, given each well location and the potential for brine dilution. During wellfield construction, each production well will be tested and analyzed immediately after construction.

Well depths, well filters, and well casing blind intervals sealed from pumping were designed based on the following factors:

- Location of lithium-bearing brine zones.
- Location of aquifer zones with comparatively large hydraulic conductivity.
- Location of existing fresh or brackish water zones, and/or future potential for brackish water to enter the wellfield.

With the exploration currently undertaken, the average production well depth in the proposed wellfields is approximately 200 m. However, because substantial areas of the wellfields require additional infill characterization, actual depths and completion zones will be determined in the field at each proposed well location. Therefore, modifications to individual well construction plans will be undertaken as necessary during construction drilling based on the actual conditions observed.

Fresh and brackish water zones occur in both proposed wellfield areas. In addition to the upper zones being brackish water in the eastern part of the basin, there are nearby wells to the east of the proposed southwest wellfield where brackish water was also observed in the upper aquifer zones. Therefore, in both wellfields, production wells are designed to seal off the upper part of the aquifer system and in effect, reduce the downward movement of fresh and brackish water into the production zones of wells. Although some subsurface variations exist between the two wellfields, the general design is to seal off approximately the upper 60 m of aquifer at each production well in the Southwest Wellfield and approximately the upper 100 m of aquifer in the eastern wells.

All production wells will be connected through pipelines to centrally positioned booster ponds. The East Wellfield (Stage 1) is designed with 8 operating wells plus one on standby (at peak flowrate seasons). These wells will be equipped with pumps and manifolds to the distribution pipeline. Wells will be cycled on and off as needed to reduce the potential for over-pumping at any given well that could result in excessive drawdown, increased pumping lift, and extra energy costs. Wells on standby will be ready to be turned on when well maintenance or pump repair/replacement is required at other wells.

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: Sal de Vida Stage 1 and 2

Fiscal Year	Units	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Wells	Million l	5,052	5,097	15,034	15,078	15,123	15,164	15,203	15,242	15,280	15,319	15,359	15,401	15,446	15,492	15,539	15,589	15,640	15,693	15,748	15,805	15,863	15,923
Lithium Grade	mg Li/l	797	790	804	801	799	797	795	793	791	789	787	785	783	780	778	775	773	770	767	765	762	759
Overall Recovery	%	-%	-%	11%	23%	59%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Production	tpa Li2CO3	-	-	7,002	14,541	38,253	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000

Fiscal Year	Units	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	LOM
Wells	Million l	15,985	16,048	16,113	16,178	16,245	16,313	16,382	16,452	16,524	16,596	16,670	16,744	16,819	16,895	16,971	17,048	17,125	17,203	-	-	-	617,400
Lithium Grade	mg Li/l	756	753	750	747	744	741	738	734	731	728	725	722	718	715	712	709	706	702	-	-	-	757
Overall Recovery	%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	-%	-%	-%	68%
Production	tpa Li2CO3	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	6,175	-	1,685,971

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 70%.

13.2 Well Materials, Pads, and Infrastructure

The materials considered for the brine well area pipelines are HDPE and cross-linked polyethylene (PEX). The maximum capacity of the brine well pumps for this area will be 115 m^3/hr each. Each wellfield pump will have a wireless data link to the process plant data acquisition system (SCADA) with remote start/stop capability. Each pump will also have its own dedicated diesel generator and diesel storage tank with three days storage capacity.

Infrastructure in the wellfield will include well pads, access roads and power generation. Each brine well will have its own generator and diesel storage tank, and each tank will have a residence time of 72 hr. A diesel truck will feed the diesel tanks to keep the diesel generators running. All wells will be connected by road to the booster station. Drilling pads will be elevated to as much as 1.5 m above the salar surface to mitigate flooding risks. Drill pad dimensions will have a platform area sufficient to house the required diesel generators and control instrumentation. Figure 13-2 shows a picture of production well SVWP21-02.

Figure 13-2 - Production Well SVWP21-02.

13.3 Equipment

Mobile equipment will be required for plant operations (Table 13-2). Some transport services will be contracted out to local companies; however, in most cases the equipment will be owned and operated by Allkem. Allkem will provide fuel and servicing for all vehicles, except for offsite reagent delivery and product trucking logistics.

Table 13-2 - Plant Mobile Equipment List.

Vehicle	Quantity Stage 1	Quantity Stage 2
Grader	2	3
Front end loader	2	4

Vehicle	Quantity Stage 1	Quantity Stage 2
Excavator	2	3
Roller	2	4
30 t truck	3	6
Transport bus	4	6
Mobile crane	1	2
Manitou telehandler	1	1
Diesel truck	1	1
Water cart	1	1
Utility vehicles	10	15
Forklift	5	10

All ponds will be harvested using specialized, Allkem-owned machinery, such as:

- Excavator CAT 330 or equivalent: perimeter trenches and cut trenches.
- Front loader CAT 980 or CAT 990 or equivalent: stacking and loading.
- Trucks CAT 730 or Mercedes Benz Actros 4144 or 3336 or equivalent: 3 - 4 per front loader, depending on the stockpile distance.
- Motor grader CAT 140H or equivalent: brine management control, finishing.
- Roller CAT CS-431 or equivalent: finishing.

The lithium carbonate product will be packed into 1-m^3 bags and loaded onto semi-trailers with side lifters. Trucks will transport the lithium carbonate to the port of Antofagasta in Chile. Lithium carbonate and reagent transport logistics will be outsourced to a local company.

During the first 2 years of operation, Allkem-owned trucks with a 30-tonne load capacity, designed for loose bulk wet solids, will be used to transport the magnesium hydroxide and calcium sulphate that will be precipitated as discards from different areas of the lithium carbonate plant. This material will be transported to the co-disposal area. To move the total amount of solids, several bins will be used to alternate bin loading. Trucks for discard transport will be necessary from Year 2 onward.

Thirty-tonne trucks will be used for maintenance and general freight movement around the site. Mobile cranes with 20-t load capacity will be retained at the site for general maintenance. Forklift trucks will be used at the plant for loading lithium carbonate, handling reagents, maintenance workshop and for the general store. Front-end loaders with backhoe will be required for general site maintenance, such as clearing drains. Water trucks (for dust suppression), graders and rollers will be required for road maintenance on the site and for roads leading into the site.

13.4 Conclusions

The described mining method is deemed adequate to support economic brine extraction and is similar in configuration to other lithium brine extraction configurations witnessed on operating properties owned by Allkem.

14. Processing and Recovery Methods

The process design is based on the testwork discussed in Chapter 10, and the brine lithium grades and required production schedules defined by the numerical modelling of Li Reserves in Chapter 12. The selected process for Sal de Vida is shown in Figure 14-1. 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 vary seasonally.

14.1 Process Flowsheet and Description

The process will commence with brine extracted from wells extending to a depth of up to 300 m into the salar. Brine will be pumped to a series of evaporation ponds at a seasonal rate ranging from 53 l/s in winter to 154 l/s in summer, where it will be evaporated to increase the salt concentration beyond the NaCl saturation point. NaCl will precipitate as halite solids that will collect at the bottom of the ponds.

The evaporated brine will be fed into the process plant liming circuit, where it will be combined with a slaked lime ($Ca(OH)_2$) slurry. The lime will react with magnesium, sulphate, and boron ions in the brine, removing these impurities as solid magnesium hydroxide ($Mg(OH)_2$), gypsum, and borate salts. The solids will be separated from the brine and reported to a discard facility.

The limed brine will be fed to the muriate (potassium chloride, KCl) series of evaporation ponds and will be further concentrated, exceeding the saturation point of sylvite (KCl), and causing it to precipitate together with halite (NaCl). Muriate is an archaic term for chloride and muriate of potassium is potassium chloride or sylvite. Usually this occurs as sylvinite which is a mix of sylvite and halite.

A small amount of gypsum ($CaSO_4 \bullet 2H_2O$) will also be precipitated.

The concentrated brine will be sent back to the process plant, where it will be softened to remove the remaining magnesium ions as well as the calcium. The softening circuit will use a combination of both caustic soda (NaOH) and sodium carbonate (Na_2CO_3) for pH management and divalent ion removal. The solid impurities will once again be separated and discarded.

The clear softened brine will be pumped through a conventional Ca/Mg IX circuit in a lead-lag-regeneration configuration to ensure that trace magnesium and calcium ions still present in the brine are removed. HCl and NaOH or water will be used for stripping and regeneration of the IX resin respectively.

The softened brine will be sent to the lithium carbonate crystallization circuit to crystallize lithium by combining the brine with sodium carbonate at elevated temperatures to produce lithium carbonate. The lithium carbonate solids will be recovered while the liquor will be recycled back into the process.

Finally, the lithium carbonate solids will be processed through a product finishing circuit for drying, cooling, micronizing, and bagging.

The process was simulated using an in-house pond evaporation model developed by Galaxy, together with a METSIM simulation of the process plant.

14.1.1 Halite Evaporation Ponds

The objective of the halite evaporation ponds is to evaporate the brine to reduce the volume that must be processed through the liming plant, while also increasing the lithium concentration. In the process, sodium and chloride impurities will reach saturation and will be precipitated as halite salts. The brine will be evaporated until the lithium concentration reaches 0.7% by weight.

The key parameters used in the pond model are the concentration of magnesium at the inlet and outlet of each pond, and the outlet brine required. For the first pond in the sequence, the inlet concentration was known from analysis of the raw brine from the wellfields. For the final pond in the sequence, the required magnesium concentration is the value in the concentration path data corresponding to a concentration of 0.7% Li. For all other ponds, the inlet and outlet magnesium concentrations were determined iteratively, such that sequential ponds would decrease in area as their average brine concentration increased. This approach was taken to minimize the impact of leakage on lithium recovery (leakage is proportional to area, so it was preferred to minimize the area of ponds with a higher lithium concentration).

The ions included in the pond brines will be Mg^{2+}, Ca^{2+}, Na^{+}, K^{+}, Li^{+}, Cl^{-}, SO_4^{2-} and B (present as a variety of borates). In the halite ponds the sodium saturation value is based on the concentration path correlations (see Section 10.2.9).

14.1.2 Liming

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 ($CaSO_4 \bullet 2H_2O$). The slurry of limed brine and precipitated impurities will be sent to a thickener for solid-liquid separation. The underflow will be combined with the solids from the softening circuit and filtered in the primary liming filter. The filtrate will be recombined with the thickener overflow-this clear liquor will be the limed brine that is pumped to the muriate ponds for further evaporation.

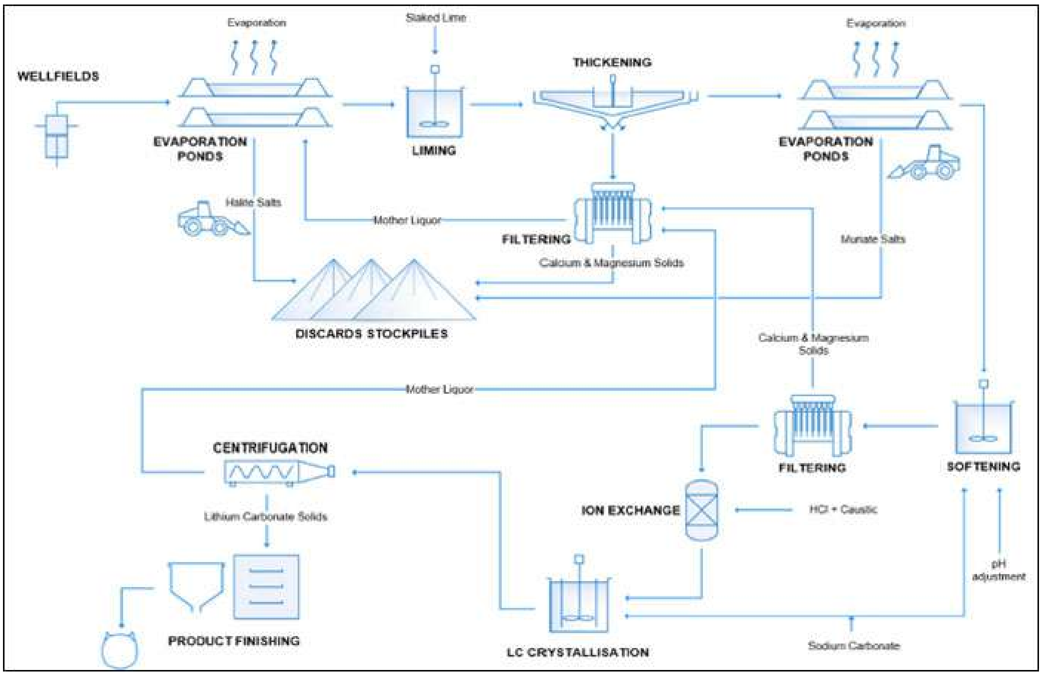


Figure 14-1 - Sal de Vida Simplified Process Flow Diagram.

14.1.3 Muriate Evaporation Ponds

After liming, the clarified limed brine will be pumped to the muriate ponds for further evaporation to bring the lithium concentration up to 1.7% by weight. The principles behind the muriate ponds are very similar to those of the halite ponds, and they were modelled with the same evaporation pond model. The key difference with the muriate ponds is that the brine will be evaporated beyond the saturation point of KCl, such that significant amount of sylvite salts will be precipitated along with the halite. Some calcium will also be precipitated as gypsum. A set of evaporation curves were developed by evaporating limed brine from the pilot plant on site (see Chapter 10.2.9).

14.1.4 Softening

Once the target lithium concentration of 1.7% is achieved in the muriate ponds, the brine must be softened to remove calcium and magnesium impurities. The brine will be heated using a two-step process at mild temperatures (~20°C) and sent to a series of six softening and mixing tanks to allow the brine to react with all reagents. The addition of 25% soda ash (sodium carbonate) solution in the softening circuit will enable the precipitation of magnesium hydroxide and calcium carbonate, as solids within the brine and pH adjustment.

Filtration will be used to remove the calcium and magnesium precipitates from the brine. This will be achieved by using a plate and frame filter to remove the bulk of the solids. It will be followed by a secondary filtration stage for final polishing. The result will be a clarified softened brine with near-negligible calcium and magnesium concentration. The clarified softened brine will be conditioned before it is fed into a Ca/Mg IX circuit. The Ca/Mg IX circuit will be a standard circuit, consisting of three columns, in a lead-lag-regeneration, merry-go-round configuration. Small amounts of HCl and NaOH or RO water will be used for stripping and resin regeneration. The treated softened brine will then be stored in two softening filtrate tanks to be used as feedstock for crystallization.

The filter cake will be pumped to the liming circuit where it will be combined with the liming thickener underflow prior to filtration. The combined reject filter cake reports to the discard facility.

14.1.5 Lithium Carbonate Crystallization

Lithium carbonate will be recovered from the purified brine by a crystallization reaction with sodium carbonate at elevated temperatures of about 84°C:

$$2LiCl_{(aq)} + Na2CO3_{(s)} \rightarrow Li2CO3_{(s)} + 2NaCl_{(aq)}$$

Sodium carbonate will be added as a solution at a concentration of 25%. The reaction will be performed in a series of heated mixing tanks (crystallizers) operated at 84°C. Higher temperatures increase the crystallization efficiency because lithium carbonate solubility decreases with increasing temperature. The temperature will be limited by the low air pressure, given the altitude at Sal de Vida, which will reduce the solution boiling point. Ideally, the circuit will be run at just below the boiling point. A seed recycle stream of lithium carbonate crystals will be implemented to improve crystal growth by providing the precipitating lithium carbonate with a surface on which to grow.

After crystallization, the lithium carbonate solids will be recovered from the mother liquor by a hydro cyclone and a centrifuge. The solid cake will be subjected to a displacement wash on the centrifuge, before being conveyed to product finishing for drying and micronizing.

The mother liquor will be combined with the softening and liming solids, before being recovered via the liming filter (essentially acting to wash the solid waste to recover entrained lithium) and sent to the halite ponds as a recycle stream.

14.1.6 Product Finishing

The purpose of the product finishing circuit is to perform the final physical operations required to make the lithium carbonate suitable for transport to customers.

First, the lithium carbonate solids will be dried to <1% moisture, before being filtered and cooled. The solids will be micronized, and iron contaminants will be removed magnetically. The micronized product will then be bagged for transport.

14.2 Process Facilities

The process facilities have been divided in the following main areas:

- Wellfield and brine distribution.
- Solar evaporation ponds.
- Production plant (liming and lithium carbonate plant).
- Waste disposal.

As seen in Figure 14-2, the East Wellfield for Stage 1 will be located directly above the east sub-basin of the Salar del Hombre Muerto over the salt pan. Stage 1´s ponds will be located in two areas directly south and Stage 2´s ponds will be located southeast of the Southwest Wellfield. The brine distribution system will traverse the salar toward where the evaporation ponds will be located. The location of the ponds has been determined based on a number of a factors including optimal constructability properties and minimizing earthworks, environmental impact, and risk of flooding.

The processing plant for all stages will be sited in the center of Stage 1's evaporation ponds. A road system, including ramps and causeways, will connect the processing facilities and provide access to all working areas. The waste disposal areas will surround the evaporation ponds to the north, east and southeast.

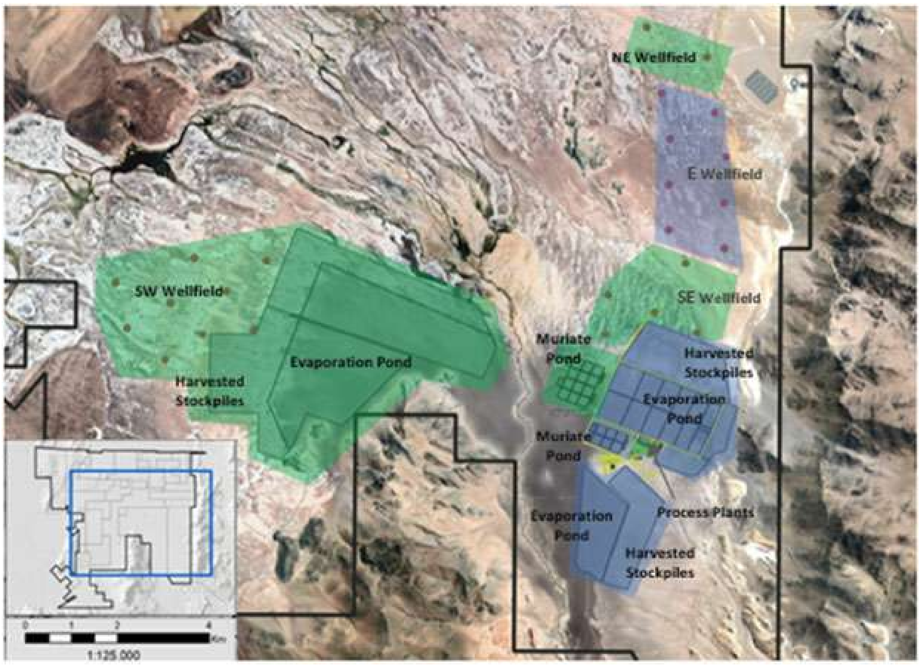


Figure 14-2 - Sal de Vida Layout Plan. (Note: Blue areas represent Stage 1, green areas are Stage 2 facilities)

14.2.1 Wellfield and Brine Distribution

14.2.1.1 Wells

The first step in the lithium recovery process is the extraction of brine from the hydrogeological reserve via well pumps. The wellfields and associated infrastructure are described in Chapter 13.

14.2.1.2 Booster Station

A booster station will mix brine from the different wells, both acting as a buffer for the seasonal flow changes and as a brine pumping station to reach the halite ponds. The station will consist of two booster station ponds, which will operate in parallel based on volume requirements. During summer, both ponds will operate; during winter, only one pond would be used. These ponds will be regularly cleaned; the cleaning frequency will depend on the amount of salt that may precipitate out on the pond bottom.

Five transfer pumps will be located at the pond outlets, operating with four pumps on duty and one on standby. Pumps will have a wireless data link to the process plant SCADA system with remote start/stop capability.

Stage 1 design includes one booster station in the East Wellfields. Stage 2 will require two booster stations in the Southwest Wellfield.

14.2.1.3 Brine Distribution

The brine distribution system will connect all wells with the booster station. From there, brine will be pumped to the evaporation ponds. The piping system requires separate lines from each pump station to the booster ponds. From the booster ponds three booster pumps will feed a single pipeline, which will deliver brine to the evaporation ponds. The design includes trenches for laying pipelines and suitable ground-anchoring systems. Pipeline design includes section divisions at 100-m spacing for pipeline flushing/cleaning. The pipeline materials for this area will consist of HDPE and PEX. Instrumentation will be implemented accordingly for these areas.

Brine well instrumentation will include instrumentation for the operational safety of the pumps (pressure and temperature) as well as instrumentation to monitor process variables (e.g., liquid level in each well and brine flow from each pump). In the booster station area, instrumentation will be required for the booster station ponds and the outlet pumps. The booster station ponds will monitor the brine levels through the use of radar sensors, and sending the data collected to the control system. The booster station pumps will have instrumentation for pump operational safety (e.g., measuring pressure and temperature) as well as instruments that will measure process variables (e.g., total brine flow to the pumps).

14.2.2 Solar Evaporation Ponds

The solar evaporation pond system will consist of a series of halite and muriate evaporation ponds, which will concentrate brine suitable for feeding a lithium carbonate plant. The evaporation ponds for Stage 1 will be located in two areas on the northeastern corner and southeastern edge of the Río de los Patos alluvial fan, over a large gravel field directly south of the East Wellfield and above the salar, covering a total area of approximately 450 ha. The halite evaporation ponds for Stage 2 will be located on the northwestern corner of the Río de los Patos alluvial fan, over a large gravel field directly southeast of the Southwest wellfield covering an area of approximately 850 ha. The muriate evaporation ponds for Stage 2 will be located next to the Stage 1 halite ponds and will cover approximately 50 ha.

14.2.2.1 Halite Ponds

Halite ponds for Stage 1 will be arranged in three strings which will operate in parallel. Strings 1 and 2 will be located immediately north of the process plant in the northeastern corner of the alluvial fan and String 3 will be located about 1.5 km southeast of the process plant. Each string will contain six cells plus a buffer pond with the flow from one pond to the next in series. The halite system will have a total surface area of approximately 400 ha, divided evenly among the three strings. The key assumptions that were used in the halite pond design were:

- Average evaporation rate of 2,700 mm/a.
- Evaporation derating factor of 0.7 for pond size.
- Evaporation derating for brine activity based on empirical correlations with Mg and Li.
- Availability derating based on estimated harvesting times (approximately 91% on average).
- Average leakage rate of 0.03 mm/d.
- Lined ponds.
- Depth of 1.2 m including 0.3 m freeboard.
- Entrainment loss factor of 0.14 tonnes of brine per tonne of precipitated salt (conservative based on pilot pond harvesting detailed in Section 10.2.9).

A 0.3 m permanent salt bed layer will be maintained on the pond base to protect the liner during harvesting. That layer would not be harvested. A maximum 0.3 m high harvesting layer will be formed on top of the salt bed layer and the liquid pond depth will be controlled to stay around 0.3 m above the harvest salt layer.

Pond construction will consist primarily of cut-and-fill earthworks and, if required, local quarry material would be introduced. The ponds will be lined with a geomembrane that would consist of a HDPE layer installed above the soil to waterproof the ponds.

14.2.2.2 Muriate Ponds

The muriate ponds will be located south of the Stage 1 halite ponds strings 1 and 2, adjacent to the process plant. The muriate pond system will consist of a muriate buffer pond, two strings of muriate ponds operating in parallel with three cells each, and two concentrated brine storage ponds. Brine will flow from one pond to the next in series. The system will also include a mother liquor buffer pond located between the process plant and Strings 1 and 2 of the halite ponds. The muriate system will have a surface area of approximately 26 ha for Stage 1 and 52 ha for Stage 2.

The key assumptions used in the muriate pond design include:

- Average evaporation rate of 2,700 mm/a.
- Evaporation derating factor of 0.7 for pond size.
- Evaporation derating for brine activity based on empirical correlations with Mg and Li.
- Availability derating based on estimated harvesting times (approximately 91% on average).
- Average leakage rate of 0.02 mm/d.
- Lined ponds.
- Depth of 1.2 m including 0.3 m freeboard.
- Entrainment loss factor of 0.11 tonnes of brine per tonne of precipitated salt (conservative based on pilot pond harvesting detailed in Section 10.2.9).

A 0.3 m permanent salt bed layer will be maintained on the pond base to protect the liner during harvesting. That layer would not be harvested. A maximum 0.3 m high harvesting layer will be formed on top of the salt bed layer and the liquid pond depth would be controlled to stay around 0.3 m above the harvest salt layer.

Pond construction will consist primarily of cut-and-fill earthworks and, if required, local quarry material would be introduced. The ponds will be lined with a geomembrane that would consist of a HDPE layer installed above the soil to waterproof the ponds.

14.2.2.3 Pond Infrastructure

Weirs will be used to transfer brine between the same pond types. Weirs will have a width of 5 m to allow for the correct flow between the ponds. The connection between ponds through weirs will allow for a constant natural flow from one pond to the next and will keep the same brine level in all ponds, reducing pump usage. Since the brine transferred between ponds is saturated, the weirs will have to be periodically cleaned to reduce salt accumulation. For brine transfers over longer distances (i.e., between halite and muriate ponds) pumping will be required. The pump type and size will depend on application. The expected maximum flow is 450 m^3/hr. All pumps and pipelines will have a connection point to periodically flush any salt scaling build-up. The washing frequency will be determined during operations.

The feed to the pond system is provided by the booster pumps from the booster station area. Pumps in the pond area will consist of mobile transfer pumps, fixed transfer pumps from the Mother Liquor and Muriate Buffer Ponds, and the feed pumps to the liming and process plants.

The road system will connect all of the processing facilities and provide access to the working areas. Roads, ramps, and causeways will be designed based on the vehicle types that will be used. In the evaporation ponds area, roads will be designed to externally circumnavigate the berms. These roads will be designed with a width that is sufficient to allow the transit of harvest trucks, which will be operating during salt harvest from each pond. A ramp will be constructed during pond harvest using harvested salts from previously harvested ponds to allow the truck access into each pond. Internal roads for light vehicles, buses, and heavy vehicles supplying reagent or diesel, will be constructed for production plant support.

14.2.2.4 Operational Monitoring and Control

The first process step will consist of pumping brine into the halite ponds to initiate lithium concentration through evaporation. Evaporation will result from the combination mostly of solar radiation, wind, temperature, and relative humidity. The evaporation area required was calculated based on the expected evaporation rates and the well flow rates.

Chloride salts (primarily sodium chloride) will precipitate and deposit in the pond bottom. To avoid increasing the bottom salt level inside each pond above an optimal operational level, these salts will be periodically harvested, and stockpiled in accordance with environmental requirements.

The muriate ponds will be physically located adjacent to the halite ponds and will consist of two strings. Brine will be transferred from the muriate buffer pond to each muriate pond string. The muriate ponds have the same design basis as the halite ponds (depth, liner, layer depth) and will also be harvestable. When the brine reaches an overall concentration of ~21 g/l, it will be stored in a set of concentrated brine storage ponds, from where the brine would be fed to the lithium carbonate plant.

The concentrated brine storage ponds will act as buffer ponds to accommodate seasonal flow variations.

All evaporation ponds will be harvestable, with a harvesting frequency of approximately once a year. The estimated annual total of salt harvest from the halite ponds is 1.4 million tonnes per annum (tpa), and from the muriate ponds is 79,000 tpa for Stage 1 of the Project. For Stage 2, the annual halite harvest will be 2.8 million tpa, and a muriate harvest of 158,000 tpa.

There is an initial hold-up of 0.21 tonnes of pond brine in each tonne of salt. During harvesting, the salt is drained and compacted to collect the brine in channels and sumps, from which it can then be recovered using mobile pumps. Based on the pilot pond harvesting test (Section 10.2.9), this allows a harvesting recovery of 0.12 tonnes of brine per tonne of harvested salt.

The harvested salt will be stockpiled in areas lined with 1 mm HDPE. Brine will be drained from these stockpiles and collected in sumps for pumping back to the ponds to improve the overall pond recovery.

The total brine level in each pond, the total salt level in each pond and the chemical composition will require control. The total brine level of the ponds and the salt level will be measured manually or through topography. The chemical composition will be measured through laboratory analysis of a manually taken brine sample. The inlet flow will be measured in four places:

- At the inlet to the first halite pond of each string.
- At the inlet to the first muriate pond of each muriate string.

Flow rates will be monitored using flowmeters and tracked in the control room via a control system. Flow rates will depend on seasonal fluctuations.

14.2.3 Process Plant

The process facilities will consist of a lithium carbonate plant, with a liming plant and associated plant infrastructure, such as the power station, fueling and workshops. The process facilities will be located in an area adjacent to the muriate ponds south of the Stage 1 halite ponds.

14.2.3.1 Liming Plant

The liming plant will include the following equipment:

- Liming mixing tanks.
- Heat exchangers.
- Storage tanks.
- Hoppers.
- Press filters.
- Thickeners.
- Pumps.
- Sump pumps.

The pump types to be used will depend on the specific application, and pump sizes would vary between 20 - 100 m^3/hr. Pipeline material will also depend on the specific application.

14.2.3.2 Softening Stage

The softening stage will include the following equipment:

- Softening mixing tanks.
- Heat exchangers.

- Storage tanks.
- Storage hoppers.
- Press filter.
- Polishing filters.
- Ion exchange columns.
- Pumps.
- Sump pumps.

The pump type to be used will depend on the specific application in this area, and pump size will vary from 4 - 67 m^3/hr. Pipeline material will also depend on the specific application.

14.2.3.3 Crystallization Stage

The crystallization stage will consist of the following:

- Crystallization mixing tanks.
- Heat exchangers.
- Storage tanks.
- Storage hoppers.
- Cyclones.
- Centrifuges.
- Cartridge filters.
- Pumps.
- Sump pumps.

The pump type will depend on the specific application in this area, and pump sizes will vary from 7 - 69 m^3/hr. Pipeline material will also depend on the specific application.

14.2.3.4 Product Finishing

The main equipment requirements in the product finishing plant include:

- Belt conveyors.
- Hoppers.
- Screw feeders.
- Drying system (includes air heater, dust collector and air heat exchanger).
- Transport filter.
- Chiller hopper.

- Magnets.
- Vibrating screen.
- Bagging system (includes storage hopper, samplers, vibrator, and conveyor for final product big bags).
- Product storage shed.

14.2.3.5 Reagents Area

Each reagent will have its own preparation area, with equipment consisting of feed hoppers, mixing tanks and storage tanks. Reagents will be transported to the plant site in a solid state and be prepared based on the process requirements.

14.2.3.6 Process plant operations and controls

When the brine reaches a suitable lithium concentration in the halite ponds (8.9 g/l, 0.7 wt%), it will be stored in three liming plant buffer ponds, designed to store brine, and handle all seasonal variations in the brine flow. From these buffer ponds, brine will be fed to the liming stage, which is the first purification process that requires the addition of reagents. A solution of milk-of-lime ($Ca(OH)_2$) will be added to the brine inside agitated mixing tanks that will operate in series, increasing pH and precipitating magnesium as magnesium hydroxide, as well as removing other unwanted elements from the brine, such as boron and sulphates. The limed brine will be pumped to solid - liquid separation equipment (thickeners and press filters), to separate the precipitated solids from the lithium- concentrated brine. The solids will be sent to a final disposal area. The lithium-concentrated brine will be pumped to a muriate buffer pond and distributed to the muriate ponds. It will evaporate to ~21 g/l Li and will be stored in the concentrated brine storage ponds, which will handle all seasonal variations in the brine flow similarly to the liming buffer ponds.

The lithium carbonate plant was designed to produce 15,000 tpa of lithium carbonate in Stage 1, with Stage 2 enabling the production of an additional 30,000 tpa. This design was based on average brine supplies of 26 m^3/hr and 52 m^3/hr for Stage 1 and 2 respectively, and an average lithium concentration of 21 g/l in the softening feed. The plant will operate continuously with a design availability of 91%.

Brine coming from the concentrated brine storage ponds will enter a softening stage, where magnesium and calcium will be removed from the brine. The brine will enter the plant at a temperature of around 0°C and will be stored in an evaporated brine storage tank where it will be diluted slightly with RO water. It will be heated to 20°C by a spiral heat exchanger and a plate heat exchanged in series, which will use recirculation of process streams and hot water respectively as heating agents. The heated brine will enter a group of six softening mixing tanks, which will operate in series, to allow the correct residence time for the brine to react with all reagents. Caustic soda will be added in the first mixing tank, and pH will be controlled in the third tank. The brine will be mixed with a sodium carbonate solution in the fourth softening mixing tanks. Both reagents will react with the divalent ions left in the brine and precipitate magnesium hydroxide and calcium carbonate ($CaCO_3$), as solids within the brine. The brine and precipitated solids will be subject to a solid-liquid separation stage, to remove all solid contaminants, using press filters and polish filters. The lithium-concentrated brine will be sent to storage tanks to feed the ion exchange columns. Solid contaminants will be sent to a filter cake tank to be re-pulped with the liming area waste/discards and then sent to the discard facility.

The softened brine will be passed through ion exchange columns to remove any residual calcium and magnesium in solution. It will then be stored in two softening filtrate tanks to be used as feedstock for crystallization.

Lithium-concentrated brine from the softening stage will feed the crystallization stage at a rate of 28 m^3/h for Stage 1 and 56 m^3/h for Stage 2 and will have a lithium concentration of around 14 g/l and will be contaminant-free. The first crystallization step will consist of feeding the brine through a spiral heat exchanger and a plate heat exchanger operating in series, increasing the temperature of the brine from 21°C to 85°C. Hot mother liquor recycle will be used as a heating agent in the first heat exchanger. Saturated steam will be used in the second heat exchanger and will be obtained from a boiler. The heated brine will feed a group of five crystallization mixing tanks that will operate in series. Sodium carbonate, with a concentration of 25% w/w, will be fed to the first and second crystallization mixing tanks, where the reagent will react with the dissolved lithium contained in the brine and precipitate lithium carbonate as a solid inside the tanks. To separate the precipitated lithium carbonate with the brine solution, the crystallization mixing tank outlets will feed a crystallization cyclone cluster for dewatering. 50% of the cyclone cluster underflow, which is the precipitated lithium carbonate, will be returned to the crystallization mixing tanks as a seed recycle. The other 50% cyclone cluster underflow will be sent to the centrifuge stage for lithium carbonate recovery and washing. The centrifuge stage will consist of three centrifuges operating in duty/duty/standby configuration. The centrifuge stage process will operate in batch mode. Each centrifuge will have specific loading, centrifuging, washing, and unloading stages. The final washed, low-moisture content product will be fed to the product finishing stage. All equipment in the crystallization stage will be thermally insulated.

14.2.3.7 Product Finishing

Following dewatering and washing in the centrifuge the wet lithium carbonate solids will be transported via a belt conveyor to a surge hopper and then via a steep incline belt conveyor to the dryer to reduce the moisture content to less than 1 wt%. The dryer is fed via a surge hopper to allow continuous operation, because the centrifuges discharge wet product for 5.5 minutes in a 22-minute cycle. A diverter gate before the surge hopper enables the bagging of wet product. Filtered ambient air will be preheated to 101 °C by the 149 °C exhaust air from the dryer and to 400 °C by an electric air heater before entering the dryer to remove moisture from the product solids. The solids entrained by the dryer exhaust air will be removed by the dust collector upstream of the air preheater. The cleaned air will be discharged to atmosphere, while the hot lithium carbonate solids at 149 °C will be discharged from the bottom of the dryer and dust collector via rotary valves and pneumatically transported to the bulk solids heat exchanger cooler to cool to 50 °C prior to transferring by pneumatic conveyance to the lithium carbonate hopper. The cooler will use RO water, which will then be directed to the hot RO water tank.

Product from the hopper will be fed via a rotary valve to the micronizer through a grate magnet to remove ferrous (magnetic) contaminants. A portion of the filtered ambient air drawn from the downstream fan will entrain via a feed chute the product solids fed by a rotary valve to the air classifier mill. The remaining filtered ambient air will be combined with the solids transport air in the air classifier mill. The solids size will be reduced from 100% < 4 mm with a d50 of 55 - 57 µm to 100% < 40 µm with a d50 of 5 - 6 µm. The milled product solids will be collected by the air classifier mill bag filter and the clean air will be discharged to atmosphere via the mill fan. Lithium carbonate product in the lithium carbonate hopper, which will not be micronized will be pneumatically transported via a rotary valve to contaminants removal.

The product solids will be removed from the bottom of the air classifier mill bag filter by a screw feeder and then fed by a rotary valve to a circular vibrating screen to remove non-magnetic contaminants before conveyed to the downstream equipment. The removal of ferrous (magnetic) contaminants to a specification of <400 ppb is achieved, first by the RO water cooled dry vibrating magnetic filter and then by a grate magnet. Similarly, non-ferrous, and ferrous contaminants in the non-micronized lithium carbonate product will be removed by a dedicated circular vibrating screen, dry vibrating magnetic filter and grate magnet.

The micronized BG lithium carbonate product will then be pneumatically transported to the product storage bin and then via a rotary valve packed into 1 ton (2-m^3) bulk bags and stored for export. The non-micronized lithium carbonate product will similarly be pneumatically transported to the non-micronized product storage bin and via a rotary valve packed into 1 ton (2-m^3) bulk bags and stored for export.

The bagging system will fill labelled maxi bags (or big bags) with solid lithium carbonate. Automatic sampling will be carried out in the storage bin inlet of the and manual sampling will be conducted on each filled maxi bag. All samples will be sent for laboratory analysis. The filled and sampled maxi bags will be stored in a product storage shed, prior to dispatch. The storage shed will have a one-month storage capacity.

14.2.4 Waste Disposal

This facility will consist of halite, muriate, and co-disposal stockpiles surrounding the halite ponds and will cover a total area of approximately 300 ha for Stage 1 and 600 ha for Stage 2. All waste/discards from the process will be appropriately treated, stockpiled, and stored to comply with corporate and environmental requirements.

The main process waste/discards will include:

- Solid discards from the evaporation ponds: these would consist of harvested salts from the halite and muriate ponds. These salts would be generated from year two of production, since the salt layer and harvestable layer must be in place at the base of each pond before the first harvest can be undertaken. The estimated annual total of salt harvested and stockpile from the halite ponds is 1.4 million t/a, and from the muriate ponds is 79,000 tpa for Stage 1 of the Project. For Stage 2, the annual salt harvest will be 2.8 million tpa and 158,000 tpa for halite and muriate ponds respectively.

- Solid-liquid waste/discards from the process plant:
  - Liming solid discards: primarily precipitated magnesium hydroxide, borate salts and gypsum. Around 80,000 dry tpa are estimated to be produced in Stage 1 and 160,000 in Stage 2.
  - Softening solid discards: primarily precipitated calcium carbonate and magnesium hydroxide. Around 12,800 and 25,300 dry tpa are assumed to be produced in Stage 1 and 2 respectively, which are combined with the liming solids and transported by truck to co-disposal stockpiles.
  - Mother liquor that is not used in the process: while most is recycled, a portion of the mother liquor generated from the lithium carbonate plant is entrained as moisture in the liming filter cake and will be disposed of on the co-disposal stockpiles along with the solids. This acts as a natural ‘bleed’ stream, preventing the build-up of contaminants from the recycle stream.
  - RO plant retentate.
  - Steam boiler retentate.
- Any sump pump solutions that cannot be recycled within the process.

The majority of the mother liquor from the crystallization stage will be recycled into the process (see Section 14.1.5) and will therefore not require a dedicated disposal method or facility.

14.2.4.1 Solids Disposal (Harvested Salt and Co-Disposal Stockpiles)

The co-disposal area, approximately 300 ha in area for Stage 1 and 600 ha for Stage 2, will be used for the storage of both discards/waste from the process plant as well as harvested halite salts. Since the generation of solid-liquid discards from the process plant begin before the harvest of any salts from the pond, these discards will be treated differently during the first two years. During this period, all liquid discards generated from the process plant would be sent to an event pond (see Section 14.2.4.1), which will be located near the plant. After year two of production, the event pond will only be used for unprogrammed events such as flooding or plant spills. All process plant solid discards from that point onward will be sent to the co-disposal area for stockpiling.

From year two of production onward, the solid salts harvested from the halite evaporation ponds will be sent to the same co-disposal area and will be deposited around the initial two years of solid stockpile that will have built, generating a containment dam. From year two of production onward, both liquid and solid wastes from the process plant (including the small portion of mother liquor entrained in the solid cake) will be mixed in a tank located near the production plant and will be sent as a pulp (or slurry stream) to the co-disposal area, to be co-disposed in the containment dam within the halite salts. This setup will operate for the remainder of the Project life.

Not all harvested halite salts will be sent to the co-disposal area. Some halite salts will be stockpiled separately to be used as construction material for future evaporation ponds. These salts will be sent by truck directly to the halite stockpile area. The total area required for the halite stockpile is 93 ha.

All muriate salts that are harvested will be separately stockpiled. These salts will be sent by truck directly to the muriate stockpile area, after being harvested. The total area required for the muriate stockpile is 10.7 ha for Stage 1 and a further 21 ha for Stage 2.

The infrastructure in the stockpile and co-disposal areas will consist of:

- Access roads to each stockpile and co-disposal area, accessible by trucks and light vehicles.
- HDPE liner (1 mm) to waterproof the area and allow drainage from the harvested salts and plant solids to be collected and returned to the ponds, improving the overall process recovery.
- Containment system such as low-height berms, for any liquids that may permeate from the salt stockpiles.

No other major infrastructure is required for this area.

14.2.4.2 Liquids Disposal (Event Pond)

A lined disposal pond will be located adjacent to the process plant and will be used to evaporate the liquid aqueous waste from the process plant. RO retentate, demineralization retentate and any unprogrammed ‘events’ (such as spillages and flooding) will be sent to this pond for evaporation.

14.3 Process Control Strategy

Process control will be achieved using the supervisory control and data acquisition (SCADA) system, which will consist of computers, networked data communications, and a graphical user interface for process supervisory management at a high level. The SCADA system will interact with PLCs to continuously monitor the input values from sensors and the output values for actuator operations. Operators will interface with the SCADA system using a PC-based operator interface terminal (OIT) from the process plant control room.

14.4 Consumables and Reagents

14.4.1 Water

Raw water will be pumped from Well SVWF 12_19 to the raw water storage tanks. From these tanks, the raw water is distributed around the plant including lime slaking, product cooling and RO water production. RO water will be produced from raw water by an onsite RO plant and will be used for sodium carbonate and caustic preparation, as hot water for process heating and as feed for the demineralization plant. The demineralization water will be used as boiler feed water. Other than the raw water stream, the only water input to the process will be the raw brine. Water will exit the process through pond evaporation, entrainment in harvested salt deposits, pond leakage, process discard streams (which include RO and demineralization retentate as well as filter cake discards), general water losses from evaporation throughout the process plant, and as entrained moisture in the lithium carbonate product.

14.4.2 Steam

Steam will be used for sodium carbonate storage and crystallization heating, mixing, and thickening. Steam will also be used to heat RO water. The steam boiler will be housed in a dedicated building with fire-resistant walls. The boiler for Stage 1 will produce 6.6 t/hr of saturated steam ~5 bar g.

A diesel bulk tank and the deaerator tank will be located outside the building.

14.4.3 Compressed Air

The process plant will require compressed air for the main equipment and instrumentation. For all users the quality will be 1-2-1, based on ISO 85731 specifications. The supply will include dry air vessel, three screw compressors, filters, and an adsorption dryer unit.

14.4.4 Reagents

Lime will be delivered as quicklime in solid granule form and will be slaked with raw water to produce hydrated lime slurry for the liming circuit.

Sodium carbonate (soda ash) will be delivered in solid powder form and dissolved in RO water to produce sodium carbonate solution for the softening and lithium carbonate crystallization circuits.

Caustic soda will be delivered as a solid and dissolved in RO water to produce a 50% caustic soda solution.

14.4.5 Power

Power requirements for the process operations are provided in Chapter 15.

14.5 Summary of Mass and Water Balances

For Stage 1, reagents, raw water, and brine consumptions are as described in Table 14-1.

Table 14-1 - Stage 1 Reagent Consumption.

Reagent description	Qty	Unit
32% Hydrochloric acid	615	tonne/year
Lime	2 4320	tonne/year
Sodium Carbonate	34 000	tonne/year
Sodium Hydroxide	8 960	tonne/year
Raw water	616 880	m³/year
Raw Brine	4 896 000	m³/year

14.6 Operations staff

The total forecast number of operational personnel including on-duty and off-duty will be approximately 270 people.

14.7 Conclusions

It is the opinion of the employee of Gunn Metallurgy that the test work conducted is in concept appropriate and well-conceived and the described process design is reasonable and implementable. The process concept is largely standard and has been previously proven to produce similar products. The process design is based on the conducted test work and should reflect the related test work parameters. The process related equipment is suitably organized to produce the mentioned products in the quantities specified, however the employee of Gunn Metallurgy has no basis to comment on the sizing of and so the capacity of the selected equipment. The reagent and commodity consumption rates are deemed appropriate for the process selected and the targeted plant production rate.

The employee of Gunn Metallurgy has reviewed the testwork, mass balance and design criteria, however this does not constitute an independent review of the test work and its interpretation into plant design. The employee of Gunn Metallurgy is not able to rigorously assess whether the plant design as described is adequate for the specified duty, however based on previous experience the plant design does appear to be capable of producing lithium carbonate at the specified cost and of the claimed quality.

The employee of Gunn Metallurgy cannot attest to the reliability of the overall plant recoveries as presented in section 10 for several reasons:

1. The basis for the selection of pond areas is not adequately defined and so the nominated lithium concentrations may not be achieved, which consequently could impact production rates.
2. The assumption by Allkem that in the short term the mother liquor lithium content can be ignored for the purpose of calculating overall recovery of lithium.
3. The conceptual vulnerability of the plant operation and so production to disruptions in the softening area.

14.8 Recommendations

The design of the Stage 1 ponds and plant should be reviewed by an independent party. Upon the completion and operation of Stage 1, operational trends and plant performance must be considered for the Stage 2 plant designs toward optimizing and enhancing production.

15. INFRASTRUCTURE

Project infrastructure is divided into process infrastructure (see Chapter 14), and non-process infrastructure.

The non-process infrastructure includes:

- Raw water and RO water.
- Demin water.
- Power generation and distribution.
- Fuel storage and dispensing.
- Construction camp to accommodate up to 900 people.
- Sewage treatment plant.
- Fire protection system.
- Buildings:
    - Process plant buildings.
    - Reagent storage and preparation building.
    - Product storage building.
    - Maintenance workshop.
    - Equipment storage.
    - Vehicle workshop.
    - Boiler building.
    - Site access security control.
    - Administration offices.
    - Canteen.
    - First aid building.
    - Electrical and control rooms.
    - Laboratory.
    - Locker room.
- Site roads, causeways, and river crossings.
- Communications and control system.
- Steam generation and water heating.
- Compressed air system.
- Drainage system.

A location plan showing the major non-process infrastructure is included as Figure 15-1 and Figure 15-2.

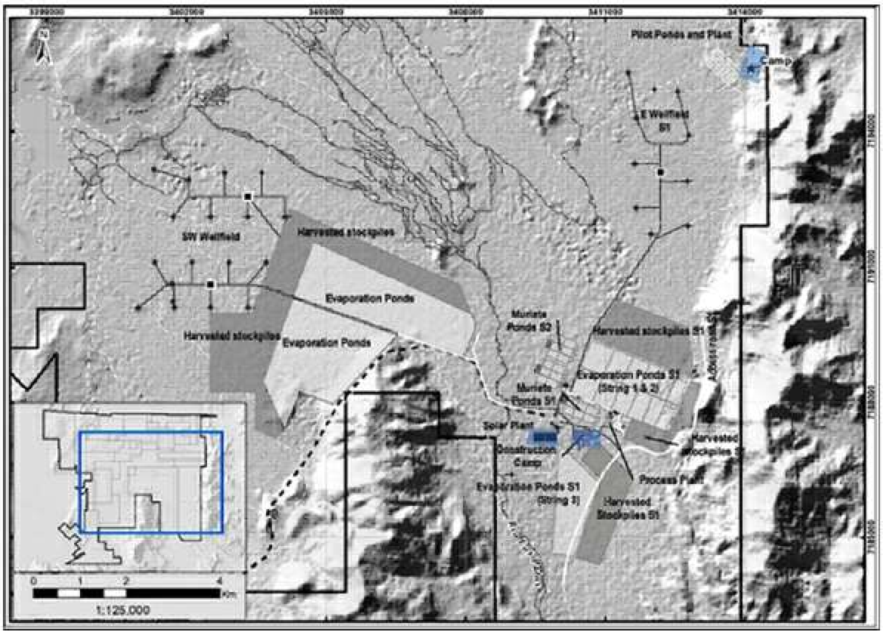


Figure 15-1 - Non-Process Infrastructure Layout Plan.

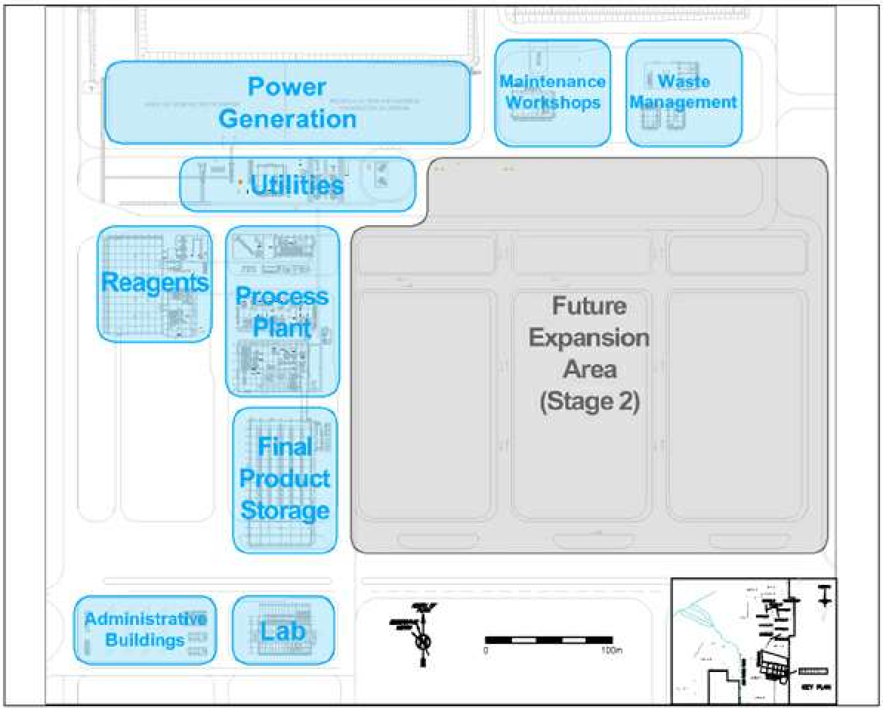


Figure 15-2 - Process Area Infrastructure.

15.1 Road and logistics

Site roads will range from 6 - 11 m wide depending on the traffic requirements. The road elevation will be sufficient to maintain the roads as operable throughout normal weather conditions. The road surface will be treated with local material from borrow pits. Maintenance will be performed periodically, and salt will be used, once available, to strengthen and provide longevity to the roads.

Since the salar is prone to flooding during the rainy season, suitable road embankments will be constructed to allow permanent access. Causeways connecting the East wellfield will consist of 3.6 m wide single lane roads with stopping bays constructed at an elevation 0.5 m. During operations, salt harvesting material will be used to further elevate the causeways up to 1.5 m above the surface of the salar and allow sufficient height for insertion of drainage pipes where required.

The main access road connecting the site with the national road network traverses the Río de los Patos and the Río Aguas Calientes. Two river crossings are required to enable inbound/outbound logistics.

15.2 Built Infrastructure

The infrastructure will contain two types of buildings: site erected steel buildings and modular steel buildings/rooms:

Erected Buildings:

- Maintenance Workshop.
- Equipment Storage.
- Vehicle Workshop.
- Reagent Storage.
- Reagent and Consumable Preparation Building.
- Quick Lime Plant Building.
- Liming Plant Building.
- Softening Plant Building.
- Crystallization Plant / Product Finishing Building.
- Product Storage.
- Boiler Building.

Modular Buildings/Rooms:

- Vehicle support module.
- Administrative Building.
- General restrooms.
- Lunchroom.
- Changing room.
- First aid.
- Access control.
- Truckers room.
- Control Room.
- MV Electric room.
- LV Electric room.

There will be four separate process buildings. The Reagent Storage building will have three areas, one each for quicklime, caustic, and sodium carbonate. The Product Storage building will have a storage capacity of 1,230 tonne of product and will be connected to the bagging area by a covered, closed corridor.

The Liming building will have multiple areas for circuits required to remove magnesium from brine. The Softening building will have a dedicated room containing all necessary circuits including mixing tanks, filters, treatment tanks and ion exchangers, to precipitate and extract any remaining magnesium and calcium, prior to the Crystallization stage. The Crystallization and Product Finishing stages will be placed in one single building to optimize the operation and the footprint. The centrifuge area will be located in the same building. The Product Storage building will contain the final lithium carbonate product bagged in 1-tonne bulk bags. The filled bags will be sealed and stored, ready for transportation in flatbed trucks. Each bag will have a unique bar code attached to it so that it can be traced.

The maintenance workshop will consist of closed building with an electrical overhead crane, workbenches, and different dedicated areas for mechanical repairs, electrical repairs, painting, and welding. It will also include a break room space, an office, and an electrical storage room. The vehicle workshop will be fully dedicated to the maintenance of the truck fleet that will mostly be used for salt harvesting. It will include four bays for truck maintenance, a store area, administrative offices, and restroom facilities.

The site access and security control facilities will include a gatehouse with access control, communications, ablutions, parking, and area lighting. A weighbridge provision will be made for security cameras and display screens in key areas where security or safety risks are considered high. The first aid building will consist of four fully equipped emergency rooms to attend to patients and treat emergencies. This facility will have an emergency phone line to communicate with medical support services.

Administration offices will be sized for 18 people and will consist of offices, conference facilities, restrooms and a break room.

15.3 Camp Facilities

Tango 01 is the name given to the Sal de Vida accommodations camp. Tango 01 can host up to 330 people and is currently used by Allkem staff and contractors principally for exploration work, pilot operations and early works. The Tango 01 camp was originally designed for modular expansion.

Tango 02 is the name to the construction camp, with capacity to accommodate up to 900 people. The construction camp is located next to the process plant area. Buildings are of the prefabricated type.

15.4 Raw Water and RO Water

All raw water will be sourced from wells SVWF12_19 and SVWF21_21 to pumped to the process plant and distributed to the various applications requiring fresh water.

Currently, raw water for camp will be trucked in 30 m^3 trucks from the process plant and stored in three 300 m^3 tanks (one existing and two future tanks) located on the hill immediately west of camp. The RO plant will be located adjacent to the raw water tanks with parallel trains treating 3 m^3/hr. Treated RO water will be stored in two tanks, each of 48 m^3 capacity, connected to the water network. Two additional RO plants and four storage tanks are considered for future expansion.

Significant salt build-up is expected in the pumps and pipe network during wellfield operation. Regular maintenance will be required. Lines will be flushed with raw water to dissolve the encrusted salts. Major maintenance activities will be performed during winter, when several wellfield pumps are expected to be offline. Tees and valves will be present in the pipeline for the injection of flushing water. Raw water will be trucked to the individual injection points and line sections will be flushed to remove salt build-ups.

Raw water from well SVWF 12_19 and SVWF21_21 will be connected and pumped to water tanks in the process area. The raw water system will consist of centrifugal water pumps (duty and standby) and a pipe distribution network to reticulate water to all process areas as required. Raw water requirements in the process plant facilities will be equivalent to the 42 m^3/hr per 15kt stage. Raw water will be used in the demineralized water plant, lime slaking, fire systems amongst other plant uses.

The demineralization (demin) circuit will be a turnkey vendor-supplied package. It will receive raw water and produce demineralized water to supply the boiler for steam production.

15.5 Power Generation and Distribution

Power generation will consist of off grid power generation centers to power the geographically isolated facilities. The configuration will consist of the following:

- Camp: A diesel central serving camp facilities. Later, the Camp will be powered by a power line with renewable energy and an automatic transfer to the diesel central generation will be designed in case the power line is out of service.
- Wellfield: Individual generators with their dedicated fuel tank powering each well during pre- production (approx. 1 year). Once the Power Generation commissioned, the booster stations will be powered by a power line.
- Booster station: Individual generators with their dedicated fuel tank powering the booster stations during pre-production (approx. 1 year). Once the Power Generation commissioned, the booster stations will be powered by a power line.
- A Power Distribution Line will be designed to power the pumps stations, Pilot Plant, and the Camp.
- Main Diesel Generation Plant: Central 6 MW powerhouse and electric distribution system to supply power to the ponds, processing plant, civil infrastructure (buildings), the Power Distribution Line, and the raw water well; implying 5,900 m^3/year diesel consumption (for a 44,500 MWh/year energy consumption. Please see the following Table 15-1).
- A Photovoltaic utility to offset carbon emissions from hydrocarbon power generation has been specified, capable of generating (P50) 45,000 MWh/year.
- In anticipation of future natural gas availability, the scope of the power supply package includes the shift from diesel generation to natural gas, replacing each diesel generator by a natural gas one, maintaining the same general arrangement. This power generation package also includes the photovoltaic unit and the transmission line that connects it to the diesel plant.

Table 15-1 - Power consumptions (MWh/year).

Power Consumption Item	Power Consumption (MWh/year)
Pilot Plan	325
Operation Camp	3,330
Process Plant and Utilities	32,193
Wellfield	8,655

The Tango 01 camp powerhouse will consist of a series of 380 V, diesel generators that will be located to the southeast of the sleeping modules and offices. The future Power Line's substation will be located next to the Genset.

All wells will have the similar configurations that will consist of 380 V diesel generators per pump, depending on the specific requirements, with an external fuel tank (with autonomy of three days) and an electric panel with the well pump starter and a variable frequency drive (VFD). The future Power Line's substation will be located next to the VFD's board.

The booster station will have a similar configuration that consist of 380 V diesel generators and electric panels with VFD per pump. The generators will share an external fuel tank and a fuel distribution (with autonomy for three days at full operation). The future Power Line's substation will be located next to the VFD's board.

The Diesel Generation Centre will be located at the process plant substation and the power configuration will consist of approximately 6 MVA powerhouse and an electrical distribution system serving the plant, Camp, Pilot Plant, ponds, and raw water well areas. The powerhouse will consist of a series of generators of approximately 1,400 kVA of installed power or equivalent derated by the site conditions, which will be housed in weather-proof enclosures. The expected operating mode is 75% running and 25% on standby. The electrical distribution system will consist of a medium-voltage network (13,200 V) connecting the powerhouse with three electrical rooms. The electrical rooms will house the switchgears, the motor control center (MCC) and boards, which will feed the different electrical equipment with the respective transformers. A redundant substation of 13,200/380 V will be located next to each electrical room.

The Diesel Generation Centre will have a heat exchanger system to cogenerate thermal energy to heat water for process use, resulting in efficiency gains.

The electrical distribution system in the process plant will consist of three electrical rooms deployed in different strategic areas to reduce electrical losses. For reliability reasons, the distribution will be redundant and transmitted in medium voltage, hence each electrical room will have a substation comprised by two transformers. In addition, a UPS and battery systems will be installed in each electrical room to power all the critical loads in case of contingencies.

Despite the adoption of diesel power generation in this study, Allkem is targeting 30% of power generation for Stage 1 production to be sourced from photovoltaic energy generated by a site-based solar farm. The Company plans to install this hybrid solution for Day 1 of Stage 1 production. This is not factored into any of the operating costs or economics outlined in this report.

15.6 Fuel storage and Dispensing

Fuel will be trucked to site by a contracted vendor and stored in two principal locations: at camp in two 40 m^3 capacity dispenser units, and at the process plant, in the 240 m^3 capacity tank farm plus one 40 m^3 capacity dispenser unit.

15.7 Reagents

Reagents will be delivered in 1-tonne bulk bags on 28-tonne flatbed trucks. The operator will unload bulk bags from the trucks with a forklift and store them in a dynamic rack system (FIFO). There will be a total of four forklifts in the process plant: one for the warehouse, one for product bagging and two for reagent operations.

15.8 Communication and Control System

The communication system will consist of:

- Site Data Network (WWAN wireless).
- Telephony Services.
- Video Surveillance (CCTV).
- Access Control Systems.
- Intruder Detection System.
- Mobile Radio Communication.
- Measuring and control instruments.
- Process Control System (PCS).
- Fire Detection System.
- Radio communication service.
- Satellite phone service.

The main control system room, which will be located inside the process plant building, will house necessary PC based OIT. OITs will act as the control system SCADA servers as well as configuration and operator stations. The control room is intended to provide a central area from where the plant and well stations is operated and monitored and from which the regulatory control loops can be monitored and adjusted. All key process and maintenance parameters will be available for trending and alarming on the process control system. Centralization of the complete plant will be at the operation control room and the command of operations will be made remotely from the control system workstations.

15.9 Sewage Treatment Plant

Sal de Vida has four sewerage treatment plants: one located at the Tango 01 camp, and three at the Tango 02 Construction camp. The effluent quality will comply with Catamarca Province regulations (Resolution 65/05 Parameters of discharge).

15.10 Fire Protection System

Fire Protection (FP) systems are divided into two main categories:

- Firewater based FP systems that are connected to a fixed firewater distribution system, including the following elements:
  - Firewater supply (storage system and pumps).
  - Firewater distribution (firewater ring-main and feeder lines to firewater users).
  - Delivery systems (e.g., hydrants, hose reels, monitors).
- Other fire protection systems, such as self-contained foam skids and portable/mobile extinguishing systems that are not connected to the firewater distribution systems.

15.11 Drainage System

The process plant will consist of multiple sump pumps in operational areas to collect any spills that may occur.

- Reagent preparation sumps will discharge to the event pond.
- Liming circuit sumps will discharge to event pond to prevent dilution, and if appropriate to the first liming mixing tank.
- Softening mixing tank area sump will discharge to event pond to prevent dilution, and if this is not possible to the first softening mixing tank.
- Softening filter area sump will discharge to the softening filter cake tank.
- Crystallization area sump will discharge to the liquid discards tank.

15.12 Steam System and Water Heating

The boiler system will consist of two boilers each capable of supplying 50% of the total heating requirements of the plant, which includes the heating provided by the hot RO water and mother liquor. Each boiler will be an OEM supplied package which will include a de-aerator, burner, boiler, flu gas stack and steam distribution system. Inlet streams include water from the demin circuit and condensate return. Diesel is pumped from the diesel storage tanks into the boilers.

Outlet streams from the boilers include steam to the crystallization circuit, and steam to sodium carbonate mixing. Steam will heat cold RO water to produce hot RO water when not possible to recover heat from the diesel generators. Steam requirements in the process plant facilities will be equivalent to the 13 t/hr.

15.13 Compressed Air System

Compressed air services for the process plant will be a vendor supplied package. Two plant air compressors, with a third on standby, will distribute compressed air through a filter following by two air dryers in parallel and another filter to a receiver. From there the air will be distributed to service instrument and plant air. Instrument air will be dry and clean air and will be used for pneumatic instrumentation. In addition, another air compressor and drying/filtration system will provide air to the vehicle workshop.

15.14 Construction Materials

Project construction materials can be roughly separated into two different areas, the wellfield and ponds, and the industrial process area.

The brine wells comprise mainly the well casing, its pump, manifold, and its electrical equipment. Then the brine pipelines are made of plastic materials (e.g. HDPE), and the ponds are run from an earthwork platform with its embankment, and then lined (LLDPE, HDPE).

Regarding the industrial area, bulk materials are:

- concrete foundations and pavement.
- steel structures and supports.
- steel and plastic piping, cables trays and wiring, etc.

Regarding process equipment:(thickeners, conveyors, cyclones, boilers, compressors, pumps, filters, steel and plastic tanks, agitators, centrifuges, bagging equipment, heat exchangers, etc.) the main characteristic for process piping and equipment is that they need to deal with salt incrustation, acid, hydroxide, etc., so in many cases plastic material and some exotic steels are used. Most of these materials require certain engineering progress to be specified, and at the same time they are not produced in Argentina. Therefore, purchasing these materials is an important issue to consider.

For the industrial plant, the Owner is responsible for the long lead items provision (process main equipment). Bulk materials and other equipment are on main contractor scope.

For the balance of plant (wellfield, ponds, and some other) equipment and material supply is by the Owner.

Logistics and Warehousing is segregated in the same way, it is the responsibility of whoever purchase it.

15.15 Security

Due to the remote site location, a minimum level of security is necessary. The main security function will be to man the gatehouse at the entrance to the plant and camp and monitor and provide guidance and direction to traffic entering and leaving the site.

Monitoring the weighbridge, fuel dispensing and onsite assets will also be carried out by the security staff. The facilities will include a gatehouse with access control, communications, parking, and appropriate area lighting. Certain areas will be equipped with security cameras and a monitoring room will be equipped with screens for surveillance of key areas where security or safety risks are considered high.

15.16 Conclusion

The Project support infrastructure has been reviewed and is deemed adequate by the employee of Gunn Metallurgy set forth herein to support the processing infrastructure and process operations described in this report.

15.17 Recommendations

Both the temporary and permanent Stage 1 construction support infrastructure can be utilized for the Stage 2 development. The infrastructure can be enhanced to accommodate future upgrade readiness related to new commodity (natural gas, or grid power) introduction.

16. MARKET STUDIES AND CONTRACTS

The information on the lithium market is provided by Wood McKenzie, a prominent global market research group to 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 Project 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.

16.1.1.1 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.

16.1.1.2 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 [$Na_{0.3}(Mg,Li)_3Si_4O_{10}(OH)_2$]. 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 most economical to process. Brines with lower lithium contents can be exploited economically if evaporation costs or impurities are low. Lithium concentrations at the Salar de Atacama in Chile and Salar de Hombre Muerto in Argentina are higher than the majority of other locations, although the Zabuye Salt Lake in China has a more favorable Li:Mg ratio.

16.1.2 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 in yellow.

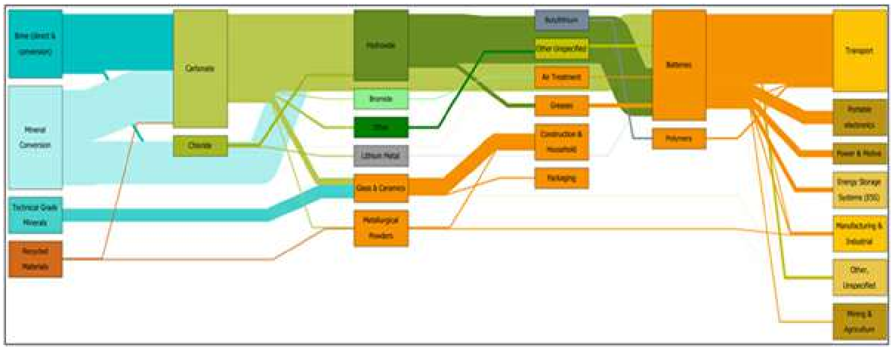


Figure 16-1 - Lithium Industry Flowchart (Wood Mackenzie).

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.

16.1.3 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 (Figure 16-2).

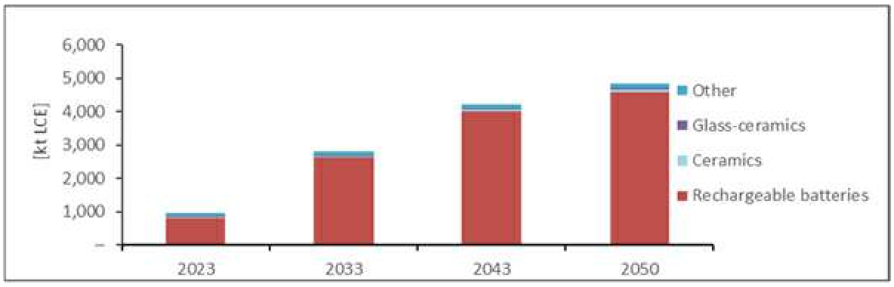


Figure 16-2 - Global Demand for Lithium by End Use, 2030 - 2050 (Wood Mackenzie).

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 (Figure 16-3). 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.

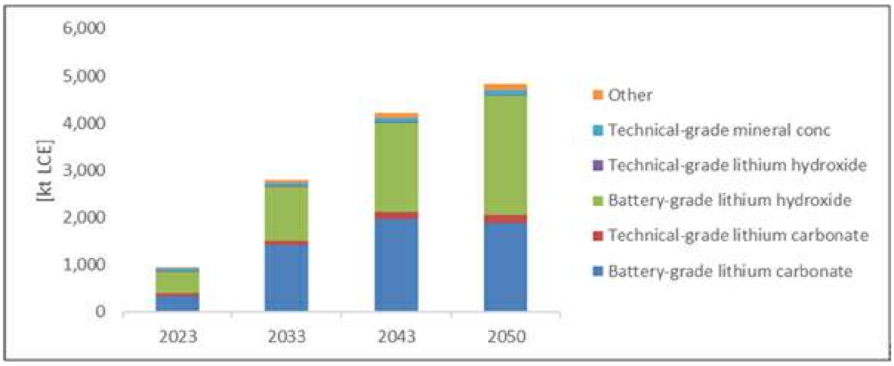


Figure 16-3 - Global Demand for Lithium by Product, 2023 - 2050 (Wood Mackenzie).

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.

16.1.4 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 predict 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, 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.

The pricing used in the financial analysis is taken from the WoodMac pricing projections and these are then applied on a weighted basis to the projected production rates of the three key products. These are Prime which exceeds 99.3% Li content, often referred to as Technical grade, Purified product which is often referred to as Battery Grade and exceeds 99.5% Li content. At Olaroz the Purified product greatly exceeds the Battery Grade specifications and, in some contracts, can attract premium payments. A premium is usually applied to Micronised product.

The pricing outcomes are shown in the financial analysis detail.

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) (Figure 16-4).

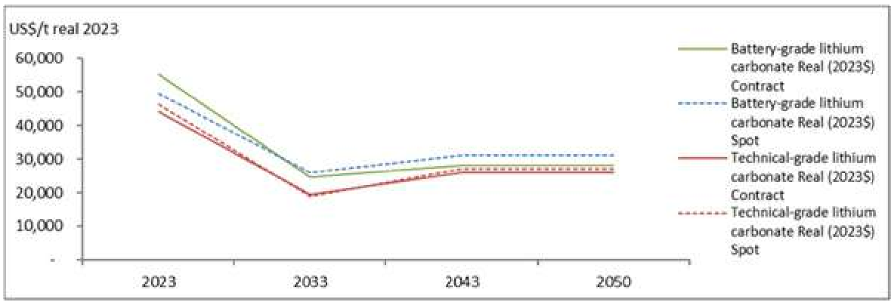


Figure 16-4 - Lithium Carbonate Price Outlook, 2023 - 2050 (Wood Mackenzie).

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.

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 is likely to follow spot price trends albeit with a lag. Over the longer term, Wood Mackenzie expect hydroxide prices to settle at between US$25,000 and US$35,000 / t (real US$ 2023 terms) (Figure 16-5).

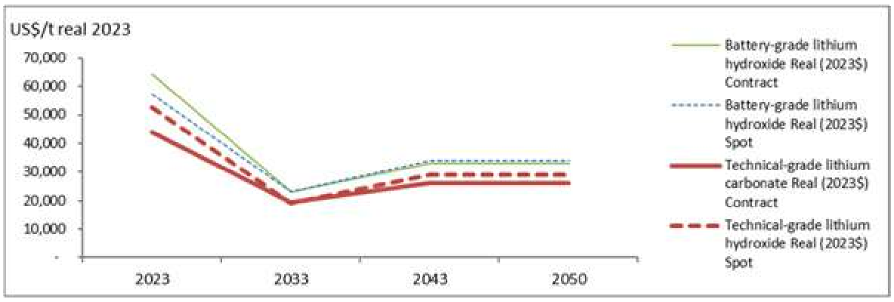


Figure 16-5 - Lithium Hydroxide Price Outlook, 2023 - 2050 (Wood Mackenzie).

16.2.3 Chemical Grade Spodumene

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 forecast a short period of supply volatility in the years to 2030, moving from surplus to deficit, to surplus before entering into a sustained deficit beyond 2031. Reflecting this dynamic, prices are expected to be in line with market imbalances. Wood Mackenzie forecast a long-term price between US$2,000/t and US$3,000/t (real US$2023 terms) (Figure 16-6).

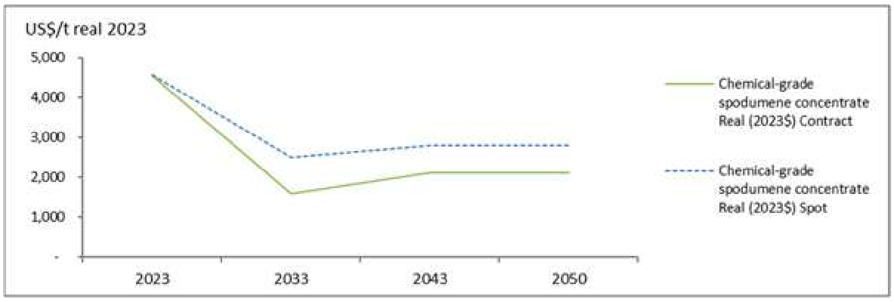


Figure 16-6 - Chemical-grade Spodumene Price Outlook, 2023 - 2050 (Wood Mackenzie).

16.3 Offtake Agreements

As of the date of this Technical Report, Allkem has no existing formalized commercial agreements in place for the sale of lithium carbonate from the Sal de Vida Project. Allkem remains in discussions with potential customers. In line with the Project execution schedule, these discussions are expected to advance to negotiations throughout the course of the Project.

16.4 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 that the long-term pricing assessment indicated in this section is deemed suitable for economic assessment of the Project at the current level of study.

The pricing is based upon the projections of production for the three product types, Prime (close to battery grade specification), Purified (exceeds battery grade) and Micronized. It is universally accepted by banks, investors and knowledgeable industry commentators and consultants at this time that demand will outstrip supply in the next few years. The employee of Gunn Metallurgy is confident that the pricing of lithium products in the near term is not a challenge to the viability of the project. The medium to long term lithium product pricing is not considered to be predictable in the current dynamic and changeable ecommerce industrial environment that determines demand forces.

16.6 Recommendations

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.

It is recommended to further develop diversified customer base and secure off take agreements to support the next study phase and potential expansion.

17. ENVIRONMENTAL STUDIES, PERMITTING, SOCIAL OR COMMUNITY IMPACTS

The following section describes the updated environmental, permitting and social contexts of the Sal de Vida Project.

It is the QP's opinion that the current Sal de Vida plans are adequate for environmental compliance, permitting, and local community relations. The estimated closing and reclamation cost is US$29.2M for Stage 1. Total closure and reclamation cost for Stage 1 and Stage 2 is estimated at US$88M.

In terms of environmental studies, permitting, and social factors, the Project follows all federal and local regulations. Environmental Studies have been submitted during the life of the Project and throughout its different stages. A permit strategy and environmental monitoring plan have also been implemented. Furthermore, the Project is approved by local communities and authorities; the Sal de Vida Community Relations Plan has been applied through a territory-based community management approach, complying with the 70/30 local employee requirement.

In summary, the Project has fulfilled required environmental and social assessments to progress into construction of Stage 1 and is permitted by the provincial mining authorities, reflecting the positive social and socio-economic benefits for local communities.

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 the project by maximizing this renewable energy source through its life. The design basis and infrastructure could allow the project 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 ISO 45001 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 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 which covers the Sal de Vida Project.

17.2 Reference Documents and Permitting Status

The physical and biological baseline data for the Project have been collected over the wider area of the Salar de Hombre Muerto since 2011 (ERM, 2011), with more recent baseline field programs focusing on Stage 1 and Stage 2 up to date (see Table 17-1).

The Sal de Vida project has obtained an international finance via established capital markets and lenders. Updates and integrated approaches to environmental and social variables are being carried out in accordance with international guidelines such as International Finance Corporation (IFC) guidelines, which implies the compliance of a high-performance standard.

Other reference documents include the Social and Environmental Impact Report (EIR) prepared by Ausenco for Allkem in 2021 and 2022, and Allkem's previously mentioned corporate policies.

A further update to the Environment Impact Assessment Report is currently underway, with the aim of the Regulatory submission in August 2023 and renewal of the Stage 1 environmental mining permit (DIA).

17.3 Protected Areas

The Sal de Vida mining project located in the Department of Antofagasta de la Sierra Catamarca (Argentina) according to the legal statement (Notification N° NO-2021-01085055-CAT-DPBANP#MAEMA), is not located within the jurisdictional limits of any Provincial and/or National Protected Natural Area, RAMSAR Site, Biosphere Reserve, or in any other legal figure currently existing conservation in this province. The closest Protected Area to the Project is the Laguna Blanca Provincial Wildlife and Biosphere Reserve, whose northern limit is about 20 km south of the Project area indicated in Figure 17-1. The designated protected areas and Project consideration of these areas are further discussed in this section.

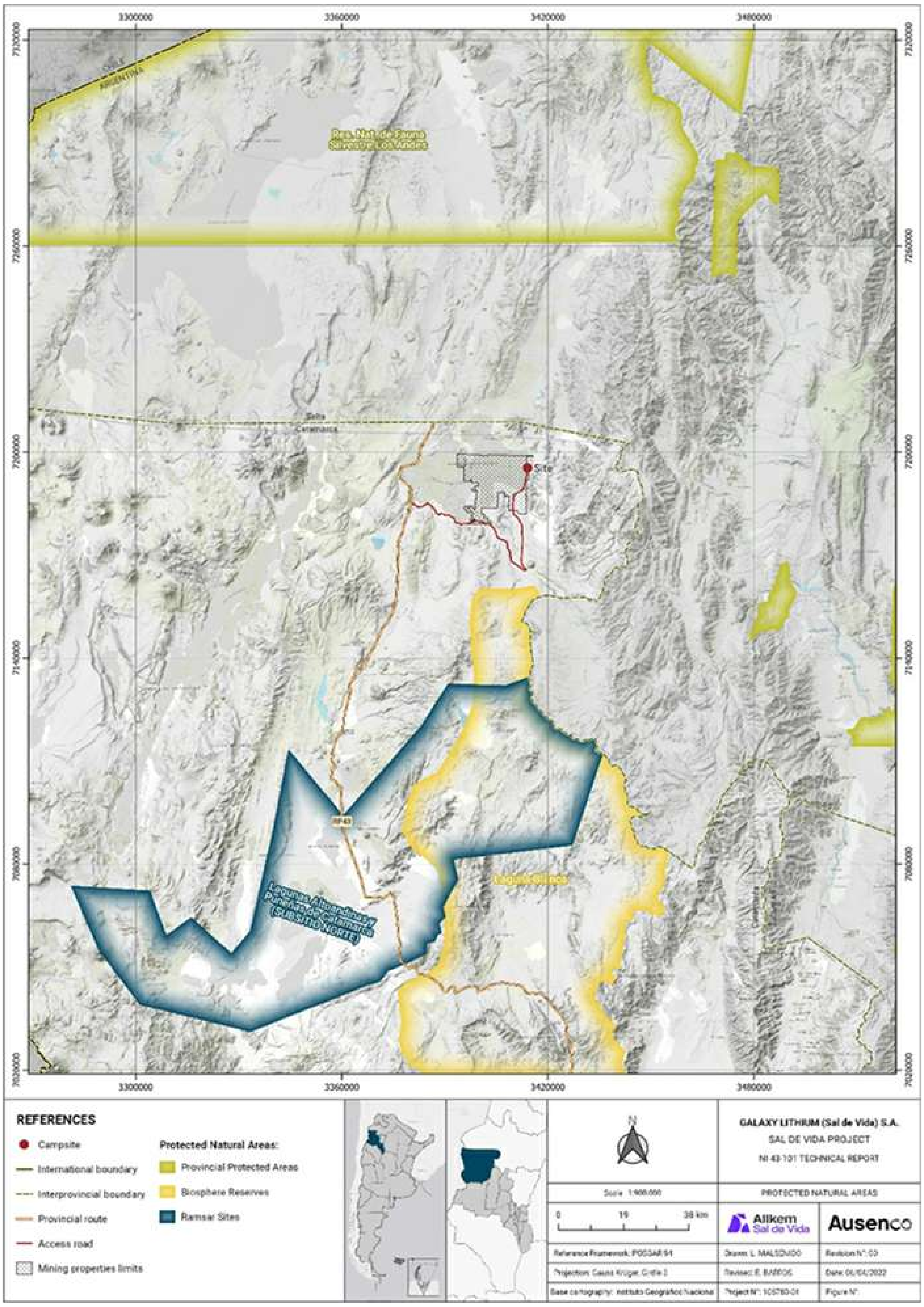


Figure 17-1 - Protected Natural Areas Closest to the Sal de Vida Project.

17.4 Environmental Baseline Studies

Environmental baseline studies were carried out in the Salar del Hombre Muerto area over a number of field seasons starting in 1997. The baseline study area has changed over time as the Project footprint has changed.

- The total water catchment area for Salar del Hombre Muerto is approximately 3,929 km^2. The main perennial streams entering the Hombre Muerto basin salar are the Trapiche River and the Los Patos River, both of which enter from the south and come from two different basins. Estimated total surface water flow to the salt pan is 147 x 10^6 m^3/year. The natural chemical composition of the Los Patos River is brackish and is not suitable for human consumption.
- Water Balance: The following elements can be summarized regarding the baseline water balance (Montgomery & Associates, 2020) and recharge estimates:
  - The average rainfall on the basin is 107 mm/yr, or about 9,150 l/s.
  - The total snow precipitation estimated amounts to 61 mm/yr, of which 39 mm/yr are lost to sublimation and 22 mm/yr are snowmelt.
  - Total precipitation basin is 129 mm/yr, or about 11,050 L/s. Recharge in basins similar to Salar del Hombre Muerto has been estimated to range from 5% to 20% of its volumetric precipitation; therefore, the initial estimated recharge range is approximately 550 l/s to 2,200 l/s.
  - The evaporation discharge estimated from the 2014-2019 satellite images is 1,005 l/s for the low evaporation scenario, 1,708 for the medium evaporation scenario, and 2,697 for the high evaporation scenario.
  - Given that satellite images were only available for a six-year period (2014-2019), the evaporation estimate was adjusted by a long-term correction factor of 0.85 based on the relationship between long-term and 2014-2019 precipitation, assuming that evaporation is proportional to precipitation. After this correction factor was applied, the following long- term evaporation estimates were obtained: 850 l/s, 1,500 l/s, and 2,300 l/s for the low, medium, and high evaporation scenarios, respectively.
  - The higher evaporation estimate is slightly larger than the upper bound of the precipitation recharge estimate (2,200 l/s). The lower bound of the precipitation recharge estimate (550 l/s) is significantly inferior to lower evaporation estimate (~850 l/s). An estimated average recharge rate for the basin would then be in the range of 850 l/s to 2,200 l/s.
  - The current best estimate for recharge is considered 1,500 l/s; however, whenever the recharge estimate is used, we recommend running a sensitivity analysis for recharge rates as low as 850 l/s, or as high as 2,200 l/s. If these sensitivity analyses identify a risk, then a more focused investigation could be required to assess the chance of a having a recharge below or above a specific value (Montgomery, 2020).

17.4.1 Water Quality

17.4.1.1 Surface Water Quality

Surface water sampling campaigns commenced with the 2011 environmental baseline studies at five locations which included one site in the Río de los Patos and one site in each of the Laguna Verde, Vega de Hombre Muerto, Vega de las Ignimbritas, and at the mouth of the Laguna Catal (ERM, 2011). In 2011, samples were taken from areas with no evidence of any type of disturbance and were representative of the baseline in the study area. Results indicated that the water samples had high levels of sulphates, chlorides, boron, arsenic, lithium, TDS. Since 2009 to quarterly water campaigns have been carried out in Los Patos basin river; high arsenic is considered typical of the Puna area.

The evaluation of the historical hydro chemical data confirmed the classification of the water as a sodium chloride type.

17.4.1.2 Groundwater Quality (Freshwater Wells)

Groundwater quality was first sampled in 2012 during the water well drilling program and has been continuously monitored until now. This water is used as raw water for the construction and mining activities. However, it is not potable and is treated via a reverse osmosis (RO) treatment plant that produces potable water.

The groundwater samples were classified as sodium chloride. The predominant anions were chlorides, and the main cations were Na^+ and K^+.

TDS values were lower in groundwater than the ones in surface water.

17.4.1.3 Groundwater Quality (Brine Semiconfined and Confined Deep Aquifer):

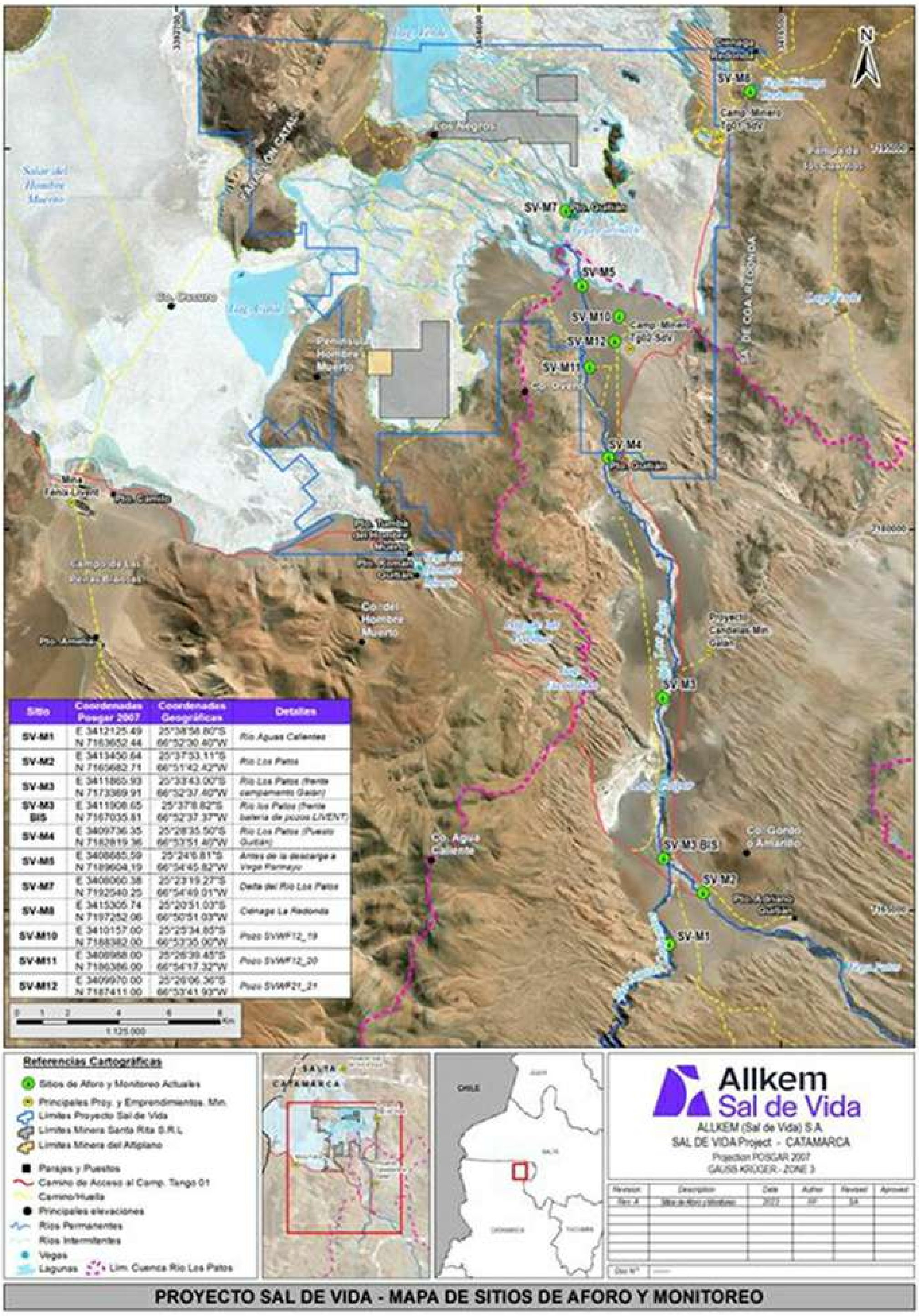
This water quality is discussed in Sections 7 and 15 as it is related to the resource/reserve for the Project.

17.4.1.4 Water Monitoring Program

Current water monitoring program includes streamflow, groundwater level, field water quality parameters major anions and cations and trace metals. Water quality is sampled quarterly, while field parameters and streamflow levels are measured monthly. This frequency was irregular during the last two years because of pandemic restrictions. According to the agreements acquired in the 2021 DIA, the monitoring at sites SV-M4, -M10 and -M11 are conducted with the participation of the local community. From SV-M1 to SV-M5 is measured streamflow and surface water quality and from SV-M10 (SVFW12_19) to SV-12 (SVFW21_21) shallow aquifer levels and field parameters.

The SVFW12_20 (SV-M11) monitoring well has several probes installed that provide information of seasonal variations of water levels and physical-chemical parameters such as TDS, Ph, Dissolved oxygen, temperature, and conductivity through real time data transmission (Wi-Fi).

A location map is provided in the next Figure 17-2.



Sitio	Coordenadas Posgar 2007	Coordenadas Geográficas	Detalles
SV-M1	E 3412125.49 N 7163652.44	25°38'56.80"S 66°52'30.40"W	Rio Aguas Calientes
SV-M2	E 3413450.64 N 7165682.71	25°37'53.11"S 66°51'42.42"W	Rio Los Patos
SV-M3	E 3411860.93 N 7173369.91	25°33'43.00"S 66°52'37.40"W	Rio Los Patos (frente campamento Galan)
SV-M3 BIS	E 3411908.65 N 7167035.81	25°37'8.82"S 66°52'37.37"W	Rio los Patos (frente bateria de pozos LIVENT)
SV-M4	E 3409736.35 N 7182819.36	25°28'35.50"S 66°53'51.40"W	Rio Los Patos (Puesto Quitían)
SV-M5	E 3408680.59 N 7189604.19	25°24'6.81"S 66°54'45.82"W	Antes de la descarga a Vega Pamayo
SV-M7	E 3408060.38 N 7192540.25	25°23'19.27"S 66°54'49.01"W	Delta del Rio Los Patos
SV-M8	E 3415305.74 N 7197252.06	25°20'51.03"S 66°50'51.03"W	Ciénaga La Redonda
SV-M10	E 3410157.00 N 7188382.00	25°25'34.85"S 66°53'35.00"W	Pozo SVWF12_19
SV-M11	E 3408968.00 N 7186386.00	25°26'39.45"S 66°54'17.32"W	Pozo SVWF12_20
SV-M12	E 3409970.00 N 7187411.00	25°26'06.36"S 66°53'41.93"W	Pozo SVWF21_21

Figure 17-2 - Location of current sites of the groundwater and surface water baseline monitoring program.

17.4.2 Air Quality

The parameters evaluated were found in low concentrations in accordance with favorable atmospheric dispersion conditions and limited anthropic activity in the study area.

The last air quality and environmental noise monitoring, which was conducted in December 2022, showed results below the limits established by Law 24.585 for mining activities, for all five sites sampled.

17.4.3 Soils

Soils are generally alkaline in character, especially in the salt pan. Interpreted as being due to the higher concentration of ionic elements supplied by the phreatic water in the salt pan. There is a low level of organic matter in the samples. Where high nitrogen content is found, this corresponds to the organic composition of black, fetid clay. There is a strong concentration of calcium and sodium in the superficial horizon located on the margins next to the salt pan, decreasing in the deeper horizons of the soil profile. No hydrocarbons were detected in any of the samples taken during the 2011 baseline studies. The absence of heavy metals anomalies in the waters implies their absence as well as in the soils affected by them.

17.4.4 Biodiversity Baseline Studies & Monitoring Conducted

The Project is located in the Central Andean Dry Puna Ecoregion. This 118,000 km^2 ecoregion occurs between 3,500 to 5,000 m elevation and is characterized by cold temperatures and aridity, with precipitation 3400 mm per year. Vegetation includes grassy and shrubland steppe habitats. Other habitats include streams, rivers, bofedales (bogs), Vegas, lakes and salt flats. Wildlife characteristics of the ecoregion include vicuna, puma, Andean cat, Andean fox, and three species of flamingo. Endemic plant and animal species are also present. Centuries of livestock grazing, and firewood collection have degraded the Puna but it is considered by World Wildlife Fund as “relatively stable/intact”.

Baseline studies and monitoring reports are available for the SDV project, including the ERM 2011. Environmental and Social Baseline study and several monitoring campaigns carried out in recent years by Knight Piesold (since August 2020, May2023). The 2011 ERM assessment randomly sampled various taxonomic groups and plant communities across the entire project area. The subsequent Knight Piesold monitoring campaigns were more comprehensive and focused on what are considered to be the habitats of highest biodiversity value across the eastern Salar del Hombre Muerto and the Los Patos River basin. These studies provided the basis for the identification of biodiversity values in the vicinity of the Project and supported a Critical Habitat Assessment. In the future as more monitoring campaigns are completed, a better understanding of the variability of biodiversity values both spatially and temporally will be gained (SRK, 2022). Assessments conducted in March 2021 by Knight Piésold Consulting identified only the presence of rainbow trout specimen and no other species of fish were recorded.

17.4.5 Limnology

Since March 2020 to May 2023 baseline studies highlighted the ecological value of the macroinvertebrates that inhabit aquatic lotic ecosystems such as the Río de los Patos since they process organic matter and serve as food for other organisms, such as fish or amphibians. Supplementary studies of the limnological Baseline for the area of influence of the Sal de Vida Project performed by Knight Piésold , made it possible to characterize the taxonomic assemblages of phytobenthos, zooplankton, phytoplankton, and aquatic macroinvertebrates in wetland bodies. Shallow and hypersaline water bodies condition the limnological composition to less richness and abundance of organisms, where species of the Bacillariophytes and Cyanobacteria taxa predominate. In the water bodies with better chemical quality or less saline concentration, macroinvertebrates predominate, and zooplankton are much more abundant.

17.4.6 Ecosystem Characterization

The area of the Sal de Vida Project covers two Phytogeographic Provinces of the Andean Domain: Puna and Altos Andes (Cabrera, 1976). The climate is cold and dry, with very strong winds and precipitation in the form of snow or hail in any season of the year. In general, the higher peaks have permanent snow coverage. The average annual temperature is 3.1°C and the mean monthly temperatures tend to be below freezing for more than half the year; the solar radiation is high, and the thermal amplitude is very large. During 2021, two wetland monitoring campaigns were carried out in the salar basin in order to define the main characteristics of the most fragile ecosystems called Vegas, some of which provide ecosystem services to the local community of Ciénaga Redonda (Table 17-1).

17.4.7 Landscape

The dominant landscape is extensive alluvial and salt flats. The main landscape modelling agents are river run-off and wind action, generating both erosion and accumulation geo-forms. The salar has superficial salt crusts and shallow superficial lagoons. The visual quality is favored by the scenic background, especially in those units of landscape in which steep mountain ranges stand out in different perspectives, with unique elements such as high-altitude hills like the Ratones volcano and the Ciénaga mountain range. There are natural landmarks that increase the visual quality of the landscape, such as the Los Patos River and its delta, meadows, streams, as well as positive cultural landmarks like the Ciénaga Redonda hamlet.

17.4.8 Socioeconomic Setting

The department of Antofagasta de la Sierra is located to the west of the province, 580 km from the capital city of San Fernando del Valle de Catamarca, while the distance between the provincial capital and the head of the department is 608 km. The department consists of the localities of Villa de Antofagasta, El Peñón, Los Nacimientos, el Salar del Hombre Muerto, Antofalla, Las Quinuas, Ciénaga La Redonda, Paraje La Banda, Vega de la Laguna and Río la Punilla. According to the Municipal Census (2018) it has 1,684 inhabitants, with a density of 0.6 inhabitants/km^2. The type of population is rural grouped: 72.7%, rural dispersed: 27.3%.

17.4.9 Archaeology

The 2011 baseline studies provided an archaeological profile of the study area and a reference framework at a regional level, upon which it would be possible to compare and integrate results of future surveys carried out for infrastructure works programmed in the framework of ongoing projects. The Stage 1 area was covered by the 2020 - 2021 archaeological baseline studies (see Table 17-1) and the Stage 2 Project area was studied in the 2022 and June 2023 Geology and geomorphology: Covered in Section 7.

Table 17-1 - Environmental Baseline Field Campaigns.

Month/Year	Environmental Elements	Season	General Comments	Technical Comments
February 1992	Water quality data of Salar del Hombre Muerto Fenix Project	Summer	Published in DIA 1997 Fenix Project	Rio de Los Patos (upstream), Los Patos delta, Laguna Catal and Laguna Verde sites.
July 1993	Water quality data of Salar del Hombre Muerto Fenix Project	Winter	Published in DIA 1997 Fenix Project	Rio de Los Patos (upstream), Los Patos delta, Laguna Catal and Laguna Verde
29 January 1998	Surface water quality	Summer	Sampling done by the Secretary of Water Resources of the Province of Salta, within the framework of the Provincial Sampling Plan	Peak water flow
21 July 1998	Surface water/ quality	Winter	Sampling done by Secretary of Water Resources of the Province of Salta, within the framework of the Provincial Sampling Plan	Low water flow
25 April - 06 May 2011 (ERM, 2011)	Flora, fauna; archaeology; air quality, soils, geology, geomorphology, hydrogeology, hydrology and surface water quality; socioeconomic.	Autumn	Study area consists of much larger area that the Stage 1 Project	Comprehensive baseline study

Month/Year	Environmental Elements	Season	General Comments	Technical Comments
July 2009	Geochemistry evaluation of Salar del Hombre Muerto	Winter	Undertaken by Conhidro for Lithium One	
April 2012	Hydrological Study of Los Patos river basin	Autumn	Carried out by Conhidro for Lithium One	Rio Aguas Calientes, Rio de Los Patos, upstream, confluence, and downstream
February 2018	Water baseline sampling	Summer	Sampling by Secretary of Mining of Catamarca	Five sampling sites along Rio de Los Patos basin (three surface and two groundwater samples)
June 2018	Water baseline sampling	Summer	Sampling by Secretary of Mining of Catamarca	Five sampling sites along Rio de Los Patos basin (three surface and two groundwater samples)
July 2019	Water quality and air quality	Winter	Monitoring sampling by Inducer Laboratory for Galaxy	Five sampling sites along Rio de Los Patos basin (three surface and two groundwater samples)
November 2019	Water	Spring	Sampling by GXY and chemical analysis by Inducer Laboratory for Galaxy	Five sampling sites along Río de los Patos basin (three surface and two groundwater samples)
December 2019	Air quality and noise	Summer	Monitoring and analysis by Inducer Laboratory for Galaxy	Five sampling sites in Salar del Hombre Muerto
February 2020	Water	Summer	Sampling by Galaxy and chemical analysis by EnviroSG lab.	Five sampling sites along Río de los Patos basin (three surface and two groundwater samples)
March 2020	Biodiversity (flora and vegetation, terrestrial and aquatic vertebrates)	Summer	Monitoring campaign carried out by SEIMCAT for Galaxy	Carried out in the area of Project direct and indirect influence.
March 2020	Archaeology	Summer	Carried out by external archaeologist for Galaxy	Survey of proposed main access road site and control of archaeological sites detected in previous campaigns.
May 2020	Water baseline	Autumn	Monitoring sampling by Galaxy	Five sampling sites along Río de los Patos basin (three surface and two groundwater samples)
June 2020	Air quality and noise	Spring	Monitoring sampling by Inducer Laboratory for Galaxy	Five sampling sites in Salar del Hombre Muerto
September 2020	Water baseline	Spring	Monitoring sampling by Galaxy	Five sampling sites along Río de los Patos (three surface and two groundwater samples)
November 2020	Air quality and noise	Spring	Sampling and chemical assays by Inducer Laboratory for Galaxy	Five sampling sites in Salar del Hombre Muerto
December 2020	Water baseline	Summer	Sampling by Galaxy and chemical assays by ALS Lab.	Sampling along Rio de Los Patos basin (five surface and two groundwater sampling points)
March 2021	Water quality	Summer	Monitoring sampling by INDUSER Laboratory for Galaxy	Seven sampling points along the Los Patos River watershed (five surface water and two groundwater samples).
March 2021	Biodiversity Monitoring	Summer	Field campaign and report by Knight Piésold Consultants	Including Wetlands monitoring (fauna, flora, limnology and vicugna and avifauna censuses).
April 2021	Water quality	Autumn	Monitoring sampling by INDUSER Laboratory for Galaxy	Three sampling points along the de Los Patos River watershed (one surface water and two groundwater samples).
May 2021	Archaeology	Autumn	Archaeological survey and monitoring performed by external archaeologist for Galaxy	Survey of the future bypass route and control of archaeological sites detected in previous campaigns.

Month/Year	Environmental Elements	Season	General Comments	Technical Comments
July 2021	Water quality	Winter	Monitoring sampling by Alex Stewart Laboratory for Allkem	Monitoring sampling by Alex Stewart Lab for Allkem. Seven sampling points along the de Los Patos River watershed (five surface water and two groundwater samples).
September 2021	Water quality	Spring	Monitoring sampling by Alex Stewart Laboratory for Allkem	Monitoring sampling by Alex Stewart Lab for Allkem. Seven sampling points along the de Los Patos River watershed (five surface water and two groundwater samples).
November 2021	Air quality and Environmental Noise	Spring	Monitoring sampling by ENVIRO SG Laboratory for Allkem	Five sampling sites in Salar del Hombre Muerto
November 2021	Biodiversity Monitoring	Spring	Field campaign and report by Knight Piésold Consultants.	Including Wetlands monitoring (fauna, flora, limnology and vicugna and avifauna censuses).
March 2022	Water Monitoring	summer	Monitoring sampling by AKE staff and assays by Alex Stewart Laboratory	Eight sampling points along the de Los Patos River watershed (five surface water and three groundwater samples).
May 2022	Archaeology	Autumn	Archaeological survey and monitoring performed by external archaeologist for Allkem	Survey along the MAKTUB Road, Tumba del Hombre Muerto, by pass south trace and control of archaeological sites detected in previous campaigns.
June 2022	Air quality and Environmental Noise	Winter	Monitoring sampling and assays by INDUSER Laboratory for Allkem	Five sampling sites in Salar del Hombre Muerto
June 2022	Water Monitoring	Autumn	Monitoring sampling by Environment staff of AKE and assays by Alex Stewart Laboratory (certified)	Eigth sampling points along the Los Patos River watershed (five surface water and three groundwater samples). Sampling in conjunction with Regulators and community.
August 2022	Biodiversity Monitoring	Winter	Field campaign and report by Knight Piésold Consultants.	Including Wetlands monitoring (fauna, flora, limnology and vicugna and avifauna censuses). Footprint Stage 2 and future area of Los Patos bridge.
September 2022	Water Monitoring	Autumn	Monitoring sampling by Environment staff of AKE and assays by Alex Stewart Laboratory (certified)	Eigth sampling points along the Los Patos River watershed (five surface water and three groundwater samples).
September 2022	Air quality and Environmental Noise	Spring	Monitoring sampling by INDUSER Laboratory for Allkem	Five sampling sites in Salar del Hombre Muerto
December 2022	Biodiversity Monitoring	Summer	Field campaign and report by Knight Piésold Consultants.	Including Wetlands monitoring (fauna, flora, limnology and vicugna and avifauna censuses). Footprint Stage 2 and future area of Los Patos bridge.
December 2022	Water monitoring	spring	Monitoring sampling by Environment staff of AKE and assays by Alex Stewart Laboratory (certified)	Eigth sampling points along the Los Patos River watershed (five surface water and three groundwater samples). Sampling in conjunction with Regulators and community.
Marzo 2023	Water monitoring	summer	Monitoring sampling by Environment staff of AKE and assays by Alex Stewart Laboratory (certified)	Six sampling points along the Los Patos River watershed (three surface water and three groundwater samples). Sampling in conjunction with Regulators and community.

Month/Year	Environmental Elements	Season	General Comments	Technical Comments
May 2023	Biodiversity Monitoring	Autumn	Field campaign and report by Knight Piésold Consultants.	Including Wetlands monitoring (fauna, flora, limnology and vicugna and avifauna censuses).
June 2023	Archaeology	Autumn	Archaeological survey and monitoring performed by external archaeologist for Allkem	Survey in the Stage 2 footprint, Tumba del Hombre Muerto and control of archaeological sites detected in previous campaigns.
June 2023	Water Monitoring		Monitoring sampling by Environment staff of AKE and assays by Alex Stewart Laboratory (certified)	9 samples along Los Patos River watershed (six surface water and three of groundwater samples). Sampling in conjunction with Regulators and community.

[1] The arsenic and other heavy metal concentrations are related to the geological outcrop.

17.4.10 Mining Waste

The Project will generate discarded salts and liquid waste during the process, mainly brines, which are not expected to represent a contamination risk. This liquid waste will be sent to the waterproofed waste/discard disposal facilities. The Project does not require a tailings storage facility.

This waste/discard disposal facility will consist of halite stockpiles, muriate stockpiles and co-disposal stockpiles surrounding the halite ponds. The facility will cover a total area of approximately 402 300 ha for Stages 1 of the Project. The salt piles will average 30 m in height and will be built principally on the salt pan surface. Further details on waste/discard disposal can be found in Chapter 14.2.4 - Waste Disposal.

The salts are generated from brines already present in the salt flat and do not introduce foreign compounds to it. Basically, they are composed of sodium chloride (common salt), potassium chloride, sodium and calcium sulphates, magnesium hydroxide and boron. It is estimated that sodium chloride and sulphate make up over 94% of this waste.

The main process waste/discards will include:

- Solid discards from the evaporation ponds: these will comprise harvested salts from the halite and muriate ponds. These salts will be generated from around Year 2 of production, since the salt layer and harvestable layer must be in place at the base of each pond before the first harvest can be undertaken.
- Solid-liquid waste/discards from the process plant:
- Liming solid discards: primarily precipitated magnesium hydroxide, borate salts and gypsum.
- Softening solid discards: primarily precipitated calcium carbonate and magnesium carbonate.
- Mother liquor that is not used in the process: a portion of the mother liquor generated from the primary lithium carbonate plant will be discarded since it is not required in the process.
- RO plant retentate (reject).

- Steam boiler retentate.
- Any sump pump solutions that cannot be recycled within the process.

All waste/discards will be disposed as follows:

- Co-storage of solids and liquids: the co-storage area will be around the halite ponds for both process plant discards/wastes and harvested halite salts. It will consist of an area of approximately 402 ha.
- Since the generation of solid-liquid discards from the process plant begin before the harvesting of any salts from the pond, these discards will be treated differently during the first two years. During the first two years all, liquid discards generated from the process will be sent to an event pond, which will be located near the process plant. After Year 2 of production, the event pond will only be used for unprogrammed events. All solid discards will be sent to de co-disposal area, to be stockpiled in the harvested salts storage area. From Year 2 of production onward, the solid salts harvested from the halite evaporation ponds will be sent to the same co-disposal area and will be deposited around the initial 2 years of solid stockpile built up to that date, generating a containment dam. From Year 2 of production onward, both liquid and solid waste from the process plant will be mixed in a tank located near the process plant and sent as a pulp (or slurry stream) to the co-disposal area, to be co-disposed in the containment dam within the halite salts. This will operate for the remainder of the Project life.
- Halite stockpile: not all harvested halite salts will be sent to the co-disposal area. Some halite salts will be stockpiled separately to be used as construction material for future evaporation ponds. These salts will be sent directly to the halite stockpile area by truck after being harvested, to be stockpiled accordingly. The total area available for the halite stockpile will be 20.8 ha.
- Muriate stockpile: all muriate salts that are harvested will be stockpiled separately. These salts will be sent directly to the muriate stockpile area by truck after being harvested, to be stockpiled accordingly. The total area available for the muriate stockpile will be 46.3 ha.
- The infrastructure of these areas (stockpiles of harvesting salts) will include mainly of access roads on ramps and systems of containment, such as low-height berms at the base, to retain slurry effluents that can filter from salt stockpiles. In addition, the entire bases of the harvesting salts piles will be waterproofed with 1mm thick HDPE geomembrane.
- The Environmental Control Program (PCA) for of the Process Waste Management is a legal requirement (DIA 2021) which was submitted to Mining Authority for approval.

17.5 Permitting

17.5.1 Environmental Impact Assessment Permit

Within the Argentinian regulatory framework, the Environmental Impact Assessment Report (EIA) allows for one to obtain a Declaration of Environment Impact (DIA), which is the legal instrument that governs all of a Project's exploration, construction, and exploitation activities, and it must be updated every 2 years (Article 11 of Federal Law No. 24.585). The Sal de Vida Project has an approved DIA, Resolution 2021-781- E-CAT-MM, which enables the Project to construct and operate within the constraints of the issued permit. This approval is included in Allkem's DIPGAM file E4220/2013 (Allkem's file with the Secretary of Mining of the Province of Catamarca) for the proposed Sal de Vida operations.

The DIA approvals for the Project are shown in Table 17-2. The DIA submission includes, and its approval generates, a series of commitments and obligations. Obligations and commitments include, but are not limited to schedules, investment commitments, social obligations, environmental monitoring and audits, and safety conditions. Breaches of these commitments and obligations may result in sanctions, fines, project suspensions and, after an administrative procedure, in the cancellation of the environmental permit.

Table 17-2 - Exploitation Permits for Sal de Vida Project.

Permit Name	Date Filed	Approval Resolution	Approval Date	Expiration Date	Observations
DIA for Exploitation	-	Resolution SEM 256/2014	March 20, 2014	(Updated)	Production of 25,000 tpa of lithium carbonate (Li_2CO_3) and 107,000 tpa of potassium chloride (KCl). A description of the Project's flowsheet, infrastructure, layouts, studies, and environmental impacts were included in the submission.
DIA, Extension Request (1 year)	April 2016	-	-	(Updated)	Request filed with DIPGAM for 1-year extension to biannual update requirement for DIA. Request based on statement that none of the activities approved in Resolution SEM 256/2014 have been carried out.
DIA, Second Extension Request (6 months)	April 2017	Resolution SEM 147/2017	March 3, 2017	(Updated)	A 6-month extension of the deadline to present the DIA update was granted.
Biannual Update, Environmental Impact Declaration DIA for Exploitation	June 3, 2018	Resolution SEM 639/2018	August 24, 2018	(Updated)	Approval of the update of the general DIA and construction of a pilot plant; drilling of seven wells to 150 m; two wells to 400 m; and four wells to 260 m; Relocation of the Ratones camp.

Permit Name	Date Filed	Approval Resolution	Approval Date	Expiration Date	Observations
					Approved for 6 months.
Biannual Update, Environmental Impact Declaration DIA for Exploitation	February 22, 2019	Resolution SEM 676/2019	July 31, 2019	July 30, 2021 (update submitted for approval)	Approval of the update of the general DIA and approval to drill eight production wells in the East Wellfield
Biannual Update, Environmental Impact Declaration DIA for Exploitation	March 1, 2021	Resolution 2021] 781-E-CAT-MM	December 21, 2021	December 21, 2023	Update of the general DIA Resolution SEM 676/2019 and requesting approval to build ponds and plant of lithium carbonate (Li_2CO_3) for Stage 1. A description of the Project's flowsheet, infrastructure, layouts, studies, and environmental impacts and mitigation plans were included in the submission.
Addendum 2022	March 2022	Resolution 2022- 11013-E-CAT-MM	December 20, 2022	December 20, 2023	String 3 expansion
Biannual Update, Environmental Impact Declaration 2023	August 2023	To be granted	To be granted	December 2025	Not include stage 2 expansion Only early works and updated status of the approved works in DIA 2021/Addendum 2022 and mining activities associated.

The DIA update submitted on March 1, 2021, includes the brine distribution system, 320 ha of evaporation ponds, the latest flowsheet and lithium carbonate plant, and onsite infrastructure for Stage 1 of the Project. The early works including the East wellfield were previously approved in the application filed on February 22, 2019.

17.5.2 Permits Required for Construction and Operation

Table 17-3 summarizes the permit applications to support construction and operations for the Stage 1 Project that have been approved or are pending approval.

17.5.3 Water Permit

Last November 2022, the concession for the use of groundwater for mining purposes was granted to the Company Galaxy Lithium -Sal de Vida S.A. C.I.U.T. Nº 30-71105187-9 of two (2) perforations, with a flow of 130 m3/h for each one, in the Los Patos River Basin in the Salar del Hombre Muerto - Antofagasta de la Sierra Department, in the following identifications and coordinates:

SVFW12-19 Lat 25º 25 ’34, 85” S Long 66° 53’ 35,00” O

SVFW21-21 25° 26 ’6,36” S Long 66° 53’41,93” O

The Monitoring Plan and Early Warning System was approved, as an Annex that forms an integral part of the Water permit Decree M.A.E. y M.A. N° 2867.

A set of monitoring narrow wells will be drilled during next months on alluvial fan of Los Patos River in order to comply with the requirements of the water decree. Additionally, two snows and water flow gauge stations should be installed at defined coordinates to maintain the water permit current.

Regarding the use of surface water, the company declared in 2021 that the SDV Project will not use water from the Ciénaga Redonda community or the Los Patos River as part of its social and sustainability commitment.

17.6 Approvals & Permits

Allkem maintains various permits as described in Table 17-3.

Table 17-3 - Sal de Vida permits and status.

Permit	Status	Regulator	Comments / Observations	Validity / Renewal
Environmental Impact Assessment (EIA)	Renewed	Ministry of Mining (Provincial)	To be updated in a bi-annual basis (at least). Update must be approved by DIPGAM Authority. Last Approval by Resolution RESOL-2021-781-E-CAT-MM on 20/12/2021.	20/12/2023.
Addenda of EIA	Granted	Ministry of Mining (Provincial)	String 3 (15.000 TPA LCE): Addenda submitted in August 2022. Considering the scope of Art 1 and 6 de la DIA 2021.	20/12/2023.
Chemical precursors (reagents)	Granted	RENPRE (Federal)	To be renewed annually. Mandatory quarterly reports on usage and traceability of precursors to be submitted to regulators to maintain good standing for future renewals.	1 year (May 2024)
Easements	Granted for groundwater and camp site. Granted for services and infrastructure.	Mining Court	Groundwater easements issued by Mining Judge. Services and infrastructure easement obtained in December 2020.-	LOM
Fresh Water	Groundwater - granted	Water Authority (Provincial)	Groundwater: permit granted to extract 130m^3/h for well SVW12_19 and well SVFW21_21 (November 2022). *Mandatory monitoring and studies to be submitted to the Water Authority in order to keep the permit in good standing.	LOM*
Sewage - Camp and Industrial wastewater	Granted	Environment Province Secretariat	The treatment plant (Tango 01 and Tango 02). It was renewed on 12.21.2022.	Expire 12.21.2024.
Quarries	Granted	DIPGAM (Provincial)	Quarry B, D, E, G, K, N, P and others, granted. Paperwork pending to file. If new quarries would be needed, new filings are required.	Two and six years
Fuel Tank	Granted	SEN (National Energy Secretariat) (Federal)	External Auditor Approved installation for use. To be reviewed and updated for construction and operation needs.	Expire Dec 2023.
Liquid Gas	Granted	YPF (Service Provider)	Approval delivered by YPF with services contract and licences. To be reviewed and updated for construction and operation needs.	1 year
Hazardous Waste	Granted	Environmental Authority (Provincial)	Expte N° 18587/17 Type Y48, Y8, Y9, Y31, Y34, Y35 and Y48. Each contractor obtained its permits.	Expires on March 2024. Annual renewal.
Hazardous Waste Pathogenic (nursery)	Pending	Environmental Authority (Provincial)	The documentation for the renewal was submitted on 30th November 2021. In the context of the pandemic this permit is important.	11/11/2023. Annual renewal.
Trucks	Granted	RUTA (Federal)	Only for transportation of domestic waste.	LOM

Permit	Status	Regulator	Comments / Observations	Validity / Renewal
Commercial license	Granted	Municipality of Antofagasta de la Sierra (Municipal)	Annual renewal.	
Radio Communications	Pending	ENACOM (Federal)	Filed March 2020	To check IT
Drone	Pending	ANAC (Federal)	License for users needed	To check IT
Register of Mining Investment	Granted	Federal Secretary of Mining (Federal)	Granted in 2013 (To be updated if we want to reset tax stability regime)	LOM
Register of Mining Producers	Granted	Provincial Mining Ministry (Provincial)	Updated for Addenda.	1 year (Aug 2023).
Tax Stability	To be granted	Federal Secretary if Mining (Federal)	Filed in 2013 - Certificate pending (if we decide to reset tax stability, we will need to do a new filing)	30 years
EIA - Solar Plant	Granted	Environmental Authority (Provincial)	Annual renewal.	Expires on 12.22.2023

Acronyms:

RENPRE: Registro Nacional de Precursores Químicos / National Registry of Chemical Precursors

ANAC: Administración Nacional de Aviación Civil / National Administration of Civil Aviation

ENACOM: Ente Nacional de Comunicaciones / National Entity of Communications

RUTA: Registro Único de Transporte Automotor / Vehicle license for transportation

DIPGAM: Dirección Provincial de Gestión Ambiental Minera / Provincial Direction of Mining Environmental Management

EANA: Empresa Argentina de Navegación Aérea / National Aviation Agency

AFIP: Administración Federal de Ingresos Públicos / Federal Tax Bureau

EIA: Environmental Impact Assessment

17.6.1 Environmental Insurance

Environmental insurance requirements are prescribed by Argentinian National Law No. 25.675 and by Resolution No. 19/12 by the Secretariat for the Environment and Sustainable Development of Catamarca. This resolution requires mandatory insurance coverage, sufficient to guarantee the financing of any environmental remediation. The insurance must be in place to obtain any related permits, authorizations, registrations, and Environmental Impact Statements. It is an essential requirement for the issuance of certain permits, such as the National Hazardous Wastes registration (Blue Pampa, 2019).

Allkem has insurance (Mandatory Environmental Insurance- SAO) for all early work activities and has extended its coverage to coincide with the ongoing construction activities. Insurance coverage is reviewed annual and adjusted to suit ongoing Project activities.

17.6.2 Environmental Liabilities

The Project is not subject to any known environmental liabilities. There has been active ulexite mining within the boundaries of the existing land agreement, but the operations are limited to within 5 m of the surface and will naturally be reclaimed fairly quickly once mining has halted (Houston and Jaacks, 2010).

17.7 Social and Community Considerations

17.7.1 Project Setting and Social Baseline Studies

The original sociocultural baseline was conducted in 2011 (ERM, 2011). In 2018, the National Council for Scientific and Technical Research (CONICET), in conjunction with the University of Salta, conducted a social survey in the Ciénaga La Redonda community immediately to the east of the Project area. In 2020, an update of the social baseline and social perception study were carried out, then in 2022 the company carried out a complementary social baseline which emphasized the inhabitants of the Salar del Hombre Muerto.

In the area of the Salar de Hombre Muerto there are five population centers: Antofagasta de la Sierra and Ciénaga La Redonda in the Province of Catamarca, and Pocitos, San Antonio de los Cobres and Santa Rosa de los Pastos Grandes in the Province of Salta. (ERM, 2011). The closest settlement to the Project is Ciénaga La Redonda, which is approximately 5 km by road from Allkem Sal de Vida’s Tango 01 camp. Allkem Sal de Vida updated the social reference report by carrying out the following studies:

- A complementary social baseline (2022)
- Previously in 2020 Sal de Vida performed:
    - A social perception survey with local communities.

  - A new socioeconomic baseline based on the 2011 ERM report.
  - A survey of local suppliers, particularly in the Province of Catamarca.
  - A study of local competencies in the area of direct influence and the Province of Catamarca.

17.7.2 Socioeconomic Aspects

The department of Antofagasta de la Sierra is made up of the towns of El Peñón, Antofalla, Los Nacimientos, Ciénaga Redonda, and Antofagasta Villa, which are dispersed rural towns. Currently there are 1,684 inhabitants in the entire department (Municipal Census 2018). Villa de Antofagasta is the departmental head, being a single third-category municipality. The Municipality does not have a Deliberative Council or Municipal Charter. The population is rural, 60.1% resides in Villa de Antofagasta, the rest is distributed in the aforementioned localities.

The age structure of the population shows a particular concentration of inhabitants in the central active ages, namely, 25 - 29 and 30 - 34 years; This concentration is more accentuated in the male population than in the female population, which is attributed to a phenomenon of population attraction associated with the development of mining activity in recent years.

We can recognize two emigration processes in the department, both on a small scale. On the one hand, there is seasonal family migration between the months of June and August associated with climatic reasons towards Belén and the provincial capital. On the other hand, there is the migration of young people to the provincial capital, Belén or Salta for study purposes. However, few families can bear the economic costs of having one of their members in another jurisdiction.

According to the 2010 Census, the percentage of households with Unsatisfied Basic Needs (UBN) in the department is 17.5%, compared to 11.4% at the provincial level and 9.2% at the national level. Regarding the quality of the dwellings, almost all of them (97.8%) have an insufficient quality and only 2.2% have a satisfactory quality. In general, connections to basic services are insufficient. According to the 2010 Census, only 30.3% of the dwellings in the department are connected to the sewage system. The rest of the inhabitants have septic tanks.

The school term in the department begins on August 20 and lasts until mid-June, with a school break at the end of the year. In total, the department has 3 preschools, 5 primary schools, and 3 secondary schools. In 2021 Allkem Sal de Vida contributed to the communities of Antofagasta de la Sierra with the construction of two schools: Secondary School No. 27 in El Peñon and the expansion of Primary School No. 494 in Villa de Antofagasta.

Antofagasta de la Sierra has a low-risk care hospital with single hospitalization. In the districts there are health posts run by nurses or health workers.

Outside the mining sector, opportunities for qualified formal employment with wages above the minimum wage are scarce. Thus, the development of self-employed activities or family businesses in services and commerce is limited by the restricted purchasing power of a large part of the families in the population, as well as by the absence of credit options adapted to the local reality.

In the last three years, a boost has been given to local development initiatives and expectations of improving the quality of life, attributed to the development of mining activity and the associated royalty system. The improvements can be seen mainly in the area of public works and access to basic services.

Municipal employment absorbs about 70% of the municipal budget. If this figure is considered in percentage terms, it is possible to estimate that around 47% of the economically active population works as a municipal employee.

Since 1990, mining has begun to gain momentum in the department, becoming the main economic activity of the private sector.

Tourism is the second most important economic activity in the private sector. Its development is based on the initiatives of extra-local tourist guides and the private ventures of local families that have created lodgings, restaurants, diners, and craft shops.

Livestock is an important source of family support for households in the department. The production of sheep and camelids is the most important and, second place, goats.

17.7.3 Indigenous Communities

In Antofagasta de La Sierra, there are two indigenous communities, as described below.

Kolla-Atacameña de Antofalla Community: it is the only native community officially recognized within the department of Antofagasta de la Sierra by Resolution No. 158 of the National Indigenous Institute (INAI), issued on May 4, 2007. It is made up of 60 people. According to the information provided by the Cacique of the Community, 45 of them reside in Antofalla, while another 15 members are scattered in the vicinity of the territory, in houses called “stone huts”.

The internal organization system of the Kolla-Atacameña de Antofalla community is made up of a Cacique, the Council of Elders (made up of a total of 18 people, including men and women), an administrator, a treasurer, a delegate from the North and a South delegate. All these authorities are elected in an open assembly every two years. At the time of the survey and given the health emergency decreed at the national level as a result of COVID 19, the assembly to elect the new cacique had not yet been held in Antofalla. The term is two years.

Community members do not have individual title to the land. The land is managed by the community and has been endorsed by national regulations (INAI). It is precisely on this premise that the community consultation processes are based, which are carried out prior to the implementation of any mining project. Although each family or individual owns their own land, it is not formally demarcated.

Mining activity is strongly established in the Antofalla community and constitutes, together with tourism, the main source of employment for the population. Even before the arrival of the mining companies, there was a strong "mining culture" due to the artisanal development of this activity (mainly gold and silver mining).

Atacameños del Altiplano Community: In the Salar del Hombre Muerto there is an identity emergency process that corresponds to the creation of an indigenous community called "Atacameños del Altiplano". This native community still does not have legal status or technical or legal cadastral studies, its formation is in process, the community has submitted documentation to the INAI during 2020 and is awaiting the resolution. The community is made up of a small number of people, some from Ciénaga Redonda and families from places in the Salar del Hombre Muerto.

Sal de Vida currently works actively with the two indigenous communities through the implementation of solid community programs for the inclusion of indigenous peoples (infrastructure projects, training, health and well-being, etc.).

17.7.4 Identification of Social Risks and Opportunities

It is expected that there will be both positive and negative social impacts from the Sal de Vida Project on the surrounding communities. A potential negative impact could be the influx of new people to the area and its effect on public infrastructure and resources, such as housing, clinics, schools, municipal services, and the potential to affect local cultural values. The growing activity derived from the construction and operation of the Project will have a positive impact on the revitalization of the local and regional economy. Local communities in the area of influence will be able to access jobs with social benefits, medical services, retirement contributions and good contracting conditions.

As part of the social commitments and compliance with the requirements established by the Catamarca Mining Authority, Allkem Sal de Vida has been working with the government on community participation programs designed to:

- Train and improve the skills of people from local communities.
- Prioritize the hiring of local operators and technicians in the area of influence.
- Work with the University of Catamarca and technical schools to develop professionals for future positions.
- Consider gender and diversity perspectives in the processes of hiring local labor and in community projects.

17.7.5 Community Relations

The Sal de Vida Project has a Community Relations Plan (PRC) whose objectives are:

- Implement and develop CRP programs to maximize the positive effects of the Project and optimize the relationship between Sal de Vida and the communities and institutions in Antofagasta de la Sierra.
- Minimize the risks of misunderstandings that may arise between Sal de Vida and local communities by having conflict resolution strategies.
- Encourage families, residents, and institutions to take advantage of sustainable development opportunities, based on joint work with local communities to identify such opportunities.
- Establish an information and consultation system open to the community on the activities carried out by Allkem Sal de Vida in its Project areas and activities in the areas of influence.

The programs established in the CRP are:

- Program of Communication and Commitment with the Population.
- Local Training and Employment Program.
- Program for Procurement and Purchase of Local Goods and Services.
- Program for the Development of Infrastructure and Productive Projects.
- Support Program for Sports, Cultural and Educational Initiatives.
- Community Health and Wellness Program.

Sal de Vida in the year 2023 has increased new programs internal procedures to improve community management, which are mentioned below.

- Community Complaints and Claims Procedure
- Procedure Identification of Community Infrastructure Needs
- Local Labor Hiring Procedure
- Strategic Communication Program
- Program to Strengthen Livestock Farming for Local Rural Producers
- Indigenous Peoples Program
- Stakeholder Participation Program
- Intangible Cultural Heritage Strengthening Program
- Instructions for Good Practices in the Community

The programs establish commitments that include deadlines and schedules as appropriate and that are aligned with Allkem Sal de Vida’s four-pillar approach to social initiatives and projects within its sustainability framework, namely education and employment, sustainable development and culture, health and wellness and infrastructure.

The Sal de Vida Project has also defined a territorial community management approach. This approach specifies the following points:

- Open door communication policy with the community.
- Early and constant contact and relationship with institutions, organizations, and the community in general.
- Identification and characterization of communities, idiosyncrasies, mapping of social actors, survey of common social problems.
- Early response to inquiries and claims.
- During 2021 Allkem Sal de Vida completed important works in Ciénaga Redonda for the benefit of its inhabitants: construction of a first aid post, construction of a sports field, construction and improvement of sanitary facilities, implementation of water heaters with solar panel technology and has implemented a successful training program that was developed in all the communities of the department of Antofagasta de la Sierra. The training program was designed and established so that the inhabitants near Sal de Vida can be trained in issues of the lithium industry and thus acquire skills that allow them to have job opportunities within the Sal de Vida Project.

Since 2021, Sal de Vida has been developing a “Completion of Education” program that benefits project collaborators, the communities of Ciénaga Redonda and Antofalla. This program is carried out jointly through an agreement signed with the Ministry of Education of Catamarca. Allkem aims to support local communities by maximizing health, well-being and the acquisition of local goods and services while upskilling and providing future employment opportunities. During CY21, Allkem undertook a number of initiatives including:

- Industrial technical training program in Antofagasta de La Sierra, carrying out more than 43 courses attended by more than 600 people.
- The development of local suppliers in Antofagasta de La Sierra, establishing a local laundry service for the Sal de Vida project.
- Implementation of Health and Well-being Days in the towns of Antofagasta de la Sierra, which involved talks by medical professionals on the prevention and care of different conditions and pathologies in all communities.

As of March 31, 2022, more than 70% of local employees are from Catamarca and Stage 1 will create approximately 900 full-time positions at peak construction and 170 full-time positions during stable Stage 1 operations.

Engagement with the provincial government and stakeholders, including the Antofagasta de La Sierra communities, regarding project updates continues.

17.7.5.1.1 Successful Community Programs Period 2022 - 2023

IMPLEMENTATION PROGRAMS OF UNIVERSITY TECHNIQUE IN LITHIUM BRINE

Background: It is observed that in the Antofagasta de La Sierra department there is no tertiary and/or university educational proposal.

Proposal: Framework Agreement between the Faculty of Technology of the National University of Catamarca, the Municipality of Antofagasta de La Sierra, and the company Allkem Sal de Vida, for the implementation of University Technique in Lithium Brines. In May 2023, the first year (of three) of the Brine Technician completed successfully, to resume the second year in September 2023.

Alliances: Faculty of Technology of the National University of Catamarca, Municipality of Antofagasta de La Sierra, and Allkem Sal de Vida.

Indicators and achievements: Number of people from the communities in the training process: 14 people.

STRENGTHENING PROGRAM FOR LOCAL RURAL PRODUCERS

Within the framework of the development of Community Productive Projects carried out by Allkem SDV during the second semester of 2023 and the first semester of 2024, a Rural Community Strengthening Program was developed, with the objective of benefiting rural producers in the department of Antofagasta de La Sierra.

Background: The Antofagasta department is in the middle of the Catamarca puna, characterized by altitudes that vary between 4,600 and 3,200 meters above sea level, registering extreme temperatures of -30 °C. Its characteristic arid Puno climate does not allow for extensive agricultural development, which is why local producers resort to farming practices in small plots and/or in fertile plain areas, as well as small greenhouses. Of the production generated, a small percentage is for local sale, the rest is distributed for family consumption and animal fodder to a lesser extent.

Proposal: Based on the survey of a professional external agronomist consultant from CSR SDV, potential development paths are identified to strengthen family farming practices based on:

- Incentive, technical monitoring of new crop varieties
- Improvement of infrastructure for crop irrigation.
- Technical advice for agricultural improvement (incorporation of technology in production)
- Technical advice for animal health
- Implementation of greenhouses
- Technical advice for the sale of agricultural and livestock products (processing in municipal, provincial, and national organizations). Key points of the chain by local collectors.

Alliances: As a strategic alliance, we have the collaboration of the Department of Agriculture and Livestock of the Municipality of Antofagasta de la Sierra, in terms of providing historical information on local producers.

Indicators and achievements: Number of residents trained in agricultural and livestock issues during the period July 2022 - June 2023: 38 people.

COMMUNITY MEDICAL VISITS PROGRAM

Background: Lack of medical care is identified in the communities of Antofagasta de La Sierra

Proposal: A team of medical professionals is hired to carry out a monthly round of medical care in all the towns of Antofagasta de La Sierra (El Peñón, Antofalla, Los Nacimientos, Ciénaga Redonda and Salar del Hombre Muerto posts).

Alliances: It coordinates with the Hospital Zonal de Antofagasta de La Sierra to carry out community rounds of medical visits to the various locations in the department.

Indicators and achievements: Number of people with medical attention period July 2022 - June 2023: 441 people

COMMUNITY INFRASTRUCTURE PROGRAM

Project “Implementation of Photovoltaic System in Rural Posts”

Background: The populations that currently inhabit the Salar de Hombre Muerto sector lack electrical infrastructure in their rural homes.

Proposal: Alkem Sal de Vida developed during the first semester of 2023 a Project for the “Implementation of Photovoltaic System in Rural Posts” in the Salar de Hombre Muerto sector. It had the objective of providing electricity to 10 rural homes, which, due to their geographical location, did not have access to this service.

Indicators and achievements: Number of people benefited with access to electricity: 32 people.

COMMUNITY INFRASTRUCTURE PROGRAM

Project “Installation of wireless Wi-Fi system in rural posts”

Background: The inhabitants of rural posts in the Salar de Hombre Muerto sector lack connectivity to communicate with the nearest populations

Proposal: From Allkem Sal de Vida, a Project was developed for the “Installation of a Wi-Fi system in two Rural Posts in the Salar de Hombre Muerto sector, with the purpose of providing a connection for the permanent communication of its inhabitants, understanding communication as a Universal Right of people, which allows them to have access to health, education, and welfare.

Indicators and achievements: Number of people benefited with access to electricity: 8 people.

17.7.5.1.2 Agreements With Communities

Allkem Sal de Vida, through the Community Relations area, has established strong communication with the communities in general and with the indigenous groups of the region. The established agreements are detailed in minutes and initialed (Table 17-4).

Table 17-4 - Community agreement compliance meeting minutes/ record.

AGREEMENTS WITH COMMUNITIES - COMPLIANCE		PROCESSING STATUS	COMMENTS
Date			
19/11/21	Installation of wireless internet in compliance with the commitment assumed by Allkem (Sal de Vida) S.A. with the Cienaga Redonda Community] Antofagasta de La Sierra. Agreement registered in the Minutes of Public Hearing provided by DISPR-2021-4-E-CAT-DPGAM#MM, on November 19, 2021, in Cienaga Redonda.	COMPLETED - CLOSED	Internet system in operation
19/11/21	Hiring of 20 people from the town of Cienaga Redonda in compliance with the commitment assumed by Allkem (Sal de Vida) S.A. with the Cienaga Redonda Community - Antofagasta de La Sierra. Agreement registered in the Minutes of Public Hearing provided by DISPR]2021-4-ECAT- DPGAM#MM, on November 19, 2021, in Cienaga Redonda.	COMPLETED - CLOSED	The 20 people are currently working in various areas of Alkem Sal de Vida
08/02/22	Agreement with Cacique of the “Atacameños del Altiplano” Indigenous Community, Mr. Román Guitian, for the request to hire members of the aforementioned community (four people).	COMPLETED - CLOSED	The 4 people are currently working in various areas of Alkem Sal de Vida
31/01/23	Agreement with Cacique of the Indigenous Community “Atacameños del Altiplano” Mr. Román Guitian, for inclusion in the “Community Infrastructure Program”, to be benefited in the “Tomb of the Dead Man” post with the installation of a modular bathroom with a solar hot water	COMPLETED - CLOSED	The wireless WIFI system is currently installed and operational

AGREEMENTS WITH COMMUNITIES - COMPLIANCE		PROCESSING STATUS	COMMENTS
	tank, as well as access to the benefit of connectivity from the installation of wireless Wi]Fi service.		
23/05/23	Agreement with Cacique of the Indigenous Community “Atacameños del Altiplano” Mr. Román Guitian, on the one hand, requests the participation in job opportunities of the Sal de Vida project of two people belonging to his indigenous community, as well as requests the collaboration with heavy machinery for the leveling of a land near the “Tomb of a Dead Man” post (60 mts x 20 mts).	COMPLETED - CLOSED	The 2 people are currently working in various areas of Alkem Sal de Vida. Collaborated and carried out the leveling of the land

17.7.5.1.3 Communication with Communities

Allkem Sal de Vida has implemented a communication system for all stakeholders so that all communities and social actors can access information on the development of the project.

17.7.5.1.4 Local Hiring Commitments

Allkem has a strong commitment to hiring local labor, which favors the socioeconomic development of populations near the Sal de Vida Project.

To facilitate the inclusion of local labor, the company has implemented several mechanisms for its achievement, such as a training system for communities so that they can be trained in industrial technical skills, Sal de Vida also has an internal procedure for “recruitment of local labor” which ensures the instances of community participation during the personnel recruitment process.

17.8 Closure and Reclamation

Closure considerations cover the different Project phases, from exploration, to construction and operations.

A detailed closure and post-closure monitoring plan will be prepared for the Sal de Vida Project incorporating Allkem’s requirements. The closure and post-closure monitoring plan will also comply with applicable legal closure and post-closure requirements. Objectives will focus on physical and chemical stability, safety, environmental restoration, and legal compliance with applicable regulatory requirements. The closure plan scope will include Sal de Vida facilities at the mine site as well as all associated offsite infrastructure.

The Project has an estimated life of mine (LOM) of 40 years. It is expected that closure and post-closure monitoring activities will continue for a minimum of five years from the end of the operation phase. Most of the closure activities will be carried out at the end of the mine operation phase; however, it is possible that some activities will be carried out in parallel with the operation stage as concurrent closure. Once the closure activities have been executed, a minimum period of seven years of post-closure environmental monitoring will continue, before definitive closure is achieved. The removal of access roads to the pond and waste pile areas will occur at the end of the monitoring period.

The cost for remediation is indicated in Section 18 and includes for remediation and reclamation activities at the end of Life of mine (LOM).

17.9 Conclusions

The project has fulfilled the required environmental and social assessments to progress into construction of Stage 1. The project is permitted by the provincial mining authorities and has provincial and federal permits.

The project reflects positive social and socio-economic benefits for local communities.

Expansion Stage 2 permitting application process is still to commence.

18. CAPITAL AND OPERATING COSTS

The Qualified Person for this chapter is the employee of Gunn Metallurgy, outlining the capital and operational costs for Sal de Vida. Every cost forecast is delineated on a yearly basis for the Sal de Vida life of mine.

Sal de Vida stands as a project, and the capital cost does not consider expenditures that have already been absorbed by Allkem in the prior development phases, also called as sunk cost. Furthermore, ongoing outlays unrelated to the direct Sal de Vida project.

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.

Capital and operating cost estimates for Stage 1 were prepared using AACE International guidelines. The Stage 1 wellfield, brine distribution, evaporation ponds, waste (wells and ponds) and Stage 1 process plant capital and cost accuracy is ±10% with a contingency less than or equal to 10% as defined by the SK Regulations, with remaining uncertainty associated with an expected 40-year life of mine.

18.1.1 Basis of Capital Cost Estimate

The Sal de Vida Project Stage 1 overall construction progress reached 24% completion in June 2023. As of July 2023, the project achieved Well & Brine distribution and Pond Strings 1&2 Completion and is progressing towards finishing the construction camp to its full capacity. The Capital expenditures for Sal de Vida Stage 1 were estimated for a plant capacity of 15,000 tonnes of lithium carbonate per year.

The estimate includes capital cost estimation data developed and provided by Worley, Allkem, and current estimates for completion for Stage 1.

The capital cost was broken into direct and indirect costs.

18.1.1.1 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.

18.1.1.2 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.

18.1.1.3 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.

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 similar projects.
- Estimated or built-up rates and allowances.
- placed purchased orders.
- Labor hourly costs based on hourly labor costs built up to include labor wages, statutory payroll additives, insurances, vacation, and overtime provisions.

The estimate considers execution under an EPC approach.

The construction working hours are based on 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 the engineering, management and Owner's costs was based on a preliminary staffing schedule for the 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.

18.1.2 Summary of Capital Cost Estimate

A summary of the estimated direct and indirect capital costs by area is presented in Table 18-1. The capital costs are expressed in an effective exchange rate shown as Allkem's actual expense.

Table 18-1 - Capital Expenditures: Stage 1.

Description	Capital Intensity (US$ / t Li2CO3)	CAPEX Breakdown (US$ m)
Direct Costs		
General Engineering & Studies	746	11
Wellfields & Brine Distribution	839	13
Evaporation Ponds, Waste & Tailings	4,555	68
LiCO Plant & Reagents	12,133	182
Utilities	587	9
Infrastructure	1,533	23
Total Direct Cost	**20,392**	**306**
Owner Costs + Contingency	4,567	69
TOTAL CAPEX	**24,959**	**374**

The total sustaining and enhancement capital expenditures for Sal de Vida Project over the total Life of Mine (LOM) period are shown in the Table 18-2.

Table 18-2 - Sustaining and Enhancement CAPEX.

Description	Total Year* (US$ m)	Total LOM (US$ m)
Sustaining CAPEX	11	434

* Long Term estimated cost per year

18.2 Operating Costs Estimate

The operating cost estimate for Sal de Vida Project was prepared by Allkem's management team. The cost estimate excludes indirect costs such as distributed corporate head office costs for corporate management and administration, marketing and sales, exploration, project and technical developments, and other centralized corporate services. The operating cost also does not include royalties, and export taxes to the company.

18.2.1 Basis of Operating Cost Estimate

18.2.1.1 Reagents and consumables

Reagent consumption rates were obtained from the plant mass balance. Prices for the main reagent supplies were obtained from costs prevailing for FY2024 Budget and were based on delivery to site.

18.2.1.2 Equipment maintenance

A maintenance factor based on industry norms was applied to each area to calculate the consumables and materials costs.

18.2.1.3 G&A

Annual general and administrative (G&A) costs include the on-site accommodation camp, miscellaneous office costs and an allowance for a corporate social responsibility.

18.2.1.4 Taxes, Royalties, and Other Agreements

Catamarca Province Law 4757 requires provincial royalties that are generally 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. On December 20, 2021, Allkem and the Province of Catamarca executed a Royalties Commitment Deed, pursuant to which Allkem is to pay to the Province of Catamarca a maximum amount of 3.5% of the "net monthly revenue" from Sal de Vida Project. This royalty is inclusive of the standard provincial royalty and includes a 0.03% corporate sustainability contribution. 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.

18.2.1.5 Employee Benefit Expenses

Allkem developed a detailed proposed organizational chart and salary plan for the entire Project. Salaries were based on current actual costs, with a 25% uplift for market positioning and an attraction/retention factor for the number of personnel required for the first year of operations.

The operations will use the following work rotation, depending on the operational area:

- 14 days on/14 days off: this work rotation would be based on fourteen days on-duty and fourteen days off- duty, with 12-hour shifts per workday, and would be applicable for staff at site.
- 5 days on/2 days off: this work rotation would be based on a Monday-to-Friday schedule, 40 hours per week, and would be applicable only to personnel at the Catamarca city office.

18.2.1.6 Operation Transports

The Sal de Vida Project is located approximately 1,400 km northwest of Buenos Aires, Argentina, within the Salar del Hombre Muerto in the Province of Catamarca, 650km from the city of Catamarca via Antofagasta de la Sierra and 390 km from the city of Salta via San Antonio de los Cobres.

Pricing for transportation and port costs were obtained from budgetary quotations and are based on 30t trucks, the maximum load allowed in Argentina. The estimate includes freight, handling, depot, and customs clearance to deliver lithium carbonate FOB Angamos (Chile).

The transportation approach considers a storage facility at the port to supply a buffer for shipments against disruption events such as road blocks, strikes, production, etc. Approximately 120 t of lithium carbonate will be trucked to port each day, equivalent to just over four trucks per day. During operations, transport strategy optimization opportunities in truck movement of reagents and finished product will be considered, such as backhaul opportunities.

18.2.1.7 Energy

Electrical power will be supplied by a hybrid solar diesel generation plant with costs defined by a power purchase agreement (PPA) with a third-party contractor and will be distributed internally to the process areas and through an overhead power line to booster station, wells, pilot plant and camp facilities. PPA fixed prices are based on budgetary prices and benchmarking. Diesel pricing estimates are based on current actuals.

The electrical load was developed by Allkem, using typical mechanical and electrical efficiency factors for each piece of equipment.

18.2.2 Summary of Operating Cost Estimate

The Table 18-3 provides a summary of the estimated cost for a nominal year of operation. No inflation or escalation provisions were included. Subject to the exceptions and exclusions set forth in this Report.

Table 18-3 - Operation Cost: Summary.

Operating Cost	Per Tonne LOM (US$ / t Li_2CO_3)	Total LOM (US$ m)	Total Year* (US$ m)
Variable Cost	2,161	1,259	32
Fixed Cost	2,367	1,380	34
TOTAL OPERATING COST	**4,529**	**2,639**	**66**

* Long Term estimated cost per year

18.2.3 Summary of Operating Cost Estimate by Category

For Sal de Vida Project, reagents represent the largest operating cost category of site cash costs, followed by general & administration, labor, and energy. The cost breakdown is shown in the Consumable chemical reagents are the main variable operating cost. The Table 18-5 details the variable costs.

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	1,681	980	25
Labour	703	409	10
Energy	608	354	9
General & Administration	801	446	11
Consumables & Materials	561	348	9
SITE CASH COSTS	**4,353**	**2,537**	**64**
Transport & Port	175	102	3
FOB CASH OPERATING COSTS	**4,529**	**2,639**	**66**

* Long Term estimated cost per year

18.2.4 Variable Operating Costs

Consumable chemical reagents are the main variable operating cost. 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 Section 14.

Table 18-5 - Cash Operating Cost: Variable.

Description	US$ / t Li_2CO_3 (LOM)	Total LOM US$ m	Total Year* US$ m
Soda Ash	920	536	14
Lime	307	179	4
Diesel	12	7	-
Natural Gas	71	42	1
Other Reagents	618	360	9
REAGENTS + NATURAL GAS COSTS	**1,929**	**1,124**	**28**
Logistics	175	102	3
Packaging	57	33	1
VARIABLE COSTS	**2,161**	**1,259**	**32**

* Long Term estimated cost per year

18.2.5 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 - Cash Operating Cost: Fixed.

Description	US$ / t Li_2CO_3 (LOM)	Total LOM US$ m	Total Year* US$ m
Labour	703	409	10
Maintenance	340	198	5
Operations	407	237	6
Energy	524	305	8
Others	394	229	6
FIXED COSTS	**2,367**	**1,380**	**34**

* Long Term estimated cost per year

18.2.6 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.

18.3 Conclusion

The indicated capital and operational costs accurately reflect the incurred and future expected costs for the SDV Stage 1 project and can be utilized for economic analysis.

18.4 Recommendation

As Sal de Vida Stage 1 has commenced construction, capital commitment is underway. Tracking of commitments against budget, along with construction trends will further improve confidence in the estimate and reduce contingency requirements.

The further progression and finalization of detailed engineering will provide final construction quantities.

19. ECONOMIC ANALYSIS

This section analyzes the Sal de Vida Project Stage 1 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.

19.1 Forward Looking and Cautionary Statement

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 production program based on the plant performance capability and the pricing forecast outlined in Section 16.

Using the cash flow model, it has been calculated the key project's indicators, including a sensitivity analysis on the most critical revenue and cost variables to assess their impact on the project's financial metrics.

19.2 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 expenditures incurred to date for Sal de Vida Project were considered as sunk costs and excluded them 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 model assumes that all cash flows occur on December 31st, aligning with Allkem's Fiscal Year.

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% Project basis, include:

- NPV at a discount rate of 10%.
- Internal rate of return (IRR), when applicable.
- Payback period, when applicable.

19.3 Financial Model Parameters

19.3.1 Overview

The financial model is based on several key assumptions, including:

Production schedule, including annual brine production, pond evaporation rates, process plant production, and ramp-up schedule.

- Plant recoveries and lithium grades.

- Operating, capital, and closure costs for a 40-year operating life.
- 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.

19.3.2 Production Rate

The Sal de Vida Project nominal capacity of annual lithium carbonate is estimated to be 15,000t/year as described in the Section 1.13.

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 - Stage 1

Fiscal Year	Units	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Wells	Million l	5,052	5,097	5,710	5,733	5,760	5,778	5,796	5,813	5,837	5,854	5,871	5,889	5,902	5,915	5,930	5,945	5,961	5,978	5,996	6,014	6,033	6,053
Lithium Grade	mg Li/l	797	790	787	784	782	780	778	776	774	772	770	768	765	763	760	758	755	752	749	745	742	738
Recovery	%	-%	-%	29%	61%	63%	63%	63%	63%	62%	62%	62%	62%	62%	62%	63%	63%	63%	63%	63%	63%	63%	63%
Production	tpa Li2CO3	-	-	7,002	14,541	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000
Avg Sale Price	US$/t Li2CO3	-	-	24,908	33,340	29,940	26,590	24,490	23,140	22,940	23,290	24,290	26,340	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440
Revenues	US$M	-	-	174	485	449	399	367	347	344	349	364	395	412	412	412	412	412	412	412	412	412	412
Operating Costs	US$M	-	-	(53)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)
Royalties and Export duties	US$M	-	-	(14)	(38)	(35)	(31)	(29)	(27)	(27)	(27)	(29)	(31)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)
EBITDA	**US$M**	**-**	**-**	**107**	**381**	**348**	**301**	**272**	**254**	**251**	**256**	**270**	**298**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**
Depreciation| Amortization	US$M	(3)	(6)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)
Taxes	US$M	(42)	(39)	(7)	(55)	(118)	(102)	(91)	(85)	(84)	(86)	(91)	(100)	(106)	(106)	(106)	(106)	(106)	(106)	(106)	(106)	(106)	(106)
Δ Working Capital	US$M	(11)	(32)	(26)	(49)	6	8	5	3	1	(1)	(2)	(5)	(3)	(0)	0	0	0	(0)	0	0	0	(0)
Pre-tax Operating Cash Flow	**US$M**	**(11)**	**(32)**	**81**	**331**	**354**	**309**	**277**	**257**	**251**	**255**	**267**	**293**	**311**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**
Post-tax Operating Cash Flow	**US$M**	**(53)**	**(71)**	**74**	**277**	**236**	**208**	**186**	**172**	**168**	**169**	**177**	**192**	**205**	**207**	**207**	**207**	**208**	**207**	**207**	**207**	**208**	**207**
Growth CAPEX	US$M	(145)	(196)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sustaining Capex	US$M	-	-	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)
Investment Cash Flow	**US$M**	**(145)**	**(196)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**
Closing Costs[9]	US$M	(29)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-tax Free Cash Flow	**US$M**	**(156)**	**(228)**	**70**	**320**	**343**	**298**	**266**	**246**	**240**	**244**	**256**	**282**	**300**	**302**	**302**	**302**	**302**	**302**	**302**	**302**	**302**	**302**
Post-tax Free Cash Flow	**US$M**	**(198)**	**(267)**	**63**	**266**	**225**	**197**	**175**	**161**	**156**	**158**	**166**	**181**	**194**	**196**	**196**	**196**	**197**	**196**	**196**	**196**	**196**	**196**

Fiscal Year	Units	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	LOM
Wells	Million l	6,074	6,095	6,117	6,139	6,162	6,186	6,209	6,234	6,258	6,283	6,309	6,335	6,361	6,388	6,415	6,442	6,470	6,498	-	-	-	240,890
Lithium Grade	mg Li/l	735	731	727	723	719	715	711	707	703	699	694	690	686	681	677	673	668	664	-	-	-	735
Recovery	%	63%	63%	63%	64%	64%	64%	64%	64%	64%	64%	64%	64%	65%	65%	65%	65%	65%	65%	-%	-%	-%	62%
Production	tpa Li2CO3	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	15,000	6,175	-	582,719
Avg Sale Price	US$/t Li2CO3	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	-	27,081
Revenues	US$M	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	412	169	-	15,780
Operating Costs	US$M	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(66)	(67)	(67)	(67)	(67)	(67)	(67)	(67)	(77)	(54)	(0)	(2,639)
Royalties and Export duties	US$M	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(32)	(13)	-	(1,238)
EBITDA	**US$M**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**302**	**103**	**(0)**	**11,904**
Depreciation| Amortization	US$M	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(467)
Taxes	US$M	(106)	(106)	(106)	(106)	(106)	(106)	(106)	(106)	(106)	(106)	(106)	(106)	(106)	(106)	(106)	(106)	(106)	(106)	(102)	(32)	(0)	(3,994)
Δ Working Capital	US$M	0	0	0	(0)	0	0	0	(0)	0	0	0	(0)	0	0	0	(0)	0	0	16	67	26	3
Pre-tax Operating Cash Flow	**US$M**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**313**	**318**	**170**	**26**	**11,907**
Post-tax Operating Cash Flow	**US$M**	**207**	**207**	**207**	**207**	**207**	**207**	**207**	**207**	**207**	**207**	**207**	**207**	**207**	**207**	**207**	**207**	**207**	**207**	**216**	**138**	**26**	**7,913**
Growth CAPEX	US$M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(341)
Sustaining Capex	US$M	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(5)	-	(434)
Investment Cash Flow	**US$M**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(11)**	**(5)**	**-**	**(775)**
Closing Costs[1]	US$M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(29)
Pre-tax Free Cash Flow	**US$M**	**302**	**302**	**302**	**302**	**302**	**302**	**302**	**302**	**302**	**302**	**302**	**302**	**302**	**302**	**302**	**302**	**302**	**302**	**307**	**165**	**26**	**11,131**
Post-tax Free Cash Flow	**US$M**	**196**	**196**	**196**	**196**	**196**	**196**	**196**	**196**	**196**	**196**	**196**	**196**	**196**	**196**	**196**	**196**	**196**	**196**	**205**	**133**	**26**	**7,137**

Note: The overall recovery is calculated considering the total lithium units produced relative to the total lithium units pumped out of the wells. The calculated annual recovery is affected by the pond inventory and production ramp-up, causing temporary fluctuations. The total recovery (evaporation ponds and process plant) is estimated at 70% and a brine production plan has been developed for both Stage 1 and Stage 2 using this assumption. However, the eastern wellfield associated with Stage 1 does contribute additional brine volumes for Stage 2 production and for the purposes of financial modelling of Stage 1, on a stand-alone basis, an artificially lower recovery is used to maintain the lithium units required to support Stage 1 annual production.

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[8] Reclamation and closure costs are calculated at a Present Value of US$ 29 M and is not disclosed as a cashflow.

19.3.3 Process Recoveries

The basis for the process recoveries is included in Section 10, and the process design is outlined in Section 14.

19.3.4 Commodity Prices

Wood Mackenzie provided near and long-term price outlooks for all products in Q1 2023. As per detailed in Chapter 16, lithium spot prices have experienced considerable volatility in 2022 and 2023.

The price used in the economic analysis is calculated from the proportions of Prime, Pure and Micronised products and the WoodMac price projections shown in Section 16.

19.3.5 Capital and Operating Costs

The capital and operating cost estimates are detailed in Section 18.

19.3.6 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%.

19.3.7 Closure Costs and Salvage Value

Allkem currently estimates US$29.2 million rehabilitation cost for the closure cost, and it is outlined in the Chapter 17.

19.3.8 Financing

The economic analysis assumes 100% equity financing and is reported on a 100% project ownership basis.

19.3.9 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.

19.3.10 Exchange Rate

All estimates disclosed herein are expressed in US dollars. Allkem uses US dollars as reporting currency in all statements and reports. Allkem's subsidiaries use US dollars as reporting currency and operational currency. Argentine Peso is used as a transactional currency for local payments within the country. Argentine peso has seen high volatility due to hyperinflation and macroeconomic challenges adopting the US dollar as operational currency used to determine prices, costs, estimates, and projections. Foreign exchange currency exposure is an inherent risk Allkem is exposed to and has been considered when estimating escalation costs.

19.4 Economic Evaluation Results

The key metrics for Sal de Vida Project Stage 1 are summarized in the Table 19-2.

Table 19-2 - Main Economic Results.

Summary Economics		
Production		
LOM	yrs	40
First Production	Date	2H CY25
Full Production	Date	2026
Capacity	tpa	15,000
Investment		
Development Capital Costs *(sunk cost)*	US$m	374
Sustaining Capital Costs	US$m per year	11
Development Capital Intensity	US$/tpa Cap	24,959
Cash Flow		
LOM Operating Costs	US$/t LCE	4,529
Avg Sale Price (TG)	US$/t LCE	27,081
Financial Metrics		
NPV @ 10% (Pre-Tax)	US$m	2,006
NPV @ 10% (Post-Tax)	US$m	1,152
NPV @ 8% (Post-Tax)	US$m	1,555
IRR (Pre-Tax)	%	45.5%
IRR (Post-Tax)	%	32.5%
Payback After Tax (production start)	yrs	2.6
Tax Rate	%	35.0%

19.5 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 SDV 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 of the analysis are summarized in Table 19-2 and Figure 19-1.

19.6 Sal de Vida 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 Sal de Vida Project's NPV, followed by production levels, OPEX, and CAPEX. Price emerges as the most influential factor with a mere 10% variation in price results in an 18% impact on the NPV. Even under adverse market conditions, such as unfavorable price levels, increased costs, and investment challenges, Sal de Vida 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% (MMUS$)				
			Percent of Base Case Value				
			-25%	-10%	Base Case	+10%	+25%
Production	Tonne/yr	15,000	699	971	1,152	1,332	1,603
Price	US$/tonne	27,081	655	953	1,152	1,350	1,647
CAPEX*	MUS$	736	1,245	1,189	1,152	1,115	1,058
OPEX	US$/tonne	4,529	1,259	1,195	1,152	1,109	1,043

* Capital + Sustainnig

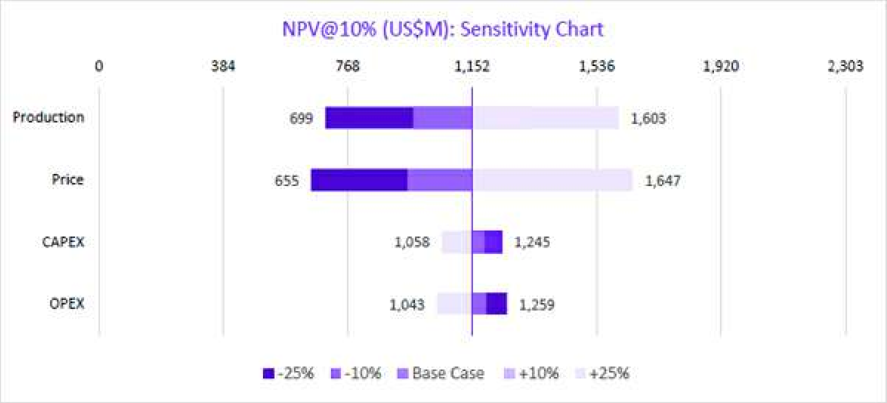

Figure 19-1 - NPV Sensitivity Chart.

19.7 Conclusion

Based on the assumptions detailed in this report, the economic analysis of Sal de Vida demonstrates positive financial outcomes. The sensitivity analysis further strengthens its viability, as it indicates resilience to market fluctuations and cost changes.

By conducting the sensitivity analysis, it provides a comprehensive understanding of the project's financial risks and opportunities. This approach allows for informed decision-making and assessment of the Sal de Vida project potential performance under varying economic scenarios.

It is the opinion of the employee of Gunn Metallurgy that 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.

19.8 Recommendations

It is recommended that the Project economics for Stage 1 be reviewed periodically as commitments are confirmed.

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.

20. ADJACENT PROPERTIES

Within the Salar de Hombre Muerto Basin, several neighboring properties are present including: Posco Argentina (Posco), Livent, Galan Lithium Ltd. (Galan), and Minera Santa Rita (Figure 20-1). The employee of Gunn Metallurgy has not verified all information contained in this section, as most of it has been summarized from public announcements and third-party websites.

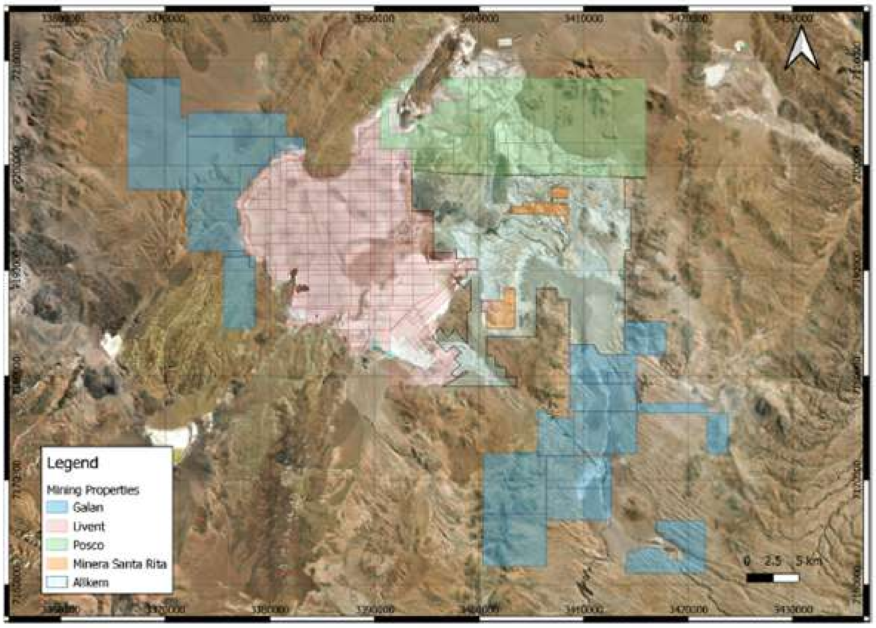

Figure 20-1 - Adjacent Properties.

Posco's lithium project (Sal de Oro) is located in the northern area of the Salar de Hombre Muerto Basin, intersecting both the Salta and Catamarca provinces of Argentina. Posco is headquarter in South Korea, and they initially developed an extraction technology for lithium in 2010. In 2018, their offices were opened in Salta and Catamarca and a pilot plant was created with a capacity of 2,500 tonnes per year of lithium. Currently, Posco is in the advanced stage of exploration, and they expect to have a commercial plant by the end of 2023 (Posco, 2023).

Livent's Fenix Project in Hombre Muerto West is the only current commercial producer of lithium in the basin. Livent has prepared and uploaded a S-K 1300 Technical Report Summary to the SEC website (Integral, 2023) where their Mineral Resource and Reserve Estimates along with other processing and financial analyses are reported at the pre-feasibility level. On May 10, 2023, Livent and Allkem announced that a merger will occur between the two companies to create a global leader in the lithium market. As of the effective date of this report, both companies are operating separately.

Galan owns mining properties in Hombre Muerto West, to the west of Allkem's properties, as well as in Candelas (to the south). In Hombre Muerto West, Galan announced that their project resource has increased to 6.6 Mt of LCE, with an average of 880 mg/l of lithium (Galan, 2023). In the Candelas mine concessions, Galan's exploration and resource estimate was announced in 2019, with an estimated resource of 685 Kt of LCE and average lithium grade of 672 mg/l (Galan, 2019).

Minera Santa Rita is a boron mining company with properties in the Salar de Hombre Muerto. The principal source of their boron exploration and reserves occurs in the properties of the salar, with 60,000 tonnes exploited per year and more than 2,000,000 t of reserves (Minera Santa Rita, 2023). The utilized mining process does not typically involve groundwater extraction; thus, the mining process is different than that of the Sal de Vida Project described in this Technical Report Summary.

21. OTHER RELEVANT DATA AND INFORMATION

The Project Stage 2 expansion and further Project Risks and Opportunities are discussed in this section.

21.1 Sal de Vida Project Stage 2

This section will describe the development of the Stage 2 expansions. Stage 2 is currently at the pre- feasibility study stage and will be further developed to feasibility study level.

The Stage 2 wellfield, brine distribution, evaporation ponds, waste (wells and ponds) and, process plant capital and cost accuracy is ±25% and contingency less than or equal to 15% as defined by the SK Regulations, with remaining uncertainty associated with an expected 40-year life of mine.

21.1.1 Stage 2 Modular Expansion

The Sal de Vida lithium carbonate plants were designed to produce 15,000 tpa of lithium carbonate in Stage 1, with Stage 2 enabling the production of an additional 30,000 tpa through two 15,000 tpa modules. The modular plant design was based on average brine supplies of 26 m^3/hr for Stage 1 and an additional 52 m^3/hr for stage 2 respectively. The design includes an average lithium concentration of 21 g/l in the softening feed. Plants will operate continuously with a design availability of 91%.

21.1.2 Stage 2 Scope

Stage 2 will consist of further expansion of operations as established in Stage 1. All Stage 2 facilities will be located within the Stage 1 Project tenements in the southern sector of the Salar del Hombre Muerto. The wellfield will be located directly above the western sub-basin of the Salar del Hombre Muerto over the salt pan. The brine distribution will traverse the salar southeast towards the evaporation ponds on the alluvial field. The production plant for Stage 2 will be sited adjacent to the production plant for Stage 1. The waste disposal areas will surround the evaporation ponds.

The integrated expansion for Stage 2 was considered during the initial layout of the project as represented in Figure 21-1.

21.1.2.1 Increased Well Fields and Ponds

Brine production wells, referred to for the Stage 2 development as the Southwest Wellfield, will be located over the west sub-basin of the Salar del Hombre Muerto. Sixteen wells will be used for Stage 2, of which fourteen wells will be operational during the maximum brine pumping season,and two will be on stand-by. All wells will be connected through pipelines to one of two booster stations that will be situated in a central position to the wells.

The solar evaporation pond system will consist of a series of halite and muriate evaporation ponds, which will concentrate brine suitable for feeding a primary lithium carbonate plant. The evaporation ponds will be located on the northwestern corner of the Los Patos alluvial fan, over a large gravel field directly southeast of the wellfield and above the salar, covering an area of approximately 800 ha.

The halite pond systems will be arranged in four strings which will operate in parallel. Each string will contain six cells plus a buffer pond with the flow moving in a south easterly direction from one pond to the next in series. Each halite string will have a total surface area of approximately 200 ha.

The Stage 2 muriate pond system will consist of two muriate buffer ponds, four strings of muriate ponds operating in parallel with three cells each, and four brine storage ponds. Brine will flow from one pond to the next in series. The system will also include a pair of mother liquor buffer ponds located east of the process plant.

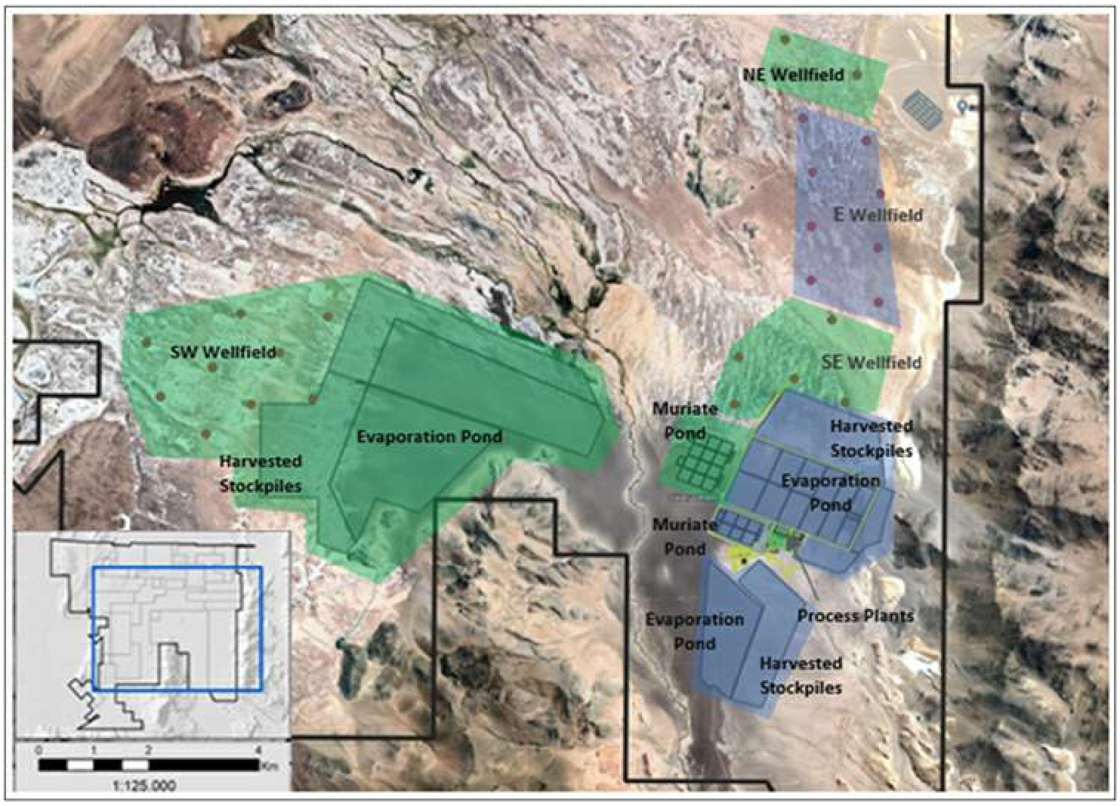

Figure 21-1 - Sal de Vida Stage 2 integrated expansion.

21.1.2.2 New Modular Process Plants

Stages 1 & 2 process plants will operate independently and will share non-process infrastructure (power station, fueling and workshops). The facilities for all Stage 2 will be located in an area adjacent to the Stage 1 muriate ponds and Stage 1 process plant, as shown in Figure 21-2.

The Stage 2 process plants will consist of Liming Plants, Carbonation Plants and Reagent Preparation areas similar to Stage1 as described in Chapter 15.

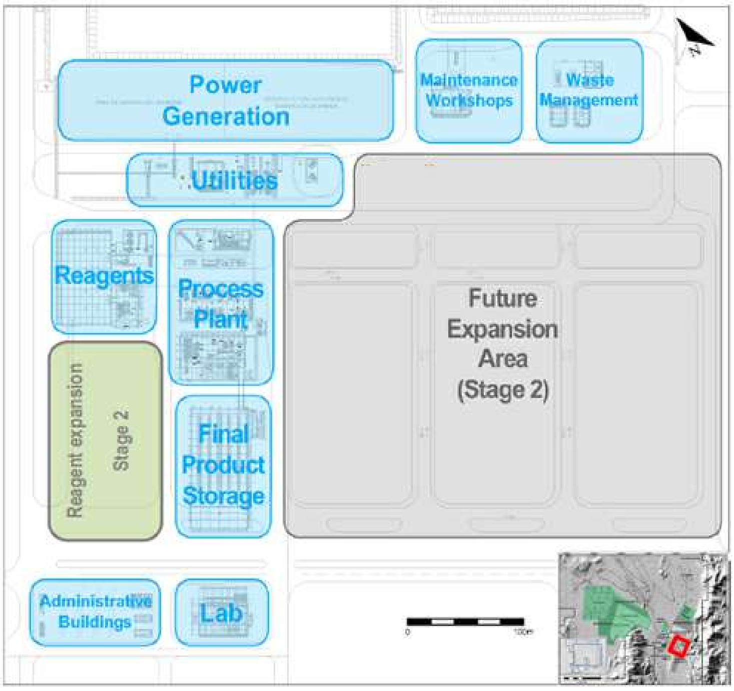

Figure 21-2 - Process Plant area general layout indicating Stage 2 expansion.

21.1.2.3 Upgrading of Support Infrastructure

Utilities and support infrastructure will be expanded in a modularized fashion as necessary to support Stage 2.

Given that Stage 2 is an expansion of Stage 1 of the Sal de Vida Project, certain infrastructure such as roads and camp will either remain the same or experience incremental changes (i.e., an extra tank, genset or another module). This section includes a description of the main infrastructure located at site, including the facilities outlined in Table 21-1.

Table 21-1 - Sal de Vida Infrastructure Facilities.

Facility	Stage 2 (Incremental)	Stage 2 Description
Raw water, Reverse Osmosis (RO) water and Demineralized water	Camp - 1 raw water tanks, 1 RO plants and 2 RO water tanks Plant - 6 raw water tanks, 2 RO plants, 2 demineralized water plants	Raw water requirements in the process plant facilities will be equivalent to the 84 m^3/hr used for the RO plant. The facilities for Stage 2 will consist of nine raw water tanks, three RO plants and three demineralized water plants. Raw water will be used in the demineralized water plant, lime slaking, fire systems amongst other plant uses. The RO water plants will be a pre-assembled, skid mounted package
Power generation and distribution	Camp - 1 genset (0.6 MW) Wellfield - 16 gensets adjacent to wells Booster Station - 2 x 1.4 MW powerhouses Plant - 8 MW Hybrid generation	Power generation will consist of centralized hybrid power generation with power line distribution to the individual points of consumption: ● Wellfield: 16 well pads. ● Two additional Booster station. ● Process plant: 8 MW additional generation and one new electric distribution system connecting the new buildings. ● The Tango 01 camp Back-up powerhouse will consist of a series of 380 V, 220 kW diesel generators.
Fuel storage and dispensing	Camp - NIL Plant - 4 x 75m^3 additional diesel tanks or equivalent	Fuel will be trucked to site by the vendor and stored in two principal locations, one at camp and one at the process plant.
Camp	Operations - 3 sleeping modules (100 beds) Construction - NIL	Tango 01 is the name given to the Sal de Vida accommodations camp. Tango 01 will host up to 330 people during Stage 2 and is currently used by Allkem staff and contractors principally for exploration work, pilot operations and early works.
Sewage treatment plant	Operations - 60 m^3 per day Construction - NIL	Sal de Vida will have three sewage treatment plants, one located at the Tango 01 camp, one at the Construction camp and one at the process plant location. The quality of the effluent will comply the with the province of Catamarca (resolution 65/05) regulations
Fire protection system	Camp - NIL Plant - Extension of system to cover new buildings	The fire protection system was designed to comply with the local regulations and the National Fire Protection Association (NFPA) standards and the requirements of the facilities insurance underwriter
Buildings	Camp: ● Medical centre (expansion). ● Kitchen and dining room (expansion). ● Offices (expansion). Plant: ● Process plant building expansion.	All buildings will be made of corrugated steel enclosures and modulated steel structures

Facility	Stage 2 (Incremental)	Stage 2 Description
	● Reagent storage and preparation building expansion. ● Product storage building expansion. ● Administration offices expansion. ● Canteen expansion. ● First aid building expansion;	
Site roads, causeways and river crossings	● Main southwestern access road. ● Rio de los Patos river crossing. ● Salt harvesting roads (west). ● SW wellfield road network.	Stage 2 will utilize the road system constructed for Stage 1 and develop a road network on the western areas of the salar which will include: ● Main western access road ● Rio de los Patos river crossing ● Salt harvesting roads ● SW wellfield road network
Communications	● Internet service: increase capacity. ● Radio: repeat station (west)	Stage 2 will utilize the same infrastructure used for Stage 1, increase of internet service capacity to meet the growing demand and place an additional repeat tower to expand the VHF radio coverage west of the Project.
Mobile equipment	● 25 x Heavy Vehicles ● 25 x Light Vehicles	Mobile equipment will be required for plant operations. Sal de Vida will provide fuel and servicing for all vehicles, with the exception of reagent and product logistics.
Steam generation	● 4 units (6.7 t/hr of saturated steam each)	At Stage 2, four steams boilers will be housed in a dedicated building with fire-resistant walls. A diesel bulk tank and the deaerator tank will be located outside the building. The boiler will be a pre-assembled skid-mounted package that will include the boiler, pumps and chimney with separate ancillary equipment.
Compressed air	● 4 units	A total of three units will be installed at Stage 2 (two additional units to the unit installed in Stage 1).

21.1.3 Stage 2 Permitting

21.1.3.1 Introduction

Given that the Project will be developed in stages and much of the facilities and infrastructure of Stage 2 will be an extension of Stage 1, the following sub-sections will make reference to all stages of the Project unless stated otherwise.

21.1.3.2 Baseline studies

The physical, biological, and social baseline data for the Project has been collected over the wider area of the Salar de Hombre Muerto since 2011 (ERM, 2011). Specific baseline field campaigns and environmental impact studies will need to be performed as part of the environmental permitting for Stage 2 of the Project. The Stage 2 baseline field campaigns have not commenced as yet.

21.1.3.3 Environmental impact assessment

The Environmental Impact Declaration (DIA) approved in December 2021 was for Stage 1 only and includes the brine distribution system, 320 ha of evaporation ponds, the latest flowsheet and Li_2CO_3 Plant, and onsite infrastructure for Stage 1 of the Project. The Stage 2 will require an amendment to the Stage 1 DIA with separate investigations related to the Stage 2 affected areas. The Stage 2 DIA application has not commenced as yet. Further study and basic engineering as required to further define the technical and economic development of Stage 2.

21.1.3.4 Water Permits

The Sal de Vida Project will require 100-120 m^3/hr of raw water for the operation of Stage 1 and 2.

The granted groundwater permit was obtained on 15 May 2020, by Provincial Decree 770/20, for well SVWF12_19 with a flow of 130 m^3/hr and well SVFW12_20 only for monitoring, for a term of two years (renewable), as stipulated in Article 7° of the Water Law of the Province of Catamarca, N° 2577/73.

The water permits that will be required to take account of the increased water demand to construct and operate Stage 2 of the Project have not yet been applied for.

It is estimated that required engineering, studies and permitting application processing will require approximately 18 months based on timelines experienced with Stage 1.

21.1.4 Stage 2 Capex & Opex

The capital cost estimate for Stage 2 of the Sal de Vida Project was prepared by Allkem based on previously completed studies by Worley Chile S.A. and Worley Argentina S.A. (Collectively, Worley) in collaboration with Allkem. Allkem supplemented previous study estimates with actual construction cost data obtained from the ongoing Sal de Vida Stage 1 construction.

21.1.4.1 Estimate Accuracy

The estimate is a Class 4 following AACCE International Recommended Practice No. 18R-97. Rev February 2, 2005, with an expected accuracy of +30% / - 20%. The costs are based on Q2 2023 pricing.

21.1.4.2 Basis of estimate

Capital Cost Estimation of Stage 2 was based on Sal de Vida Stage 1 AACE class 2 estimation development for Stage 1 currently in execution. The modularized nature of the project expansion allows for direct cost comparisons from Stage 1 for Stage 2, supplemented by escalation estimation and appropriate contingency. Where equipment sizing changed, established factorization techniques were applied.

21.1.4.3 Exchange rates

Exchange rates were applied similarly to Stage 1, as described in Section 19, for consistency.

21.1.4.4 Capex summary

Table 21-2 summarizes the Stage 2 capital cost estimate.

Table 21-2 - Stage 2 Capital Expenditures. Stage 2 (Standalone).

Description	Capital Intensity (US$ / t Li_2CO_3)	CAPEX Breakdown (US$ m)
Direct Costs		
General Engineering & Studies	1,146	34
Wellfields & Brine Distribution	818	25
Evaporation Ponds, Waste & Tailings	4,692	141
LiCO Plant & Reagents	11,408	342
Utilities	546	16
Infrastructure	427	13
Total Direct Cost	**19,036**	**571**
Owner Costs + Contingency	2,855	86
TOTAL CAPEX	**21,891**	**657**

The total sustaining and enhancement capital expenditures for Sal de Vida Project stage 2 are shown in the Table 21-3.

Table 21-3 Sustaining and Enhancement CAPEX. Stage 2 (Standalone)

Description	Total Year* (US$ m)	Total LOM (US$ m)
Enhancement CAPEX	-	40
Sustaining CAPEX	17	625
Total	**17**	**665**

21.1.4.0 Opex Summary

The operating cost estimate (Opex) for Stage 2 of the Sal de Vida Project was prepared by Allkem's team based on Olaroz Stage 1 experience and progress on the Sal de Vida Stage 1 development. The Opex excludes indirect costs such as distributed corporate head office costs for corporate management and administration, marketing and sales, exploration, project and technical developments, and other centralized corporate services.

The Direct Materials & Consumables are proportional to the scale up in production. This assumption considers that the scale up in the purchasing volume of Materials & Consumables (e.g., reagents, fuel, etc.) does not imply a reduction in cost from economies of scale.

The only synergies stipulated are those related to labor and overheads such as Catamarca office and personnel, and its associated costs. The Opex estimate is based on current operational pricing as described in Chapter 18 of the report. Subject to the exceptions and exclusions set forth in this pre-feasibility study.

The summary breakdown is presented in Table 21-4.

Table 21-4 - Estimated Operating Costs by Category. Stage 2 (Standalone)

Description	Per Tonne LOM (US$ / t Li_2CO_3)	Total LOM (US$ m)	Total Year* (US$ m)
Reagents	1,844	2,034	55
Labour	257	284	7
Energy	603	665	17
General & Administration	432	476	13
Consumables & Materials	415	457	12
SITE CASH COSTS	**3,550**	**3,917**	**104**
Transport & Port	175	193	5
FOB CASH OPERATING COSTS	**3,726**	**4,110**	**109**

* Long Term estimated cost per year

21.1.5 Stage 2 Economics

Financial modelling was completed on a 100% Project basis, using the discounted cash flow (DCF) method of analysis to assess Sal de Vida's estimated economics and evaluate the sensitivity of key input parameters on the Project expected returns.

21.1.5.1 Basis of Analysis

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 as 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 expenditures incurred up to June 30th, 2023, for the Sal de Vida Project were considered as sunk costs and excluded them 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 model assumes that all cash flows occur on December 31st, aligning with Allkem's Fiscal Year.

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% Project basis, include:

- NPV at a discount rate of 10%.
- Internal rate of return (IRR), when applicable.
- Payback period, when applicable.

21.1.5.2 Assumptions

The financial evaluation is dependent on key input parameters and assumptions:

1. Production schedule, including annual brine production, pond evaporation rates, process plant production, and ramp-up schedule. The Sal de Vida Project Stage 2 nominal capacity of annual lithium carbonate is estimated to be 30,000t/year.
2. Plant recoveries and lithium grades.
3. Operating, capital, and closure costs for a 37-years operating life.
4. 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).

5. Product sales assumed to be Free on Board (FOB) South America.
6. For the purpose of this report, the Corporate Rate was 35%.
7. The economic analysis assumes 100% equity financing.
8. 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.

21.1.5.3 Summary of Stage 2 Economic Results

The results are summarized in Table 21-5. The Table 21-6 details 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 for Stage 1 and 2 combined.

Table 21-5 - Summary of Sal de Vida Economic Analysis. Stage 2

Summary Economics		
Production		
LOM	yrs	37
First Production	Date	2028
Full Production	Date	2030
Capacity	tpa	30,000
Investment		
Development Capital Costs	US$m	657
Sustaining Capital Costs	US$m	625
Development Capital Intensity	US$/tpa Cap	21,891
Cash Flow		
LOM Operating Costs	US$/t LCE	3,726
Avg Sale Price (TG)	US$/t LCE	26,922
Financial Metrics		
NPV @ 10% (Pre-Tax)	US$m	3,509
NPV @ 10% (Post-Tax)	US$m	2,028
NPV @ 8% (Post-Tax)	US$m	2,834
IRR (Pre-Tax)	%	50.3%
IRR (Post-Tax)	%	35.3%
Payback After Tax (production start)	yrs	2.4
Breakeven Price @10%	US$/t LCE	12,249
Tax Rate	%	35.0%

Table 21-6 - Annual economic analysis: Stage 1 + Stage 2

Fiscal Year	Units	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045
Wells	Million l	5,052	5,097	15,034	15,078	15,123	15,164	15,203	15,242	15,280	15,319	15,359	15,401	15,446	15,492	15,539	15,589	15,640	15,693	15,748	15,805	15,863	15,923
Lithium Grade	mg Li/l	797	790	804	801	799	797	795	793	791	789	787	785	783	780	778	775	773	770	767	765	762	759
Recovery	%	-%	-%	11%	23%	59%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%
Production	tpa Li2CO3	-	-	7,002	14,541	38,253	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
Avg Sale Price	US$/t Li2CO3	-	-	24,908	33,340	29,940	26,590	24,490	23,140	22,940	23,290	24,290	26,340	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440
Revenues	US$M	-	-	174	485	1,145	1,197	1,102	1,041	1,032	1,048	1,093	1,185	1,235	1,235	1,235	1,235	1,235	1,235	1,235	1,235	1,235	1,235
Operating Costs	US$M	0	(0)	(53)	(66)	(188)	(183)	(176)	(176)	(176)	(176)	(176)	(176)	(176)	(176)	(176)	(176)	(176)	(176)	(176)	(176)	(176)	(176)
Royalties and Export duties	US$M	-	-	(14)	(38)	(90)	(94)	(86)	(82)	(81)	(82)	(86)	(93)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)
EBITDA	**US$M**	**0**	**(0)**	**107**	**381**	**868**	**919**	**839**	**784**	**775**	**790**	**831**	**917**	**962**	**962**	**962**	**962**	**962**	**962**	**962**	**962**	**962**	**962**
Depreciation| Amortization	US$M	(3)	(6)	96	370	337	290	261	243	240	245	259	287	302	302	302	302	302	302	302	302	302	302
Taxes	US$M	(42)	(39)	(80)	(132)	(141)	(312)	(284)	(264)	(262)	(267)	(281)	(311)	(327)	(327)	(327)	(327)	(327)	(327)	(327)	(327)	(327)	(327)
Δ Working Capital	US$M	(11)	(32)	(39)	(100)	(83)	(1)	16	10	2	(3)	(7)	(15)	(8)	(1)	0	0	1	(1)	0	0	1	(1)
Pre-tax Operating Cash Flow	**US$M**	**(11)**	**(32)**	**68**	**281**	**785**	**918**	**855**	**794**	**777**	**787**	**824**	**902**	**955**	**962**	**962**	**962**	**963**	**962**	**962**	**962**	**963**	**961**
Post-tax Operating Cash Flow	**US$M**	**(53)**	**(71)**	**(11)**	**149**	**644**	**606**	**571**	**529**	**516**	**520**	**543**	**591**	**628**	**635**	**635**	**635**	**636**	**635**	**635**	**635**	**636**	**635**
Growth CAPEX	US$M	(145)	(196)	(328)	(368)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sustaining Capex	US$M	-	-	(11)	(11)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)
Investment Cash Flow	**US$M**	**(145)**	**(196)**	**(339)**	**(379)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**
Closing Costs[10]	US$M	(88)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pre-tax Free Cash Flow	**US$M**	**(156)**	**(228)**	**(271)**	**(98)**	**757**	**891**	**827**	**766**	**750**	**759**	**796**	**874**	**927**	**934**	**935**	**935**	**935**	**934**	**934**	**934**	**935**	**934**
Post-tax Free Cash Flow	**US$M**	**(198)**	**(267)**	**(351)**	**(230)**	**616**	**579**	**543**	**501**	**488**	**492**	**515**	**563**	**600**	**607**	**608**	**608**	**608**	**607**	**607**	**607**	**608**	**607**

Fiscal Year	Units	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	LOM
Wells	Million l	15,985	16,048	16,113	16,178	16,245	16,313	16,382	16,452	16,524	16,596	16,670	16,744	16,819	16,895	16,971	17,048	17,125	17,203	-	-	-	617,400
Lithium Grade	mg Li/l	756	753	750	747	744	741	738	734	731	728	725	722	718	715	712	709	706	702	-	-	-	757
Recovery	%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	70%	-%	-%	-%	68%
Production	tpa Li2CO3	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	6,175	-	1,685,971
Avg Sale Price	US$/t Li2CO3	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	27,440	-	26,977
Revenues	US$M	1,235	1,235	1,235	1,235	1,235	1,235	1,235	1,235	1,235	1,235	1,235	1,235	1,235	1,235	1,235	1,235	1,235	1,235	1,235	169	-	45,482
Operating Costs	US$M	(176)	(176)	(176)	(176)	(176)	(176)	(176)	(176)	(177)	(177)	(177)	(177)	(177)	(177)	(177)	(177)	(177)	(177)	(206)	(60)	(1)	(6,749)
Royalties and Export duties	US$M	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(97)	(13)	-	(3,567)
EBITDA	**US$M**	**962**	**962**	**962**	**962**	**962**	**962**	**962**	**961**	**961**	**961**	**961**	**961**	**961**	**961**	**961**	**961**	**961**	**961**	**932**	**96**	**(1)**	**35,166**
Depreciation| Amortization	US$M	302	302	302	302	302	302	302	302	302	302	302	302	302	302	302	302	302	302	291	92	(11)	-
Taxes	US$M	(327)	(327)	(327)	(327)	(327)	(327)	(327)	(327)	(327)	(327)	(327)	(327)	(327)	(327)	(327)	(327)	(327)	(327)	(317)	(24)	(0)	(11,907)
ΔWorking Capital	US$M	0	0	1	(1)	0	0	1	(1)	0	0	1	(1)	0	0	1	(1)	0	0	47	195	25	(4)
Pre-tax Operating Cash Flow	**US$M**	**962**	**962**	**962**	**961**	**962**	**962**	**962**	**961**	**961**	**961**	**962**	**961**	**961**	**961**	**962**	**960**	**961**	**961**	**979**	**291**	**25**	**35,161**
Post-tax Operating Cash Flow	**US$M**	**635**	**635**	**635**	**634**	**635**	**635**	**635**	**634**	**635**	**635**	**635**	**634**	**635**	**634**	**635**	**634**	**634**	**634**	**662**	**267**	**25**	**23,255**
Growth CAPEX	US$M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(1,037)
Sustaining Capex	US$M	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(28)	(11)	-	(1,059)
Investment Cash Flow	**US$M**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(28)**	**(11)**	**-**	**(2,097)**
Closing Costs[1]	US$M	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	(88)
Pre-tax Free Cash Flow	**US$M**	**934**	**934**	**935**	**934**	**934**	**934**	**934**	**933**	**934**	**934**	**934**	**933**	**933**	**933**	**934**	**933**	**933**	**933**	**951**	**279**	**25**	**33,065**
Free Cash Flow	**US$M**	**607**	**607**	**608**	**607**	**607**	**607**	**608**	**607**	**607**	**607**	**607**	**606**	**607**	**607**	**607**	**606**	**607**	**607**	**634**	**255**	**25**	**21,158**

Note: The overall recovery is calculated considering the total lithium units produced relative to the total lithium units pumped out of the wells. The calculate overall recovery is affected by the pond inventory and production ramp-up, causing temporary fluctuations. The total recovery (evaporation ponds and process plant) is estimated at 70% and a brine production plan has been developed for both Stage 1 and Stage 2 using this assumption. However, the eastern wellfield associated with Stage 1 does contribute additional brine volumes for Stage 2 production and for the purposes of financial modelling of Stage 1, on a stand-alone basis, an artificially lower recovery is used to maintain the lithium units required to support Stage 1 annual production.

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[9] Reclamation and closure costs are calculated at a Present Value of US$ 88 M and is not disclosed as a cashflow.

21.1.5.4 Sensitivity Analysis

Table 21-6 shows the impact of changes in key variables on the Project's pre-tax net present value.

Table 21-6 - Project Net Present Value Pre-Tax Sensitivity Analysis. Stage 2.

Driver Variable	Base Case Values		Project NPV@10% (MMUS$)				
			Percent of Base Case Value				
			-25%	-10%	Base Case	+10%	+25%
Production	Tonne/yr	30,000	1,289	1,733	2,028	2,323	2,765
Price	US$/tonne	26,922	1,204	1,699	2,028	2,357	2,850
CAPEX*	MUS$	1,321	2,198	2,096	2,028	1,960	1,858
OPEX	US$/tonne	432	3,726	2,088	2,028	1,967	1,876

* Capital + Enhancement + Sustaining

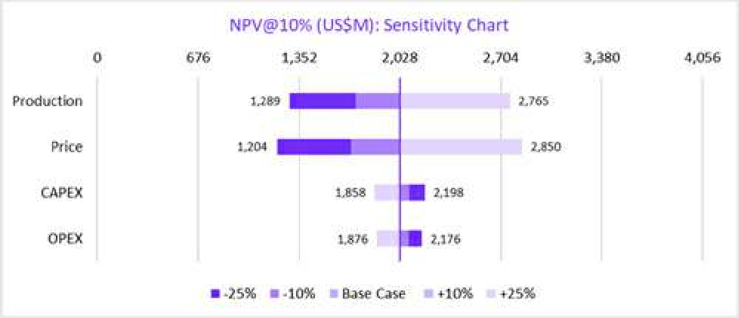

Figure 21-3 - Sensitivity Chart, Stage 2.

21.1.5.5 Stage 2 Risk Assessments

A Risk Assessment process was conducted in 2021 (Spark, 2021) which identify a broad spectrum of hazards that provides a reasonable representation of the current risk profile for the project. As can be seen in Figure 21-4 the overall risk profile is currently driven by Project Delivery, and Financial/ Operational Performance[10] issues, which is to be expected of this project at the Pre-feasibility stage.

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[10] The operational performance risk effectively results in a financial impact on Allkem as if the delivered operation is not able to make its performance targets (through-put, sales value, ramp-up etc.) this directly impacts on the cashflow and hence NPV of the project.

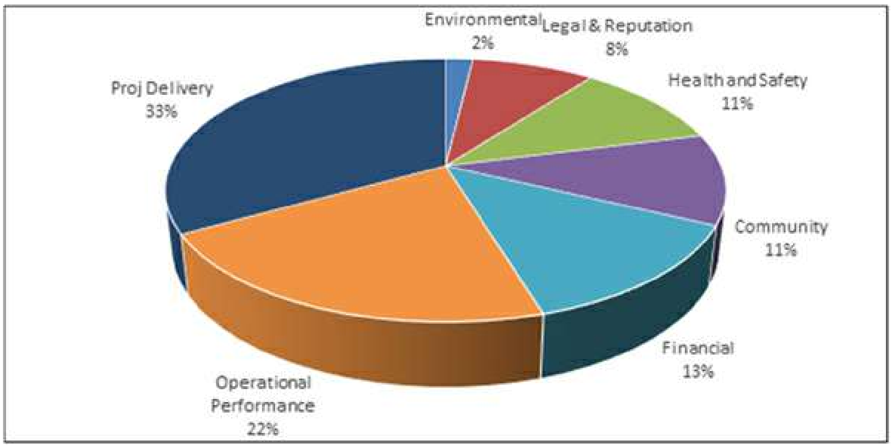

Figure 21-4 - Qualitative Grouping of Project Risk (Risk Consultant, 2021).

While this profile is anticipated to change over the project duration (as the nature of the risk understanding and effectiveness of the control regime changes) currently the major risk to the project is dominated by the project Deliver and Financial/ Operational Performance. This is consistent with the project management team's expectations for a pre-feasibility study stage given the industry's history with delivery of medium-sized project and the inherent uncertainty regarding how a number of key risks in these areas are to be managed.

While the current risk profile has a significant degree of uncertainty within it, the predominant issues seen as potential threats to project viability are as detailed in Table 21-7.

Table 21-7 - Stage 2 Risks to the Project Viability.

Risk Type	Stage 2 Risk Description
HSE	Project as delivered (execution and into operations) fails to meet Allkem Health & Safety, Environmental or CSR expectations.
Community	Loss of Community Support for project.
Financial	Project CAPEX blow-out (Productivity, Incomplete engineering, Poor estimation, Project delays, Poor project controls, Changing market conditions, etc.)
Financial	Plant unable to achieve Ramp-up to full production rates to plan.
Financial	As built plant fails to achieve the lithium carbonate production expectation (throughput/ utilization/ recovery/ product quality).
Financial	Changing in Argentinian financial/ regulatory framework (taxation, new legislation, import/ exports, inflation).
Project Delivery	Increased complexity of the design (battery grade, automation, late change to the design) impacting the schedule or budget.
Project Delivery	Delays to achieving the planned project schedule.
Project Delivery	Ability for the EPCM to deliver the full spectrum of Allkem expectations (Schedule, Cost, Quality, remote operations).
Regulatory	Ability to meet all required condition (70:30, Environmental, etc.)

The existing controls and those that will be implemented during the implementation/ operations phases, are broadly defined in the relevant risk register, and will be enhanced as the register is revisited through the project delivery and into operations. These controls are predicted to be appropriate for the further reduction of the risk, however, ongoing effort will be required to ensure the delivery of all required controls to achieve acceptable (and well understood) levels of risk within the project.

While it is clear there is still considerable risk assessment work yet to be undertaken through the development of the Sal de Vida Project, there are no current risk issues that have been identified that are considered insurmountable or that will prevent the project from being delivered, although those listed in Table 21-7 will require specific focus and comprehensive follow-up.

21.1.6 Stage 2 Conclusion

The planned Sal de Vida Stage 2 expansion has been studied at a pre-feasibility study level. The process pond infrastructure, process plant design and support service infrastructure are deemed of suitable design and sufficiently quantified to support the level of study. The accuracy of cost information gained from ongoing Stage 1 execution is deemed sufficiently accurate for the level of study. Within the constraints described in this chapter, it is the opinion of the employee of Gunn Metallurgy that the Stage 2 expansion will support economically viable extraction of the mentioned saleable lithium products.

21.1.7 Stage 2 Recommendations

The Sal de Vida Stage 2 expansion must progress with further studies toward improving financial accuracy, reducing schedule and overall risk. A detailed feasibility study is recommended.

After completing any required value engineering, finalizing technology tradeoffs and selections, and advancing engineering design, the permitting process should commence in parallel with further engineering design. Progression of the Stage 1 execution must be monitored, and lessons learned incorporated into the Stage 2 project. Ongoing risk management and reviews are recommended to ensure currency of risk management activities. Social engagement processes and programs can be amended as needed to include for the future Stage 2 expansion.

21.2 Risks and Opportunities

21.2.1 Risks

A Project risk workshop was held in February 2020 and was subsequently updated in a risk assessment process was conducted on March 21, 2021. This identified a broad spectrum of hazards which provides a reasonable representation of the current Project risk profile, with a focus on the initial stage of the Project. The overall risk profile is currently driven by Project delivery, and financial/ operational performance issues, which is to be expected of a brine project at the feasibility stage. This is consistent with the Project management team's expectations for a feasibility-stage study, given the industry's history with medium- sized project delivery, and the inherent uncertainty as to how a number of key risks in these areas can to be managed.

The Sal de Vida Project had ~70 risks identified for areas of focus in the Project risk register. The key risks to Project viability can be summarized as:

- Allkem activities fail to meet health, safety, environmental, community (HSEC) or CSR expectations.
- Loss of community support for the Project.
- Project capital cost increases significantly (e.g., productivity, incomplete engineering, poor estimation, Project delays, poor Project controls, changing market conditions).
- Plant unable to achieve name plate production within expected timeframes.
- Plant fails to achieve the production metrics (e.g., throughput, utilization, recovery, product quality).
- Changes to the Argentinian financial/regulatory framework (e.g., taxation, new legislation, import/ exports, inflation).
- Increased complexity of the design (BG, automation, late changes to the design) impacting the rate of engineering, procurement of long leads, commissioning etc.
- Performance of selected contractors (schedule, cost, quality, remote operations).
- COVID-19 or similar impacting the Project (cost, schedule, outbreak on site).
- Ability to meet all required stakeholder conditions (e.g., local employment, environmental).

The existing risk controls and those that will be implemented during the implementation/ operations phases are broadly defined in the relevant risk register and will be enhanced as the register is revisited throughout the Project delivery phase and into the operational phase. These controls are predicted to be appropriate for further risk reduction; however, ongoing effort will be required to ensure the delivery of all required controls to achieve acceptable risk levels within the Project, and that these risks are well-understood. This risk/reward evaluation will need to be reviewed at each key Project stage.

21.2.2 Opportunities

Strategically, the two staged approach allows prudent de-risking of the development, by adopting experience from Stage 1 into later stages. It is expected that the subsequent stage will not commit significant funds until the previous stage production is proven. Additionally, it is expected that Stage 2 delivery costs from continuity of people, systems and processes, engineering efficiencies and targeted allocation of contingency may provide upside. The PFS level does not accommodate these synergies, but they are expected as engineering advances.

The estimated Brine Resources and Brine Reserves summarized in this Report may have upside potential for tonnage increases, based on results from the ongoing production well drilling, and aquifer testing of the recently constructed Eastern wellfield production wells.

Currently, the area that includes the East Wellfield is designated as Indicated. Even though the conceptual understanding of this area is very good, this designation is because aquifer tests have previously been conducted at only two wells in the area. The 2020 - 2021 production well program for this area will increase aquifer understanding and could result in Brine Resource confidence category upgrades.

The Southwest Wellfield is currently considered to be very conservatively categorized as Inferred because only information from failed borehole SVH10_05 exists for that area. Borehole SVH10_05 could not be completed because of flowing brine conditions in a highly transmissive, and nearly uncemented sand and gravel unit. Good quality brine was confirmed in the area, but measurements equivalent to other boreholes used to characterize the Brine Resource were not possible. With additional drilling and testing in the area, there is potential to upgrade the Brine Resource confidence category.

Two of the already-drilled production wells have reached bedrock at about 220 meters below land surface (m bls), and one has been drilled to over 300 m bls without reaching bedrock. Previous exploration drilling allowed for a maximum depth of the Brine Resource to about 170 m bls. These deeper drill holes have upside potential to extend the limit of the Brine Resource estimates at depth.

The Brine Resources are reported above a 300 mg/l Li cut-off. Many of the brine players in the industry use a 200 mg/l Li cut-off. Should Allkem elect to lower the cut-off, there is potential for additional lithium carbonate content to be estimated as part of the Brine Resources. Changing the cut-off grade will have no impact on the Brine Reserve because all the production wells associated with the Brine Reserve are being designed to avoid capturing this lower lithium grade brackish water. If the Project continues past the current projected 40-year mine life, lower- grade brine and brackish water have potential to be economic in the future.

22. INTERPRETATION AND CONCLUSIONS

This section contains forward-looking information related to the Sal de Vida Project. The material factors that could cause actual results to differ from the estimates or conclusions include any significant differences from one or more of the material aspects or assumptions set forth in this Technical Report Summary related to exploration, resource, reserve, processing, or financial analyses.

The QPs believe that this Technical Report Summary was prepared in accordance with the SEC's S-K 1300 requirements. The QPs note the following interpretations and conclusions in their respective areas of expertise, based on the review of data available for this Report.

22.1 Geology and Mineralization

The Sal de Vida deposit is considered to be typical of a brine system with an evaporite core dominated by halite in the northern and western areas, as well as interbedded clastic sediments which are predominant in the southern and eastern portions of the mine concessions. The most notable source of fresh water to Salar del Hombre Muerto is the Río de los Patos drainage that enters the basin from the southeast.

Sal de Vida's brine chemistry has a high lithium grade, low levels of magnesium, calcium and boron impurities and readily upgrades to battery grade lithium carbonate. The knowledge of the hydrogeological system is sufficient to support the Mineral Resource and Reserve estimates.

22.2 Exploration, Drilling, and Analytical Data

Exploration activities to date have identified the Sal de Vida brines, and has used exploration methodology conventional to brine exploration, such as geophysics and surface sampling, in addition to the drilling programs.

Drilling was conducted in several phases including small diameter shallow wells, brine exploration diamond drillhole (DDH) wells, pilot brine production wells, freshwater wells, and reverse circulation (RC) drill holes. The phases were broken out into Phase 1 to 6, with Phase 1 commencing in 2009, and Phase 6 in 2021 as part of the East wellfield development. Drill data are acceptable to support the Mineral Resource and Reserve estimates.

Short-term pumping tests were completed as part of all drill program phases to measure aquifer transmissivity, obtain a representative brine sample for the well, and provide design data for future higher-capacity production wells.

Analyses for porosity and brine chemistry were performed at accredited laboratories independent of Allkem. Analytical quality was monitored through the use of randomly inserted quality control samples, including SRMs, blanks and duplicates, as well as check assays at independent laboratories. The drainable porosity and chemistry data to support the Brine Resource estimate were verified. These verifications confirmed that the analytical results delivered by the participating laboratories and the digital exploration data were sufficiently reliable for Brine Resource estimation purposes.

Sample collection, preparation, analysis, and security for the drill programs are in line with industry- standard methods for brine deposits. Drill programs included QA/QC measures. QA/QC program results do not indicate any problems with the analytical programs. The employees of Montgomery & Associates are of the opinion that the quality of the analytical data is sufficiently reliable to support the Mineral Resource and Reserve estimates.

The conceptual understanding of the hydrogeological system of Salar del Hombre Muerto is good, and the observed drilling and testing results are consistent with anticipated stratigraphic and hydrogeological conditions associated with mature, closed-basin, high altitude salar systems. One of the most important features of this hydrogeological system is the general consistency of the lithium and potassium grades measured throughout the entire salar and the high value of lithium grade. The majority of the salar contains high-density brine with an average lithium grade over 700 mg/l. The identified aquifer units in the basin are shown to be aerially extensive with a demonstrated ability to pump brine.

22.3 Mineral Resources

To estimate the Mineral Resource, utilized parameters correspond to drainable porosity and brine concentration. The polygon method was used, a commonly applied method for lithium brine resource estimates, where the mine properties were first sectioned into polygons based on the location of exploration drilling. Each polygon block contained one core drill exploration hole that was analyzed for both depth-specific brine chemistry and drainable porosity, and the base of each polygon corresponds to the total well depth. Boundaries between polygon blocks were generally equidistant from the core drill holes. The total area of polygon blocks used for resource estimates is about 160.9 square kilometers (km^2). Within each polygon shown on the surface, the subsurface lithological column was separated into lithologic units and discrete intervals with data, where a specific thickness with a value for drainable porosity and average lithium content was assigned based on laboratory analyses of samples collected during exploration drilling. The estimated resource for each polygon was the sum of the products of saturated lithologic unit thickness, polygon area, drainable porosity, and lithium content. The resource estimated for each polygon was independent of adjacent polygons.

The Mineral Resource, exclusive of Mineral Reserves, corresponds to 3.07 Mt of LCE for the Measured category and 0.96 Mt of LCE for the Indicated category, with a total Measured and Indicated Resource (exclusive of Mineral Reserves) of 4.03 Mt of LCE. Mineral Resources inclusive of Mineral Reserves are also reported. To classify a polygon as Measured or Indicated, the following factors were considered: (i) level of understanding and reliability of the basin stratigraphy, (ii) level of understanding of the local hydrogeologic characteristics of the aquifer system, and (iii) density of drilling and testing in the salar and general uniformity of results within an area. A lithium cut-off grade of 300 mg/l was conservatively utilized based on a breakeven cut-off grade for a projected lithium carbonate equivalent price of US$20,000 per tonne over the entirety of the LOM and a grade tonnage curve (Figure 11-2). Intervals of each polygon with lithium content less than cut-off grade were not included in the resource estimate, demonstrating a reasonable basis for the prospects of economic extraction for Mineral Resources.

Factors that may affect the Brine Resource estimate include: locations of aquifer boundaries; lateral continuity of key aquifer zones; presence of fresh and brackish water which have the potential to dilute the brine in the wellfield area; the uniformity of aquifer parameters within specific aquifer units; commodity price assumptions; changes to hydrogeological, metallurgical recovery, and extraction assumptions; density assignments; input factors used to assess reasonable prospects for eventual economic extraction; and assumptions as to social, permitting and environmental conditions. To the extent known by the employees of Montgomery & Associates, there are no known environmental, permitting, legal, title, taxation, socioeconomic, marketing, political or other relevant factors that could affect the Mineral Resource estimate which are not discussed in this Report.

22.4 Mineral Reserves

The Mineral Reserve was estimated using a calibrated numerical model which simulates groundwater flow and solute transport. The method considers the modifying factors for converting Mineral Resources to Mineral Reserves in brine deposits, including allowable well field pumping, dilution of brine during production, process recovery factors, among others.

The 3D numerical model was constructed using the Groundwater Vistas Version 7 interface and Modflow USG-Transport was utilized to simulate variable-density flow and transport. Prior to the simulation of future brine production, the numerical model was calibrated to verify assigned model parameters such as hydraulic conductivity and specific storage. The numerical groundwater model was initially calibrated to average, steady-state conditions using the available average on-site field measurements of water levels in observation wells. A transient model calibration to two long-term pumping tests in the East and Southwest Wellfields was conducted to better represent the aquifer's response to pumping. Furthermore, a verification period was analyzed with regard to extracted concentrations in early 2023.

For the numerical model projections, total lithium to be extracted from the proposed wellfields was calculated for a total period of 40 years considering the two stages of the Project and considering that the East Wellfield will be pumping for 40 years and that the Stage 2 Expansion wells will be pumping for 38 years (at the start of year 3 of the LOM). The projected wellfields were designed to produce a reliable quantity of brine at an average annual rate of approximately 315 L/s in the case of the East Wellfield and 191 L/s in the case of the Southwest Wellfield.

From the point of reference of brine pumped to the evaporation ponds, the estimated Proven Reserve corresponds to 0.445 Mt of LCE while the estimated Probable Reserve is 2.041 Mt of LCE, with a total Proven and Probable Reserve of 2.486 Mt of LCE. The Mineral Reserve was classified according to industry standards for brine projects, as well as the confidence of the numerical model predictions and potential factors that could affect the estimation.

Production wells were placed in Measured Resource zones. The employees of Montgomery & Associates believe that the Proven and Probable Mineral Reserves were adequately categorized, as described below:

- Proven Reserves were specified for the first 7 years of operation (years 1-7 in the East Wellfield (Stage 1) and years 3-9 for the Stage 2 Expansion given that short-term results have higher confidence due to the current model calibration and also the initial portion of the projected LOM has higher confidence due to less expected short-term changes in extraction, water balance components, and hydraulic parameters.
- Probable Reserves were conservatively assigned after 6 years of operation (years 8-40 in the East Wellfield and years 10-40 for the Stage 2 wells because the numerical model will be recalibrated and improved in the future due to potential changes in neighboring extraction, water balance components, and hydraulic parameters.

During the evaporation and concentration process of the brine, there will be anticipated losses of lithium. Based on the Chapter 10 breakdown of recoveries and consideration of deleterious element concentrations, the amount of recoverable lithium from the ponds and plant is calculated to be 70% of the total brine supplied to the ponds. This applies for the current processing method which may be subject to improvements at a later date.

Factors that may affect the Brine Reserve estimate include:

- Assumptions regarding aquifer parameters and total dissolved solids used in the groundwater flow model for areas where empirical data do not exist.
- Estimated vertical hydraulic conductivity values which partially control the amount of anticipated future dilution in areas where fresh water overlies brine.

Regardless of these sources of uncertainty, each phase of the Project was conducted in a logical manner, and results were supportable using standard analytical methodologies. In addition, calibration of the numerical model against long-term pumping tests provides solid support for the conceptual hydrogeologic model developed for the Project. Thus, there is a reasonably high-level confidence in the ability of the aquifer system to yield the quantities and grade of brine estimated as Proven and Probable Mineral Reserves. To the extent known by the employees of Montgomery & Associates, there are no known environmental, permitting, legal, title, taxation, socioeconomic, marketing, political or other relevant factors that could affect the Mineral Reserve estimate which are not discussed in this Report.

22.5 Capital and Operating cost estimates

The indicated capital and operational costs reflect a reasonable estimate of the incurred and future expected costs for the SDV Stage 1 project within the limitations defined in the document. These costs can be utilized for economic analysis, with particular attention required to the sensitivity analysis of excursions in production rates.

22.6 Economic Analysis

Based on the assumptions detailed in this report, the economic analysis of Sal de Vida demonstrates positive financial outcomes. The sensitivity analysis further strengthens its viability, as it indicates resilience to market fluctuations and cost changes.

By conducting the sensitivity analysis, it provides a comprehensive understanding of the project's financial risks and opportunities. This approach allows for informed decision-making and assessment of the Sal de Vida project potential performance under varying economic scenarios.

It is the opinion of the employee of Gunn Metallurgy that 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.

22.7 SDV Stage 2 expansion

The planned Sal de Vida Stage 2 expansion has been studied at a pre-feasibility study level. The process pond infrastructure, process plant design and support service infrastructure are deemed of suitable design and sufficiently quantified to support the level of study. The accuracy of cost information gained from ongoing Stage 1 execution is deemed sufficiently accurate for the level of study. Within the constraints described in this chapter, it is the QPs opinion that the Stage 2 expansion will support economically viable extraction of the mentioned saleable lithium products.

23. RECOMMENDATIONS

23.1 Exploration

Exploration should be conducted to better identify and potentially demonstrate additional extractable brine in other parts of the basin. Favorable exploration results represent Project upside potential. The following additional investigations are recommended:

- Geophysical surveys: perform additional gravity, magnetic, and resistivity surveys over the east, south and west sub-basins to supplement the existing surveys.
- Core drilling: additional wells in the southwest and eastern portions of the mine concessions that are deeper than 300 m.
- Downhole sampling of any additional wells to obtain brine chemistry and drainable porosity results.
- Additional 30-day pumping tests to identify potential for new wellfields.

Quality assurance and quality control (QA/QC) measures should be continued for all collected brine samples including the use of blanks, duplicates, standards, and secondary (external) laboratories to increase confidence in the obtained data. 10% to 20% of the collected samples should be analyzed for QA/QC purposes, and a round-robin analysis of brine samples is recommended. The determination of drainable porosity should be confirmed with two independent methodologies including the analysis of core samples and indirect measurements (e.g. borehole magnetic resonance), among others.

This program is estimated at US$3 M.

23.2 Resource Estimate

23.2.1 Resource block model

It is recommended that a resource block model be created instead of the polygon method to estimate the lithium brine resource. The recommended block model will incorporate the same input parameters as the polygon method (lithium concentration and drainable porosity) in the categorized zones, however more refined block sizes and an appropriate interpolation method is believed to improve confidence in the resource estimate. Furthermore, new brine sample results from pumping and production wells should be incorporated.

This initial resource model update is estimated at US$200,000.

23.2.2 Block model updates

Based on newly obtained field data which would include additional wells, depth specific sampling for brine and drainable porosity at greater depths, and additional pumping tests, the resource estimate should be updated. The categorization should also be reviewed based on newly obtained information.

The subsequent resource model update is estimated at US$200,000.

23.3 Reserve Estimate

23.3.1 Further collection of data

The numerical model should be updated in the short to medium term to simulate lithium in addition to total dissolved solids. The simulation of total dissolved solids is necessary to properly simulate density- driven flow due to its good correlation to water density. However, recent software advances allow for a more feasible simulation of multiple solutes; thus, it is recommended that lithium be simulated as the second solute (instead of based on the linear relationship to total dissolved solids) to improve the reserve estimate. To incorporate lithium, a 3D distribution is required for the initial conditions of the reserve simulation, and the calibration phase should be revisited to confirm the simulated lithium grades. During this update, the grid refinement should also be adjusted based on the most recent wellfields.

This initial reserve model update is estimated at US$200,000.

23.3.2 Updating of models

A review of the numerical model should be completed when information from the Recommendations Phase 1 work is available. Results of the gravity and magnetic surveys should be used to reinterpret the structural model with the inclusion of all existing core holes. A sensitivity analysis should be completed on the updated steady-state and transient calibration models as well as the predictive model based on potential changes in the anisotropy of hydraulic conductivity, and the extension of the deeper, more permeable units, along with other important model parameters such as effective porosity and dispersivity.

Modeling other elements of interest as distinct solutes in the model could be conducted, rather than relying on the best-fit linear curves with TDS. This will allow for the improved determination of extracted concentrations of other solutes that are not well correlated to TDS (e.g., magnesium and sulphate).

The grid should be further refined in areas of the projected production wells and the deeper portions of the numerical model should be updated with improved information on the brines at depth, including the hydraulic conductivity and storage zones. Also, model calibration in the Río de los Patos sub-basin should be updated, depending on the streamflow measurement data.

Recommended future work includes:

- A sensitivity analysis on the updated steady-state and transient calibration models as well as the predictive model based on potential changes in the anisotropy of hydraulic conductivity, and the extension of the deeper, more permeable units, along with other important model parameters such as effective porosity and dispersivity.
- A detail analysis of flow units and low conductivity clay barriers, including lateral extension over the modeled area. This will further improve decisions on future drillings locations and screened zones, understanding of the connectivity with shallower aquifers and surface, and estimate drawdown effects over time.
- Upon additional deeper drilling, updating the deeper portions of the numerical model with improved information including the hydraulic conductivity and storage zones.
- Collection of quarterly streamflow measurements along the Río de los Patos at multiple locations in order to improve its representation in the numerical model and better evaluate the gaining and losing reaches of the river.
- Continued monitoring of water levels and water chemistry data from wells and surface water.
- Further improvement of the model calibration in the Río de los Patos sub-basin if a detailed evaluation of freshwater extraction is needed.
- Further vertical refinement of the upper model layer to better represent evapotranspiration and changes in water density at the surface.
- Recalibration of the model after at least 1 year of production wellfield pumping and monitoring.

This reserve model update is estimated at US$300,000.

23.4 Environmental Studies

According with the water balance report (Montgomery & Associates, 2020) liquid and solid (snowmelt) precipitation in the basin is estimated at 129 mm/a, or as a volumetric rate, at 39,780 m^3/hr. Using 5 - 20% of the annual volumetric precipitation, an estimated range of precipitation recharge is likely between 1,980 - 7,920 m^3/hr (Montgomery & Associates, 2020). The current best estimate for groundwater recharge at this area is considered to be 5,400 m^3/hr; however, whenever the recharge estimate is used, it is recommended that a sensitivity analysis for recharge rates as low as 1,980 m^3/hr, or as high as 7,920 m^3/hr also be run. If these sensitivity analyses identify a risk, then a more focused investigation may be required to assess the chance of a having a recharge below or above a specific value (Montgomery & Associates, 2020). Specific factors that are recommended for investigation include:

- Estimating runoff and shallow groundwater directions and rates from available topography.
- Estimating trends in precipitation, snowmelt, and evaporation in the mid-term (approximately 30 years) and long term (approximately 60 years) from IPCC approved climate models for an intermediate scenario.

- Evaluating the variation of drought periods and wet periods from the climate record and from remote sensing observations of lake extents in the salar over the last 40 years. Determine whether El Niño Southern Oscillation (ENSO) effect can be observed in the record.
- Generating scenarios for multi-year droughts that last as long as those interpreted from the above-mentioned analysis.
- Modeling the effects of the water balance of dry, average, and wet scenarios, with and without effects of groundwater withdrawals derived from the groundwater model.
- Ecological flows should be estimated for Río de Los Patos upstream and downstream of where groundwater pumping will occur.
- Ecological levels should be estimated for the lakes in the salar, including Laguna Verde and Laguna Catal.
- Generating a synthetic climate and surface flow series based on the existing meteorological and streamflow monitoring existing to date.
- Model the seasonal and multi-year variations in the water balance based on the field data.

Collection of quarterly streamflow measurements along the Río de los Patos at multiple locations should be conducted to improve its representation in the numerical model and better evaluate the gaining and losing reaches of the river.

Monitoring of water levels and water chemistry data from wells and surface water should continue to provide additional data for numerical modeling purposes.

This program is estimated at US$300,000.

23.5 SDV Stage expansion

The Sal de Vida Stage 2 expansion must progress with independent review of the process design and the plant engineering, and with further studies toward improving financial accuracy, reducing schedule and overall risk. A detailed feasibility study is recommended.

After completing any required value engineering, finalizing technology tradeoffs and selections, and advancing engineering design, the permitting process should commence in parallel with further engineering design. Progression of the Stage 1 execution must be monitored, and lessons learned incorporated into the Stage 2 project. Ongoing risk management and reviews are recommended to ensure currency of risk management activities. Social engagement processes and programs can be amended as needed to include for the future Stage 2 expansion.

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25. RELIANCE ON INFORMATION PROVIDED BY THE REGISTRANT

25.1 Introduction

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.

25.2 Mineral Tenure, Surface Rights, and Royalties

The QPs have not independently reviewed ownership of the Project area and any underlying mineral tenure, surface rights, or royalties. The QPs have relied upon information derived from Allkem, and legal experts retained by Allkem for this information through the following document:

- Allende & Brea Legal Opinion on Galaxy's Mining Properties (December 2020).

The sections of this report that were prepared in reliance on such information are: Section 3.2

25.3 Environmental

The QPs have not independently reviewed the baseline survey data collected. The QPs have relied upon information derived from Allkem and experts retained by Allkem for this information through the following documents:

- ERM, 2011. Línea de Base Ambiental y Social en el Salar de Hombre Muerto.
- Regalado, C.D., 2019. Informe de Impacto Ambiental, Actualización - Proyecto Sal de Vida.
- Ausenco & OWN (Open Work Nature), 2021. Informe de Impacto Ambiental, Actualización - Proyecto Sal de Vida.
- Galaxy. 2021. Technical Report: Mine Closure. Sal de Vida Lithium Project Salar del Hombre Muerto Catamarca, Argentina.
- Knight Piésold Argentina Consultores S.A. 2021. Monitoreo de Humedales Proyecto "Sal de Vida" Salar del Hombre Muerto.

- Montgomery & Associates, 2021. Balance Hídrico de Línea de Base. Proyecto Sal de Vida. Salar del Hombre Muerto, Catamarca, Argentina. Galaxy Lithium (Sal de Vida) S.A.

The sections of this report that were prepared in reliance on such information are: Section 17

25.4 Social and economic impacts

The QPs have not independently reviewed the social and community impacts of the Project. The QPs have relied upon information derived from Allkem and experts retained by Allkem for this information through the following documents:

- ERM, 2011. Línea de Base Ambiental y Social en el Salar de Hombre Muerto.
- Galaxy, 2020. Updated Social Baseline Report.
- Ausenco & OWN (Open Work Nature), 2021. Actualización del Informe de Impacto Ambiental.

The sections of this report that were prepared in reliance on such information are: Section 17.7

25.5 Markets

The QPs have not independently reviewed marketing considerations and commodity price assumptions relevant to the Project. The QPs have relied upon information provided by Allkem, and experts retained by Allkem for this information through the following document:

- Lithium Market Report prepared by Wood Mackenzie, 2022 for Allkem.

The sections of this report that were prepared in reliance on such information are: Section 16

25.6 Taxation

The QPs have not independently reviewed taxation considerations relevant to the Project. The QPs have relied upon information derived from Allkem, and experts retained by Allkem for this information.

The sections of this report that were prepared in reliance on such information are: 18.2.1.4

26. SIGNATURE PAGE

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, Sal de Vida Lithium Brine Project" 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 (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 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 20, Chapter 21, Chapter 22 -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 Sal de Vida 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

CERTIFICATE OF CONSENT for Montgomery & Associates Consultores Limitada

We hereby consent to the incorporation by reference of Chapters 1 (shared), Chapters 3-9, Chapter 11-13, Chapter 17, and Chapters 22-25 (shared) for the “SEC Technical Report Summary, Sal de Vida Lithium Brine Project” the (“Technical Report Summary”) performed by Montgomery & Associates Consultores Limitada in its capacity as an independent consultant to Allkem Limited, which are set forth in 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. We further consent to the use of our name in the Technical Report Summary S-K §229.1300.

PERSONAL INSPECTIONS of Montgomery & Associates Consultores Limitada: Visited site on April 5 to 10, 2010, August 11 to 16, 2010, January 16 to 26, 2011, June 22 to 28, 2011, August 15 to 20, 2011, and April 13, 2018, Qualified Person (“QP”) Michael Rosko conducted a site visit to Sal de Vida, while on July 29 to August 2, 2023, QP Brandon Schneider conducted a site visit to Sal de Vida.

Signing Date: November 15, 2023

/s/ Michael Rosko

Michael Rosko
Principal Hydrogeologist of Montgomery & Associates Consultores Limitada
Registered Professional Geologist of Arizona (#25065), California (#5236), and Texas (#6359)
SME Registered Member #4064687

/s/ Brandon Schneider

Brandon Schneider
Senior Hydrogeologist of Montgomery & Associates Consultores Limitada
Arizona Registered Professional Geologist (#61267)
SME Registered Member #4306449

This report titled “SEC Technical Report Summary, Sal de Vida Lithium Brine Project” with an effective date of June 30, 2023, was prepared and signed by:

/s/ Montgomery & Associates Consultores Limitada

Montgomery & Associates Consultores Limitada

/s/ Michael J. Gunn

Gunn Metallurgy

By: Michael J. Gunn